



May 23, 2025

Subject: Technical Memo for Variance Request: 1010 Osceola Avenue Grading and Drainage Improvements

From: Kevin B. Herren, PE and Ryne C. Phillips, PE, PhD
Seamon, Whiteside & Associates, Inc.

To: Charles Drayton
Director of Planning & Zoning
Town of Sullivan's Island
2056 Middle Street, P.O. Box 427
Sullivan's Island, SC 29482

Attachments: 1010 Osceola Avenue Grading and Drainage Plans
Town of Sullivan's Island Osceola Avenue Project Exhibit

1. Executive Summary

- 1010 Osceola Avenue, without interventions, is at severe risk of repetitive tidal flooding. Current recommendations proposed as part of the recently completed (and approved by Town Council) Stormwater Master Plan were limited to flood mitigation projects that could be implemented within the public right-of-way which may exclude marsh-adjacent properties (such as 1010 Osceola Avenue) from receiving flood mitigation benefits. Therefore, to accommodate these properties, this plan recommended that the Town of Sullivan's Island encourage and allow property owners to fill or protect their property against an appropriate tidal mitigation target.
- Stormwater impacts to adjacent property owners and public rights-of-way will be reduced if the proposed grading and drainage plan is implemented.
 - Existing Conditions: 30% of Property Flows towards Osceola Avenue, 18% of Property Flows towards 1018 Osceola Avenue, 52% of Property Flows towards the marsh
 - Proposed Conditions: 15% of Property Flows towards Osceola Avenue, 5% of Property Flows towards 1018 Osceola Avenue, 80% of Property Flows towards the marsh
- Town Osceola Avenue Project: The proposed grading and drainage improvements of this property should reduce the stormwater operations and maintenance by the Town after the roadway project is complete. The runoff will be routed more efficiently and retained within the property / toward the marsh, making it easier for the Town to manage the stormwater along the road. If the road project is completed without these improvements to the property, more stormwater management would likely be required by the Town in front of this property.
- Based on the results of our analysis, and the information presented herein, the owner of 1010 Osceola Avenue is requesting a variance of Town Code Section 21-13, 21-139 (2) and 21-139 (3) to allow implementation of the proposed grading and drainage project.

2. Introduction

Seamon, Whiteside & Associates, Inc. has completed a grading and drainage plan to portray the necessary improvements for protecting the historic property at 1010 Osceola Avenue from tidal-driven flooding within the Town of Sullivan's Island, SC. Figure 1 below depicts the project area for this analysis. This technical memorandum serves to document our analysis and reasoning for requesting variance from current Town code and policy.



Figure 1 – Project location within the Town of Sullivan's Island, SC.

3. Existing Conditions & Property Risks

The property at 1010 Osceola Avenue is a vulnerable property on Osceola Avenue for tidal-driven flooding. This property sits directly adjacent to the open marsh with no form of flood protection. With recent flooding of Osceola Avenue, rainfall becoming increasingly more intense, and tide elevations in the area expected to continue rising, the risks of flooding associated with this property continue to increase moving forward without any improvements being made. These risks include:

- **Tidal Flooding** - As noted in the “Island-Wide Stormwater Master Plan and Infrastructure Improvement Strategy” by Seamon, Whiteside, & Associates, Inc. Dated February 2025 and approved by Town Council in March 2025 (hereby referred to as the Stormwater Master Plan), the current typical tide elevation on Sullivan’s Island is 3.31 feet NAVD88 with extreme tidal elevations exceeding 4.55 feet NAVD88 (Section 4.4.2 of the Stormwater Master Plan). Future sea level rise was also analyzed as a part of the Stormwater Master Plan. The results of this future sea level rise analysis indicated that future (50-year planning horizon) typical tides would exceed 5.39 feet NAVD88, with extreme tides exceeding 6.63 feet NAVD88 (Section 4.4.2.1 of the Stormwater Master Plan). The property elevation currently ranges from approximately 6 feet NAVD88 near the building and slopes down to 2.5 – 3 feet NAVD88 in the back of the property (along the marsh) and down to 4 feet NAVD88 along Osceola Avenue. Based on the analysis and results of the Stormwater Master Plan, severe and repetitive tidal flooding will be a systemic problem for this property, that without intervention, may lead to irrevocable damage for this historic property.
- **Roadway Improvements** – The Stormwater Master Plan outlines high-priority projects for mitigating flooding on Sullivan’s Island such as proposed improvements for Osceola Avenue (Section 5.3.1 of the Stormwater Masterplan). Specifically, the Stormwater Master Plan calls for raising Osceola Avenue by 1.5 – 2 feet up to an elevation of 6 feet NAVD88 with suggestions of a future final target elevation of 7 feet NAVD88 (see attached for project exhibit). This is being proposed due to the constant flooding and submergence of the roadway in recent storm events and to combat the projected sea level rise in the future. Figure 2 below shows Osceola Avenue flooded near Station 9 ½ after a storm event, roughly 500 feet from the property, while Figures 3 through 5 show the roadway flooded directly adjacent to the property. Raising this street will protect the roadway from future floods but will still leave low-lying and marsh-adjacent properties, such as 1010 Osceola Avenue, at risk of tidal floods.



Figure 2 – Flooded Osceola Avenue (near Sta. 9 ½)
December 2023



Figure 3 – Flooded Osceola Avenue (in front of 1018 Osceola Avenue)
November 2024



Figure 4 – Flooded Osceola Avenue (in front of 1018 Osceola Avenue)
November 2024



Figure 5 – Flooded Osceola Avenue (in front of 1018 Osceola Avenue)
November 2024

4. Proposed Conditions and Town Code Variance Reasoning

The attached grading and drainage plan proposes the following improvements to 1010 Osceola Avenue:

- Extension of the 1018 Osceola Avenue Landscape Wall – The proposed landscape wall (submitted as part of the Variance Request for 1018 Osceola Avenue) will extend from the adjacent property (1018 Osceola Avenue) along the critical wetland limits, to a point along the western property boundary. The wall is proposed at elevation 7 feet NAVD88, reaching a maximum height of approximately 1 foot above proposed grade inside the property.
- Raising the Property Elevation - this includes raising the grade up to 7 feet NAVD88 for the majority of the landscape wall boundary, the front yard and area to the east of the house to 6 feet NAVD88 in addition to adding a berm on the east side of the property. Grading also includes raising the roadside drainage swale from 3 feet to 4 feet NAVD88. A drainage swale is proposed in the southwest corner of the property sloped away from the new driveway location. Grading will blend into the existing elevations along the back of the property with drainage being captured by a yard inlet and discharged into the marsh. The proposed grading will also blend back to existing grades surrounding the existing trees in the backyard for protection.

These improvements are necessary to protect this property from tidal flooding. This will require variance from Town Code Section 21-13, which states “Any importation of materials of any type or re-contouring of a lot’s existing contours that increased a lot’s existing ground elevation more than one (1) foot above existing grade and results or may result in elevating an existing or proposed structure is strictly prohibited”. Due to the landscape wall, which is being represented as a fence, this project will also require variance from the Town Code Section 21-139 (2), which states “All fences shall be constructed of wood or metal or manufactured materials that appear to be wood, or wood/wire materials; chain-link fences are prohibited. New fence products may be allowed, subject to approval by the Design Review Board. (12-18-12)” and Section 21-139 (3) “All fences shall be at least twenty-five percent (25%) open across the entire plane of the fence.”



The improvements and variance are required for the following reasons:

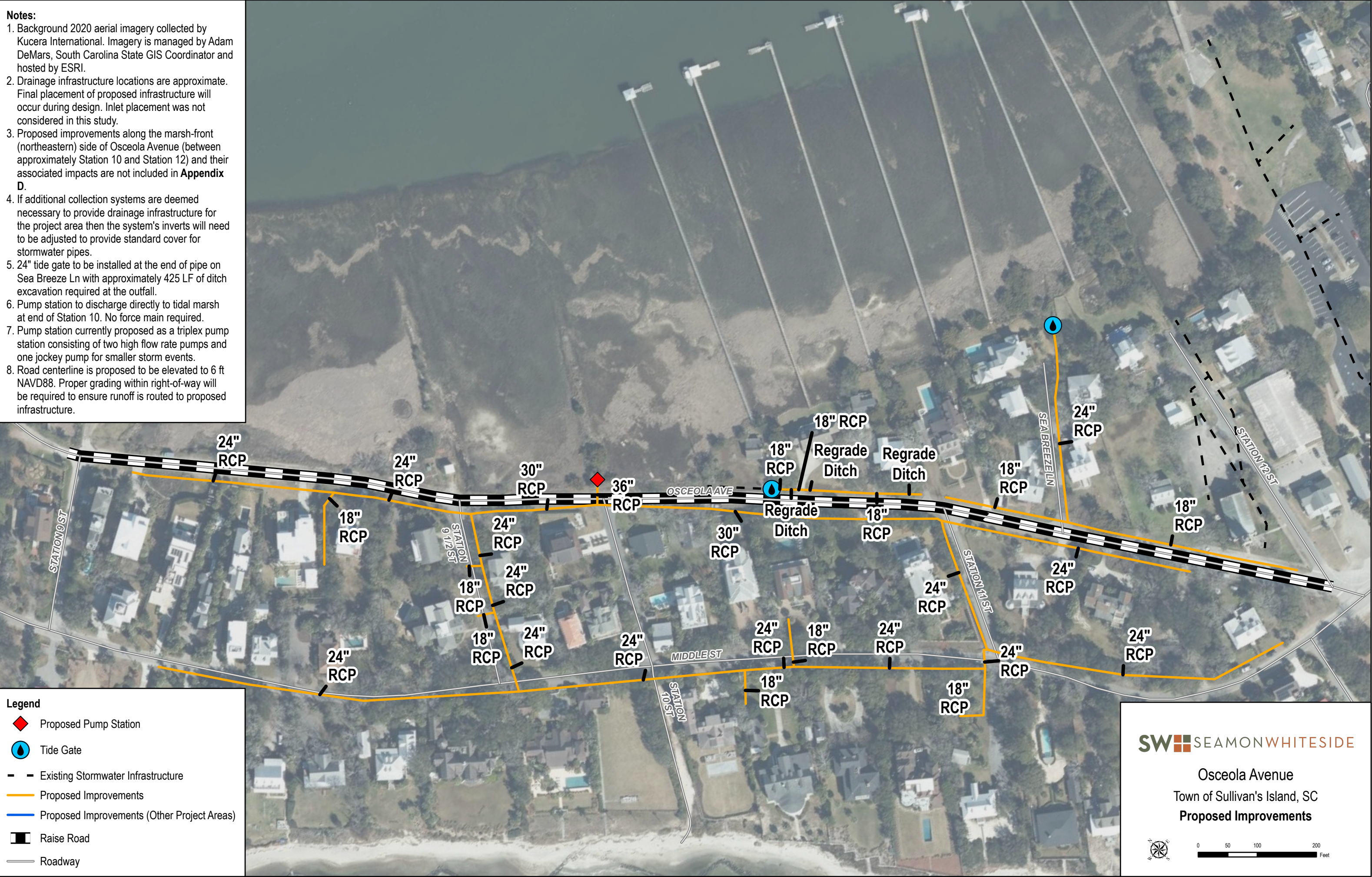
- Provide flood mitigation for repetitive tidal flooding of this property which is severely impacted by today's extreme tides that are only anticipated to become worse and more frequent in the future. The current extreme tidal elevation (as analyzed within the Stormwater Master Plan) is already above the majority of the property, with future typical and extreme tidal elevations indicative that future tides may frequently exceed the building pad elevation, flooding the entire site, and causing severe and potentially irrevocable damage to this historic property. The proposed landscape wall extension and grading at elevation 7 feet NAVD88 will mitigate against projected extreme tidal events and will protect the Owner's property and house. This design aligns with the general Lowcountry target elevations for long-term coastal resiliency. This elevation is also referenced in Section 5.3.1 of the Stormwater Master Plan as a recommended target elevation of tidal perimeter protection improvements.
- The grading and necessary fill will create a safe and efficient drainage layout for the site, neighboring property, and Osceola Avenue. The berm at elevation 6 feet NAVD88 will prevent tidal water from entering the backyard during most storm events in the present and future. Surface water will be directed away from the house into a proposed yard inlet that will discharge into the marsh. It is proposed that a tidal check valve will be installed as a part of this system to prevent tidal backflow. With the Town exploring raising Osceola Avenue (as recommended within the Stormwater Master Plan), the additional fill will allow for this property's grading to blend with the new road elevation. This will prevent flooding of the driveway and allow the roadside drainage to operate more efficiently.

5. Alignment with Proposed Osceola Town Project

The Stormwater Master Plan identified the proposed improvements along Osceola Avenue (including raising the roadway) as the highest priority project that the Town of Sullivan's Island need to implement to improve their long-term coastal resiliency. This entire corridor has already experienced severe systemic flooding that will continue to increase and pose risks to the properties adjacent to the roadway.

The improvements proposed in the attached grading and drainage plan will not only preserve the property at 1010 Osceola Avenue but will also safeguard the Town's investment if / when the roadway elevation is raised. With tidal elevations rising and storm events expected to increase in severity, the property would continue to flood if the roadway project was implemented without any of the proposed changes recommended herein. Implementing the landscape wall at elevation 7 feet NAVD88 in addition to the proposed grading and drainage improvements will protect the property and aligns with the objectives/recommendations of the Town's Stormwater Master Plan. Most importantly, the proposed site improvements do not and will not jeopardize the Town's proposed project.


- Notes:**
- 1. Background 2020 aerial imagery collected by Kucera International. Imagery is managed by Adam DeMars, South Carolina State GIS Coordinator and hosted by ESRI.
 - 2. Drainage infrastructure locations are approximate. Final placement of proposed infrastructure will occur during design. Inlet placement was not considered in this study.
 - 3. Proposed improvements along the marsh-front (northeastern) side of Osceola Avenue (between approximately Station 10 and Station 12) and their associated impacts are not included in **Appendix D**.
 - 4. If additional collection systems are deemed necessary to provide drainage infrastructure for the project area then the system's inverts will need to be adjusted to provide standard cover for stormwater pipes.
 - 5. 24" tide gate to be installed at the end of pipe on Sea Breeze Ln with approximately 425 LF of ditch excavation required at the outfall.
 - 6. Pump station to discharge directly to tidal marsh at end of Station 10. No force main required.
 - 7. Pump station currently proposed as a triplex pump station consisting of two high flow rate pumps and one jockey pump for smaller storm events.
 - 8. Road centerline is proposed to be elevated to 6 ft NAVD88. Proper grading within right-of-way will be required to ensure runoff is routed to proposed infrastructure.



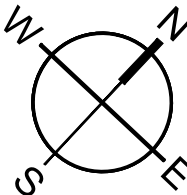
501 WINDO PARK BOULEVARD, SUITE 200, MOUNT PLEASANT, SC 29464 | JUDSONVILLE BUILDING 600, 701 EAST FV BRIDGE RD, SUITE 600, GREENVILLE, SC 29611 | 200 PETERSON DR, CHARLOTTE, NC 28207 | 1711 N. CEDAR STREET, SUMMERVILLE, SC 29583 | 104 N. DANIEL MORGAN AVENUE, SUITE 300, SPARTANBURG, SC 29306
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- NOTES:**
1. SPOT ELEVATION KEY: "EX" = EXISTING, "FUT" = FUTURE, "BW" = BOTTOM OF WALL, "TW" = TOP OF WALL.
 2. FOR PROJECT SURVEY INFORMATION INCLUDING VERTICAL DATUM AND BENCHMARK LOCATION, SEE SHEET C2.0.
 3. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS, INCLUDING BUT NOT LIMITED TO TOPOGRAPHIC, TREE, STORM DRAINAGE FACILITIES, AND ALL UTILITIES. EXISTING UTILITIES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ENGINEER. THEREFORE, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXACT VERTICAL AND HORIZONTAL LOCATIONS OF ALL EXISTING UTILITIES. ANY DISCREPANCIES OR CONFLICTS IDENTIFIED DURING VERIFICATION OF EXISTING CONDITIONS AND UTILITIES SHALL BE REPORTED TO THE OWNER AND ENGINEER. ANY COSTS ASSOCIATED WITH CORRECTIVE WORK OR DAMAGES THAT ARE A RESULT OF THE CONTRACTOR NOT VERIFYING EXISTING CONDITIONS AND THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES WILL BE THE CONTRACTOR'S RESPONSIBILITY.
 4. CONTRACTOR TO SELF-VERIFY THAT SITE GRADES, DRAINAGE PIPES, AND DRAINAGE STRUCTURES ARE CONSTRUCTED PER THE PLANS.
 5. YARD INLET LOCATIONS ARE SUBJECT TO CHANGE PRIOR TO CONSTRUCTION BASED ON FIELD CONDITIONS.
 6. ALL DRAINAGE PIPE TO BE INSTALLED WITH CHECK VALVES AT THE DISCHARGE LOCATION (TIDEFLEX DUCKBILL CHECK VALVE, OR EQUAL).
 7. PIPE PENETRATIONS THROUGH THE LANDSCAPE WALL SHALL BE WATERTIGHT SEALED WITH FLEXIBLE BOOTS, OR EQUAL.



Know what's below.
Call before you dig.

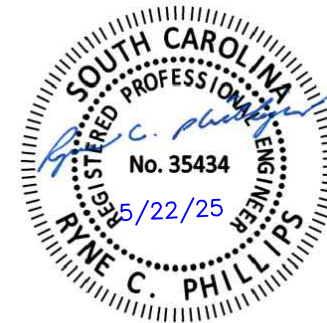
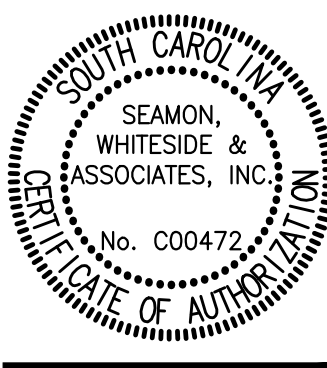


SCALE: 1" = 10'



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OSCEOLA AVENUE GRADING AND DRAINAGE PLAN
HARPER BUILDING GROUP
1018 & 1010 OSCEOLA AVENUE
SULLIVANS ISLAND, SC

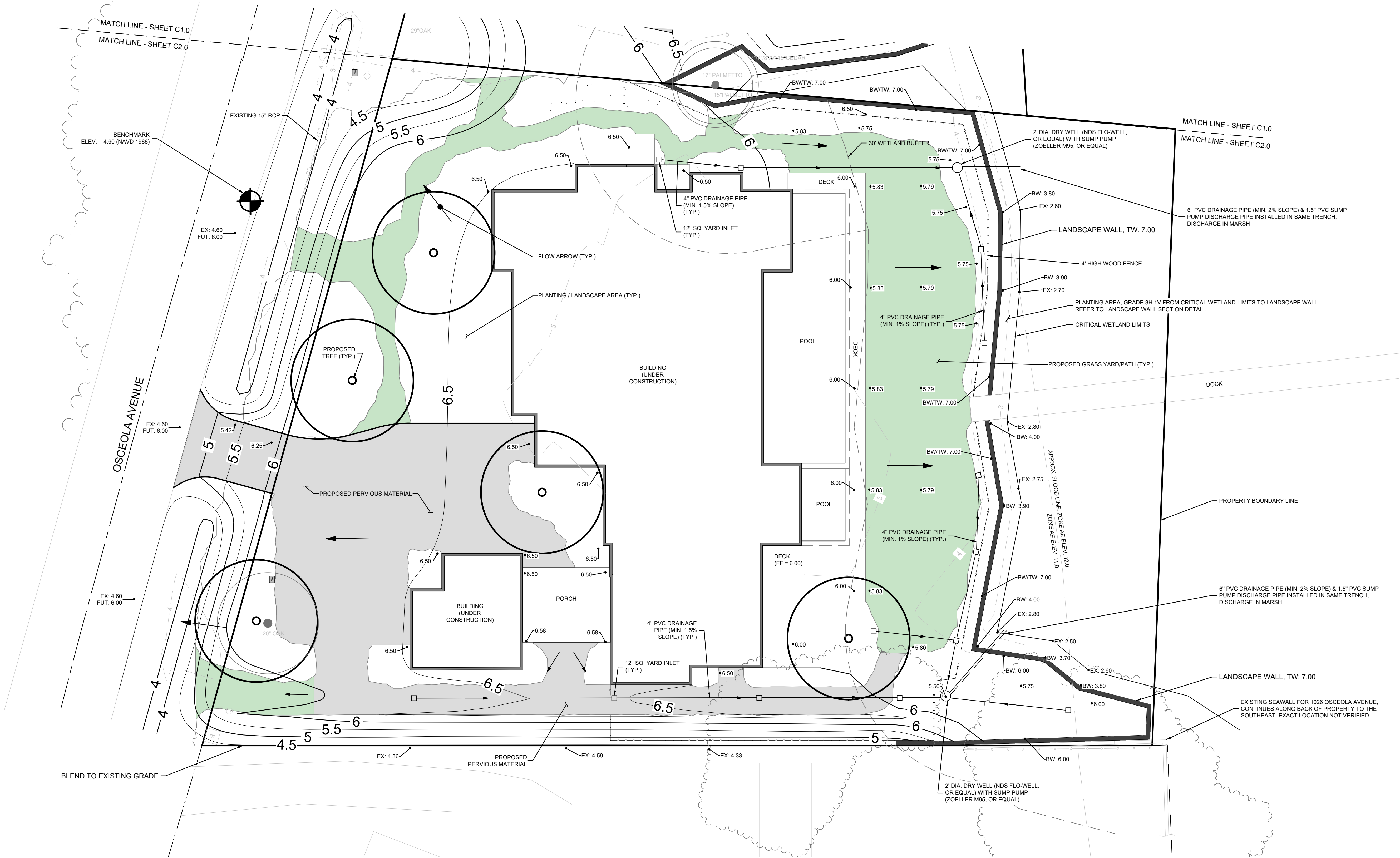
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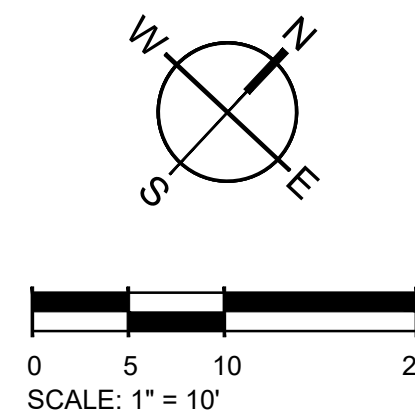
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1010
OSCEOLA AVE
GRADING AND
DRAINAGE
PLAN

501 WINDO PARK BOULEVARD, SUITE 200, MOUNT PLEASANT, SC 29464 | JUDSONVILLE BUILDING GROUP, 701 EASLEY DRIVE, SUITE 600, GREENVILLE, SC 29611 | 250 PETERSON DRIVE, CHARLOTTE, NC 28207 | 1710 N. CEDAR STREET, SUMMERVILLE, SC 29485 | 104 N. DANIEL MORGAN AVENUE, SUITE 200, SPARTANBURG, SC 29306
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 - CONTRACTOR TO SELF-VERIFY THAT SITE GRADES, DRAINAGE PIPES, AND DRAINAGE STRUCTURES ARE CONSTRUCTED PER THE PLANS PRIOR.
 - GUTTER DESIGN ON THE BUILDING IS TO BE DESIGNED BY OTHERS. GUTTERS ARE TO TIE-IN TO THE YARD INLET DRAINAGE SYSTEM. YARD INLET LOCATIONS ARE SUBJECT TO CHANGE PRIOR TO CONSTRUCTION BASED ON FIELD CONDITIONS.
 - FINAL DESIGN OF DRY WELL AND SUMP PUMP LOCATION, EQUIPMENT, AND PIPE CONNECTIONS SUBJECT TO CHANGE PRIOR TO CONSTRUCTION BASED ON FIELD CONDITIONS.
 - ALL DRAINAGE PIPE AND SUMP PUMP DISCHARGE PIPE TO BE INSTALLED WITH CHECK VALVES AT THE DISCHARGE LOCATION (TIDEFLEX DUCKBILL CHECK VALVE, OR EQUAL).
 - PIPE PENETRATIONS THROUGH THE LANDSCAPE WALL SHALL BE WATERTIGHT SEALED WITH FLEXIBLE BOOTS, OR EQUAL.



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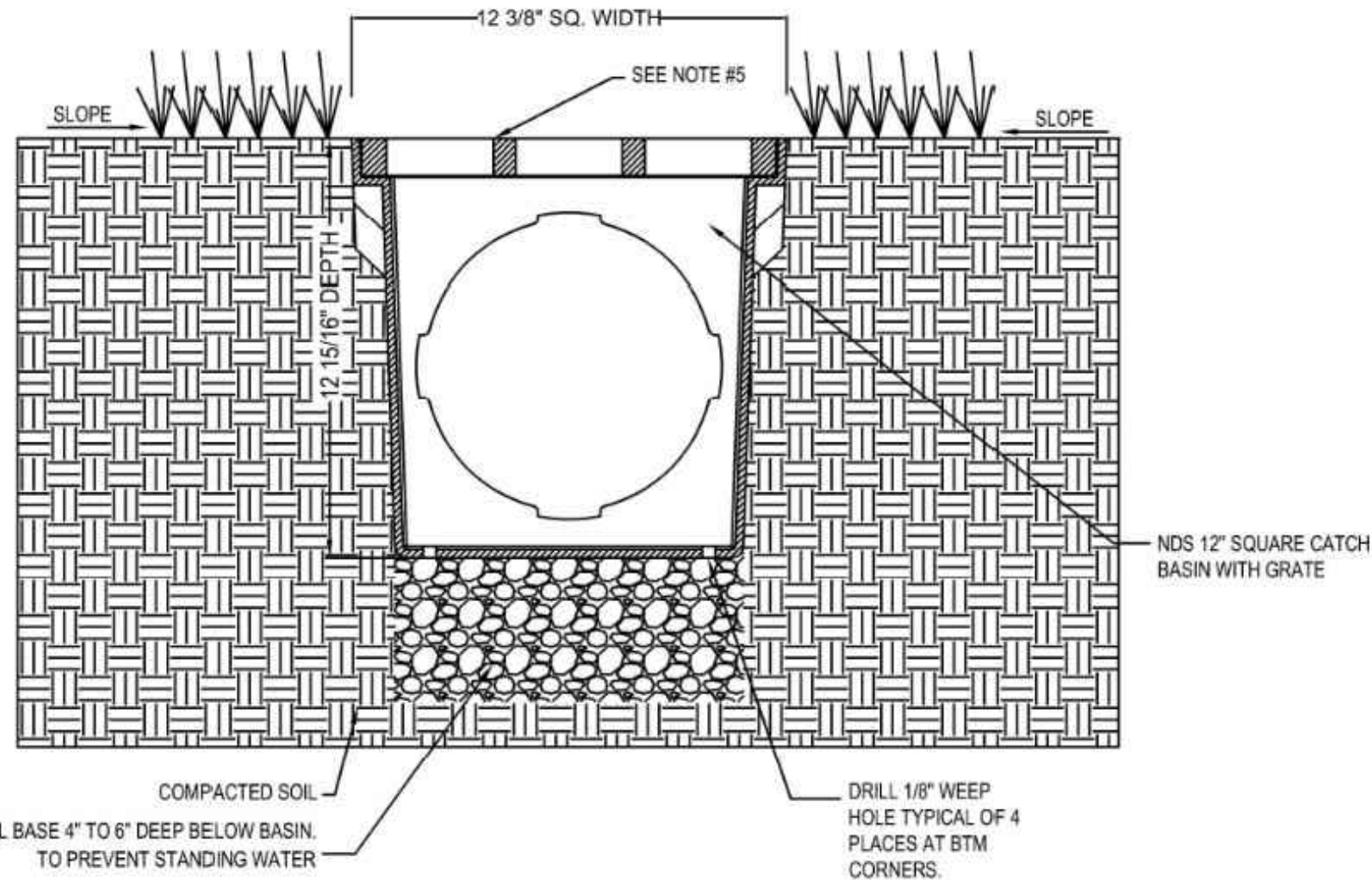


OSCEOLA AVENUE GRADING AND DRAINAGE PLAN
HARPER BUILDING GROUP
1018 & 1010 OSCEOLA AVENUE
SULLIVANS ISLAND, SC

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REVISION HISTORY	

1018
OSCEOLA AVE
GRADING AND
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PLAN



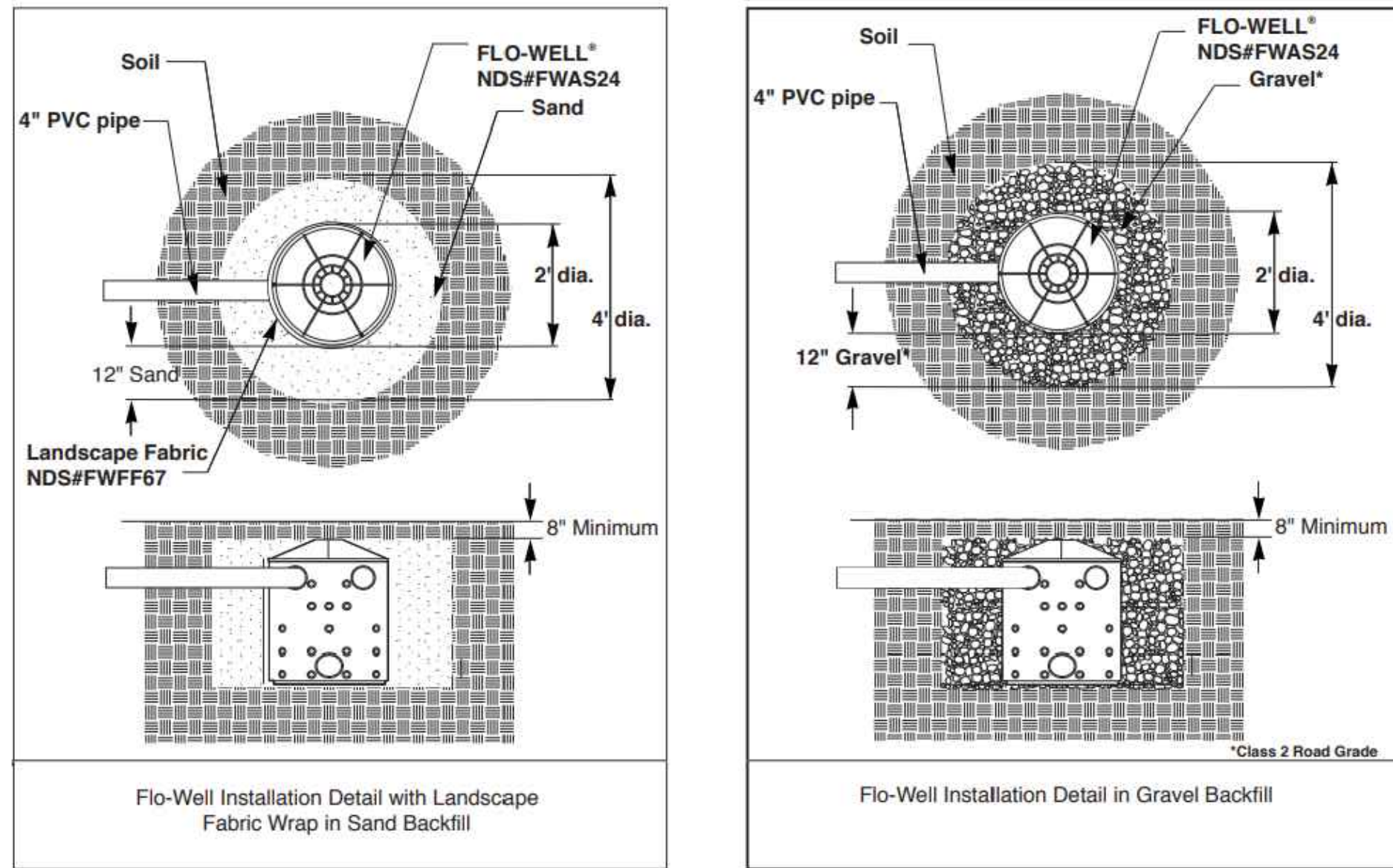
NOTES:

1. GRATE TO BE ATTACHED TO CATCH BASIN WITH SCREW PROVIDED AT TIME OF INSTALLATION.
2. RISER CAN BE CUT TO ACHIEVE EXACT ELEVATION.
3. EXISTING SOILS SHOULD BE EVALUATED TO ENSURE PROPER STRUCTURAL AND PERMEABILITY PROPERTIES.
4. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
5. RECESS CHANNEL AND GRATE 1/8" FOR PEDESTRIAN TRAFFIC.
6. DO NOT SCALE DRAWING.
7. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY.
8. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.

12" Square Yard Inlet Detail

SCALE: NOT TO SCALE

Installation Note: Location and number of ports removed will determine the rate and direction of leaching.
* Add gravel around outside of Flo-Well® unit to increase leaching capacity.

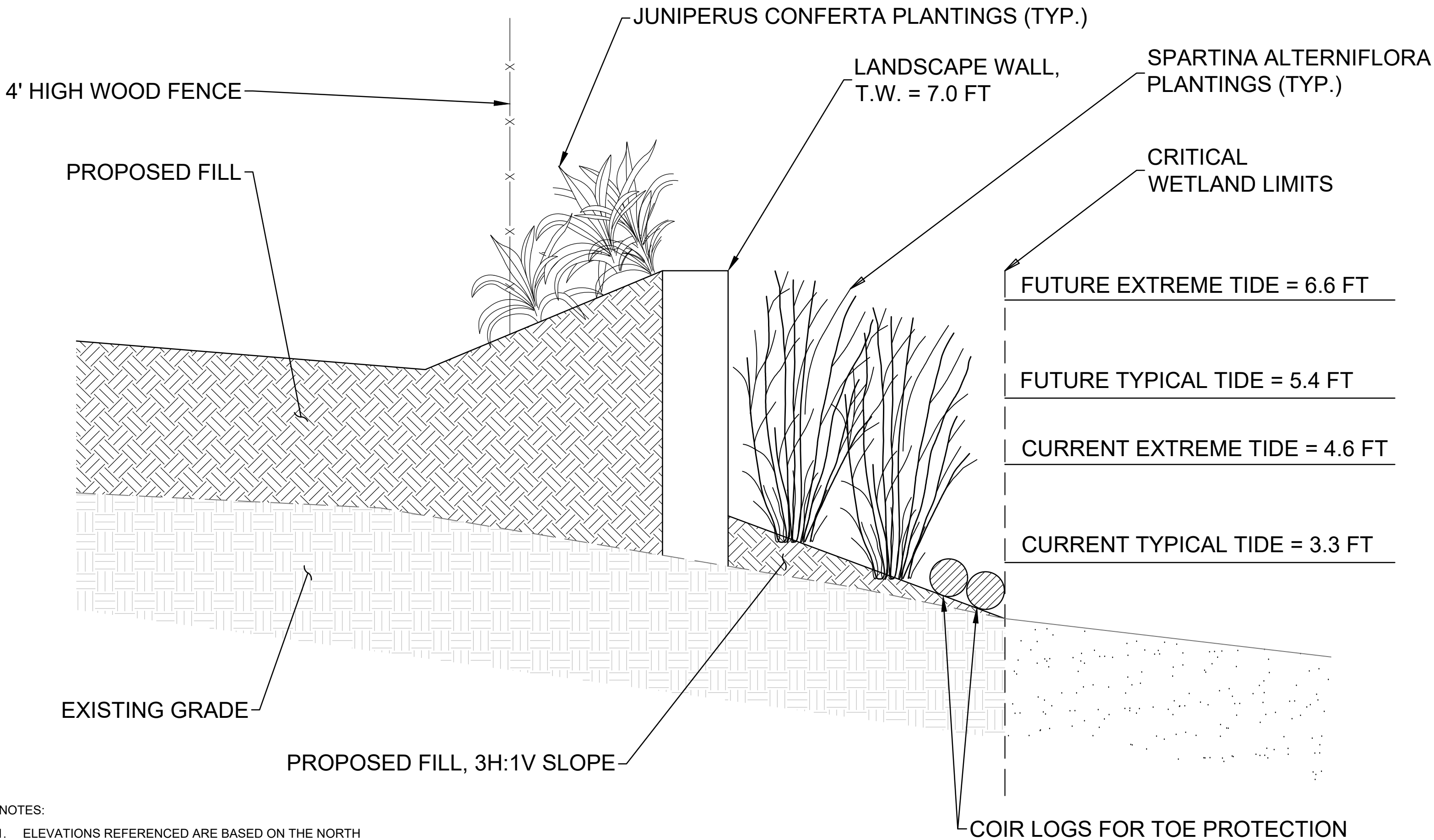
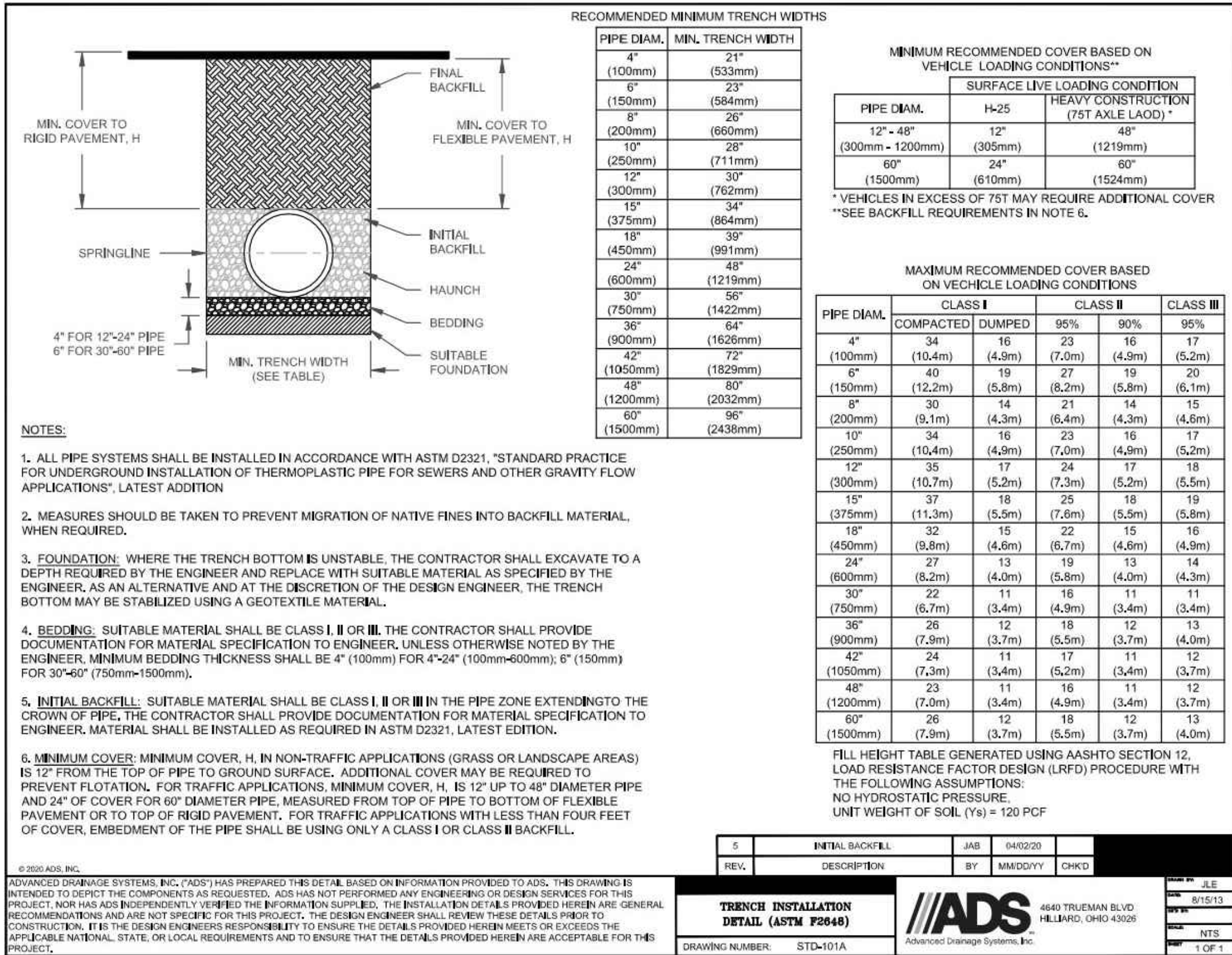


NOTES:

1. SUMP PUMP IN DRY WELL TO BE SIZED WITH A MINIMUM PUMP CAPACITY OF 50 GPM AT 3 FEET OF HEAD.

Dry Well Detail

SCALE: NOT TO SCALE



NOTES:

1. ELEVATIONS REFERENCED ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

Landscape Wall Section Detail

SCALE: NOT TO SCALE

Drainage Pipe Trench Detail

SCALE: NOT TO SCALE

REVISION HISTORY

NO.	DATE	DESCRIPTION
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DRAINAGE DETAILS