

## 2. Product Data & System Overview

### 2.1 Manufacturer / Supplier Information

Manufacturer / Supplier: **PureRain Tanks LLC**

Primary Contact: **Chad Bate**

Email: **chad@prpstorm.com**

Phone: **713-513-0103**

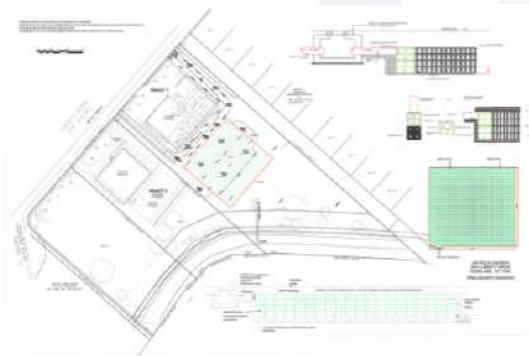
Website: **purerainproducts.com**

### 2.2 Product Description

The PureRain Modular Stormwater Storage System is a below-grade stormwater management solution consisting of structurally engineered, interlocking modular units that are assembled in the field to form an underground storage chamber. The system is used to provide stormwater detention and/or retention storage volume in accordance with project plans and specifications.

Installation typically includes prepared subgrade, a leveling/bedding layer, modular unit placement, geotextile and/or geomembrane encapsulation, and controlled backfilling/compaction. Where required, access ports and inspection points may be incorporated to support long-term maintenance and verification.

Typical Plan View (Modular Footprint + Access Ports)

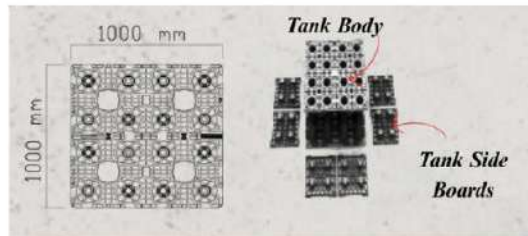


*Illustration: Plan view showing a modular footprint with access ports and inlet/outlet concepts. Actual layout will follow project drawings.*

### 2.3 Intended Applications

- Stormwater detention (temporary storage with controlled discharge)
- Stormwater retention/infiltration (where permitted by geotechnical and regulatory requirements)
- Underground attenuation under paved or landscaped areas (as designed by the EOR)
- Stormwater storage for fire protection reserve (when specified)

## 2.4 System Components (Typical)



### A) Structural Storage Units

- Modular interlocking storage units (field assembled)
- Stack/connection components (as applicable)
- Perimeter stability components (as required by configuration)

### B) Geosynthetics (By Specification / Project Requirements)

- Non-woven geotextile for filtration/separation (per design)
- Impermeable geomembrane liner for full containment (when required)
- Protective cushioning layers as required by design

### C) Appurtenances & Connections

- Pipe penetrations with sealing/connection components (as applicable)
- Access ports and risers (when required)
- Inspection provisions (as required by plans)

### PureRain Highlights (Agency-Focused)

- Designed for heavy-duty civil infrastructure applications and high-load environments.
- Supports project-specific detention (fully contained) or retention (infiltration) designs.
- Configurable access ports and inspection provisions for long-term maintenance.
- Can incorporate stored stormwater as a dedicated fire protection reserve compartment when specified.

### PureRain Product Families (Related Systems)

- **Geo-Tank** modular underground detention/storage (stormwater and fire reserve)
- **ReservGuard** (fire protection focused reserve storage concept)
- **DeepGuard** (deep storage concept for tight footprints)
- **SurgeGuard** (attenuation / peak shaving concept)
- **RoadCore** structural civil platform systems
- **Earth-Xpand** soil stabilization and confinement systems

## 2.5 Materials, Structural Performance & Storage

### 2.5 Material Composition

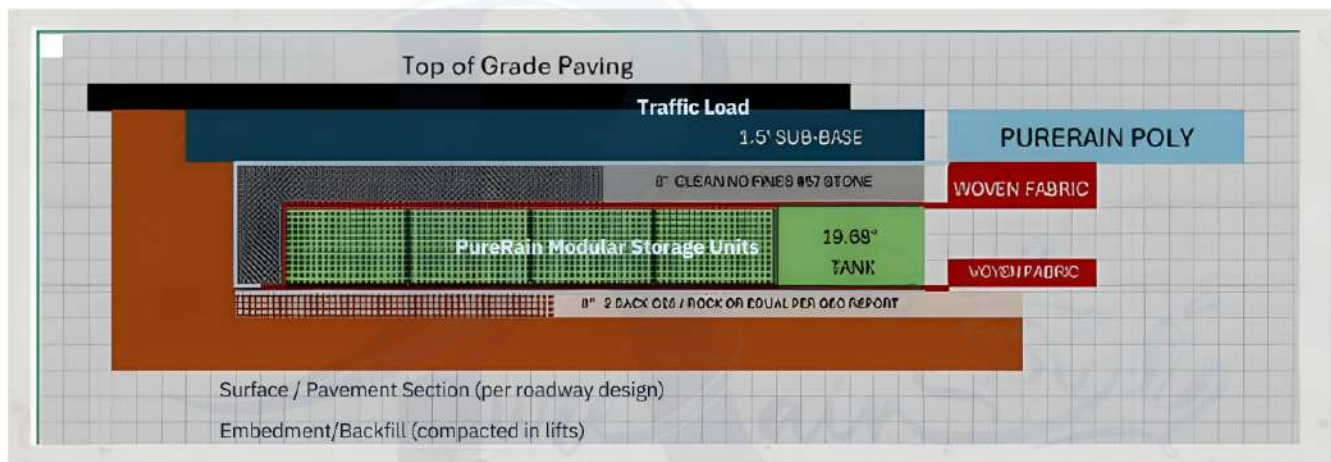
PureRain modular units are produced from engineered polymer materials appropriate for buried infrastructure applications. Product performance data, dimensional information, and supporting technical documentation may be provided as part of the project submittal requirements.

### 2.6 Structural Capacity / Load Performance

PureRain modular storage systems are designed for below-grade installations supporting civil infrastructure loads. On a manufacturer performance basis, PureRain modules exceed TxDOT H-25 load rating requirements, with reported load-bearing capacity up to **60 tons per square inch**.

Final traffic classification, minimum cover, and structural design must follow the project plans and the Engineer of Record (EOR).

Typical Cross Section (Bedding, Modules, Wrap, Backfill, Surface)



*Illustration: Typical cross section showing bedding, module layer, wrap, backfill, and surface. Actual sections will be project-specific.*

### 2.7 Storage Volume / Void Ratio

The modular system provides high usable storage volume through internal void space. Net storage capacity is determined by the project-specific module type, footprint dimensions, stacking (if applicable), and any specified internal features. The EOR will confirm required storage volume and configuration.

<b>Project Tank Configuration</b>	Single-stack / Multi-stack (per plans)
<b>Footprint Dimensions</b>	__xxx__ ft (L) x __xxx__ ft (W)
<b>Storage Volume Required</b>	__xxxx__ cubic feet
<b>Storage Volume Provided</b>	__xxxxxx__ cubic feet (net)

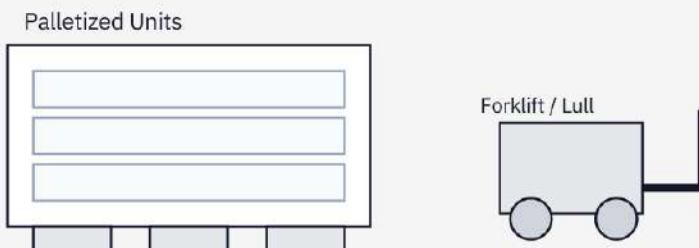
## 2.8 Configuration Options

- Single-stack (low profile / shallow cover applications)
- Multi-stack (greater storage depth where allowable)
- Permeable wrap systems (infiltration allowed by design)
- Impermeable wrap systems (full containment detention)

## 2.9 Handling and Storage

PureRain modular units are delivered palletized and packaged for jobsite handling. Units shall be stored on stable ground and protected from damage. Units exhibiting deformation, cracking, or damage that may affect structural performance shall not be installed.

Handling & Storage (Typical)



The diagram illustrates the typical handling and storage of PureRain tanks. On the left, a stack of three rectangular units is shown on a pallet, labeled "Palletized Units". On the right, a forklift or lull is shown, labeled "Forklift / Lull". To the right of the forklift, there are two lists of instructions: "Do:" and "Don't:". The "Do:" list includes: "Store on stable ground", "Protect from impact", and "Inspect before install". The "Don't:" list includes: "Drag pallets", "Stack on uneven soil", and "Install damaged units".

**Do:**

- Store on stable ground
- Protect from impact
- Inspect before install

**Don't:**

- Drag pallets
- Stack on uneven soil
- Install damaged units



## 2.10 Installation Overview & Quality Control

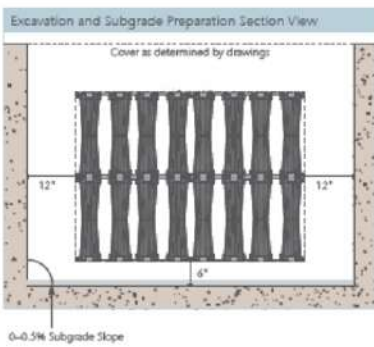
### 2.10 Installation Overview

Installation shall follow the project plans, TxDOT specifications, OSHA requirements, and geotechnical recommendations. The typical installation sequence includes excavation, bedding preparation, module placement, geotextile/geomembrane installation, and backfilling/compaction.

#### Installation Overview (Typical Sequence)

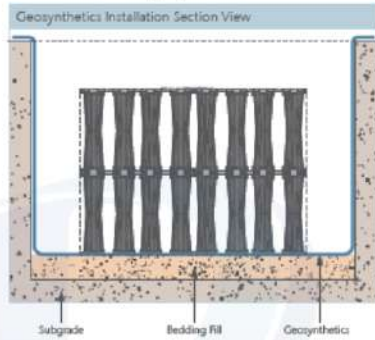
**1. Excavate**

Excavate to design subgrade



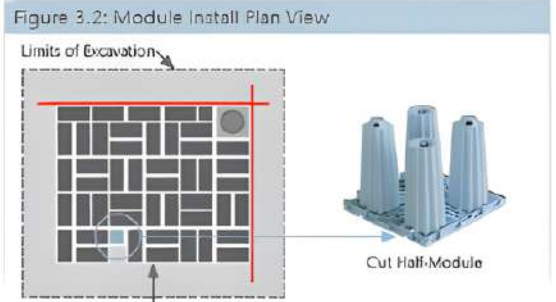
**2. Bed**

Place/compact bedding layer



**3. Assemble**

Set modules to layout & align

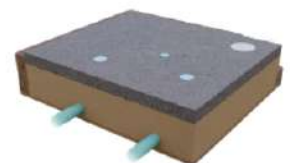
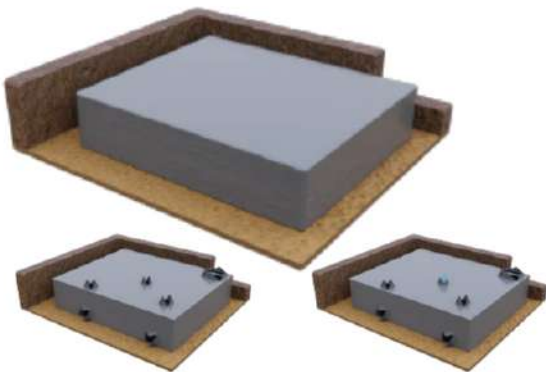


**4. Wrap**

Install geotextile/geomembrane

**5. Backfill**

Backfill in lifts per geotech



**Field Notes (Common TxDOT Expectations)**

- Verify subgrade conditions prior to bedding and module placement (per geotechnical/EOR requirements).
- Maintain square alignment and consistent elevation across module placement.
- Protect geosynthetics from puncture; patch damage per manufacturer requirements.
- Backfill in controlled lifts and compact per project and geotechnical requirements.
- Avoid unnecessary construction traffic over shallow cover installations until minimum cover is achieved.

**Quality Control (QC) Checklist - Installer Sign-Off (sample)**

**PURE RAIN PRODUCTS – FIELD INSTALLATION SIGN-OFF SHEET (TxDOT Submittal)**

Use: Installer / Inspector / General Contractor final acceptance & hold-point verification.

**PROJECT INFORMATION**

Project Name:		TxDOT CSJ / Project ID:	
County / District:		Location:	
Engineer of Record (EOR):		Date:	
Submittal Rev #:			

**A) REQUIRED HOLD POINTS / QC CHECKLIST (Initial each item)**

Init.	Item
	Excavation limits verified per plans; safe access and work area established.
	Subgrade inspected and accepted by Geotechnical / EOR (hold point).
	Bedding placed to thickness and level tolerance per plans/specs.
	Geotextile / Geomembrane installed with required overlaps; no damage observed; repairs made as needed.
	Modules placed to layout; alignment/squareness checked; connectors installed where required.
	Pipe penetrations sealed; clamps/bands tightened; watertightness verified (if impermeable system).
	Wrap completed (top/sides) and secured prior to embedment placement.
	Embedment/backfill placed in lifts and compacted per geotech/EOR requirements; no heavy turning traffic over tank during shallow cover phase.
	Access/inspection ports installed to grade; covers secured; final surface restored per plans.
	As-built photos captured and submitted to GC/EOR (recommended).

**B) SIGNATURES / ACCEPTANCE**

**INSTALLER / FOREMAN SIGN-OFF**

Name:		Company:	
Signature:		Date:	
Notes / Exceptions:			

**INSPECTOR SIGN-OFF (TxDOT / EOR / Third-Party)**

Name:		Company:	
Signature:		Date:	
Notes / Exceptions:			

**GENERAL CONTRACTOR AUTHORIZATION**

Name:		Company:	
Signature:		Date:	
Notes / Exceptions:			

*PureRain Products | [purerainproducts.com](http://purerainproducts.com) | [chad@prpstorm.com](mailto:chad@prpstorm.com) | 713-513-0103*

End of document ■



**Manufacturer Support**

PureRain Products can provide project coordination, layout review, and installation guidance upon request to support field execution and inspection readiness.

**End of Section 2** - Additional project-specific drawings, calculations, and materials documentation may be appended behind this section as required by TxDOT and the Engineer of Record.

# Section 3

## System Configuration Drawings & Details

Typical layout drawings and details to support TxDOT review and approval.

### Included Details

- Typical plan view and layout grid
- Typical cross section and materials
- Pipe seal and access details

### Project-Specific Configuration (Fill In)

TxDOT CSJ / Project ID \_\_\_\_\_

Location / District \_\_\_\_\_

Required Storage Volume \_\_\_\_\_

(cf or ac-ft)

Proposed Configuration \_\_\_\_\_

Single-stack / Multi-stack

Liner Type \_\_\_\_\_

Permeable (geotextile) / Impermeable (geomembrane)

Footprint (L x W) \_\_\_\_\_

Design Cover Above Tank \_\_\_\_\_

(in/ft)

Traffic / Loading \_\_\_\_\_

Inlet / Outlet Pipe Sizes \_\_\_\_\_

Access / Inspection Points \_\_\_\_\_

### Reviewer Notes

- 1) Final geometry, loading, cover requirements, and liner selection are governed by the project plans, TxDOT specifications, and the Engineer of Record (EOR).
- 2) Where conflicts exist between this typical guidance and project specifications, the project specifications control.

## Typical Plan View (Conceptual)

Shown for review reference. Exact layout, footprint, and piping are project-specific.

### 1. System Overview

- **Total Required Detention:** 403,365 ft<sup>3</sup>
- **System Type:** Single-stack geo-cellular tank system with surface ponding
- **Yard Envelope:** 377' × 682' max
- **Tank Footprint (with rock):** ~290.7' (short) × 605.7' (long) inside yard
- **Storage Provided:**
  - **Underground (tanks + side rock + top rock):** ≈ 324,900 ft<sup>3</sup>
  - **9" surface ponding:** ≈ 81,800 ft<sup>3</sup>
  - **Total Storage:** ≈ 406,700 ft<sup>3</sup>
- **Design uses one layer of tanks, surrounded by 12" of side rock and covered by minimum 8" of top rock to achieve the required volume.**

### 2. Tank Layout

- **Module Size:** ~3.28' × 3.28' × 1.64'
- **Grid Layout:** 88 (W) × 184 (L) – single layer
- **Total Modules:** 16,192 units
- **Module Footprint (tanks only):** ~288.7' × 603.7'
- **Rock Footprint (with 1' perimeter rock):** ~290.7' × 605.7'

### 3. Rock Requirements

#### Side Rock:

- 12" thickness around all sides
- Height matches tank height (1.64')

#### Top Rock:

- 8" thickness across entire tank footprint
- Void ratio: 40%

### 4. Storage Breakdown

- |   |   |
|---|---|
| • <b>Tanks:</b> ≈ 277,300 ft <sup>3</sup>   | • <b>Underground Total:</b> ≈ 324,900 ft <sup>3</sup>   |
| • <b>Side Rock:</b> ≈ 1,200 ft <sup>3</sup> | • <b>9" Ponding (surface):</b> ≈ 81,800 ft <sup>3</sup> |
| • <b>Top Rock:</b> ≈ 46,500 ft <sup>3</sup> | • <b>Combined Storage:</b> ≈ 406,700 ft <sup>3</sup>    |

### Summary Note

- Single-layer system: 88 × 184 module grid.
- Maintain 12" side rock envelope and minimum 8" top rock cover over tank field.
- System installs within the 377' × 682' laydown yard, using ~291' × 606' for tank plus rock.
- Combined underground storage and 9" surface ponding exceed the
- 403,365 ft<sup>3</sup> detention requirement while staying within the allowable buffer



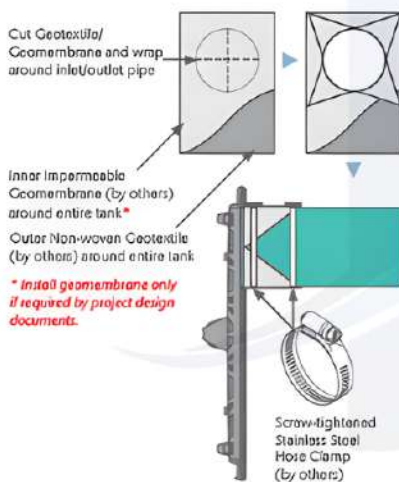
## Pipe Connection & Access Details (Typical)

Final sizes, seals, and access arrangement are project-specific and per EOR design.

### A) Pipe Penetration / Seal

Typical components:

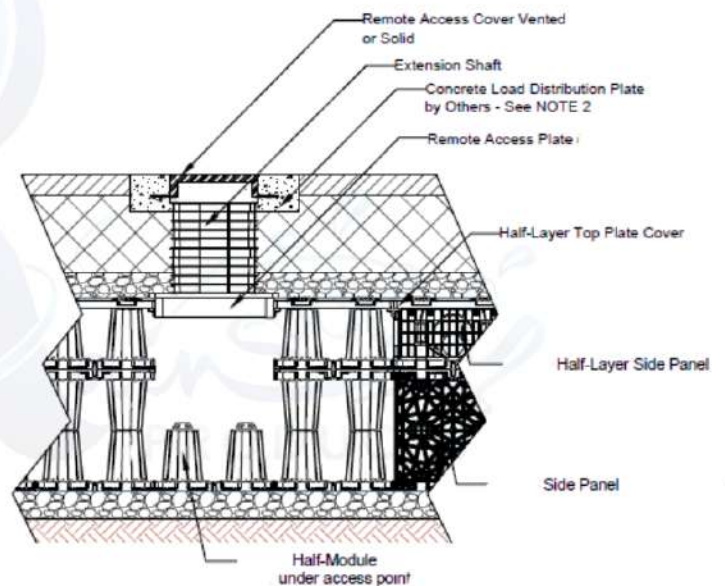
- Pipe penetration opening cut cleanly prior to wrap completion
- Flexible boot/collar seated at tank wall
- Stainless band clamp(s) tightened to manufacturer torque
- Sealant as required by design (if impermeable liner is used)



### B) Access / Inspection Port

Typical provisions:

- Access port location per plans (inspection and maintenance)
- Riser extension cut to finished grade elevation
- Cap/cover type per design (traffic-rated if required)
- Provide clear path for inspection equipment as required



### Field Acceptance Checklist (Typical)

Pipe penetration cut clean; boot seated; band clamps installed; wrap sealed continuously; riser centered; cap in place; elevations verified.

## Typical Installation Sequence & QC Checkpoints

This sequence supports field execution. Follow project plans, EOR direction, and TxDOT requirements.

**1** Excavate to design limits; verify grades and side clearance.

**2** Prepare subgrade; geotechnical verification as required.

**3** Place bedding/leveling course; compact and level.

**4** Place geotextile/geomembrane base layer; overlap and secure.

**5** Set PureRain modular units in aligned grid; install connectors as needed.

**6** Install pipe penetrations and seals; verify alignment.

**7** Wrap system fully; seal seams; protect from damage.

**8** Place embedment/backfill in lifts; compact per spec; limit construction traffic until cover achieved.

### QC / Documentation (Recommended for Submittal Closeout)

- Subgrade acceptance and elevation check - Bedding thickness and levelness check - Wrap continuity and overlap verification - Pipe seal and clamp inspection - Backfill lift thickness and compaction log - As-built access port elevations and locations

## Section 4

### Bill of Materials (BOM) & Accessories

Project-specific quantities to be completed by Contractor/EOR

This Bill of Materials outlines typical components required for a PureRain modular stormwater storage system. Final quantities, liner selection (permeable vs. impermeable), and cover/loading requirements are governed by project plans, TxDOT specifications, and the Engineer of Record (EOR).

Item	Description	Qty	Notes / Specification
<b>PureRain Modular Storage Units</b>	Interlocking modular units assembled into underground stormwater storage tank		Project-specific configuration (single-stack or multi-stack).
<b>Perimeter Confinement</b>	Side stabilization / perimeter restraints (as required)		Use where specified by EOR / layout.
<b>Layer Connectors Ties</b>	Stack connectors / connection rods (for multi-layer systems)		Required for stacked assemblies and around access openings.
<b>Access Risers / Inspection Ports</b>	Access points for inspection and maintenance		Locations and sizes per plans.
<b>Access Covers / Frames</b>	Covers (traffic-rated or non-traffic)		Per TxDOT / project requirements.
<b>Pipe Connection Components</b>	Pipe boots / seals / clamps / collars		Stainless bands/clamps as applicable.
<b>Non-woven Geotextile Impermeable</b>	Filtration / cushioning fabric		Weight and type per specifications (typ. 6 oz/sy where noted).
<b>Geomembrane (if required)</b>	Containment liner for detention systems		Thickness per plans (typ. 30 mil or as specified).
<b>Bedding Fill</b>	Leveling / bedding material below tank		Per geotechnical recommendations.
<b>Embedment Backfill</b>	Backfill surrounding sides and top of tank		Sand/gravel or open-graded aggregate blends as specified.
<b>Final Fill / Subbase</b>	Fill above embedment to finished grade		Compaction per geotech/EOR; may include pavement subbase.

## Section 4

### Tools, Materials & Equipment

Field readiness checklist for installation teams

Reference illustration (adapted from industry installation guide)

#### Minimum Tools

- Sand bags or stabilizing weights
- String line & marking paint
- Laser or transit / measuring tools
- Razor knife (for geosynthetics)
- Screw driver / nut driver set (pipe boots)
- Reciprocating saw (pipe penetrations and access openings)

#### Minimum Equipment

- Forklift (or equivalent) to unload truck
- Pallet jack (as needed for box-truck deliveries)
- Backfill placement and compaction equipment (per geotech/EOR)

#### Installer Note:

Do not traffic heavy construction equipment over the tank footprint until minimum cover/backfill requirements are achieved per EOR and project specifications.

# Section 4

## Fill Material Considerations (Typical)

Bedding / embedment / final fill guidance (project-specific)  
 Fill materials and compaction requirements shall follow the project Geotechnical Report, TxDOT specifications and the Engineer of Record (EOR). The table below provides typical fill zones and example material classifications.

### Fill Material Considerations

Fill Table

Material Location	Description	Material Classification	Compaction/Density Requirement*
<p><b>Final Fill<sup>1,3</sup></b>                      Fill starting from top of the embedment fill layer</p>	<p>Suitable fill materials as noted in Project Geotechnical Report and Site Design Engineer Plans</p>	<p>See Project Geotechnical Report and Site Design Engineer Plans</p>	<p>Plate compact or static roll loose lifts to density fill. Loose-lift thickness should be selected based on compaction equipment used. Use at least two full passes of equipment to level layer. Continue until 24" of total fill thickness has been placed above the tank. For AASHTO M145 soils, a minimum of 95% of Standard Proctor Maximum Dry Density is recommended.</p> <p>After 24" of fill is placed, place fill in accordance with the engineer of record's relative compaction requirement or the 95% of Standard Proctor Maximum Dry Density is recommended.</p>
<p><b>Embedment Fill<sup>1</sup></b>                      Fill immediately surrounding sides and top of tank</p>	<p>Sand/gravel mixtures or open-graded crushed aggregate blends</p>	<p>AASHTO M145                      A-1, A-2-4, A3</p>	<p>Plate compact or static roll loose lifts to density fill. Loose-lift thickness should be selected based on the compaction equipment used. Use at least two full passes of equipment to level layer. For AASHTO M145 soils, a minimum of 95% of Standard Proctor Maximum Dry Density is recommended.</p>
<p><b>Bedding Fill<sup>1</sup></b>                      Fill immediately below tank</p>		<p>OR</p> <p>AASHTO M43                      3, 357, 4, 467, 5, 56, 57</p>	

## Section 6: Excavation & Subgrade Preparation

Purpose: Provide TxDOT-ready installation requirements for excavation, subgrade approval, and bedding placement.

### TxDOT Review Note

Final excavation limits, cover, traffic classification, and compaction requirements shall match the project plans, TxDOT specifications, and the Engineer of Record (EOR).

### 6.1 Installer Responsibilities (Summary)

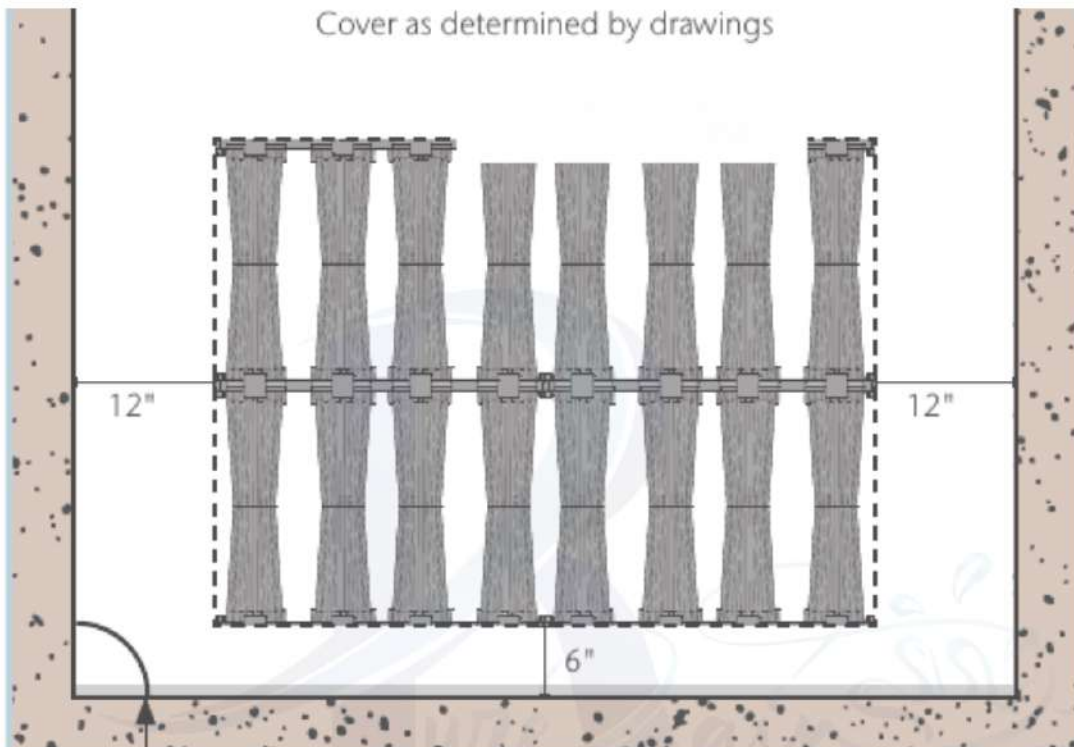
- Confirm tank footprint, invert elevations, and pipe locations prior to excavation.
- Coordinate geotechnical verification of subgrade capacity and proofrolling requirements.
- Maintain excavation dimensions that allow safe access and proper compaction on all sides of the tank footprint.
  - Install bedding to a uniform level surface prior to module placement.
  - Protect geosynthetics from damage; patch/repair any tears immediately.

### Field QC Checklist (Hold Points)

- Subgrade inspected and accepted by Geotechnical Engineer / EOR
- Bedding thickness meets project requirements (min 6 in typical)
- Bedding slope within 0-0.5% (typical) and level across footprint
- Excavation clearances confirmed for wrap + compaction equipment
- Geosynthetic overlap and protection verified prior to assembly

## 6.2 Excavation Limits & Clearances

Excavate per plans with additional working room for wrap placement and compaction.



Conceptual excavation footprint (working room shown typical). Exact dimensions are project-specific.

### Installation Notes

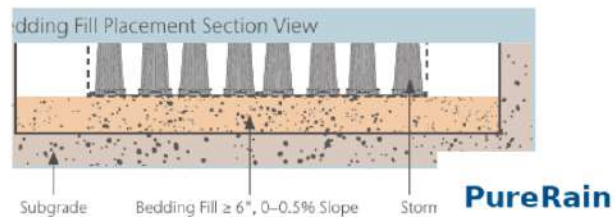
- Excavate to the bottom-of-bedding elevation shown on the drawings (includes module height + bedding thickness).
- Provide minimum side clearance sufficient for geosynthetic placement and compaction equipment access (typically 12 in minimum, verify by EOR).
- Keep excavation bottom smooth and free of protrusions, debris, or soft areas.
- Maintain safe slopes/benching/shoring per OSHA requirements and site conditions.

## 6.3 Subgrade Verification & Bedding Placement

Subgrade must be verified prior to bedding. Bedding provides uniform support and protects the liner.

### Subgrade Acceptance (Hold Point)

- Subgrade shall be inspected by the Geotechnical Engineer and/or EOR prior to placement of bedding and modules.
- Any unsuitable or yielding material must be removed and replaced per geotechnical recommendations.
- If groundwater is encountered, dewatering and stabilization measures must be implemented per project requirements.



Typical bedding placement section (conceptual).

### Bedding Requirements (Typical)

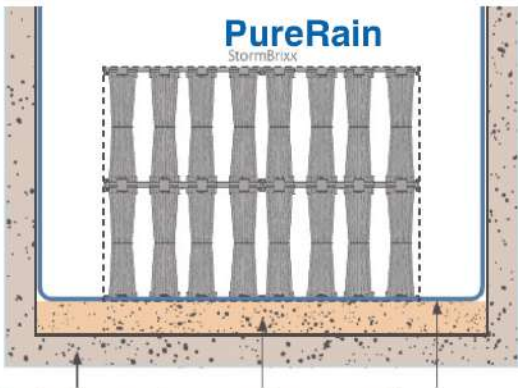
- Minimum bedding thickness: 6 in (typical). Verify project-specific minimums.
- Bedding shall be level across the footprint with a typical slope of 0-0.5% unless otherwise shown.
- Compact bedding to geotechnical requirements prior to module placement.
- Do not place modules on frozen, muddy, or disturbed bedding. Regrade as needed.

#### Recommendation

Record elevations (top of subgrade, top of bedding) at corners and along the centerline. Include in as-built notes if requested by TxDOT.

## 6.4 Geosynthetic Placement (Wrap / Liner)

Install geotextile and/or geomembrane per design (permeable vs. impermeable configuration).



Field example of protected liner installation prior to module placement

### Typical wrap placement (conceptual). Installation Steps (Typical)

- Place geotextile/geomembrane panels to fully cover the excavation bottom and sidewalls per design.
- Maintain minimum overlaps per manufacturer and project requirements (12 in typical for geotextile unless otherwise specified).
- Protect geosynthetics from puncture or tearing during module placement and backfill operations.
- Repair damaged areas using manufacturer-approved patching methods prior to covering.

#### Hold Point

Do not place modules until the wrap/liner system has been inspected and accepted by the EOR or designated representative.

## 6.5 Excavation & Bedding QC Sign-Off

Use this form for field documentation. Attach geotechnical reports/testing results as required.

**Project Name:**

**TxDOT CSJ:**

**Location:**

**Contractor:**

**Date:**

### Inspection Items

<input type="checkbox"/> Excavation limits match plans; clearances provided for wrap + compaction
<input type="checkbox"/> Subgrade inspected/accepted by Geotechnical Engineer/EOR
<input type="checkbox"/> Unsuitable material removed/replaced per geotech recommendations
<input type="checkbox"/> Bedding thickness installed and uniform (min 6 in typical)
<input type="checkbox"/> Bedding level and slope within tolerance (0-0.5% typical)
<input type="checkbox"/> Geosynthetic panels placed/overlapped; no tears/punctures observed
<input type="checkbox"/> Patching completed and accepted (if applicable)

**Installer Foreman Signature:**

**EOR / Inspector Signature:**

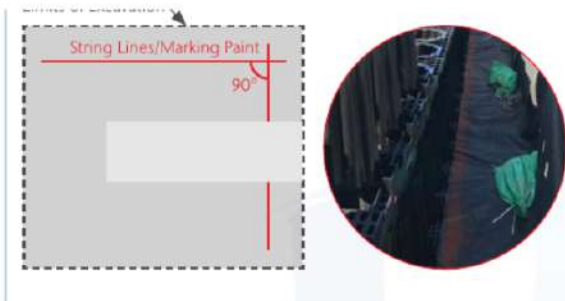
## Section 7

### Tank Assembly & Module Placement

Typical sequence for locating the footprint and beginning module placement (per plans/EOR).

#### 7.1 Determine Starting Location

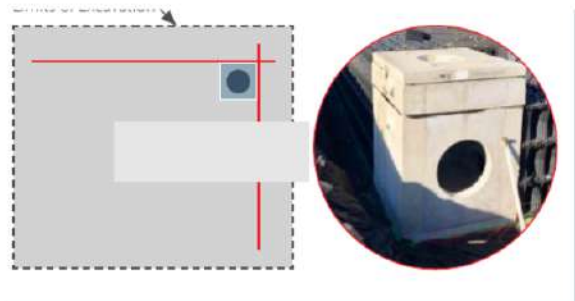
- 1) Use inlet/outlet or control structure as a guide.
- 2) Establish two adjacent edges and confirm square.
- 3) Mark limits with string line / paint.
- 4) Protect geosynthetics from puncture.



#### 7.2 Control Structures (If Used)

Control structures may be installed per plans to provide access for larger inlet/outlet pipes.

Place structure on geosynthetics prior to modules (if specified by the design team).



#### Field Acceptance Checkpoint (Typical)

Footprint squared; geosynthetics protected; starting corner verified; control structure set (if used).