APPENDIX B

EROSION AND SEDIMENTATION CONTROL STANDARDS

City of Bradenton | August 2016

TABLE OF CONTENTS

LIST OF FIGURES

1 INTRODUCTION

This appendix to the City of Bradenton Department of Public Works and Utilities Utility Specifications Manual contains standard erosion control plans and procedures that are suitable for implementation with typical residential building construction, as well as commercial building construction. It is not intended to address all sites or circumstances.

Since Bradenton's streets and storm sewers are conduits for draining and conveying stormwater to surface waters within our city and to waters of the state, it is important during construction activities to minimize the sediment and debris on the construction sites rather than tracked or eroded onto streets.

The City's primary objective is to eliminate or reduce the amount of sediments and other pollutants leaving any construction site. To accomplish this goal, erosion and sediment control steps and procedures called Best Management Practices (BMPs) must be utilized. When properly implemented and maintained, BMPs are very effective in minimizing erosion and migration of sediments off construction sites.

All projects submitted to the City of Bradenton for review through the Site Improvement Permit or Building Department Permit process are required to have a Storm Water Pollution Prevention (SWPPP) and Erosion and Sediment Control plan included in the approved construction drawings. A SWPPP is part of the Southwest Florida Water Management District (SWFWMD) Environmental Resource Permit (ERP) process but subject to review to meet City standards.

Beginning on the first day of construction activities, the SWPPP and Erosion and Sediment Control drawings must be available on site for inspection and review as well as the NOI and dewatering permits if applicable.

The grading/erosion control permit holder (City Site Improvement Permit or SWFWMD ERP) as well as the building permit holder, are responsible for ensuring that adequate BMPs are in place on site and in adjacent areas impacted by construction traffic and stormwater runoff from the construction site. These areas must be properly protected and remain functional until the building project is completed. ERP permits specifically require BMP's to remain in place and not be removed or compromised until project completion. A project is defined as completed only when 70 percent of the open space has been re-vegetated.

When reviewing the standards presented in this publication, the approved construction plans, and implementation schedule for the construction project, keep in mind the intent of the standard is "to prevent erosion and to minimize sediments from leaving the site." Failure to implement these controls may result in damage to adjacent property, damage to the City's storm sewer system, and contribute to the pollution of stormwater ponds and surface waters within the City limits which may be a violation of the federal Clean Water Act and result in fines of up to $25,000 per day.

If any questions or concerns arise, please feel free to contact the City of Bradenton Public Works and Utilities Department. The City is committed to helping all of those involved with the implementation of these construction procedures.

2 CONSTRUCTION SITE OPERATION AND MAINTENANCE

The contractor shall appoint a designated representative who holds a basic erosion control certification from the State of Florida to manage BMPs for the project and maintain SWPPP and erosion control reporting for the site.

2.1 PERMITTING

Stormwater discharges from construction activities can significantly impact water quality. As stormwater flows over a construction site, it can pick up pollutants like sediment, debris, and chemicals and transport them to nearby storm sewer systems or directly into rivers, lakes, or coastal waters. The NPDES stormwater program requires permits for discharges from construction activities that disturb one or more acres, and discharges from smaller sites that are part of a larger common plan of development or sale (USEPA, 2016).

2.1.1 CITY OF BRADENTON SITE IMPROVEMENT PERMIT

Public Works approved SIP construction plans and the SWFWMD ERP must be available at all times on site throughout the project. These plans contain the minimum standard for erosion control on site. The plans show specific detail to address:

- Appropriate and agreed upon access to the site via the construction entrance
- Maintenance of construction equipment to ensure oil, grease, gasoline and other pollutants are not released into the storm system or other waterbodies
- Provide measures to minimize tracking of soil, mud, concrete, ect onto public roadways
- Provide inlet protection measures for offsite and onsite storm connections

2.1.2 FDEP

Operators of construction activities that disturb greater than one acre must obtain coverage under an NPDES stormwater permit issued by FDEP and implement appropriate pollution prevention techniques to minimize erosion and sedimentation and properly manage stormwater. The majority of construction activities requiring an NPDES stormwater permit will likely qualify for an NPDES generic permit for construction. A generic permit is a general permit issued by DEP (FDEP, 2016).

The contractor will:

- Submit a Construction General Permit (CGP) Notice of Intent (NOI) to FDEP
    - Large construction sites are 5 or more acres, small construction sites are 1 – 4.99 acres, and land disturbances less than 1 acres but part of a larger common development all require an NOI.
- Develop and implement a Stormwater Pollution Prevention Plan (SWPPP)
- Provide a copy of the NOI and SWPPP to City of Bradenton Public Works Engineering
- Keep a hard copy of the NOI, SWPPP and associated inspections and records on site at all times for review by inspectors

2.2 INSTALLATION

No clearing, grading, excavation, filling, or other disturbances in the natural terrain will be permitted until the BMP's denoted in the SIP are installed except for the work necessary to implement these measures.

2.3 INSPECTION

Based on the conditions of the City SIP and the FDEP NOI, the permittee (general contractor, developer or the developer's designates representative) shall inspect BMPs weekly at a minimum and within twenty four (24) hours after every storm event of 0.5 inches or greater and repair or replace BMPs that are no longer functioning as design within seven days.

2.3.1 CITY INSPECTIONS

1. Prior to initiating any site improvement work, all erosion and sediment control measures depicted on the approved construction plans must be in place and pass inspection performed by the City inspector for compliance with City standards. If site work has started prior to the final inspection of the erosion control measures, a stop work order may be issued. Work will not commence again until the erosion control measures have passed inspection.

2. The City inspector will routinely inspect erosion and sediment control measures. Inspections will ensure that appropriate erosion and sediment control measures are in place and functioning appropriately.

3. The City inspections will concentrate on the installation and ongoing maintenance of the following BMPs:

    - Perimeter Controls
    - Inlet Protection
    - Construction Entrance
    - Tracking
    - Debris/trash Control
    - Concrete Washout Area
    - Dewatering
    - Hazardous Material

    If BMP's are not installed, or are improperly installed, a Notice of Violation/Order to Comply may be given to the permit holder. If the violations are not repaired within the allowed time of seven days, the inspector or code enforcement may issue an administrative fine or a Stop Work Order until the sediments have been removed and proper BMP's are established.

4. There will be instances that fall outside the norms. City staff will be available to discuss erosion and sediment control measures for any lot and the sequencing for installation. If you have questions or concerns call 941-708-6300 to speak with the Engineering Department.

2.4 MAINTENANCE

Site contractors and building contractors are responsible for ensuring adequate BMP's are in place and functioning as designed until the establishment of final cover is complete. The frequency of maintenance varies from BMP to BMP. As erosion control inspections will continue over the life of the construction project, both horizontal and vertical, the contractor will need to inspect, repair, replace and maintain the controls as outlined in Section 3.

3 BEST MANAGEMENT PRACTICES (BMPS)

The definition of BMPs as referenced in this manual are part of the EPA NPDES permitting that applies to the prevention practices aimed at reducing potential pollutant discharges related to commercial and residential construction sites. The practices discussed below are commonly found onsite and represent the most basic of BMPs to be implemented within the City of Bradenton.

3.1 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A SWPPP must identify potential sources of pollution that may be reasonably expected to affect the quality of stormwater discharge associated with construction activity. In some cases the Engineer of Record may prepare a formal SWPPP as part of the SIP construction drawing set; other times the contractor will be responsible to develop and maintain the appropriate forms reviewed by the City and inspections associated with the SWPPP.

A SWPPP submittal to FDEP from the contractor should consist of a narrative, a site map, and a certification statement at a minimum. The individual or company named as the responsible party for the SWPPP is ultimately responsible for keeping sediments from leaving the construction site. This includes actions of sub-contractors, suppliers, and delivery firms visiting the site.

3.2 CONSTRUCTION ENTRANCE

Each construction site including single or multi-family residential units must have a designated construction entrance. Commonly the future driveway is a good place for the construction entrance. The responsible party for the SWPPP should require that all trades, delivery and supply companies only use the approved construction entrance.

- Construction entrances must have a minimum depth of six (6) inches of crushed concrete, crushed rock, class 5 aggregate or a tracking mat.
- The entrance should access block stormwater runoff from the road from entering the site. A pipe may be installed along the curbline at the edge of the construction entrance to allow water to pass to the storm drain.
- Any sediment tracked on a paved surface from the construction site must be removed by the end of the day by sweeping or other approved method.
- Vehicles should stay off the construction site during wet conditions to avoid tracking sediment off the job site and into the storm sewer.
- Refer to Figure 3-1 for details on appropriate construction techniques for the temporary construction entrance.

Maintenance requirements:

- The contractor shall street sweep any public roadways adjacent to the site once a day as a minimum or more frequently as determined by the City's construction inspector during site and building construction.
- Stone aggregate needs to be checked weekly or more often based on activity and after every storm event 0.5-inches or greater. If aggregate is worn or compressed new aggregate needs to be added to maintain a minimum depth of 6-inches.

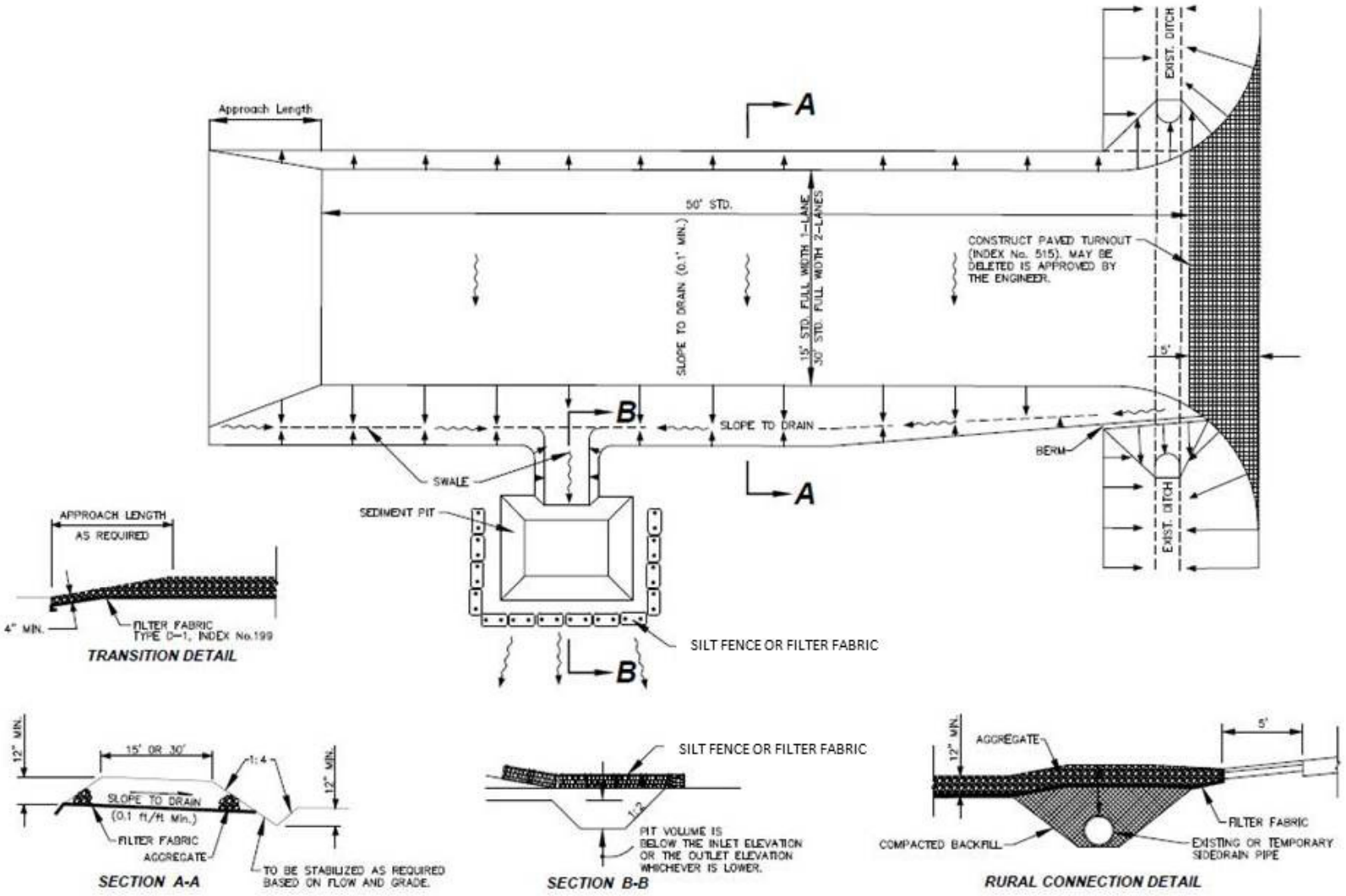

Figure 3-1 Construction Entrance

3.3 DEWATERING

Along the west coast of Florida groundwater often needs to be addressed to provide appropriate working conditions on construction sites. The common solution is to dewater via pumping onto City streets or to a nearby storm drain inlet. This water that is sediment laden and must be treated prior to being pumped into the storm drain. It is the permit holder's responsibility to keep sediment from exiting the job site, collecting on the roadway and traveling and entering the storm drain system.

- A sediment filter bag or approved temporary sediment basin must be used to remove sediment from the effluent prior to leaving the site and eventually entering a storm drain or water body.
- At a minimum, visual inspection must be done to ensure adequate treatment is achieved. The regulatory and testing requirement is no more than 29 NTUs above background levels.
- The contractor is responsible for ensuring the dewatering process will not cause a nuisance to other adjacent properties, leaving sediments within a green space or on a roadway or causing erosion of right-of way.
- All dewatering activities within the construction site are subject to regulatory compliance and City inspection.

Figure 3-2 Dewatering Sediment Trap and Turbidity Curtain

Pollution of storm system will not be tolerated and may result in Notice of Violation/Order to Comply and a Stop Work Order until the conditions are met and sediment is removed from the storm drain system.

3.4 CURB AND INLET PROTECTION

Curb and inlet protection must be installed prior to any construction activities commencing including trenching for silt fence installation. Outlined here are approved methods for protection of curbs and inlets:

- For inlet grates, filter cloth must be placed under the inlet grate during worksite construction to prevent sediment infiltration into drainage pipes.
- Filter cloth must be a minimum of twelve inches (12") past the inlet drainage structure as shown in the figure below.
- For curb inlets, a 6" wrapped under drain with washed shell, commonly referred to as a "sock," will be placed along the length of the inlet to prevent sediment from entering the drain as shown in the figure below.

- The “socks” and filter cloths must be inspected daily by the grading/erosion control permit holder and the building permit holder or contractor. “Socks” and filter cloths must be replaced before sediment clogs the inlet as shown in the above picture.
- Sediment bags may also be used in inlet structures. They are to be to be cleaned regularly, as they cannot hold high volumes of sediments.
- Inspect filter cloth and sediment bags/logs at least once a week and after every 0.5 inch or greater rainfall. Make needed repairs immediately.
- Promptly (within 24 hours) replace any collapsed, torn, decomposed or ineffective sediment logs.

Figure 3-3 Inlet Protection

3.5 SILT FENCE

Silt fence must be installed and maintained in compliance with City specifications. The following guidelines must be utilized for proper usage of the silt screen fence:

- A minimum of eight inches (8”) of the silt fence must be embedded in the ground with a minimum of sixteen inches (16”) above ground.
- Sediment control fence posts must be driven a minimum of sixteen inches (16”) into the ground; above the ground, the fence post must be a minimum of twenty inches (20”) and be a minimum of thirty-six inches (36”) in length.
- The maximum distance allowed between each fence post is ten feet (10’).

Maintenance requirements:

- Inspect silt fences at least once a week and after every 0.5 inch or greater rainfall. Make needed repairs immediately.
- Promptly (within 24 hours) replace any collapsed, torn, decomposed or ineffective silt fence.
- Remove the sediments accumulated against silt fences when those sediments reach 1/3 the height of the fence. Take care to avoid damaging or undermining the fence during cleanout.
- If construction activities necessitate temporary changes in the location of the silt fence, the contractor is responsible for ensuring that all BMP devices are reinstalled per the original design at the end of every work day.

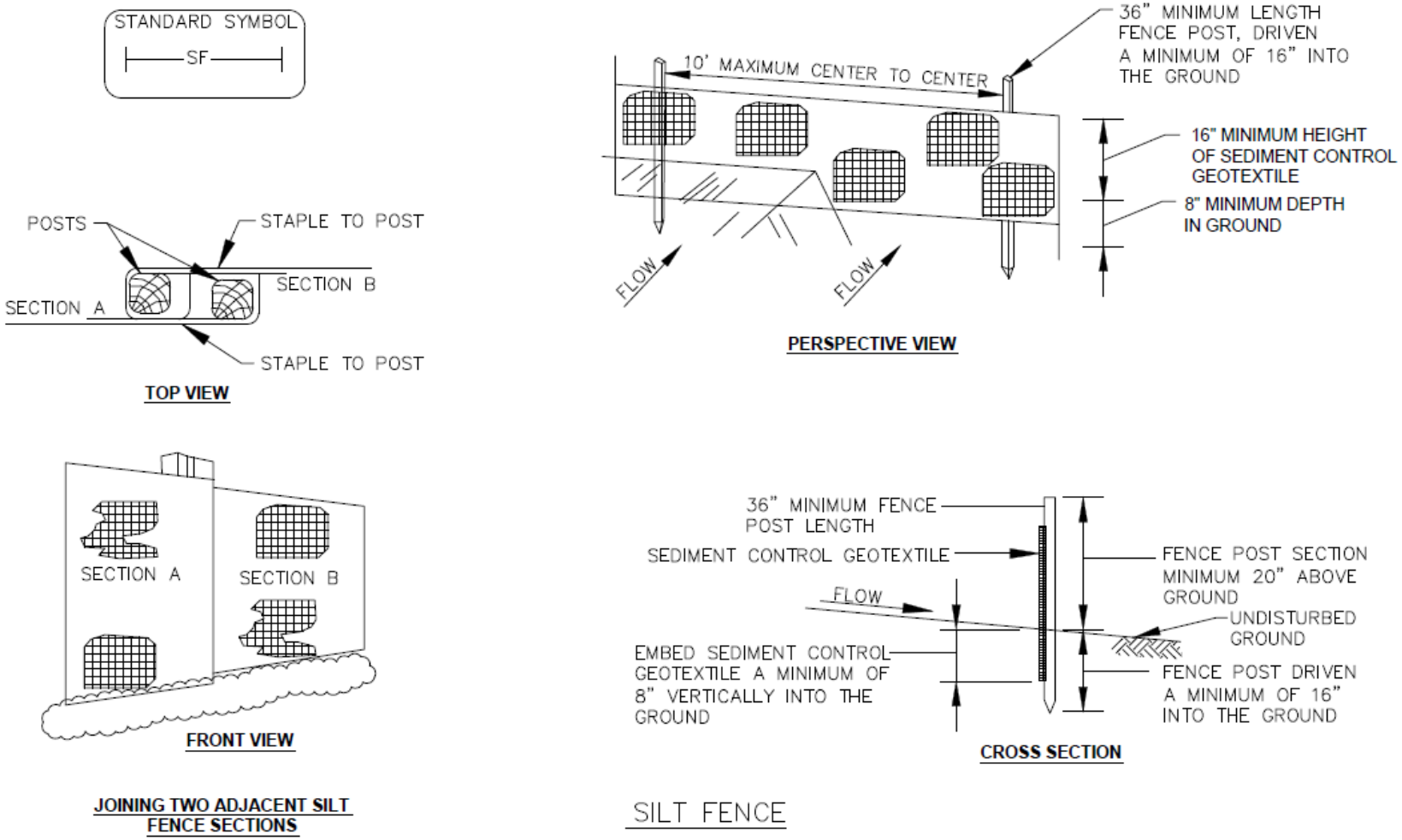

Figure 3-4 Silt Fence

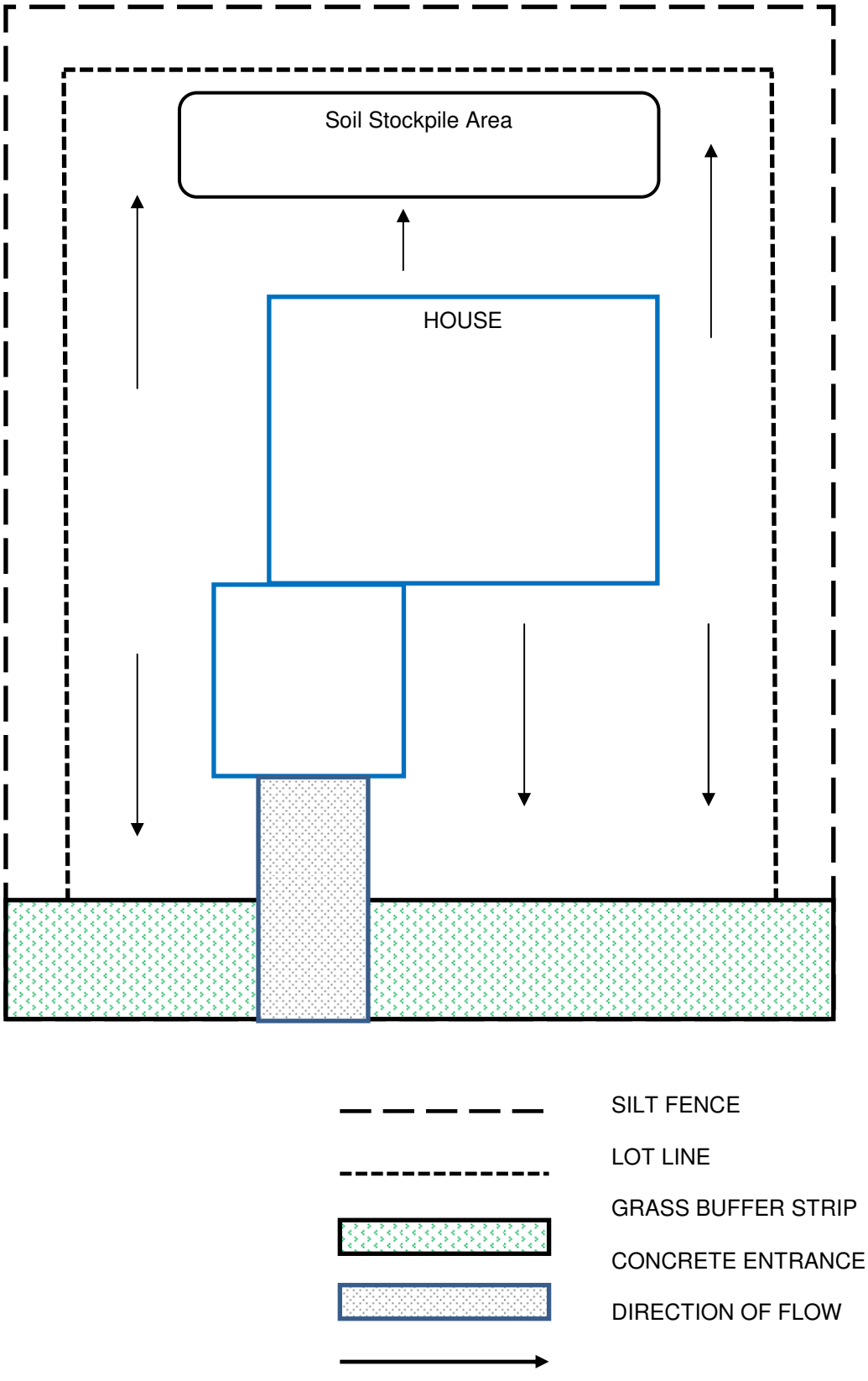

Figure 3-5 Silt Fence and Grass Buffer on a Residential Lot

3.6 BUFFER STRIPS

During high rainfall months, standing water can become an issue on work sites. Waiting for the water to recede or infiltrate naturally takes essential time and effort and can delay work for a project. The common solution is to pump this water onto the City Street or to a nearby storm drain inlet. However, this water that is being pumped is carrying sediment and must be treated prior to being deposited into the storm drain. It is the permit holder's responsibility to keep sediment from leaving the job site and from entering the storm drain.

- A sediment filter bag or approved temporary sediment basin may be used to remove sediment from the effluent prior to entering a storm drain.
- Visual inspection must be done to ensure adequate treatment is achieved.
- Dewatering must not cause a nuisance to other adjacent properties or cause erosion of right-of way.

Maintenance requirements:

1. Promptly (within 24 hours) repair any damage to the grass buffer strip or install additional BMPs (silt fence, sediment logs, sod or mulch) if the area is beyond repair.

2. On a regular basis reinforce the need to use the construction entrance and to preserve the grass buffer strips with subcontractors, employees and delivery personnel.

Pollution of storm system will not be tolerated and can result in Notice of Violation/Order to Comply and even Stop Work Order until the conditions are met and sediment is removed from the storm drain system.

3.7 SOIL STOCKPILES

Soil stockpiles should be protected or adequately covered from stormwater during construction. Simple protection measures include silt fencing or a trench around the base of the stockpile. A tarp or temporary seeding also can provide adequate cover for a soil stockpile. BMP's must be located and installed to prevent erosion of sediments onto adjacent properties, public roadways or storm drain inlets for both wind and water erosion. Stockpiles should not be placed within 50 feet of the perimeter of the site, a waterbody or storm drain inlet, or on the right-of-way (FDEP, 2008).

3.8 SODDING

Contractor shall provide establishment of the sod (Bahia or St Augustine) before final acceptance of the project with no dead areas of ground cover. Sod establishment shall consist of necessary preserving and protecting to keep the grassed areas in a satisfactory condition. The Contractor shall water the grassed areas as long and as often as necessary to promote maximum practicable growth. At any time the City may require replanting an area or portion of an area which, for any cause, shows unsatisfactory growth.

3.9 WASH OUT AREA

If conditions on the site are such that most of the mud is not removed by the vehicles traveling over the stone in the construction entrance then the vehicle tires must be washed before entering a public roadway. Wash water must be carried away from the entrance to a settling area to remove sediment (FDEP, 2009). Additionally, cement trucks or mixers need to have a contained area to wash vehicles before driving on public roadways. The tire wash area is not appropriate for this and another area will need to be established onsite. Wash water from the concrete wash out area cannot be released to the storm drain system.

In any instance of mechanical breakdown or similar circumstance where a truck cannot be cleaned via washout area, all spilled material must be shoveled off the street and swept accordingly. **NONE** of this sediment shall enter any storm drain, and the material **WILL NOT** be sprayed with water, as this will send pollutants into the storm inlet.

- The site must provide a washout area for trucks leaving the site.
- The washout material and water must be contained, meaning that none of the water can leave the washout area.
- Streets and right-of-ways may not be used as washout areas.
- Washout areas must be lined or compacted per EPA NPDES construction permitting.
- The washout area should be clearly and properly marked.
- The permit holder is responsible for suppliers' and deliveries' knowledge of washout areas.
- The washout area must be a minimum of fifteen feet (15') from any storm inlet.
- The washout area must be inspected once a week, and within 24 hours after a rain event of 0.5 inches or more.
- The washout must be emptied when 80% of its capacity is used.

Figure 3-6 Concrete Wash Out Area

3.10 ADDITIONAL CONSIDERATIONS

Hay bales and seeding are traditional erosion control practices but **are not** permissible within the City of Bradenton.

4 REFERENCES

Florida Department of Environmental Protection, 2008, *Florida Stormwater Erosion and Sedimentation Control Inspectors Manual.*

Florida Department of Environmental Protection, 2016, *http://www.dep.state.fl.us/water/stormwater/npdes/construction3.htm*

Hillsborough County, 2008, *Stormwater Management Technical Manual.*

United States Environmental Protection Agency, 2016, *https://www.epa.gov/npdes/stormwater-discharges-construction-activities#overview*