Stormwater Management Measures
Maintenance Plan & Field Manuals

Additions and Renovations to Alumni Gymnasium and Strength & Conditioning Center
Rider University
Block 2801, Lot 24
Lawrence Township, Mercer County, New Jersey

Party Responsible for Maintenance:

Rider University
2083 Lawrenceville Road
Lawrenceville, NJ 08648

Contact Person(s): Michael Reca Phone: 609-896-5080

Prepared by: Thomas E. O'Shea P.E. Date: September 17, 2021

van note - harvey associates
Since 1894

103 College Road East
Princeton, NJ 08540
609-987-2323

This plan is recorded in

Deed Book # _____ Page # ____ with _____ County Clerk on Date _____

Last Revised on 09 / 17 / 2021
#44760-400-21

Table of Contents

Project Site Description

Part I - Maintenance

Part II - Field Manuals and Maintenance Records

Project Site Description

This project consists of:

- Phase 1 – Strength and Conditioning Center: Building addition to the existing Practice Facility
- Phase 2A – Entry Vestibule: Lobby addition to the existing Alumni Gym
- Phase 2B – Office Additions: Building additions to the existing Alumni Gym consisting of offices
- Phase 3 – New Generator: Electrical equipment upgrades to support Phase 2B

To offset the impervious area increase associated with the building additions and sidewalks, a portion of an existing parking lot on the campus is being removed under Phase 1 that will be greater in area than the increase in impervious area created by the proposed improvements. Additionally, a new rain garden is proposed adjacent to the Phase 2B addition to further mitigate stormwater runoff leaving the site.

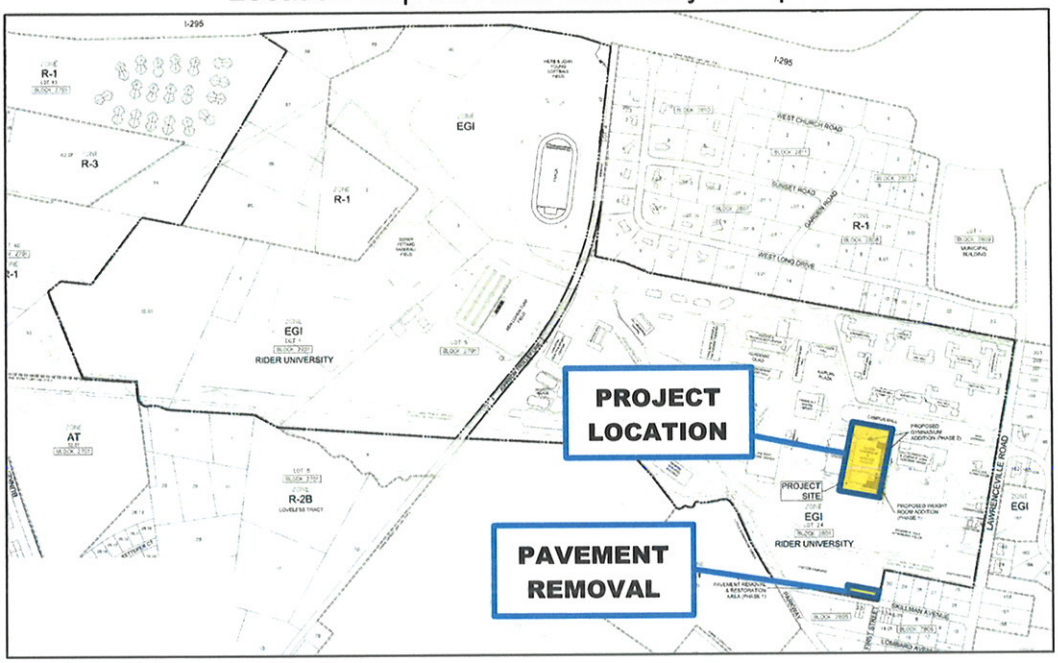
Part I - Maintenance Plan

List of Stormwater Management Measures

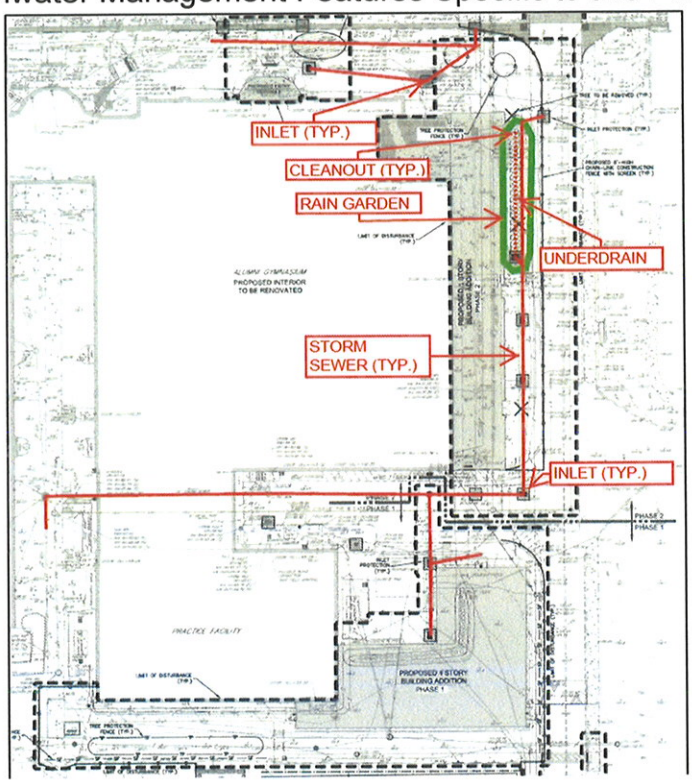
The stormwater management measures incorporated into this development are listed below. The corresponding Field Manuals for the stormwater management measures are located in Part II of the Maintenance Plan.

Type of Stormwater Management Measure	BMP No.	Location Description	State Plane Coordinates / Lat., Long.
Pavement Removal / Restored Meadow Area	Pavement Removal	Southeastern corner of campus parking lot	40.27636 (N), 74.73546 (W)
Rain Garden	Basin	Located to east of Alumni Gym	40.27899 (N), 74.73502 (W)
Storm Sewer System	N/A	Throughout Campus	N/A

Location Map on Rider University Campus



Stormwater Management Features Specific to this Project



No.	Type of Stormwater Management Measure
Rain Garden	Bioinfiltration Basin

See also included Site Utility Plans 1 & 2 (sheets CE-7 & CE-8) and Construction Details – 1 (sheet CE-10) for additional information on the Project's features.

Description of Stormwater Management Measures

- **Pavement Removal / Restored Meadow Area**
  - Approximate Dimensions: 218 ft. (length) x 57 ft. (width)

- **Rain Garden**
  - Design Purposes:
    Water quantity
    2-year storm (3.3 inches);
    10-year storm (5.0 inches);
    100-year storm (8.3 inches)
  - Outlet Control Structure: Inlet Grate set at elevation 100.00
  - Maximum Storage Elevation: 100.01 (100-year storm)
  - Approximate Dimensions: 70 ft. (length) x 5 ft. (width) x 6 in. (depth)

Preventative and Corrective Maintenance Action Plan

Overview

Effective stormwater management system performance requires regular and effective maintenance. This manual establishes a basic Operation and Maintenance (O&M) program based primarily on systematic inspections by appointees of the Owner. During each inspection, checklists (Field Manuals in Part II of this Manual) must be used. The completed checklists must be dated and signed by the designated "Inspector" and incorporated into this manual.

This manual is intended as a guide for the Owner and outlines the proper procedures for conducting routine O&M. The Owner shall appoint a key site person (Inspector) who will perform inspections for the year. This manual will then be transferred yearly to the appointed "Inspector" prior to the inspection. A continuous record of the O&M must be maintained. The Designated Inspectors List will be identified by the Owner. This section must be updated periodically pending a change in the regulatory official(s), the Inspector, the Engineer, or the Contractor.

At least two (2) current copies of this manual shall be kept by the Owner at all times. All correspondence and maintenance checklists shall be reproduced and distributed for inclusion into the manuals.

Routine maintenance and Inspection checklists do not need to be submitted to the Township after they have been completed, unless otherwise requested. This section of the manual has been prepared to provide the Inspector with a simple and systematic method for inspecting, operating and maintaining the systems. For the most part, the O&M involves observation rather than evaluation.

Schedules

Maintenance should be completed on a routine basis along with required inspections as outlined later in this manual. Specific tasks have been outlined in the following sections and should be closely followed to ensure the effectiveness and longevity of the stormwater management system and avoid costly repairs. Standard maintenance forms are provided in Part II.

Access

All of the stormwater management facilities must be accessible for inspection and maintenance. The access route to the rain garden is provided the walkway connecting the drive to the east face of the Alumni Gym building. This route needs to be kept clear and free of obstructions so that equipment and personnel can complete work in a timely fashion. Any trees, shrubs, and underbrush must be pruned or trimmed as necessary to maintain a clear route to all stormwater management systems.

In the event the stormwater management facility becomes a danger to public safety or public health, the municipality may proceed to notify the responsible party in writing. Upon receipt of that notice, the responsible party shall have 14 days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer or his

designee. The municipality, in its discretion, may extend the time allowed for performing maintenance and repair for good cause. If the responsible party fails or refuses to perform such maintenance and repair, the municipality may immediately proceed to do so and shall bill the cost thereof to the responsible party.

Safety

Standard safety precautions should be taken when maintaining the stormwater management facilities. The primary concern for the rain garden is related to standing water (above the normal water surface elevation) remaining in the system for more than 72 hours. Extreme caution should be used when entering any areas of standing water.

All personnel should receive proper training prior to commencing work. Maintenance training begins with a basic description of the purpose and function of the overall rain garden, its structures, and its major components. Such understanding will enable maintenance personnel to provide more effective component maintenance and more readily detect maintenance-related problems.

Rain Garden

All structural components of the rain garden, including but not limited to the outlet structure (inlet), grate, underdrain, underdrain valve, and the sewer pipe, must be cleared of all debris at least twice annually and after major storm events. Sediment and debris removal shall only occur when the rain garden's storage area has drawn down enough for safe and stable access and entry. Disposal of debris, trash, sediment and other waste material must be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

The rain garden's underdrain valve is normally kept closed allowing for water that soaks into the planting soil to be infiltrated into the subsoil and transpired by the plantings inside the basin. Should the planting soil remain saturated at the surface after 72 hours following a storm event, the underdrain valve should be opened for approximately 24 hours to allow for the water to drain before the valve is reclosed. Subsequently, the planting soil shall be monitored. If the oversaturation is observed again, contact the engineer.

The grass around the rain garden shall be mowed on a minimum frequency of once a month to prevent ponding and erosion. Plants at the rain garden bottom should only be mowed only once a year in the early spring to promote new growth.

Cleaning of Inlet, Cleanout and Manhole Structures

Regular removal of sediment and debris accumulated in outlet, inlet, cleanout and manhole structures is the best method to preventing clogging and failure of the storm sewer system and avoid costly repairs (i.e. no standing water). Sediment removal should take place when the sewer is completely dry. Disposal of debris and trash should be done at suitable disposal/recycling sites and in compliance with all applicable local, state, and federal waste regulations. Outlet structures, inlets, cleanouts, and manhole structures should be inspected and maintained on a biannual basis.

Landscape Care

If any bare spots or eroded areas are observed within the vegetated areas of the rain garden, the meadow restoration area, or any open space upslope of these features, they

should be replanted and/or stabilized at once. Vegetated areas should be inspected on a semiannual basis. All litter and other debris that is observed during these inspections should be removed.

Preventative Maintenance

The frequency of the preventative maintenance actions listed here is adopted from Chapter 9, BMP Manual of Structural Stormwater Management Measures. The design engineer and/or owner should adjust the frequency of preventative maintenance actions as needed for the site-specific conditions affecting the stormwater management system performance.

Preventative Maintenance Actions	Frequency
Rain garden and outlet control structure (inlet) should be inspected for clogging and excessive debris and sediment accumulation. Rip rap apron at outlet of storm sewer shall be inspected as well.	Quarterly
All storm structures and cleanouts within the rain garden or part of the sewer system should be checked for sediment and standing water.	Monthly (or as required)
General maintenance considerations include watering thoroughly the first year, and inspecting vegetation to discover and control pests and diseases in their early stages. General maintenance is the same as Landscape Care above, with the additional maintenance measure of staking.	Annual
Fertilizer should be applied with care to keep fertilizer off upslope areas where it can wash into the storm drain system. Pesticides should be used with care and only applied to address specific problems.	Unscheduled
Regular removal of sediment and debris from storm structures (including inlets, cleanouts, outlet structures and manholes) accumulated should be done when the sewer is completely dry. Herbaceous vegetation is planted to achieve between 80-100% coverage within a two-year period.	Biennial (or as required)

Inspection and Logs of All Preventative and Corrective Maintenance

Inspection Checklists in the Field Manual for the stormwater management measures on this site include:

- Rain Garden Maintenance Inspection Form
- Storm Sewer, Manhole, Inlet and Open Channel Maintenance Inspection Form

The logs of all inspections, and any preventative and corrective maintenance performed should be attached in the "**Maintenance Logs and Inspection Records**" section. See Part II of this Maintenance Plan.

Maintenance Personnel, Equipment, Tools, and Supplies

No specialized equipment, tools, or supplies are needed to maintain the stormwater management facilities; however, the following is a list of recommended materials and equipment to accompany any inspector:

Stormwater Management Recommended Inspection Equipment/Materials	Quantity	Required for:
Stormwater Facilities (SWF)-Specific Information		
Blank inspection checklists	multiple	All SWFs
Site plans/as-built drawings	per facility	All SWFs
Facility type and outfall pipe size	per facility	All SWFs
Previous inspection results (Reports, redlines and photos)	per facility	All SWFs
Confined Space Entry permit (as required)	per facility	Underground/Confined Space Entry (CSE)
Inspection Equipment		
Clipboard w/Forms, Pencil and Compass	1	All SWFs
Area Map	1	All SWFs
Mobile Telephone	1	All SWFs
Two-Way Radio w/charged batteries	2	All SWFs
100' Measuring Tape	1	All SWFs
25' Retractable Tape Measure	1	All SWFs
Bolt Cutters	1	All SWFs
Cans of Orange Spray Paint	2	All SWFs
Crow Bar	1	All SWFs
Digital Camera	1	All SWFs
First Aid Kit	1	All SWFs
Flashlight w/charged batteries	1	All SWFs
Goggles or Safety Glasses	2	All SWFs
Hardhats	2	All SWFs

Leather Gloves	2	All SWFs
Manhole Cover Tool / Puller	1	All SWFs
Pair of Hard Sole Boots (wear)	2	All SWFs
Pair of Rubber Boots (as-needed)	2	All SWFs
Roll of Orange Tie-off Tape	1	All SWFs
Std. Size Bolt Locks and Keys (for pond gates)	2	All SWFs
Waterproof Carrying Bag	1	All SWFs
Machete or Pruning Sheers	1	Above ground
Monkey Wrench	1	Above ground
Standard Shovel	1	Above ground
Observation Well Cap Wrenches	1/Size	Infiltration facilities only
Small Size Bolt Lock and Key (for well caps)	1	Infiltration facilities only

Disposal Plan

Disposal/Recycling Procedures

A disposal plan shall be prepared by the Owner. Any permits that may be required shall be obtained and this manual shall be updated accordingly.

Permits for the Proposed Onsite Disposal Field (if required)

Local/State permits ☐ not required

☐ required

Permit Number	Government Entity	Issuance Date	Expiration Date

Disposal Field – Offsite

Description of the Offsite Disposal:

_____

_____

_____

Safety Measures and Procedures

Prior to maintaining or inspecting the on-site stormwater facilities/structures, personnel should review this manual and the field manuals to understand the systems and be aware of any safety precautions that may be required.

Training Plan and Records

- Note: These are general notes and actions from the New Jersey Best Management Practices Manual and all items listed may not necessarily apply to this project.
- Chapter 9.7 Small Scale Bioretention Systms (Rain Garden)

  Regular and effective maintenance is crucial to ensure effective extended detention performance; in addition, maintenance plans are required for all stormwater management facilities associated with a major development. There are a number of required elements in all maintenance plans, pursuant to N.J.A.C. 7:8-5.8; these are discussed in more detail in Chapter 8: Maintenance of Stormwater Management Measures. Furthermore, maintenance activities are required through various regulations, including the New Jersey Pollutant Discharge Elimination System (NJPDES) Rules, N.J.A.C. 7:14A. Specific maintenance requirements for bioretention basins are presented below; these requirements must be included in the extended detention basin's maintenance plan.

  General Maintenance

  - Proper and timely maintenance is essential to continuous, effective operation; therefore, an access route must be incorporated into the design, and it must be properly maintained.
  - All structural components must be inspected, at least once annually, for cracking, subsidence, spalling, erosion and deterioration.
  - Components expected to receive and/or trap debris and sediment must be inspected for clogging at least four times annually, as well as after every storm exceeding 1 inch of rainfall.
  - Sediment removal must take place when all runoff has drained from the planting bed and the basin is dry.
  - Disposal of debris, trash, sediment and other waste material must be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.
  - In systems with underdrains, the underdrain piping must be connected, in a manner that is easily accessible for inspection and maintenance, to a downstream location.
  - Access points for maintenance are required on all enclosed areas within a small-scale bioretention system; these access points must be clearly identified in the maintenance plan.
  - Stormwater BMPs may not be used for stockpiling of plowed snow and ice, compost, or any other material.
  - A detailed, written log of all preventative and corrective maintenance performed on the small-scale bioretention system must be kept, including a record of all inspections and copies of maintenance-related work orders. Additional maintenance guidance can be found at https://www.njstormwater.org/maintenance_guidance.htm

Vegetated Areas

- Bi-weekly inspections are required when establishing/restoring vegetation.
- A minimum of one inspection during the growing season and one inspection during the non-growing season is required ensure the health, density and diversity of the vegetation.
- Mowing/trimming of vegetation must be performed on a regular schedule based on specific site conditions; perimeter grass should be mowed at least once a month during growing season.
- Grasses within the small-scale bioretention system must be carefully maintained with lightweight equipment, such as a hand-held line trimmer, in order to maintain the permeability of the system.
- Vegetative cover must be maintained at 85%; damage must be addressed through replanting in accordance with the original specifications.
- Vegetated areas must be inspected at least once annually for erosion, scour and unwanted growth; any unwanted growth should be removed with minimum disruption to the remaining vegetation.
- All use of fertilizers, pesticides, mechanical treatments and other means to ensure optimum vegetation health must not compromise the intended purpose of the bioretention system.

Drain Time

- The design drain time for the maximum design storm runoff volume must be indicated in the maintenance plan.
- The planting bed should be inspected at least twice annually to determine if the permeability of the bed has decreased.
- The design drain time for the maximum design storm runoff volume must be indicated in the maintenance manual.
- If the actual drain time is significantly different from the design drain time, the components must be evaluated, and appropriate measures taken to return the bioretention system to the original tested as-built condition.
- If the bioretention system fails to drain the Water Quality Design Storm within 72 hours, corrective action must be taken and the maintenance manual revised accordingly to prevent similar failures in the future.
- The water surface elevation must be indicated on the maintenance plan and in the maintenance logs to facilitate inspections.

More training information is available at NJ Stormwater.org (http://www.nj.gov/dep/stormwater/training.htm)

Annual Evaluation of the Effectiveness of the Plan

The responsible party should evaluate the effectiveness of the current maintenance plan by comparing the maintenance plan with the actual performance of the maintenance. The items to evaluate may include, but not be limited to,

- Whether the inspections have been performed as scheduled;
- Whether the preventive maintenance has been performed as scheduled;
- Whether the frequency of preventative maintenance needs to increase or decrease;
- Whether the planned resources were enough to perform the maintenance;
- Whether the repairs were completed on time;
- Whether the actual cost was consistent with the estimated cost;
- Whether the inspection, maintenance, and repair records have been kept.

If actual performance of those items has been deviated from the maintenance plan, the responsible party should find the causes and implement solutions in a revised maintenance plan and documents below.

Annual Evaluation Records

Evaluator(s)	Date of Evaluation	Decision
		__Maintain current version OR __Revise current version Revision date _____ (also update the last revision date on the cover page) __Requires a new deed recording (also update the last recording information on the cover page)
		__Maintain current version OR __Revise current version Revision date _____ (also update the last revision date on the cover page) __Requires a new deed recording (also update the last recording information on the cover page)
		__Maintain current version OR __Revise current version Revision date _____ (also update the last revision date on the cover page) __Requires a new deed recording (also update the last recording information on the cover page)

Part II - Field Manuals

Attachment of Field Manuals
for Stormwater Management Measures on this Site

As per N.J.A.C. 7:8-5.8(b)&(e), preventative and corrective maintenance shall be performed to maintain the function of stormwater management measures, including repair or replacement of the structure; removal of sediment, debris or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; repair or replacement of non-vegetated linings, and removal of rodent/wildlife and repair/restoration to damaged affected areas caused by them.

The Field Manual attached to this Maintenance Plan is a separate document pertaining to one specific stormwater management measure, the rain garden, and should be used by inspections and maintenance crews in order to carry out the maintenance work required by N.J.A.C. 7:8-5.8(e).

Rain Garden (Bioretention System)
Field Manual

Development Name: Rider University Additions to Alumni Gym and Strength & Conditioning Center

Township, County: Lawrence Township, Mercer County

Location of Rain Garden: 40.27899 (N), 74.73502 (W)

Location Description: To the east of Alumni Gym

Location Map

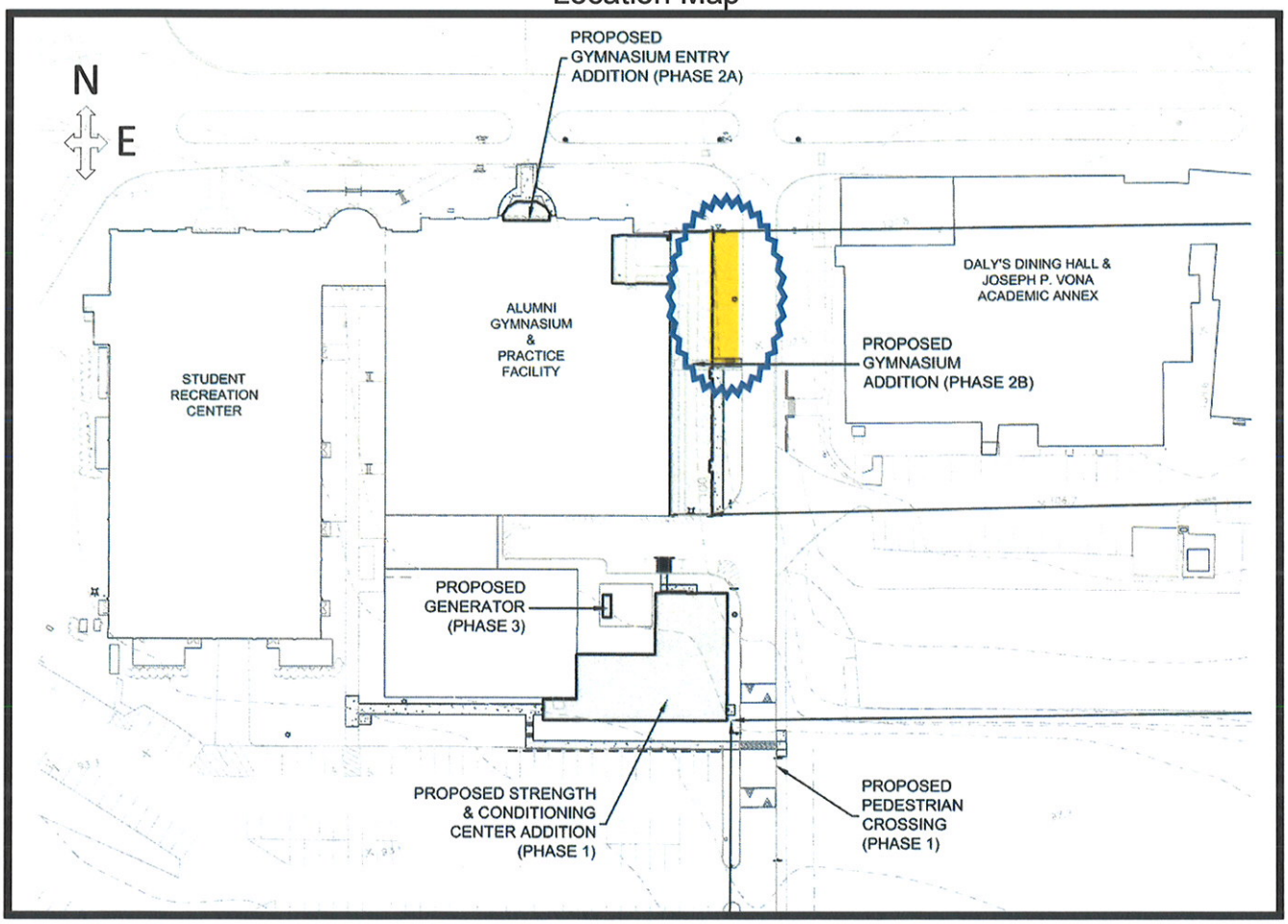


Table of Contents

Rain Garden (Bioretention System) Overview

Functionality

Rain gardens, also known as bioretention systems, are used to remove a wide range of pollutants, such as suspended solids, nutrients, metals, hydrocarbons, and bacteria from stormwater runoff. They can also be used to reduce peak runoff rates and increase stormwater infiltration when designed as a multi-stage, multi-function facility.

A bioretention system can be configured as either a bioretention basin or a longer, narrower bioretention swale. In general, a bioretention basin has a flat bottom while a bioretention swale may have sloping bottom. Runoff storage depths above the soil bed surface are typically shallow. The TSS removal rate for bioretention systems is 80 or 90 percent, depending upon the thickness of the soil planting bed and the type of vegetation grown in the bed.

Proper care and attention in the long-term maintenance of the stormwater management measure is critically important to the safety and health of the public.

Type of BMP – Dry Basin / Infiltration

A bioretention system is a type of **dry** basin. Dry basins must fully drain within 72 hours of the most recent rainfall. Standing water in excess of 72 hours is a sign of basin failure. It may also contribute to mosquito breeding and other health and safety issues. The design drain time shall be closely monitored to ensure that potential failure is recognized early.

A bioretention system with infiltration can also be designed for extended detention, in which case it will attenuate peak flows from storms larger than the Water Quality Design Storm.

Basic Design Information

Hydrology Design Targets

1. The bioretention system is designed as an offline system.
2. The design drain time is 72 hours.

Basin Configuration Targets

1. Planting Soil Bed
   - The depth of the soil planting bed is 2 feet.
   - Mixture of the planting soil consists of 0 to 92% of sand. (with no more than 25% of the sands as fine or very fine sands; no more than 15% silt and clay with 2% to 5% clay content). The organic matter shall be within 3% to 7%.
   - The pH of the planting soil should be in the range of 5.5 and 6.5.
   - Filter fabric is placed along the sides of the soil planting bed.

2. Outlet Information:
   Inlet grate elevation of 100.00'

3. Vegetation
   - The vegetation type to be used in this bioretention system includes perennial flowers and irises. A Landscaping Plan should be included in the Reference Documents section of this field manual.

4. Underdrain
   - The perforated underdrain pipe is 6 inches in diameter, about 63 feet in length, at a slope of 0%.
   - Filter fabric is installed to wrap around the laterals.
   - The gravel layer surrounding the underdrain consists of 3 inches of gravel above the underdrain and 3 inches of gravel below the underdrain.

Critical Maintenance Features

1. No heavy equipment on the basin surface.
2. Remove vegetation strictly in accordance with the landscaping plan.
3. Grass clippings shall be collected from the basin and properly disposed.
4. Keep the appearance of the basin aesthetic.

Reference Documents

Documents to be placed in this field manual should include the following:

- As-built Drawings with Drainage Plans
- Landscape Plans
- Soil Boring Logs
- Permeability Test (Pre-construction)
- Permeability Test (Post-construction)

Inspection Checklist / Maintenance Actions
Bioretention System

Checklist (circle one): Quarterly / Annual / Monthly / Special Event Inspection

Checklist No. _____ **Inspection Date:** _____

Date of most recent rain event: _____

Rain Condition (circle one):
Drizzle / Shower / Downpour / Other _____

Ground Condition (circle one):
Dry / Moist / Ponding / Submerged / Snow accumulation

The inspection items and preventative/corrective maintenance actions listed in the subsequent section represent general requirements. The design engineer and/or responsible party shall adjust the items and actions to better meet the conditions of the site, the specific design targets, and the requirements of regulatory authorities.

	For Inspector			For Maintenance Crew
B Basin Bed	1	Standing water is present after the design drain time The observed drain time is approximately _____ hours.	Y__ N__	Recheck to determine if there is standing water after 72 hours If standing water is present longer than 5 days, report to mosquito commission. Remove any sediment buildup Check the soil permeability Till the soil bed with rotary tiller or disc harrow Replace the planting soil, if necessary Work Order # _____
	2	Excessive sediment, silt, or trash accumulation on basin bed	Y__ N__	Clean pretreatment system Remove silt, sediment, and trash
	3	Erosion or channelization is present	Y__ N__	Check whether the flow bypass or diversion device is clogged Re-grade the infiltration bed Work Order # _____
	4	Animal burrows/rodents are present	Y__ N__	Pest control Work Order # _____
Note:				

	For Inspector			For Maintenance Crew
B Basin Bed	5	Uneven bed	Y__ N__	Use light equipment to resurface the bed Work Order # _____
	6	Evidence of sinkholes or subsidence	Y__ N__	Monitor for sinkhole development
C Vegetation	1	Large spot(s) showing bare soil	Y__ N__	Vegetative cover must be maintained at 85%. Revegetate the entire basin if 50% or more vegetation has been lost. Check Landscaping plan for guidance (if available) Work Order # _____
	2	Invasive plants are present	Y__ N__	Remove the invasive plants and restore the vegetation in accordance with the landscaping plan Work Order # _____
	3	The vegetation in the basin has been mowed or removed	Y__ N__	Revegetate the system in accordance with the vegetation plan Work Order # _____ Note: The vegetation in a bioretention system should **not** be mowed or removed
Note:				

	For Inspector			For Maintenance Crew
D Bioretention System Embankment and Side Slopes	1	Signs of erosion, soil slide or bulges, seeps and wet spots, loss of vegetation, or erosion on the basin slope	Y__ N__	Check for excessive overland runoff flow through the embankment. Check for any sink hole development Direct the overland runoff to the forebay or pretreatment area Restabilize the bank Work Order # _____
	2	Overgrown perimeter vegetation	Y__ N__	Mow the vegetation on the perimeter of the embankment Work Order # _____ Note: Mowing of vegetation should only take place in the area **outside** the basin. Dense vegetation must be maintained in the basin.
E Outlet	1	Trash or debris accumulation more than 20%	Y__ N__	Clean and remove Determine source of trash and address to reduce future maintenance costs or basin failure
	2	Discharge pipe apron is eroded or scoured	Y__ N__	Restabilize the discharge riprap apron Work Order #_____
G Miscellaneous	1	Excessive or overgrown vegetation blocking access to the basin	Y__ N__	Clear, trim, or prune the vegetation to allow access for inspection and maintenance Work Order #_____
Note:				

Follow Up Items (Component No. / Inspection Item No.):

_____

Associated Work Orders: # _____, # _____, # _____, # _____, # _____

_____	_____	_____
Inspector Name	**Signature**	**Date**

Report issues to the local authority and mosquito commission as required by local ordinances and regulatory authorities.

File this checklist in the Maintenance Log after performing maintenance.

Preventative Maintenance Record

Corresponding Checklist No. _____
Component No._____, Inspection Item No._____

Work Logs

Activities	Components	Date Completed
Sediment/debris removal **Sediment removal should be taken place when the basin is thoroughly dry.**	B – Basin Bed	
	D – Bioretention System Embankment and Side Slopes	
	E – Outlet	
Vegetation removal	B – Basin Bed	
	D – Basin Embankment and Side Slopes	
	E – Outlet	

Vegetation is removed by _____ (type of equipment) with minimum disruption to the remaining vegetation.

All use of fertilizers, pesticides, mechanical treatments, and other means to ensure optimum vegetation health must not compromise the intended purpose of the stormwater management measure.

Debris, sediment, and trash are handled by University staff.

Crew member:_____/_____ **Date:** _____
(name/ signature)

Supervisor:_____/_____ **Date:** _____
(name/ signature)

File this Preventative Maintenance Record in the Maintenance Log after performing maintenance.

Corrective Maintenance Record

1. **Work Order #** _____ **Date Issued** _____

2. **Issue to be resolved**:

3. The issue was from **Corresponding Checklist** _____, **Component No.** _____, **Inspection Item No.**____.

4. **Required Actions**

Actions	Planned Date	Date Completed

5. **Responsible person(s):**

   _____

6. **Special requirements**
   - Time of the season or weather condition :_____
   - Tools/equipment:_____
   - Subcontractor (name or specific type):_____

Approved by _____/_____ **Date** _____
(name/signature)

Verification of completion by _____/_____ **Date** _____
(name/signature)

File this Corrective Maintenance Record in the Maintenance Log after performing maintenance.

Maintenance Logs and Inspection Records

As per N.J.A.C. 7:8-5.8(e), preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure(s), including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of non-vegetated linings.

As per N.J.A.C. 7:8-5.8(f), the person responsible for maintenance shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.

The responsible party shall maintain a record of all maintenance actions performed, including:

1. Inspection checklists from each performed inspection
2. Preventative maintenance logs
3. Corrective maintenance logs, including work orders
4. Other maintenance records

Stormwater Management Measures
Maintenance Plan

Maintenance Logs and Inspection Records

Table of Contents

Inspection Checklist Log

1. **The responsible party shall report issues to the local authority and mosquito commission as required by local ordinances and regulatory authorities.**
2. The maintenance crew should fill out the checklist in the field manual when performing each inspection/maintenance task.
3. After the maintenance task is performed, the checklist should be filed in the Maintenance Plan and recorded in the log below.

Cycle of Inspection	Stormwater Management Measure No.	Checklist No.	Date(s) of Inspection
1st Quarter			
2nd Quarter			
3rd Quarter			
4th Quarter			
Unscheduled Inspection; e.g., after 1" rain			
1st Quarter			
2nd Quarter			
3rd Quarter			
4th Quarter			
Unscheduled Inspection; e.g., after 1" rain			
1st Quarter			
2nd Quarter			

Cycle of Inspection	Stormwater Management Measure No.	Checklist No.	Date(s) of Inspection
3rd Quarter			
4th Quarter			
Unscheduled Inspection; e.g., after 1" rain			
1st Quarter			
2nd Quarter			
3rd Quarter			
4th Quarter			
Unscheduled Inspection; e.g., after 1" rain			
1st Quarter			
2nd Quarter			
3rd Quarter			
4th Quarter			
Unscheduled Inspection; e.g., after 1" rain			

Preventative Maintenance Log

Maintenance Schedule	Stormwater Management Measure No.	Preventative Maintenance Record No.	Date(s) of Maintenance
1st Quarter			
2nd Quarter			
3rd Quarter			
4th Quarter			
Unscheduled Inspection; e.g., after 1" rain			
1st Quarter			
2nd Quarter			
3rd Quarter			
4th Quarter			
Unscheduled Inspection; e.g., after 1" rain			

Corrective Maintenance Log

Maintenance Schedule	Stormwater Management Measure No.	Corrective Maintenance Record No.	Date(s) of Maintenance
1st Quarter			
2nd Quarter			
3rd Quarter			
4th Quarter			
Unscheduled Inspection; e.g., after 1" rain			
1st Quarter			
2nd Quarter			
3rd Quarter			
4th Quarter			
Unscheduled Inspection; e.g., after 1" rain			

STORM SEWER, MANHOLE, INLET & OPEN CHANNEL MAINTENANCE INSPECTION FORM

Facility Number:_____ Date:_____ Time:_____

Subdivision Name:_____ Watershed:_____

Weather:_____ Inspector(s):_____

Date of Last Rainfall:_____ Amount:_____ Inches Streets:_____

Mapbook Location:_____ GPS Coordinates:_____

Property Classification: Residential [ ] Government [ ] Commercial [ ] Other:_____

Type of Practice (as designed): Dry Swale [ ] Wet Swale [ ] Grass Channel [ ]

As-built Plan Available? Yes [ ] No [ ]

Is Facility Inspectable? Yes [ ] No [ ] Why?_____ Comments Specific Location(s):_____

Scoring Breakdown:

N/A = Not Applicable
N/I = Not Investigated
0 = Not a Problem
1 = Monitor (potential for future problem exists)
2 = Routine Maintenance Required
3 = Immediate Repair Necessary

* **Use open space in each section to further explain scoring as needed**

1. Culverts						
Debris	N/A	N/I	0	1	2	3
Metal corrosion	N/A	N/I	0	1	2	3
Metal protective material	N/A	N/I	0	1	2	3
Metal misalignment or split seams / joints	N/A	N/I	0	1	2	3
Leaks	N/A	N/I	0	1	2	3
Concrete / masonry major spalling (exposed rebar)	N/A	N/I	0	1	2	3
Concrete / masonry minor spalling or parging (< 1")	N/A	N/I	0	1	2	3
Concrete / masonry joint failure	N/A	N/I	0	1	2	3
Concrete / masonry watertight	N/A	N/I	0	1	2	3
2. Soil / Filter Material						
Depth and material of layers	Depth:_____				Material:_____	
Test pit depth	Depth:_____					
Accumulation of debris and sediments	N/A	N/I	0	1	2	3
Accumulation of oil/ chemicals	N/A	N/I	0	1	2	3
Standing water			No		Yes	
Filter fabric	N/A	N/I	0	1	2	3
Other:	N/A	N/I	0	1	2	3
3. Underdrains						
Broken	N/A	N/I	0	1	2	3
Daylighted	N/A	N/I	0	1	2	3
Clogged	N/A	N/I	0	1	2	3
Other:	N/A	N/I	0	1	2	3

4. Check Dams						
Is clear of debris and trash	N/A	N/I	0	1	2	3
Sediment build up > 25% of original WQv	N/A	N/I	0	1	2	3
Undermined / eroded	N/A	N/I	0	1	2	3
Wood condition	N/A	N/I	0	1	2	3
Pea gravel diaphragm at correct level	N/A	N/I	0	1	2	3
5. Vegetation						
Density	N/A	N/I	0	1	2	3
Evidence of die-off	N/A	N/I	0	1	2	3
6. Upland Characteristics						
Accumulation of debris and trash	N/A	N/I	0	1	2	3
Erosion	N/A	N/I	0	1	2	3
7. Special Structures						
Vehicular access	N/A	N/I	0	1	2	3
Accumulation sediment / trash	N/A	N/I	0	1	2	3
8. Miscellaneous						
Complaints from local residents	N/A	N/I	0	1	2	3
Pea gravel diaphragm at correct level	N/A	N/I	0	1	2	3
Public hazards	N/A	N/I	0	1	2	3
Mosquitoes	N/A	N/I	0	1	2	3
Other:	N/A	N/I	0	1	2	3

N/A = Not Applicable
N/I = Not Investigated
0 = Not a Problem
1 = Monitor for Future Repairs
2 = Routine Repairs Needed
3 = Immediate Repair Needed

Overall Condition of Facility

Total number of concerns receiving a: (1)_____ - Need Monitoring
(2)_____ - Routine Repair
(3)_____ - Immediate Repair Needed

Inspector's Summary

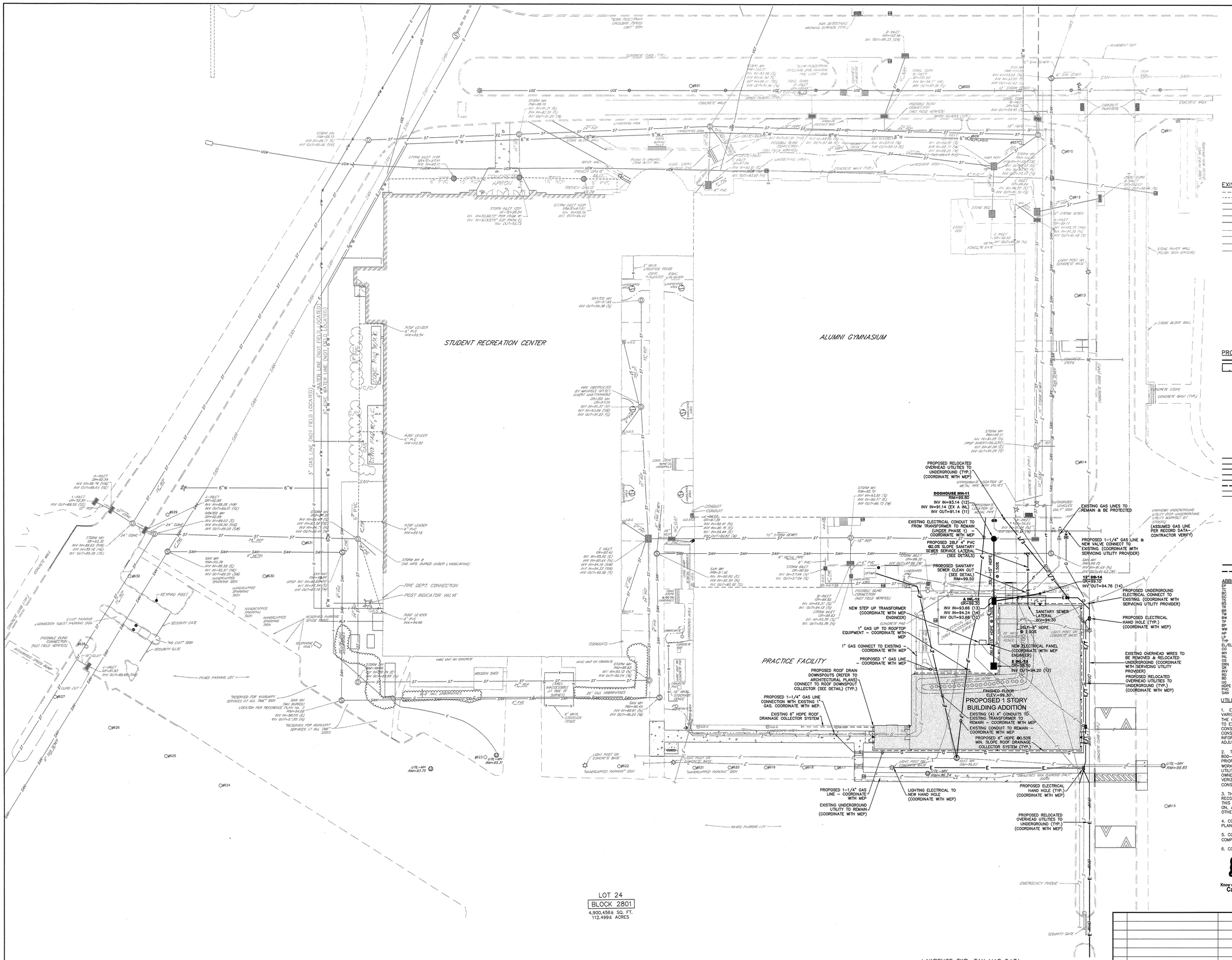
Pictures **Clock/Degrees**

1. _____ _____
2. _____ _____
3. _____ _____
4. _____ _____
5. _____ _____
6. _____ _____
7. _____ _____
8. _____ _____
9. _____ _____
10. _____ _____
11. _____ _____
12. _____ _____
13. _____ _____
14. _____ _____
15. _____ _____

N/A = Not Applicable
N/I = Not Investigated
0 = Not a Problem
1 = Monitor for Future Repairs
2 = Routine Repairs Needed
3 = Immediate Repair Needed

Sketches, If Necessary:

N/A = Not Applicable
N/I = Not Investigated
0 = Not a Problem
1 = Monitor for Future Repairs
2 = Routine Repairs Needed
3 = Immediate Repair Needed



EXISTING LEGEND:

- MAJOR CONTOUR
- MINOR CONTOUR
- VINYL FENCE
- CHAIN LINK FENCE
- POST AND RAIL FENCE
- DRCC STREAM CORRIDOR
- E ELECTRIC LINE MARK–OUT
- G GAS LINE MARK–OUT
- T TELE–COMMUNICATION LINE MARK–OUT INCLUDING FIBER–OPTIC
- W WATERMAIN MARK–OUT
- GROUND SPOT ELEVATION
- HARDSCAPE SPOT ELEVATION
- CLEAN–OUT
- SANITARY MANHOLE
- STORMWATER INLETS
- DRAINAGE/STORMWATER MANHOLE
- ROOF DRAIN
- U.G.S. ROOF DRAIN INTO UNDERGROUND DRAINAGE SYSTEM
- WATER VALVE
- FIRE DEPT. CONNECTION
- POST INDICATOR VALVE
- LIGHT POLE
- UTILITY MANHOLE
- TELCOM MANHOLE
- ELECTRIC MANHOLE
- UTILITY BOX
- BOLLARD
- SIGNS
- HYDRANT
- POST INDICATOR VALVE

PROPOSED LEGEND:

- BUILDING ADDITION
- CONCRETE WALK
- CURB
- FLUSH CURB (FC)
- DETECTABLE WARNING SURFACE (DWS)
- DOORWAY
- BUILDING MOUNTED LIGHT
- BIKE RACK
- PAVEMENT CUT LINE
- PEDESTRIAN CROSSWALK
- SPEED HUMP
- TRAFFIC CONTROL SIGN
- WHEEL STOP
- UGE UNDERGROUND ELECTRICAL SERVICE
- T/C UNDERGROUND TELEPHONE & CABLE SERVICE
- CW CHILLED WATER
- W DOMESTIC WATER SERVICE
- F FIRE WATER SUPPLY
- PVC ROOF DRAINAGE DISCHARGE PIPE
- G GAS SERVICE
- S SANITARY SEWER SERVICE LATERAL
- SANITARY SEWER CLEANOUT
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION (FDC)
- WATER VALVE
- GAS VALVE
- STORM DRAINAGE CLEAN OUT
- DRAIN BASIN
- OUTLET CONTROL STRUCTURE/STORM DRAINAGE I
- STORM DRAINAGE MANHOLE
- SANITARY SEWER MANHOLE
- STORM DRAINAGE PIPE
- PERF PVC UNDERDRAIN

ABBREVIATIONS LEGEND:

EP	EDGE OF PAVEMENT
TC	TOP OF CURB
BC	BOTTOM OF CURB
DC	DEPRESSED CURB
TS	TOP OF STEP
BS	BOTTOM OF STEP
TR	TOP OF RAMP
BR	BOTTOM OF RAMP
TW	TOP OF WALL
BW	BOTTOM OF WALL
TP	TOP OF PAD
BP	BOTTOM OF PAD
WW	WINDOW WELL
HP	HIGH POINT
LP	LOW POINT
TYP	TYPICAL
EL/ELEV	ELEVATION
CO	CLEAN OUT
MH	MANHOLE
INL	INLET
OS	OUTLET STRUCTURE
DRN	DRAIN
GR	GRATE
INV	INVERT
RD	ROOF DRAIN
BD	BUILDING DRAIN
UGE	UNDERGROUND
HDPE	HIGH DENSITY POLYETHYLENE PIPE
PVC	POLY VINYL CHLORIDE PIPE
SAN	SANITARY

UTILITY NOTES:

1. EXISTING UTILITY INFORMATION SHOWN HEREON HAS BEEN COLLECTED FROM VARIOUS SOURCES AND IS NOT GUARANTEED AS TO ACCURACY OR COMPLETENESS. THE CONTRACTOR SHALL VERIFY ALL INFORMATION TO HIS/HER SATISFACTION PRIOR TO EXCAVATION. WHERE EXISTING UTILITIES ARE TO BE CROSSED BY PROPOSED CONSTRUCTION, TEST PITS SHALL BE DUG BY THE CONTRACTOR PRIOR TO CONSTRUCTION TO ASCERTAIN EXISTING INVERTS, MATERIALS, AND SIZES. TEST PIT INFORMATION SHALL BE GIVEN TO THE ENGINEER PRIOR TO CONSTRUCTION TO PERMIT ADJUSTMENTS AS REQUIRED TO AVOID CONFLICTS.

2. THE CONTRACTOR SHALL CALL THE "ONE NUMBER TO CALL SYSTEM" 1–800–272–1000, NOT LESS THAN 72 HOURS NOR MORE THAN 10 WORKING DAYS PRIOR TO PLANNED WORK TO NOTIFY UTILITY OWNERS OF THE INTENT TO START WORK. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING "PRIVATE" NON–MEMBER UTILITY OWNERS INDIVIDUALLY. ALL WORK SHALL BE COORDINATED WITH UTILITY OWNERS INCLUDING, BUT NOT LIMITED TO, PUBLIC SERVICE ELECTRIC AND GAS CO., VERIZON TELEPHONE CO., THE SERVICING WATER COMPANY, PRIOR TO THE START OF CONSTRUCTION. (IF REQUIRED)

3. THE DEPICTION OF EXISTING UNDERGROUND FEATURES SHOWN HEREON IS BASED ON RECORD DATA, SURFACE EVIDENCE AND SUBSURFACE MARKOUT BY OTHERS ONLY. THIS DOES NOT PRECLUDE THE EXISTENCE OR ABSENCE OF UNDERGROUND FEATURES ON, ACROSS, OR ADJACENT TO THE PROJECT SITE. SUBSURFACE UTILITY MARKOUT BY OTHERS ARE LIMITED AND DID NOT COVER ENTIRE LOT.

4. COORDINATE ALL UTILITIES WITH THE ARCHITECTURAL, MEP PLANS, LANDSCAPE PLANS, AND RIDER UNIVERSITY.

5. COORDINATE ALL UTILITIES WITH APPROPRIATE SERVICING UTILITY COMPANY/PROVIDER. INSTALL PER UTILITY COMPANY REQUIREMENTS & STANDARDS.

6. CONTRACTOR VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION.

811 Know what's below. Call before you dig.

LOT 24
BLOCK 2801
4,900,456± SQ. FT.
112.499± ACRES

LAWRENCE TWP. TAX MAP DATA:

SHEET 28.02, 28.03 & 28.04
BLOCK 2801
LOT 24

GRAPHIC SCALE

20 0 10 20 40 80
(IN FEET)
1 inch = 20 feet

REV.	DESCRIPTION	DATE	DFT.BY	CKD.BY

09/17/2021
DATE OF SIGN.

THOMAS E. O'SHEA
N.J. PROFESSIONAL ENGINEER LIC. NO. GE 31228

van note-harvey associates, inc.
consulting engineers, planners & land surveyors
103 College Road East • Princeton, NJ 08540 • 609-987-2323
211 Bayberry Drive • Cape May Court House, NJ 08210 • 609-465-2600
www.vannoteharvey.com Certificate of Authorization No. 24GA28071300
van note-harvey associates - Since 1894 -

SITE UTILITY PLAN – PHASE 1
OF
ADDITIONS & RENOVATIONS TO ALUMNI GYM & STRENGTH & CONDITIONING CENTER
PREPARED FOR
RIDER UNIVERSITY
SITUATED IN
LAWRENCE TOWNSHIP MERCER CO., N.J.
SCALE 1"=20' SEPTEMBER 17, 2021

DRAWN BY JRM	FIELD BK	ORDER No.	FILE No.	SHEET No.
DATE 08/17/21	PAGE	44760-400-21	204-C-2	CE-7
CHECKED BY BRP/MNK DATE 09/17/21				

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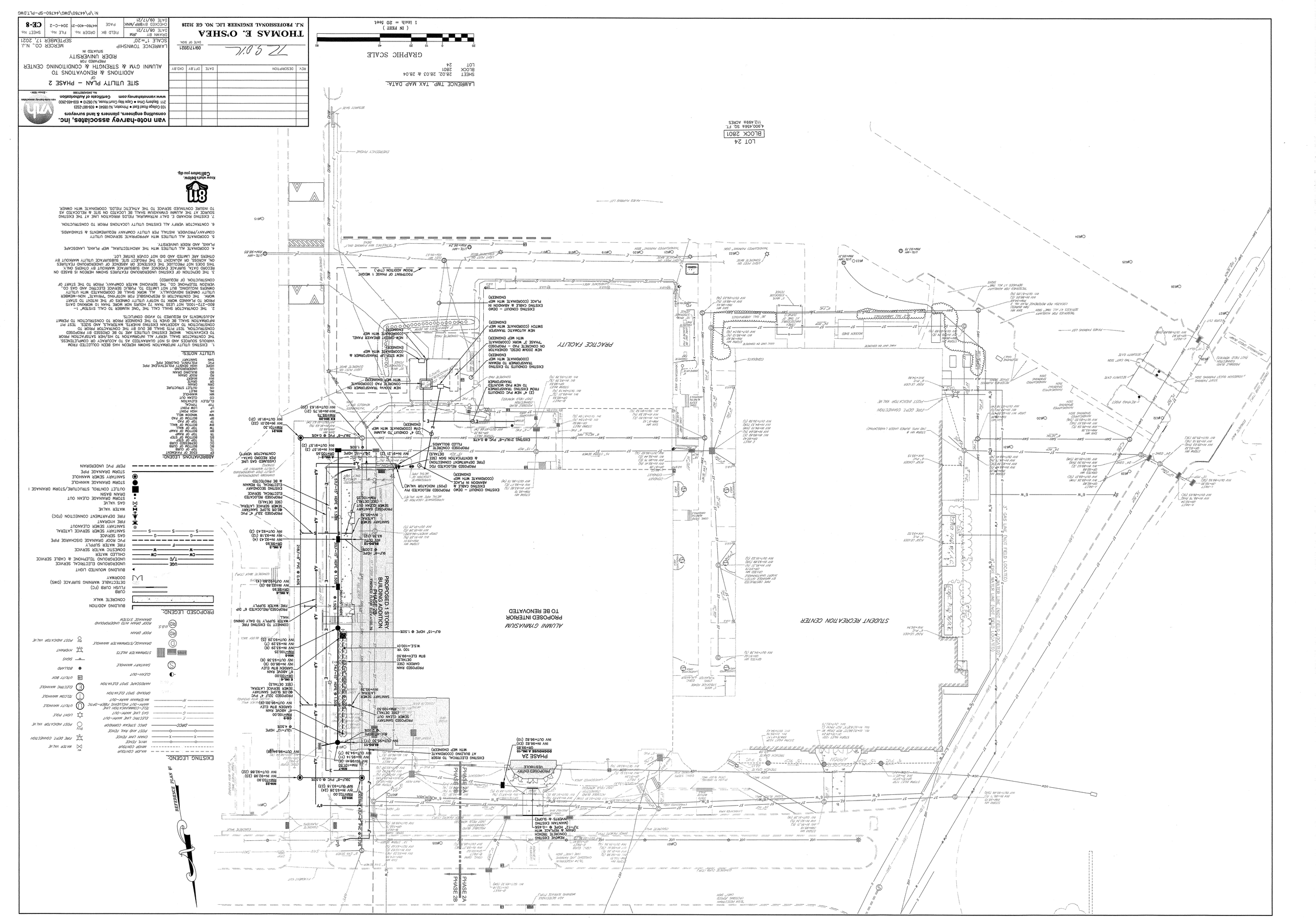
LAWRENCE TWP. TAX MAP DATA:
SHEET 28.02, 28.03 & 28.04
BLOCK 2801
LOT 24
GRAPHIC SCALE
(IN FEET)
1 inch = 20 feet
LOT 24
BLOCK 2801
4,900.4&& SQ. FT.
112.493± ACRES
PROPOSED 1 STORY BUILDING ADDITION - PHASE 2B - FINISHED FLOOR ELEV=100.00
ALUMNI GYMNASIUM
PROPOSED INTERIOR TO BE RENOVATED
STUDENT RECREATION CENTER
PRACTICE FACILITY
PHASE 2A
PROPOSED ENTRY VESTIBULE
PHASE 2B
PHASE 2A
PHASE 2B
REFERENCE PLAN #1
EXISTING LEGEND:
MAJOR CONTOUR
MINOR CONTOUR
WIRE FENCE
POST AND RAIL FENCE
CHAIN LINK FENCE
DECK LATTICE COMPARTMENT
POST INDICATOR VALVE
FIRE DEPT CONNECTION
LIGHT POLE
ELECTRIC LINE MARK-OUT
GAS LINE MARK-OUT
TELE-COMMUNICATION LINE MARK-OUT
UTILITY MANHOLE
TELECOM MANHOLE
ELECTRIC MANHOLE
GROUND SPOT ELEVATION
HARDSCAPE SPOT ELEVATION
CLEAN-OUT
UTILITY BOX
BOLLARD
SIGNS
SANITARY MANHOLE
STORMWATER INLETS
DRAINAGE/STORMWATER MANHOLE
ROOF DRAIN
ROOF DRAIN UNDERGROUND
GAS VALVE
PROPOSED LEGEND:
BUILDING ADDITION
CONCRETE WALK
DETECTABLE WARNING SURFACE (DWS)
RUSH CURB (FC)
DOORWAY
BUILDING MOUNTED LIGHT
UNDERGROUND ELECTRICAL SERVICE
UNDERGROUND TELEPHONE & CABLE SERVICE
CHILLED WATER
DOMESTIC WATER SERVICE
FIRE WATER SUPPLY
PVC ROOF DRAINAGE DISCHARGE PIPE
GAS SERVICE
SANITARY SEWER SERVICE LATERAL
SANITARY SEWER CLEANOUT
FIRE HYDRANT
FIRE DEPARTMENT CONNECTION (FDC)
WATER VALVE
STORM DRAINAGE CLEAN OUT
DRAIN BASIN
STORM DRAINAGE STRUCTURE/STORM DRAINAGE I
STORM DRAINAGE MANHOLE
SANITARY SEWER MANHOLE
OUTLET CONTROL STRUCTURE/STORM DRAINAGE I
ABBREVIATIONS LEGEND:
PER RECORD DATA: (ASSUMED GAS LINE CONTRACTOR VERIFY)
PVC UNDERDRAIN
CONCRETE
ASPHALT
EDGE OF PAVEMENT
TOP OF CURB
BOTTOM OF CURB
DEPRESSED CURB
BOTTOM OF STEP
TOP OF STEP
BOTTOM OF RAMP
TOP OF RAMP
BOTTOM OF WALL
TOP OF WALL
BOTTOM WELL
BOTTOM OF PAD
TOP OF PAD
BOTTOM OF WALL
TOP OF WALL
BOTTOM OF RAMP
TOP OF RAMP
BOTTOM OF STEP
TOP OF STEP
BOTTOM OF CURB
TOP OF CURB
EDGE OF PAVEMENT
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4. COORDINATE ALL UTILITIES WITH THE ARCHITECTURAL, MEP PLANS, LANDSCAPE PLANS, AND RIDER UNIVERSITY.
5. COORDINATE ALL UTILITIES WITH APPROPRIATE SERVICING UTILITY COMPANY/PROVIDER. INSTALL PER UTILITY COMPANY REQUIREMENTS & STANDARDS.
6. CONTRACTOR VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION.
7. EXISTING RICHARD E. DALY INTRAMURAL FIELDS IRRIGATION LINE AT THE EXISTING SOURCE AT THE ALUMNI GYMNASIUM SHALL BE LOCATED ON SITE & RELOCATED AS TO INSURE CONTINUED SERVICE TO THE ATHLETIC FIELDS. COORDINATE WITH OWNER.
Know what's below. Call before you dig.
811
NOTES:
1. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS NOTED OTHERWISE.
2. ALL RADII ARE 3' UNLESS NOTED OTHERWISE.
3. ALL PROPOSED PAVEMENT SHALL BE ASPHALT UNLESS NOTED OTHERWISE.
4. ALL PROPOSED CURB SHALL BE BELGIAN BLOCK UNLESS NOTED OTHERWISE.
5. ALL PROPOSED SIDEWALK SHALL BE CONCRETE UNLESS NOTED OTHERWISE.
6. ALL PROPOSED CROSSWALKS SHALL BE PAINTED WHITE.
7. ALL PROPOSED HANDICAP RAMPS SHALL BE CONCRETE.
8. ALL PROPOSED HANDICAP RAMPS SHALL BE PERPENDICULAR TO THE CURB.
9. ALL PROPOSED HANDICAP RAMPS SHALL BE PROVIDED WITH DETECTABLE WARNING SURFACE (DWS).
10. ALL PROPOSED HANDICAP RAMPS SHALL BE PROVIDED WITH A LANDING AREA WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
11. ALL PROPOSED HANDICAP RAMPS SHALL BE PROVIDED WITH A MAXIMUM SLOPE OF 8.33%.
12. ALL PROPOSED HANDICAP RAMPS SHALL BE PROVIDED WITH A MINIMUM WIDTH OF 4'.
13. ALL PROPOSED HANDICAP RAMPS SHALL BE PROVIDED WITH A MAXIMUM RISE OF 30".
14. ALL PROPOSED HANDICAP RAMPS SHALL BE PROVIDED WITH A MINIMUM RUN OF 4'.
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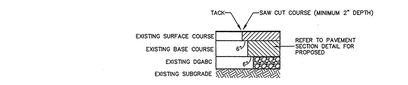
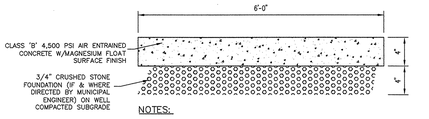
229. ALL



NOTES:
1. ALL STEP BACKS IN BITUMINOUS CONCRETE SHALL BE A MINIMUM OF 6"

BITUMINOUS PAVEMENT KEY DETAIL

NTS



NOTES:

1. PRE MOLDED BITUMINOUS EXPANSION JOINT MATERIAL (OR EQUAL) SHALL BE INSTALLED EVERY TWENTY (20) FEET AND CONTRACTION JOINTS INSTALLED EVERY FOUR (4) FEET.
2. PROVIDE 2% CROSS-SLOPE.

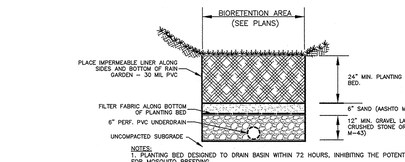
CONCRETE WALK DETAIL

NTS

NOTE:
1. TIRE STOP SHALL BE 7'-0" WIDE AND CENTERED IN PARKING STALL.

WHEEL STOP DETAIL

NTS



NOTES:
1. PLANTING BED DESIGNED TO DRAIN BASIN WITHIN 72 HOURS, INHIBITING THE POTENTIAL FOR MOSQUITO BREEDING.
2. SEE LANDSCAPE PLANS FOR BIORETENTION PLANTING DETAILS.
3. TESTING AND CERTIFICATION OF ALL SAND IS REQUIRED PRIOR TO INSTALLATION.
4. CONSTRUCTION EQUIPMENT MUST KEPT OFF BIORETENTION BASINS.
5. PREVENT ANY DEBRIS/SILT FROM ENTERING THE BASINS ONCE CONSTRUCTED.

SEED MIX SCHEDULE		
Rain Garden Bottom	Seed with Rain Garden Mix: ERNMX-180 at 30 lbs/acre, by Ernst Conservation Seeds 814-336-240	
	Seed with Rain Garden Grass Mix: ERNMX-180-L at 15 lbs/acre with cover crop of grain rye at 30 lb/acre, by Ernst Conservation Seeds 814-336-240	
Rain Garden Side Slopes	Plant with drought tolerant, low maintenance, National Seed Company Mix #25237 or approved equal at 6 lb/1000 sf of 40% creeping red fescue, 15% bergena red fescue,30% ascent perennial rye grass, 15% Kentkue Kentucky bluegrass (Seed Type)	

RAIN GARDEN DETAIL

NTS

RAIN GARDEN SPECIFICATION

A. GENERAL
THIS SUPPLEMENTAL SPECIFICATION IS PROVIDED TO SPECIFY THE METHODS OF CONSTRUCTION OF BIO-RETENTION SYSTEMS. UNLESS OTHERWISE STATED HEREIN, ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO THE CONCRETE SAND (AASHTO M-6/ASTM C-33). TO ENSURE PROPER SYSTEM OPERATION, THE SAND LAYER MUST HAVE A PERMEABILITY RATE AT LEAST TWICE AS FAST AS THE PERMEABILITY RATE OF THE PLANTING SOIL BED. STANDARD SPECIFICATION FOR THE INDIVIDUAL ITEMS WHICH COLLECTIVELY MAKE UP THE BIO-RETENTION SYSTEMS. MEASUREMENT FOR COMPENSATION SHALL BE BASED UPON FIELD MEASUREMENT OF THE CONTRACT ITEMS.

B. GRAVEL LAYER
THE GRAVEL LAYER SERVES AS A BEDDING MATERIAL AND A CONVEYANCE MEDIUM FOR THE UNDERDRAIN PIPES. IT MUST HAVE SUFFICIENT THICKNESS TO PROVIDE A MINIMUM OF 3 INCHES OF GRAVEL ABOVE AND BELOW THE PIPES. IT SHALL CONSIST OF ½ TO 1.5 INCH CLEAN WASHED STONE OR PEA GRAVEL (AASHTO M-43).

THE UNDERDRAIN PIPING MUST BE SCHEDULE 40 PVC PIPE (AASHTO M-278), FLEXIBLE ADS PIPE OR APPROVED EQUAL. THE PORTION OF DRAIN PIPING BENEATH THE PLANTING SOIL BED AND SAND LAYER MUST NOT BE PERFORATED. ALL REMAINING UNDERDRAIN PIPING, INCLUDING CLEANOUTS, MUST BE NON-PERFORATED. ALL JOINTS MUST BE SECURE AND WATERTIGHT. CLEANOUTS MUST BE LOCATED AS SPECIFIED ON THE PLANS AND EXTEND TO OR ABOVE THE SURFACE OF THE PLANTING SOIL BED. CLEANOUTS CAN ALSO SERVE TO DRAIN STANDING WATER STORED ABOVE CLOGGED OR MALFUNCTIONING PLANTING SOIL BEDS.

THE UNDERDRAIN PIPING MAY CONNECT TO THE BASIN OUTLET STRUCTURE. BLIND CONNECTIONS TO DOWNSTREAM STORM SEWERS ARE PROHIBITED.

C. SAND LAYER
THE SAND LAYER SERVES AS A TRANSITION BETWEEN THE PLANTING SOIL BED AND THE GRAVEL LAYER AND UNDERDRAIN PIPES. IT MUST HAVE A MINIMUM THICKNESS OF 12 INCHES AND CONSIST OF CLEAN MEDIUM AGGREGATE CONCRETE SAND (AASHTO M-6/ASTM C-33). TO ENSURE PROPER SYSTEM OPERATION, THE SAND LAYER MUST HAVE A PERMEABILITY RATE AT LEAST TWICE AS FAST AS THE PERMEABILITY RATE OF THE PLANTING SOIL BED.

D. PLANTING SOIL
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIO-RETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

BIO-RETENTION PLANTING SOIL MIX	
COMPONENT	PERCENTAGE MIX BY WEIGHT
FINE/VERY FINE SANDS	85.0 – 93.0%
GRANULAR SANDS	59.3 – 92.2%
CLAY	1.9 – 4.6%
SILT	3.9 – 12.6%
ORGANICS	2.0 – 5.5%
PH LEVEL	5.5 – 6.5
SOLUBLE SALTS	< 500 PPM

ALL BIO-RETENTION AREAS SHALL HAVE A MINIMUM OF ONE TEST PER 10,000 SF OF PLANTING SOIL AREA. PRIOR TO INSTALLATION EACH TEST SHALL CONSIST OF THE STANDARD SOIL TEST FOR PH, GRADATION AND ORGANIC MATTER CONTENT. IF THE SOIL DOES NOT MEET THE SPECIFICATIONS, A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH SOURCE FROM WHICH THE TOPSOIL WAS EXCAVATED.

SINCE DIFFERENT LABS CALIBRATE THEIR TESTING EQUIPMENT DIFFERENTLY, ALL TESTING RESULTS SHALL COME FROM THE SAME TESTING FACILITY.

SHOULD THE PH FALL OUT OF THE ACCEPTABLE RANGE, IT MAY BE MODIFIED (HIGHER) WITH LIME OR (LOWER) WITH IRON SULFATE PLUS SULFUR.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL OVER THE GRADATION ZONE TO FINAL GRADE.

WHEN BACKFILLING THE BIO-RETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18" AFTER THE FIRST 3" TO 4". NO EQUIPMENT OR METHODS OF CONSTRUCTION WITHIN THE BIO-RETENTION BASIN SHALL EXERT FORCES UPON THE SUB GRADE OR ANY INTERMITTENT SURFACES GREATER THAN 5 LBS PER SQUARE INCH. HEAVY EQUIPMENT CAN BE USED AROUND THE OUTER PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. BIO-RETENTION MATERIALS SHALL BE GRADED WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR DOZER/LOADER WITH MARSH TRACKS.

ALL SOIL MATERIALS IMPORTED TO THE PROPERTY MUST BE "CERTIFIED CLEAN" PER N.J.A.C. 7:26E. ADDITIONALLY:

1. THE SOIL/FILL MUST COMPLY WITH THE TECHNICAL SPECIFICATIONS FOR THE PROJECT AND SUPPORT THE INTENDED USE SPECIFIED FOR THE IMPORTED MATERIAL.
2. ALL MATERIAL SHALL BE FREE OF EXTRANEOUS DEBRIS OR SOLID WASTE.
3. DOCUMENTATION OF THE ENVIRONMENTAL QUALITY OF THE MATERIAL SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO IMPORTATION TO THE PROPERTY. NO MATERIAL SHALL BE IMPORTED TO THE PROPERTY WITHOUT PRIOR APPROVAL FROM THE OWNER'S REPRESENTATIVE.
4. IF THE MATERIAL IS FROM A VIRGIN SOURCE, DOCUMENTATION OF THE ENVIRONMENTAL QUALITY OF THE MATERIAL SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL AT LEAST ONE WEEK PRIOR TO ITS SCHEDULED IMPORTATION TO THE PROPERTY. THE DOCUMENTATION SHALL CONSIST OF AN AFFIDAVIT ISSUED BY THE SUPPLIER, IDENTIFYING THE PROJECT NAME AND LOCATION AND STATING "THAT THE SOIL/FILL TO BE SUPPLIED IS VIRGIN MATERIAL FROM A COMMERCIAL OR NON-COMMERCIAL SOURCE, AND THAT TO THE BEST OF THE SUPPLIER'S KNOWLEDGE, THE SOIL/FILL MATERIAL WAS OBTAINED (MINED) FROM A LOCATION THAT IS NOT A KNOWN OR SUSPECTED SOURCE OF CONTAMINATION AND THAT THE SOIL/FILL MATERIAL DOES NOT CONTAIN CONCENTRATIONS OF CONTAMINANTS ABOVE REGULATORY CRITERIA ESTABLISHED BY THE NJDEP, THE US ENVIRONMENTAL PROTECTION AGENCY, PUBLIC HEALTH AGENCIES, OR OTHER AGENCY WITH JURISDICTION OVER ENVIRONMENTAL, HEALTH OR ENGINEERING REQUIREMENTS FOR SOIL/FILL QUALITY."

ANY DEVIATIONS FROM THE ABOVE LANGUAGE MUST BE APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.

5. IF THE SOIL/FILL IS NOT FROM A VIRGIN SOURCE A REQUEST TO USE A SOURCE THAT IS NOT VIRGIN MUST BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR CONSIDERATION AND APPROVAL AT LEAST 14 DAYS PRIOR TO THE SCHEDULED IMPORTATION OF THE MATERIAL TO THE PROPERTY AND MUST INCLUDE ANALYTICAL INFORMATION DEMONSTRATING THE ENVIRONMENTAL QUALITY OF THE SOIL/FILL. SAMPLES OF THE MATERIAL SHALL BE COLLECTED FROM THE SOURCE TO ACCURATELY REPRESENT THE ENVIRONMENTAL QUALITY OF THE MATERIAL THAT WILL BE IMPORTED TO THE PROPERTY WITH ACCEPTABLE LABORATORY ANALYSIS OF THE FOLLOWING PARAMETERS:

TARGET COMPOUND LIST (TCL), VOLATILE ORGANIC COMPOUNDS WITH A 15-PEAK LIBRARY SEARCH (VOCS);
TCL SEMI-VOLATILE ORGANIC COMPOUNDS (BASE NEUTRAL & ACID EXTRACTABLES) WITH A 15-PEAK LIBRARY SEARCH (SVAs);
TARGET ANALYTE LIST (TAL) METALS;
TCL PESTICIDES/HERBICIDES; AND,
TCL PESTICIDES/HERBICIDES; AND,
TOTAL PETROLEUM HYDROCARBON (TPHC).

6. THE SOURCE WILL NOT BE APPROVED IF ANY OF THE ABOVE PARAMETERS ARE DETECTED AT OR ABOVE THEIR RESPECTIVE CRITERION PER NJDEP RDCSCC. SAMPLES TO ACCURATELY REPRESENT THE QUALITY OF THE SOURCE MATERIAL MUST BE COLLECTED BY A METHODS AND FREQUENCY PRESCRIBED BY N.J.A.C. 7:26E. A SOURCE MATERIAL SAMPLING PLAN SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE OWNER'S REPRESENTATIVE AT LEAST 14 DAYS PRIOR TO THE SCHEDULED SAMPLING OF THE SOURCE MATERIAL.
7. THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO SAMPLE AND ANALYZE ANY IMPORTED MATERIAL AT HIS/HER DISCRETION.
8. BILLS OF LADING SHALL ACCOMPANY EACH INCOMING SHIPMENT OF SOIL/FILL IN ORDER TO CONFIRM THE APPROVED SOURCE(S) OF FILL. THE BILLS OF LADING SHALL BE PROVIDED TO THE OWNER'S REPRESENTATIVE EACH BILL OF LADING OR ACCOMPANYING DOCUMENTATION SHALL INCLUDE:
*THE NAME OF THE VENDOR AND RELATIONSHIP TO THE SOURCE OF THE SOIL/FILL;
*THE LOCATION WHERE THE SOIL/FILL WAS OBTAINED, INCLUDING, AS NECESSARY, THE STREET, LOT AND BLOCK, MUNICIPALITY, COUNTY, AND STATE.
9. SAMPLES OF THE PLANTING SOILS SHALL BE SUBMITTED TO THE ENGINEER A MINIMUM OF TWO WEEKS PRIOR TO DELIVERY OF THE SOIL TO THE SITE FOR LAB TESTING (WHICH WOULD INCLUDE PERMEABILITY TESTING).
PERMEABILITY RATES FOR SOIL SHALL BE A MINIMUM OF 0.75 IN/HR.

E. GEO-TEXTILE/FILTER FABRIC
FILTER FABRIC IS NEEDED FOR TWO PURPOSES IN BIO-RETENTION FACILITIES: FIRSTLY, TO CONTROL TRANSPORT OF SILT, AND SECONDLY, TO CONTROL THE DIRECTION OF FLOW. THE FILTER FABRIC PLACED ON TOP OF THE PEA GRAVEL BED IS USED TO CONTROL SEDIMENT TRANSPORT INTO THE GRAVEL BED, WHICH OTHERWISE MAY BECOME CLOGGED. THIS FILTER FABRIC MUST MEET A MINIMUM PERMISSIVE RATE OF 120 GALLONS PER MINUTE PER SQUARE FOOT AND SHALL NOT ENCROACH UPON THE INFILTRATION RATE OF THE SOIL MEDIUM. FILTER FABRIC MAY BE PLACED ALONG THE "WALLS" OF THE FACILITY TO HELP DIRECT THE WATER FLOW DOWNWARD AND TO REDUCE LATERAL FLOWS. SEE TABLE A FOR FABRIC REQUIREMENTS.

F. PLANT MATERIAL
PLANT MATERIAL FOR THE BIO-RETENTION AREAS CAN BE FOUND ON THE LANDSCAPE PLAN(S) PREPARED BY OTHERS AND SUBMITTED UNDER SEPARATE COVER.

G. PLANT INSTALLATION
WHERE REQUIRED, AROUND PLANTINGS, MULCH SHOULD BE PLACED TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIO-RETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION.

TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

THE TOPSOIL/PLANTING SOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIO-RETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ACID FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

H. PLANTING NOTES:

1. CONTACT ERNST SEEDS (WWW.ERNSTSEED.COM) FOR SEED PRICING AND AVAILABILITY.
2. SEED MIX AS SPECIFIED TO BE PLACED IN BIO-RETENTION BASINS BOTTOMS AND SIDE SLOPES.
3. ALL SEED IS TO BE BROADCAST BY HAND OR APPLIED BY HYDROSEEDING EQUIPMENT. UNDER NO CIRCUMSTANCES SHALL MECHANICAL EQUIPMENT BE USED TO SPREAD SEED. SEED SHALL BE RAKED IN TO PROMOTE CONTACT WITH SOIL.
4. ALL SEEDED AREAS ON SLOPES SHALL BE STABILIZED WITH A BIODEGRADABLE EROSION CONTROL BLANKET SUCH AS A LANDLOCK C1, NORTH AMERICAN GREEN S75, OR EQUIVALENT MATERIAL, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

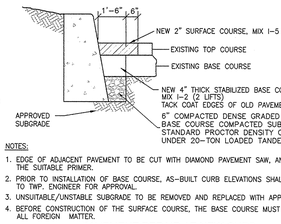
I. CONSTRUCTION SEQUENCE

1. ENSURE THAT ALL OF THE CONTRIBUTING DRAINAGE AREA TO THE BIO-RETENTION AREA IS STABILIZED.
2. EXCAVATE BIO-RETENTION AREA TO PROPOSED GRAVEL/UNDERDRAIN INVERT DEPTH.
3. INSTALL LINER (DOWNSIDE IF NECESSARY).
4. INSTALL UNDERDRAIN AND GRAVEL BED.
5. BACKFILL BIO-RETENTION AREA WITH PLANTING SOIL AS SHOWN ON THE DETAILS/PLANS. OVERFILLING (110% OF SPECIFIED DEPTH) IS RECOMMENDED TO ACCOUNT FOR SETTLEMENT.
6. PRE-WASH THE PLANTING SOIL PRIOR TO PLANTING VEGETATION TO ALLOW FOR SETTLEMENT.
7. EXCAVATE OR FILL TO ACHIEVE PROPER DESIGN GRADE, LEAVING SPACE FOR THE UPPER LAYER OF MULCH AND/OR TOPSOIL THAT WILL BRING THE SURFACE TO THE FINAL GRADE AND READY FOR PLANTING.
8. PLANT VEGETATION SPECIFIED IN THE PLANTING PLAN FOR BIO-RETENTION AREA.* ALL SEED IS TO BE BROADCAST BY HAND OR APPLIED BY HYDRO-SEEDING EQUIPMENT. UNDER NO CIRCUMSTANCES SHALL MECHANICAL EQUIPMENT BE USED TO SPREAD SEED. SEED SHALL BE RAKED IN TO PROMOTE CONTACT WITH SOIL.
9. MULCH AND INSTALL EROSION PROTECTION AT DISCHARGE ENTRANCE POINTS AS REQUIRED. REMOVE REMAINING SEDIMENT CONTROL PRACTICES UPON INSPECTOR AUTHORIZATION.

* PLANTING AND/OR SEEDING OF BIO-RETENTION SYSTEM SHOULD BE COMPLETED BETWEEN APRIL 15TH AND JUNE 15TH AND/OR BETWEEN AUGUST 15TH AND OCTOBER 15TH. IF INSTALLATION OF THE VEGETATION CANNOT BE COMPLETED DURING THESE TIME PERIODS, A LANDSCAPE ARCHITECT SHOULD BE RETAINED TO ADVISE THE OWNER/CONTRACTOR ON NECESSARY STEPS TO BE TAKEN TO ENSURE SURVIVAL OF THE VEGETATION.

J. BIO-RETENTION MAINTENANCE NOTES
THE APPLICANT, OR ITS SUCCESSORS AND ASSIGNS, SHALL BE RESPONSIBLE FOR ENSURING THAT THE FOLLOWING MAINTENANCE MEASURES ARE FOLLOWED. THE DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE FACILITY WHILE IT IS CONSTRUCTED. THE APPLICANT SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE FACILITY AFTER IT IS CONSTRUCTED.

1. ALL SEEDED AREAS SHALL BE INSPECTED FOR PLANT ESTABLISHMENT AFTER THE FIRST SUMMER OF GROWTH. ALL BARE SPOTS SHALL BE RESEEDED WITH THE APPROPRIATE MIX IN THE NEXT SPRING OR FALL PLANTING SEASON.
2. AFTER ESTABLISHMENT, ALL SEEDED AREAS SHALL BE VISUALLY INSPECTED FOR BARE SPOTS AND ERODED AREAS EVERY SPRING AND FALL, AND AFTER ANY SUBSTANTIAL STORM EVENT. ALL BARE SPOTS SHALL BE RESEEDED AND/OR STABILIZED WITH APPROPRIATE GEO-TEXTILE MATERIALS.
3. AFTER ESTABLISHMENT, ALL SEEDED AREAS SHALL BE VISUALLY INSPECTED FOR WOODY PLANTS AND UNDESIRABLE INVASIVE PLANT SPECIES EVERY SPRING AND FALL. ALL WOODY PLANTS AND UNDESIRABLE INVASIVE PLANT SPECIES SHALL BE SELECTIVELY REMOVED BY MANUAL METHODS OR BY APPROVED SELECTIVE HERBICIDE APPLICATIONS.
4. ALL SILT, LITTER, TRASH, DEBRIS SHALL BE REMOVED FROM THE BASINS AND SWALES UPON ANY NOTICEABLE ACCUMULATION, AND AT A SIX MONTH INTERVAL IN THE SUMMER AND WINTER.
5. SEEDED AREAS IN THE BASINS SHALL BE MOWED ONLY ONCE PER YEAR IN THE EARLY SPRING PRIOR TO NEW GROWTH. SEEDED AREAS IN THE SWALES SHALL BE MOWED AS DESIRED BY THE NJDOT.
6. IF NECESSARY, THE BASIN BOTTOM SHALL BE AERATED AFTER MOWING MONTHLY.
7. A WRITTEN RECORD OF EVERY INSPECTION AND MAINTENANCE PROCEDURE CONDUCTED IN THE BASINS SHALL BE KEPT ON FILE.



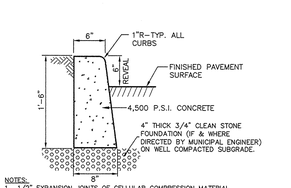
STANDARD BITUMINOUS PAVEMENT DETAIL

NTS

NOTES:
1. EDGE OF ADJACENT PAVEMENT TO BE CUT WITH DIAMOND PAVEMENT SAW, AND PRIMED WITH THE SUITABLE PRIMER.
2. PRIOR TO INSTALLATION OF BASE COURSE, AS-BUILT CURB ELEVATIONS SHALL BE SUBMITTED TO TWP. ENGINEER FOR APPROVAL.
3. UNSUITABLE/UNSTABLE SUBGRADE TO BE REMOVED AND REPLACED WITH APPROVED MATERIAL.
4. BEFORE CONSTRUCTION OF THE SURFACE COURSE, THE BASE COURSE MUST BE CLEANED OF ALL FOREIGN MATTER.

PAVEMENT REPAIR AT NEW CURB INSTALLATION DETAIL

NTS



NOTES:
1. 1/2" EXPANSION JOINTS OF CELLULAR COMPRESSION MATERIAL TO BE PLACED AT 20' INTERVALS AND 1/4" PREMOLDED EXPANSION JOINTS TO BE PLACED LONGITUDINALLY ADJACENT TO ALL ABUTTING CONCRETE STRUCTURES.
2. CONSTRUCTION JOINTS TO BE PROVIDED EVERY 20', ALTERNATING WITH EXPANSION JOINTS.
3. MATCH EXISTING.

CONCRETE CURB DETAIL

NTS

ALIGNED

CURB RAMP TYPE 5

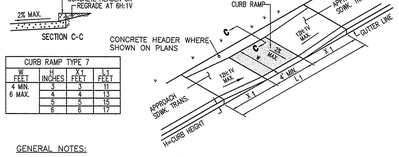
SECTION A-A

SECTION THROUGH CURB RAMPS 5 AND 6

GENERAL NOTES:
1. LANDING AREA, APPROACH SIDEWALK TRANSITIONS, AND CURB RAMP SHALL BE KEPT CLEAR OF OBSTRUCTIONS.
2. DIMENSIONS SHOWN IN TABLES ARE FOR RELATIVELY FLAT SIDEWALK AREAS. CARE SHOULD BE TAKEN WHEN DETERMINING CURB RAMP SIZE BASED ON CURB HEIGHT (H) WHERE ELEVATION OF CURB AND SIDEWALK VARY DRASTICALLY IN AREA OF PROPOSED CURB RAMP.
3. CURB (DROPPED CURB) GUTTERLINE TO BE FLUSH WITH ROADWAY PAVEMENT A MINIMUM OF 4 FEET AT ALL CURB RAMPS.
4. SIDEWALK AND CURB RAMP WITHIN AREA ENCLOSED BY HEAVY LINES TO BE PAID FOR AS CONCRETE SIDEWALK OF THE APPROPRIATE ADJACENT THICKNESS.
5. CURB AND HEADER WITHIN AREA ENCLOSED BY HEAVY LINES TO BE PAID FOR AS VERTICAL CURB OR SLOPING CURB OF THE APPROPRIATE ADJACENT SIZE AND KIND.
7. THE PUBLIC SIDEWALK CURB RAMP, DETECTABLE WARNING SURFACE (SHADED AREA) SHALL BE SAFETY RED COLOR ON CONCRETE OR 70% COLOR CONTRAST FOR OTHER SURFACE SUCH AS BRICK.
8. CROSSWALKS AND STOP LINES MAY BE MARKED OR UNMARKED, SEE PLANS.
9. PREFERRED AND ALTERNATE TREATMENTS SHOULD NOT BE INTERMIXED WITHIN THE SAME INTERSECTION.
10. DIMENSIONS SHOWN IN TABLES ARE FOR 3 INCH TO 9 INCH CURB HEIGHTS. WHERE THE CURB HEIGHTS ARE OTHER THAN WHAT IS PROVIDED IN THE TABLES, THE DIMENSIONS OF THE RAMPS WILL HAVE TO BE CALCULATED BASED ON CROSS SLOPES SHOWN.
11. ALL ACCESSIBLE CURB RAMPS SHALL BE PROVIDED A DOME DETECTABLE WARNING SURFACE IN ACCORDANCE WITH NJDOT & ADA REQUIREMENTS.

NJDOT CURB RAMP TYPE 5 DETAIL

NTS



GENERAL NOTES:
1. LANDING AREA, APPROACH SIDEWALK TRANSITIONS, AND CURB RAMP SHALL BE KEPT CLEAR OF OBSTRUCTIONS.
2. DIMENSIONS SHOWN IN TABLES ARE FOR RELATIVELY FLAT SIDEWALK AREAS. CARE SHOULD BE TAKEN WHEN DETERMINING CURB RAMP SIZE BASED ON CURB HEIGHT (H) WHERE ELEVATION OF CURB AND SIDEWALK VARY DRASTICALLY IN AREA OF PROPOSED CURB RAMP.
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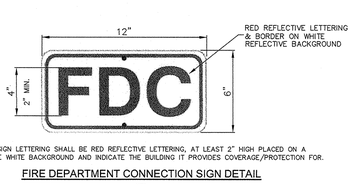
8. CROSSWALKS AND STOP LINES MAY BE MARKED OR UNMARKED, SEE PLANS.
9. PREFERRED AND ALTERNATE TREATMENTS SHOULD NOT BE INTERMIXED WITHIN THE SAME INTERSECTION.
10. DIMENSIONS SHOWN IN TABLES ARE FOR 3 INCH TO 9 INCH CURB HEIGHTS. WHERE THE CURB HEIGHTS ARE OTHER THAN WHAT IS PROVIDED IN THE TABLES, THE DIMENSIONS OF THE RAMPS WILL HAVE TO BE CALCULATED BASED ON CROSS SLOPES SHOWN.
11. ALL ACCESSIBLE CURB RAMPS SHALL BE PROVIDED A DOME DETECTABLE WARNING SURFACE IN ACCORDANCE WITH NJDOT & ADA REQUIREMENTS.

NJDOT CURB RAMP TYPE 7 DETAIL

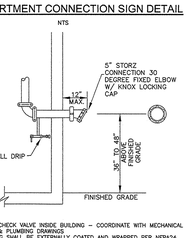
NTS



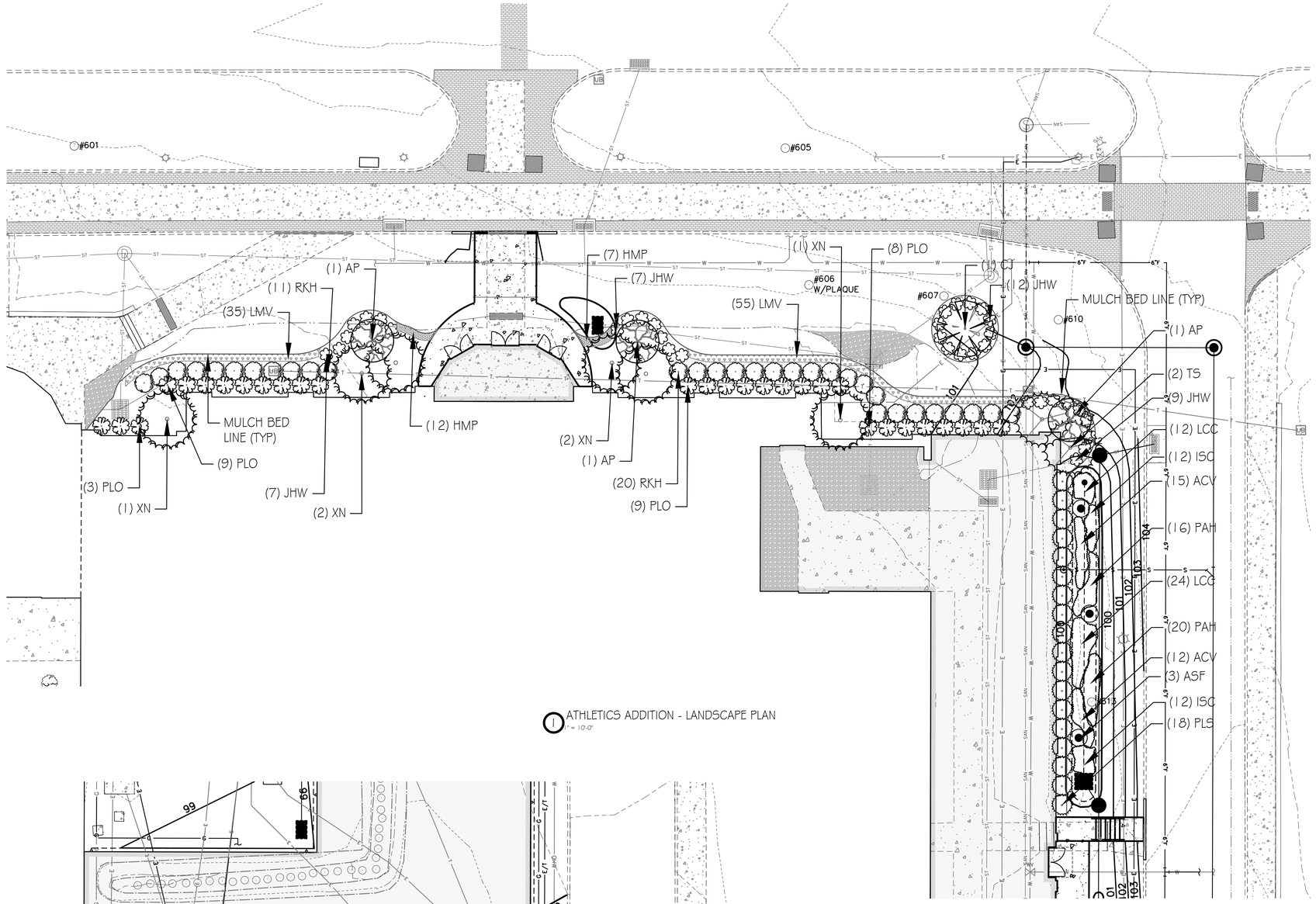
NOTE:
THE FDC SIGN LETTERING SHALL BE RED REFLECTIVE LETTERING, AT LEAST 2" HIGH PLACED ON A REFLECTIVE WHITE BACKGROUND AND INDICATE THE BUILDING IT PROVIDES COVERAGE/PROTECTION FOR.

FIRE DEPARTMENT CONNECTION SIGN DETAIL

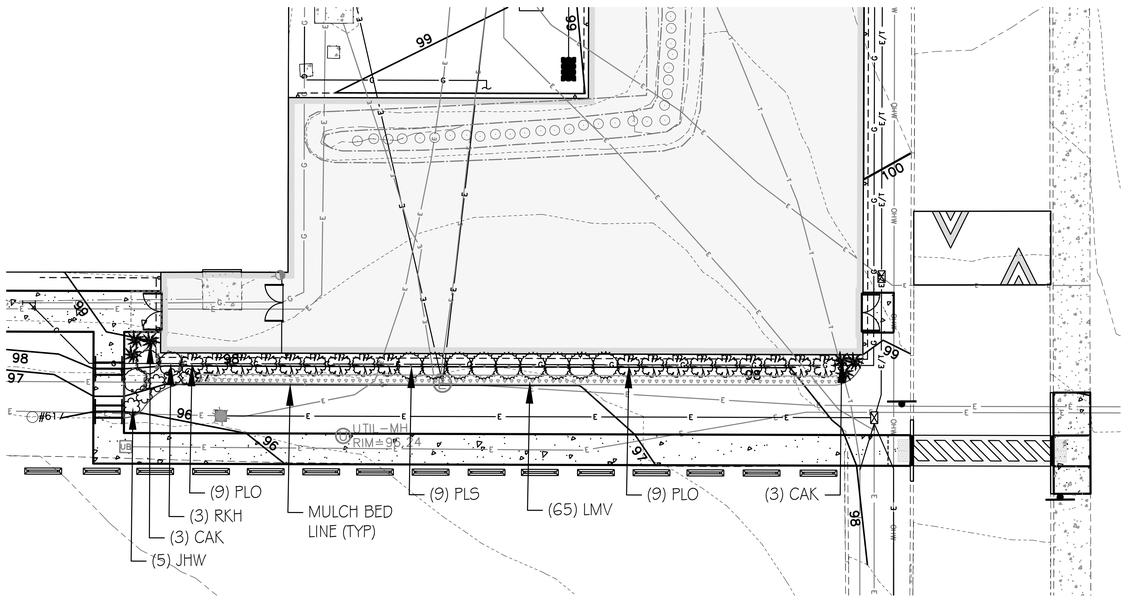
NTS



NOTES:
1. PROVIDE CHECK VALVE INSIDE BUILDING – COORDINATE WITH MECHANICAL ELECTRICAL & PLUMBING DRAWINGS
2. ALL PIPING SHALL BE EXTERNALLY COATED AND WRAPPED PER NFPA24.
3. ALL EXPOSED PIPING SHALL BE FLANGED/GALVANIZED THREADED PIPE – COORDINATE SIZE WITH MECHANICAL PLANS.
4. PROVIDE FDC IDENTIFICATION SIGNAGE PER FIRE OFFICIAL'S REQUIREMENTS.
5. FDC MUST BE SUBMITTED FOR REVIEW AND COMMENTS TO FIRE OFFICIAL PRIOR TO PERMIT APPLICATION FOR FIRE DEPARTMENTALS.
6. FDC MUST BE FM APPROVED & UL LISTED.
7. ENTIRE INSTALLATION SHALL COMPLY WITH NFPA13 AND/OR NFPA24 AS REQUIRED BY JURISD



1 ATHLETICS ADDITION - LANDSCAPE PLAN
1" = 10'-0"



2 WEIGHT ROOM ADDITION - LANDSCAPE PLAN
1" = 10'-0"

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 Inch = 10 Ft.

CODE REVIEW:

CERTIFICATE:

spiezle
SPIEZLE ARCHITECTURAL GROUP INC.
1395 YARDVILLE HAMILTON SQUARE ROAD
SUITE 2A
HAMILTON, NJ 08691
PHONE: 609-695-7400

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JOHN F. WRIGHT	21AI001794200
SPIEZLE ARCHITECTURAL GROUP, INC.	21AC000903000

SEAL:

CONSULTANTS:

PLANNING BOARD DRAWING SET

PROJECT:

ADDITIONS AND RENOVATIONS TO ALUMNI GYM AND STRENGTH AND CONDITIONING CENTER

FOR

RIDER UNIVERSITY

2083 LAWRENCEVILLE ROAD,
LAWRENCEVILLE, NJ, 08648

FOR CODE REVIEW: 9/17/21

REVISIONS:

	REVISION NAME	DATE

FOR BID: DD/MM/YYYY

DRAWING TITLE:

LANDSCAPE PLAN

COMMISSION NUMBER:
21U011

AGENCY NUMBER:
##-#####-##

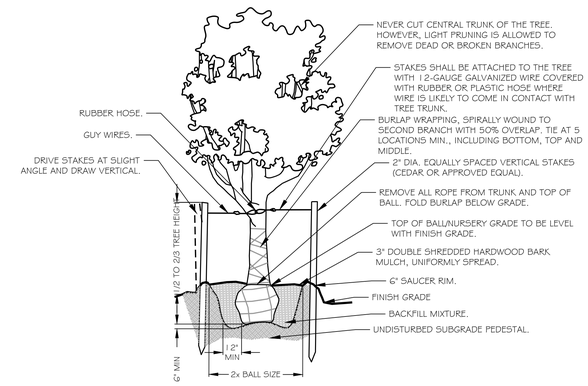
DO NOT SCALE THE DRAWINGS

DRAWING NUMBER:
L0.1

THIS DRAWING IS FORMATTED TO BE PRINTED AT 30"x42"

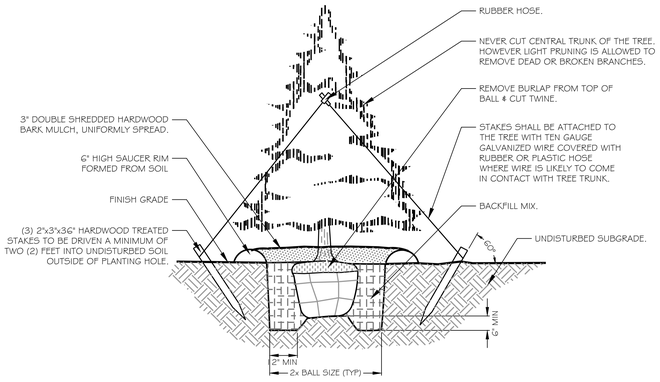
LANDSCAPE NOTES

1. THE CONTRACTOR SHALL REVIEW ARCHITECTURAL/ENGINEERING PLANS TO BECOME THOROUGHLY FAMILIAR WITH GRADING AND SURFACE UTILITIES. THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND PERFORM ALL WORK IN ACCORDANCE WITH THESE SPECIFICATIONS, APPROVED OR FINAL DRAWINGS, AND INSTRUCTIONS PROVIDED BY THE PROJECT LANDSCAPE ARCHITECT, MUNICIPAL OFFICIALS, OR OWNER/OWNERS REPRESENTATIVE. ALL WORK COMPLETED AND MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH THE INTENTION OF THE SPECIFICATIONS, DRAWINGS, AND INSTRUCTIONS, AND EXECUTED WITH THE STANDARD LEVEL OF CARE FOR THE LANDSCAPE INDUSTRY.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR WILL FLAG THE LOCATION OF THE LIMIT OF DISTURBANCE AND TREE PROTECTION AREAS FOR REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT. ALL EXISTING VEGETATION WHICH COULD BE IMPACTED AS A RESULT OF THE PROPOSED CONSTRUCTION ACTIVITIES MUST BE PROTECTED FROM DAMAGE BY THE INSTALLATION OF TREE PROTECTION FENCING. FENCING SHALL BE LOCATED AT THE DRIP-LINE OR LIMIT OF DISTURBANCE AS DEPICTED WITHIN THE APPROVED OR FINAL PLAN SET, ESTABLISHING THE TREE PROTECTION ZONE. FENCE INSTALLATION SHALL BE IN ACCORDANCE WITH THE GOVERNING SOIL CONSERVATION DISTRICT REQUIREMENTS. NO WORK MAY BEGIN UNTIL THIS REQUIREMENT IS FULFILLED. THE FENCING SHALL BE INSPECTED REGULARLY BY THE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
3. EVERY POSSIBLE SAFEGUARD SHALL BE TAKEN TO PROTECT BUILDING SURFACES, EQUIPMENT, AND FURNISHINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE OR INJURY TO PERSONS OR PROPERTY WHICH MAY OCCUR AS A RESULT OF HIS NEGLIGENCE IN THE EXECUTION OF THE WORK.
4. ALL EQUIPMENT AND TOOLS SHALL BE PLACED SO AS NOT TO INTERFERE OR HINDER THE PEDESTRIAN AND VEHICULAR TRAFFIC FLOW. SEE SEASONAL PLANT LIST FOR PLANTING TIMES OF BULBS AND SEASONAL PLANTS.
5. THE CONTRACTOR SHALL COORDINATE WITH LIGHTING AND IRRIGATION CONTRACTORS REGARDING TIMING OF INSTALLATION OF PLANT MATERIAL. THE CONTRACTOR SHALL PROVIDE NOTICE AT LEAST FORTY-EIGHT HOURS (48 HRS.) IN ADVANCE OF THE ANTICIPATED DELIVERY DATE OF ANY PLANT MATERIALS TO THE PROJECT SITE. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. A LEGIBLE COPY OF THE INVOICE, SHOWING VARIETIES AND SIZES OF MATERIALS INCLUDED FOR EACH SHIPMENT SHALL BE FURNISHED TO THE PROJECT LANDSCAPE ARCHITECT, OR GOVERNING MUNICIPAL OFFICIAL.
6. THE CONTRACTOR SHALL INSURE THAT HIS WORK DOES NOT INTERRUPT ESTABLISHED OR PROJECTED DRAINAGE PATTERNS. MAINTAIN POSITIVE DRAINAGE OUT OF PLANTING BEDS AT A MINIMUM 2% SLOPE. ALL GRADES, DIMENSIONS, AND EXISTING CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR ON SITE BEFORE CONSTRUCTION BEGINS. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT OR OWNER. THE CONTRACTOR SHALL INSURE ADEQUATE VERTICAL DRAINAGE IN ALL PLANT BEDS AND PLANTERS. IF POOR DRAINAGE CONDITIONS EXIST, CORRECTIVE ACTION SHALL BE TAKEN BY THE CONTRACTOR PRIOR TO INSTALLATION.
7. DURING THE COURSE OF CONSTRUCTION/PLANT INSTALLATION, EXCESS AND WASTE MATERIALS SHALL BE CONTINUOUSLY AND PROMPTLY REMOVED AT THE END OF EACH WORK DAY. ALL DEBRIS, MATERIALS, AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF AND ALL PAVED AREAS SHALL BE CLEANED. THE CONTRACTOR SHALL DISPOSE OF ALL RUBBISH AND EXCESS SOIL AT HIS EXPENSE TO AN OFF-SITE LOCATION AS APPROVED BY THE LOCAL MUNICIPALITY. THE CONTRACTOR SHALL DISPOSE OF STUMPS AND MAJOR ROOTS OF ALL PLANTS TO BE REMOVED. ANY DEPRESSIONS CAUSED BY REMOVAL OPERATIONS SHALL BE REFILLED WITH FERTILE, FRIABLE SOIL PLACED AND COMPACTED SO AS TO REESTABLISH PROPER GRADE FOR NEW PLANTING AND/OR LAWN AREAS.
8. THE CONTRACTOR SHALL NOTIFY THE OWNER AND CALL STATE UNDERGROUND UTILITY LOCATION SERVICE A MINIMUM OF THREE DAYS PRIOR TO ANY EXCAVATION. THE CONTRACTOR IS ADVISED OF THE EXISTENCE OF UNDERGROUND UTILITIES ON THE SITE. THEIR EXACT LOCATION SHALL BE VERIFIED IN THE FIELD WITH THE OWNER OR GENERAL CONTRACTOR PRIOR TO COMMENCEMENT OF ANY DIGGING OPERATIONS. IN THE EVENT THEY ARE UNCOVERED, THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL DAMAGE TO UTILITIES AND SUCH DAMAGE SHALL NOT RESULT IN ANY ADDITIONAL EXPENSES TO THE OWNER. ANY DAMAGE OF UNREPORTED LINES SHALL NOT BE THE RESPONSIBILITY OF THE CONTRACTOR. FIELD ADJUST ALL PROPOSED PLANTING LOCATIONS TO AVOID ANY DAMAGE TO EXISTING FACILITIES, AS WELL AS VEGETATION. ALL ADJUSTED LOCATIONS ARE TO BE APPROVED BY THE LANDSCAPE ARCHITECT BEFORE EXCAVATION.
9. IF UTILITY LINES ARE ENCOUNTERED IN EXCAVATION OF TREE PITS, OTHER LOCATIONS FOR TREES SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COMPENSATION. NO CHANGES OF LOCATION SHALL BE MADE WITHOUT APPROVAL OF THE LANDSCAPE ARCHITECT. EXCAVATION NEAR EXISTING UTILITIES TO BE CAREFULLY PERFORMED BY HAND. ALL TREES SHALL NOT BE LOCATED CLOSER THAN 10' OF ANY EXISTING OR PROPOSED UNDERGROUND UTILITIES.
10. IN THE EVENT OF VARIATIONS BETWEEN WRITTEN QUANTITIES SHOWN ON THE PLAN AND THE PLANT LIST, THE PLANS SHALL CONTROL. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL PLANT QUANTITIES PRIOR TO THE COMMENCEMENT OF WORK. SOD AND SEED QUANTITY TAKEOFFS ARE THE RESPONSIBILITY OF THE CONTRACTOR. ALL DISCREPANCIES SHALL BE REPORTED TO THE LANDSCAPE ARCHITECT FOR CLARIFICATION PRIOR TO BIDDING. IN ALL CASES, BOTANICAL NAMES LISTED WITHIN THE APPROVED OR FINAL PLANT LIST SHALL TAKE PRECEDENCE OVER COMMON NAMES. THE CONTRACTOR SHALL FURNISH PLANT MATERIAL IN SIZES AS SPECIFIED IN PLANT LIST. ALL PLANTS ARE SHOWN SEMI-MATURE SIZE ON PLANS. SIZES INDICATED IN PLANT LIST ARE SIZES AT TIME OF INSTALLATION.
11. PLANTS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS OR AS DESIGNATED IN THE FIELD. THE CONTRACTOR SHALL STAKE ALL MATERIAL LOCATED ON THE SITE FOR REVIEW AND/OR ADJUSTMENT BY THE LANDSCAPE ARCHITECT PRIOR TO PLANTING. ALL LOCATIONS ARE TO BE APPROVED BY THE LANDSCAPE ARCHITECT BEFORE EXCAVATION.
12. ALL PLANT MATERIALS USED SHALL BE TRUE TO NAME AND SIZE IN CONFORMITY WITH THE AMERICAN STANDARD OF NURSERY STOCK (LATEST VERSION) AND SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY. ALL PLANTS SHALL HAVE NORMAL, WELL-DEVELOPED BRANCHES AND VIGOROUS ROOT SYSTEMS. THEY SHALL BE SOUND, HEALTHY, VIGOROUS, FREE FROM DEFECTS, DISFIGURING KNOTS, ABRASIONS OF THE BARK, SUN SCALD INJURIES, PLANT DISEASES, INSECT EGGS, BORERS AND ALL OTHER FORMS OF INFECTION. THE ROOT SYSTEM OF EACH PLANT SHALL BE WELL PROVIDED WITH FIBROUS ROOTS. ALL PARTS SHALL BE SOUND, HEALTHY, VIGOROUS, WELL-BRANCHED AND DENSELY FOLIATED WHEN IN LEAF. ALL PLANTS SHALL BE NURSERY GROWN AND GRADE 'A' NURSERY STOCK. PLANTS SHALL NOT BE PRUNED BEFORE DELIVERY.
13. ALL PLANTS (B&B OR CONTAINER) SHALL BE PROPERLY IDENTIFIED BY WEATHERPROOF LABELS SECURELY ATTACHED THERETO BEFORE DELIVERY TO PROJECT SITE. LABELS SHALL IDENTIFY PLANTS BY NAME, SPECIES, AND SIZE. LABELS SHALL NOT BE REMOVED UNTIL THE FINAL INSPECTION BY THE LANDSCAPE ARCHITECT OR AGENT IN CHARGE.
14. THE LANDSCAPE ARCHITECT OR OWNER SHALL HAVE THE RIGHT, AT ANY STAGE OF THE OPERATIONS, TO REJECT ANY AND ALL WORK AND MATERIAL WHICH, IN HIS OPINION, DOES NOT MEET THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS. ALL REJECTED MATERIALS SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.
15. NO SUBSTITUTIONS SHALL BE MADE WITHOUT WRITTEN CONSENT OF THE OWNER OR LANDSCAPE ARCHITECT.
16. THE CONTRACTOR SHALL BE WHOLLY RESPONSIBLE FOR STABILITY AND CONDITIONS OF ALL TREES AND SHRUBS AND SHALL BE LEGALLY LIABLE FOR ANY DAMAGE CAUSED BY INSTABILITY OF ANY PLANT MATERIALS. STAKING OF ALL TREES SHALL BE DONE UTILIZING A METHOD AGREED UPON BY THE LANDSCAPE ARCHITECT, AS INDICATED ON THE DOCUMENTS.
17. ALL PROPOSED TREES TO BE INSTALLED EITHER ENTIRELY ON OR ENTIRELY OUT OF PLANTING BEDS. PLANTING BED LINES ARE NOT TO BE OBSTRUCTED. ALL SHRUBS AND GROUND COVER AREAS SHALL BE PLANTED IN CONTINUOUS PREPARED BED. PLANTS PLANTED IN ROWS SHALL BE MATCHED SPECIMENS AND BE UNIFORM IN SIZE AND FORM. PLANT MATERIAL SHOWN IN A MASS OR TOUCHING EACH OTHER SHALL BE ALLOWED TO GROW TOGETHER TO PERFORM AS A SCREEN OR A HEDGE. DO NOT PRUNE OR SHEER INTO INDIVIDUAL FREESTANDING PLANTS.
18. ALL PLANTING BEDS ADJACENT TO LAWN, SOD, OR SEEDED AREAS SHALL BE SPADE EDGED.
19. MAINTENANCE SHALL BEGIN AFTER EACH PLANT HAS BEEN INSTALLED AND SHALL CONTINUE UNTIL 90 DAYS AFTER FINAL ACCEPTANCE BY THE ARCHITECT OR OWNER REPRESENTATIVE. MAINTENANCE INCLUDES WATERING, PRUNING, WEEDING, FERTILIZING, MULCHING, REPLACEMENT OF SICK OR DEAD PLANTS, AND ANY OTHER CARE NECESSARY FOR THE PROPER GROWTH OF THE PLANT MATERIAL. THE CONTRACTOR MUST BE ABLE TO PROVIDE CONTINUED MAINTENANCE IF REQUESTED BY THE OWNER.
20. UPON COMPLETION OF ALL LANDSCAPING, AN ACCEPTANCE OF THE WORK INSPECTION SHALL BE HELD. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER FOR SCHEDULING THE INSPECTION AT LEAST SEVEN (7) DAYS PRIOR TO THE ANTICIPATED INSPECTION DATE.
21. THE CONTRACTOR IS RESPONSIBLE FOR TESTING PROJECT SOILS. THE CONTRACTOR IS TO PROVIDE A CERTIFIED SOILS REPORT TO THE OWNER. THE CONTRACTOR SHALL VERIFY THAT THE SOILS ON THE SITE ARE ACCEPTABLE FOR THE PROPER GROWTH OF THE PROPOSED PLANT MATERIAL. SHOULD THE CONTRACTOR FIND POOR SOIL CONDITIONS, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE SOIL AMENDMENTS AS NECESSARY. THESE AMENDMENTS SHALL INCLUDE, BUT NOT BE LIMITED TO, FERTILIZERS, LIME, AND TOPSOIL. PROPER PLANTING SOILS MUST BE VERIFIED PRIOR TO PLANTING OF MATERIALS.
22. PLANTER BED (IF AND WHERE REQUIRED) SHALL BE WELL-DRAINING AND FERTILE. SOILS SHALL BE SANDY-LOAM, FRIABLE MIX, FREE FROM DEBRIS, ROCKS, ETC.. SOIL TO BE 20% SAND AND 20% PEAT MIXED WITH 50% SELECTED WELL- DRAINED SOILS FROM THE SITE. BACK FILL SOILS SHALL BE AS NOTED ON THE PLANTING DETAILS.
23. ALL DISTURBED AREAS OF THE SITE, OR DISTURBED AREAS NOT PLANTED WITH SHRUBS OR GROUNDCOVER, SHALL BE FINE GRADED WITH TOP SOIL 5" THICK MIN., FERTILIZED, SEEDED AND MULCHED WITH SMALL GRAIN STRAW, OR SODDED. TOPSOIL SHALL BE NATURAL FRIABLE, FERTILE SOIL CHARACTERISTIC OF PRODUCTIVE SOIL IN THE VICINITY. IT SHALL BE FREE OF LUMPS OF CLAY, STONES, ROOTS AND OTHER FOREIGN MATTER.
24. ALL SOD (IF AND WHERE REQUIRED) SHALL BE OBTAINED FROM AREAS HAVING GROWING CONDITIONS FAMILIAR TO AREAS TO BE COVERED. AREAS TO BE SODDED SHALL BE RAKED OF STONES AND DEBRIS. DEBRIS AND STONES OVER 1-INCH (1") IN DIAMETER SHALL BE REMOVED FROM THE SITE. ALL SOD MUST BE PLACED WITH STAGGERED JOINTS, TIGHTLY BUTTED, WITH NO INEQUALITIES IN GRADE. PLACE ALL SOD IN ROWS AR RIGHT ANGLES TO SLOPES (WHERE APPLICABLE).
25. BULBS (IF AND WHERE REQUIRED) SHALL BE IN CONFORMANCE WITH SECTION 11 OF THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS.
26. SOME FIELD LOCATED PLANTS ARE NOT GRAPHICALLY SHOWN ON THIS PLAN BUT ARE WITHIN THE LIMIT OF CONSTRUCTION. ALL PLANTS (FIELD LOCATED PLANTS GRAPHICALLY SHOWN PLANS) ARE NOTED ON THE PLANT LISTS.
27. THIS PLAN IS TO BE USED FOR LANDSCAPING AND LIGHTING PURPOSES ONLY. THE CONTRACTOR SHALL EXAMINE ALL ENGINEERING DRAWINGS AND FIELD CONDITIONS FOR EXACT LOCATIONS OF UTILITIES, DRAINS ETC., AND NOTIFY THE OWNER ABOUT ANY DISCREPANCIES BEFORE STARTING WORK.
28. ALL PLANT MATERIAL SHALL BEAR THE SAME RELATION TO FINISH GRADE AS IT BORE TO EXISTING GRADE AT THE NURSERY.
29. ALL PLANTING MATERIAL IS TO BE GUARANTEED FOR A PERIOD OF 12 MONTHS FROM THE FINAL ACCEPTANCE OF THE PROJECT. IF ANY PLANTS ARE DEAD OR IN AN UNHEALTHY CONDITION BEFORE FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL REPLACE THEM AT HIS EXPENSE.
30. PRUNE NEWLY PLANTED TREES AS DIRECTED BY THE LANDSCAPE ARCHITECT. CUT AND REMOVE FROM SITE ALL STRING, WIRE OR BURLAP FROM TOP ONE-THIRD OF BALL. ALL TREES OVER 6' IN HEIGHT ARE TO BE STAKED AT TIME OF INSTALLATION. PLANTS SHALL ONLY BE INSTALLED WHEN THE SOIL IS FROST FREE AND FRIABLE. ALL PLANTING PROCEDURES SHALL CONFORM TO STATE DOT SPECIFICATIONS.
31. UNDER NO CIRCUMSTANCES SHOULD THE MAIN LEADER OF A ANY TREE BE TOPPED.
32. SHADE TREES LOCATED NEAR PEDESTRIAN OR VEHICULAR ACCESS SHOULD NOT BRANCH BELOW 7'. ALL PLANTS WITHIN SIGHT TRIANGLE EASEMENTS SHALL NOT EXCEED A MATURE HEIGHT OF 30" ABOVE ELEVATION OF CURB.
33. THE DEPTH OF PLANTING PITS SHALL BE INCREASED BY 12" THROUGH THE ADDITION OF LOOSE AGGREGATE (3/4" TO 1-1/2" DIAMETER) WHEREVER POOR DRAINAGE OCCURS OR WHERE DIRECTED BY THE LANDSCAPE ARCHITECT.
34. MULCH, 3" IN DEPTH, SHALL BE DOUBLE SHREDDED HARDWOOD BARK NOT EXCEEDING 2" IN GREATEST DIMENSION.
35. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ADEQUATE IRRIGATION TO ALL PLANT MATERIALS AND LAWN AREAS INSTALLED AS PART OF THIS CONTRACT DURING THE CONSTRUCTION TIME PERIOD UP TO AND THROUGHOUT THE REQUIRED 90-DAY MAINTENANCE PERIOD UNTIL PLANTS ARE ESTABLISHED. WATER APPLIED DURING THE GUARANTEE PERIOD SHALL BE AT THE RATE OF 1-INCH (1") OF WATER PER WEEK, WITH AN ALLOWANCE FOR NATURAL PRECIPITATION AND RAINFALL. IF ON-SITE WATER IS NOT AVAILABLE AT THE PROJECT LOCATION, THE CONTRACTOR SHALL FURNISH IT BY MEANS OR A WATERING TRUCK OR OTHER ACCEPTABLE MANNER. ALL WATER APPLIED TO PLANTED OR TURF AREAS SHALL BE FREE FROM IMPURITIES HARMFUL TO VEGETATION.
36. BACK FILL MATERIAL FOR PLANT BEDS SHALL SHALL CONSIST OF NATURAL LOAM TOPSOIL, FREE FROM SUBSOIL, AND SHALL BE OBTAINED FROM AN AREA WHICH HAS NEVER BEEN STRIPPED. TOPSOIL SHALL HAVE BEEN REMOVED FROM A DEPTH OF NO MORE THAN 1-FOOT (1'), OR LESS IF SUBSOIL IS ENCOUNTERED. TOPSOIL SHALL BE OF UNIFORM QUALITY, FREE FROM HARD CLODS, STIFF CLAY HARD PAN, SODS, PARTIALLY DISINTEGRATED STONE, LIME CEMENT, TAR RESIDUES, CHIPS OR ANY OTHER UNDESIRABLE MATERIAL.
37. A ROOT BARRIER PRODUCT SHALL BE INSTALLED IN THE PLANTING PITS OF TREES BEING INSTALLED WITHIN TEN-FEET (10') OF NEW OR EXISTING PAVEMENT, CURB OR SIDEWALK. ROOT BARRIER SHALL ONLY BE INSTALLED IN SIDE(S) OF PLANTING PITS THAT ARE WITHIN TEN-FEET (10') OF NEW OR EXISTING PAVEMENT, CURB OR SIDEWALK.
38. A TEMPORARY WATERING SYSTEM MUST BE USED FOR A PERIOD OF ONE-YEAR TO ESTABLISH PLANT MATERIAL AFTER INSTALLATION.ALL LANDSCAPE BERMS SHALL BE IRRIGATED. IRRIGATION SHALL BE DESIGNED IN ZONES WITH TIMER CONTROLS AND PRECIPITATION DETECTION TIMER BYPASS.
39. THE CONTRACTOR SHALL REMOVE AND REPLACE DYING, DEAD, OR DEFECTIVE PLANT MATERIAL AT HIS EXPENSE. ALL REPLACEMENT PLANTS SHALL BE OF THE SAME SPECIES AND SIZE AS SPECIFIED ON THE APPROVED OR FINAL PLANT LIST. REPLACEMENTS RESULTING FROM REMOVAL, LOSS, OR DAMAGE DUE TO OCCUPANCY OF THE PROJECT IN ANY PART, VANDALISM, PHYSICAL DAMAGE BY ANIMALS, VEHICLES, ETC., AND LOSSES DUE TO CURTAILMENT OF WATER BY LOCAL AUTHORITIES SHALL BE APPROVED AND PAID FOR BY THE OWNER.



NOTES
1. CROWN OF ROOTBALL SHOULD BEAR SAME RELATION (OR SLIGHTLY ABOVE) FINISHED GRADE AS IT BORE TO PREVIOUS GRADE.
2. STAKES AND GUYS SHOULD ONLY BE USED WHEN SITE CONDITIONS MERIT. GUYS SHOULD BE ATTACHED LOOSELY TO ALLOW TREE TO SWAY NATURALLY.
3. MULCH SHOULD BE APPLIED PRIOR TO INITIAL WATERING AS A MAXIMUM FOUR INCH (4") TOP DRESSING. NEVER MOUND MULCH AROUND THE BASE OF THE TREE AS THIS WILL RESULT IN PREMATURE DEATH OF THE TREE.
4. STAKES, WHEN DRIVEN MUST BE (1/2) TO (2/3) THE HEIGHT OF THE TREE MEASURED FROM THE GROUND LEVEL. TWO STAKES SHALL BE DRIVEN A MINIMUM OF TWO (2) FEET INTO UNDISTURBED SOIL OUTSIDE THE PLANTING HOLE.
5. GUYS ON MULTISTEM TREES TO BE MADE ON HEAVIEST BRANCHES OF THE PLANT.
6. CUT TWINE AND FOLD DOWN BURLAP INTO BOTTOM OF HOLE PRIOR TO BACKFILLING.
7. TREE WRAP AND LANDSCAPE FABRIC SHOULD ONLY BE USED WHEN CONDITIONS MERIT.
8. ALL NON-BIODEGRADABLE MATERIALS SHOULD BE REMOVED FROM THE ROOTBALL.

1 DECIDUOUS SHADE TREE PLANTING DETAIL
SCALE: **N.T.S.**



NOTES:
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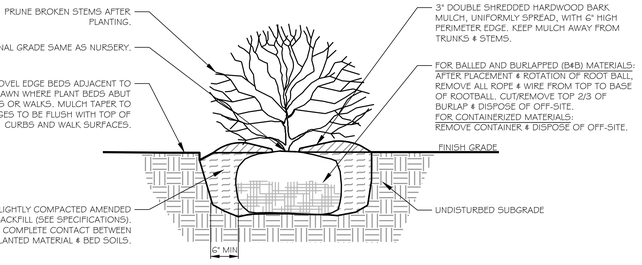
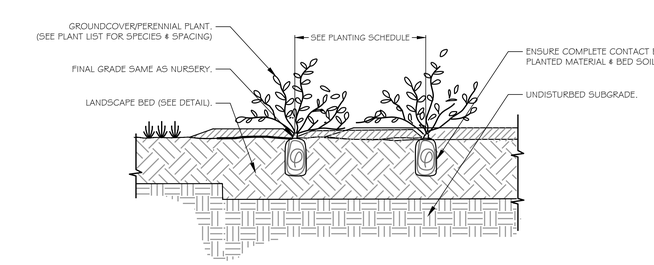
4. EVERGREEN TREES UNDER 4 FEET IN HEIGHT DO NOT REQUIRE STAKING.
5. CUT TWINE AND FOLD DOWN BURLAP INTO BOTTOM OF HOLE PRIOR TO BACKFILLING.
6. TREE WRAP AND LANDSCAPE FABRIC SHOULD ONLY BE USED WHEN CONDITIONS MERIT.
7. ALL NON-BIODEGRADABLE MATERIALS SHOULD BE REMOVED FROM THE ROOTBALL.

2 EVERGREEN TREE PLANTING DETAIL
SCALE: **N.T.S.**



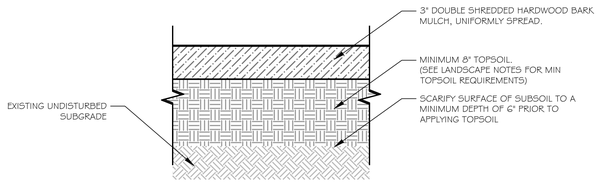
NOTES
1. ORIENT SHRUB SAME AS IN NURSERY PRIOR TO BALLING, SET SHRUB STRAIGHT AND PLUMB
2. DO NOT PRUNE EVERGREENS, EXCEPT TO REMOVE DEAD AND BROKEN BRANCHES.
3. THIN BRANCHES AND FOLIAGE (NOT ALL BRANCH TIPS) BY 1/3, RETAINING NORMAL PLANT SHAPE (EXCEPT EVERGREEN).
4. SHRUB SHALL BEAR THE SAME RELATION TO FINISHED GRADE AS IT BORE TO PREVIOUS GRADE IN THE NURSERY.

3 SHRUB PLANTING DETAIL
SCALE: **N.T.S.**



NOTE
1. GROUND COVER MATERIAL SHALL BEAR SAME RELATION TO FINISHED GRADE AS IT BORE TO PREVIOUS GRADE IN THE NURSERY.

4 GROUNDCOVER/PERENNIAL PLANTING DETAIL
SCALE: **N.T.S.**



NOTE
1. NO MACHINERY SHALL ENTER LANDSCAPE BED AREAS AFTER SCARIFICATION OF SUBSOIL AND INSTALLATION OF TOPSOIL.

5 PLANTING BED DETAIL
SCALE: **N.T.S.**

LANDSCAPE SCHEDULE
ALL PLANTS TO BE UNIFORM WITHIN SPECIES, VIGOROUS , AND FULL.

QTY	KEY	BOTANICAL NAME	COMMON NAME	MIN. SIZE.	CALIPER	ROOT
DECIDUOUS TREES						
1	CJ	CERCIDIPHYLLUM JAPONICUM 'PENDULA'	WEEPING KATSURA TREE	8' - 10'	2"-2.5"	B&B
EVERGREEN TREES						
2	TS	THUJA STANDISHII x PLICATA 'GREEN GIANT'	GREEN GIANT ARBORVITAE	6' - 8'	N/A	B&B
6	XN	XANTHOCYPARIS NOOTKATENSIS 'PENDULA'	ALASKAN WEEPING CEDAR	6' - 8'	N/A	B&B
ORNAMENTAL TREES						
3	AP	ACER PALMATUM var. DISSECTUM 'TAMUKEYAMA'	JAPANESE (RED) MAPLE	6' - 8'	1.5"-2"	B&B
SHRUBS						
3	ASC	CORNUS STOLONIFERA 'FARROW'	ARCTIC FIRE REDTWIG DOGWOOD	30" - 36"	N/A	#5 CONT.
47	PLO	PRUNUS LAUROCERASUS 'OTTO LUYKEN'	OTTO LUYKEN CHERRY LAUREL	30" - 36"	N/A	B&B
27	PLS	PRUNUS LAUROCERASUS 'SCHIPKAENSIS'	SKIP LAUREL	36" - 48"	N/A	B&B
34	RKH	RHODODENDRON KURUME x 'HINO CRIMSON'	HINO CRIMSON (RED) AZALEA	24" - 30"	N/A	#3 CONT.
ORNAMENTAL GRASS						
6	CAK	CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	KARL FOERSTER REED GRASS	24" - 36"	N/A	#3 CONT.
36	PAH	PENNISETUM ALOPECUROIDES 'HAMELN'	DWARF HAMELN FOUNTAIN GRASS	6" - 12"	N/A	#1 CONT.
GROUNDCOVER						
40	JHW	JUNIPERUS HORIZONTALIS 'WILTONII'	CREEPING JUNIPER	3" - 6"	N/A	#3 CONT.
PERENNIALS						
30	ACV	ASTILBE CHINENSIS 'VISION IN RED'	(RED) VISION ASTILBE	6" - 12"	N/A	#1 CONT.
19	HMP	HEUCHERA MICRANTHA 'PALACE PURPLE'	PURPLE PALACE CORAL BELLS	6" - 12"	N/A	#1 CONT.
24	ISC	IRIS SIBIRICA 'CAESAR'S BROTHER'	CAESAR'S BROTHER SIBERIAN IRIS	6" - 12"	N/A	#1 CONT.
36	LCC	LOBELIA CARDINALIS	(RED) CARDINAL FLOWER	6" - 12"	N/A	#1 CONT.
155	LMV	LIRIOPE MUSCARI 'VARIEGATA'	VARIEGATED LIRIOPE	6" - 12"	N/A	#1 CONT.

CODE REVIEW:

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SEAL:

CONSULTANTS:

PLANNING BOARD DRAWING SET

PROJECT:

ADDITIONS AND RENOVATIONS TO ALUMNI GYM AND STRENGTH AND CONDITIONING CENTER

FOR

RIDER UNIVERSITY

2083 LAWRENCEVILLE ROAD, LAWRENCEVILLE, NJ, 08648

FOR CODE REVIEW: 9/17/21

REVISIONS:

#	REVISION NAME	DATE

FOR BID: DD/MM/YYYY

DRAWING TITLE:

LANDSCAPING NOTES AND DETAILS

COMMISSION NUMBER: 21U011

AGENCY NUMBER: ##-##### ##

DO NOT SCALE THE DRAWINGS

DRAWING NUMBER: L0.2

THIS DRAWING IS FORMATTED TO BE PRINTED AT 30"x42"

7/12/2