



Grading and Drainage

One of the most critical issues in self storage development is obtaining an accurate grading/drainage plan. Each site is unique in its topography and layout possibilities. Trachte will help you by providing a preliminary site plan to determine the location of the buildings, however, it is imperative to hire a civil engineer to complete the final grading/drainage plan. (Refer to the example on page 3.) Trachte's plan should only be used to offer guidance to your civil engineer. The grading plan basically dictates where your storm water run off will go.

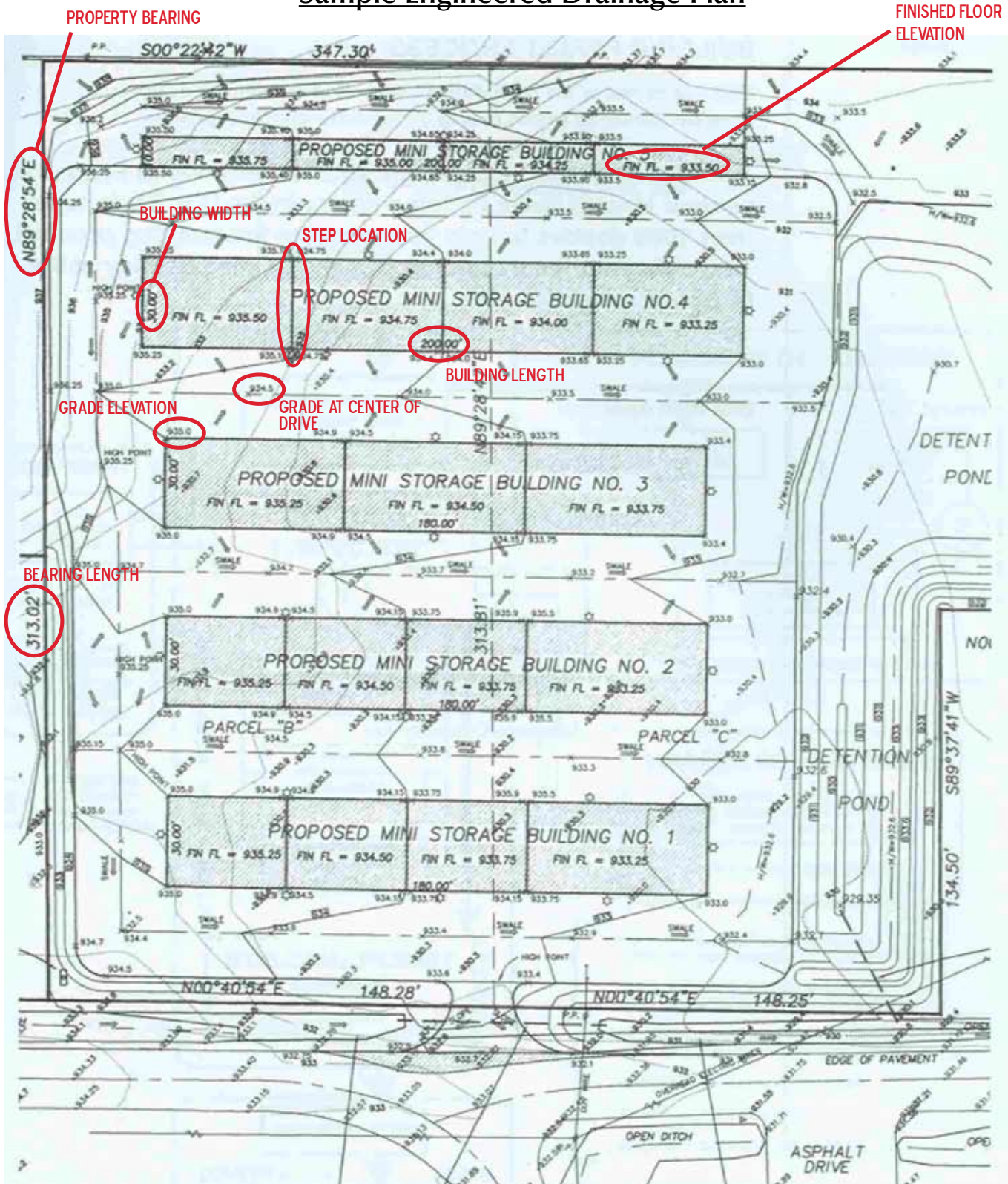
Following is a list of details you should expect to see on your grading plan:

- 1) Finished floor elevations of all foundations
- 2) All step locations in the foundation. *Trachte recommends 6", 8" 9" or 12" steps. If larger sizes are required discuss with Trachte sales.*
- 3) Pavement elevations in an array of areas on the plan, regardless of whether or not the site is utilizing surface drainage.
- 4) Size, location, and elevation of catch basins (if they will be used)
- 5) Underground water storage tank locations (if they will be used)
- 6) Retention/detention pond to hold water on your site. *The size of this is dependent on the size of your lot and your regional location. Both retention and detention ponds are used to control drainage. They are similar, but not interchangeable.*
- 7) All electrical conduit that will run from one foundation to the other. A separate conduit will be needed for the *electrical power, then another for the surveillance camera, and/or door alarms if they are going to be used.*

The civil engineer may also include a landscape plan and parking plan with turning radiuses.

The photos in this guide give an overall view of what may need to be included on your site. The photos also give you alternative ideas on how to handle a multitude of grading issues. Trachte recommends that you hire a site engineer to develop your grading plan. Please contact your Trachte regional manager to discuss other questions regarding your self-storage development.

Sample Engineered Drainage Plan



One of the most important construction issues to consider is water drainage. A civil engineer can develop a drainage plan that illustrates how and where your water will be diverted to. Above is an example of a drainage plan utilizing a detention pond. Study it to familiarize yourself with how to read a drainage plan.

The two foundations are poured level in this example. The driveway gradually gets steeper so the water can drain. The driveway is done in concrete which is more expensive initially but concrete lasts longer.



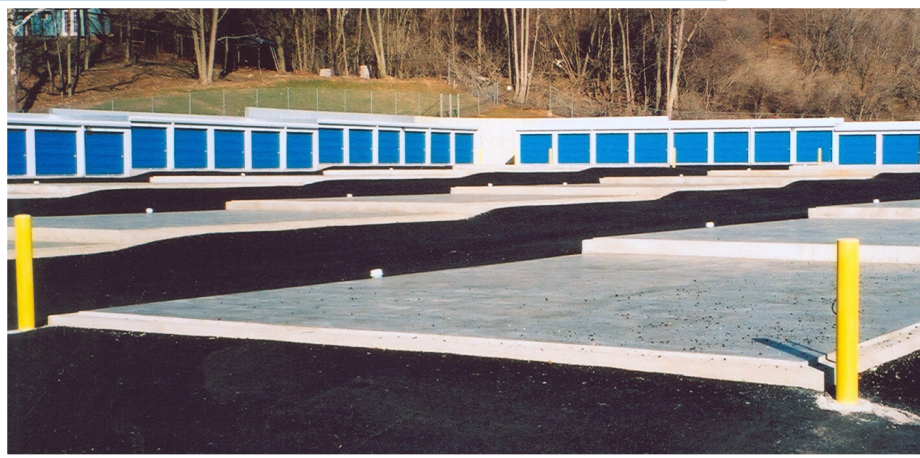
Notice the building on the left has a 2' higher elevation than the building on the right, so the pitch of the driveway is greater on the left side than the right.

This site falls over 2' from back to front. Steps are utilized to create the fall. The water is surfaced drained to the retention pond.



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If the driveway does not have high enough pitch, standing water may be an issue. A minimum 1% slope is recommended on all driveways to minimize this problem.



This building incorporates a large number of steps in the foundation to accommodate grade changes. The asphalt will have to be rolled down at each step because of the grade change.

The buildings can be installed using a rolled step in the roof. This step design minimizes the chance of leaking. Trachte recommends using this roof design.

Note: The maximum step size is 12", the minimum size is 3".



This photo shows a building with steps in foundation and a continuous roof line.



The center section of the building is raised to surface drain to each end of the building. Notice the rolled step is used in this building.

A longitudinal step can be used to change the grade. This step is done down the length of the building.



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This picture shows a building that is built on a foundation that is pitched at a 1% slope down the length of the building. By pitching the foundation, you minimize the need for steps in the foundation and roof. Trachte's building can be designed to work on anything up to a 1 percent slope foundation.

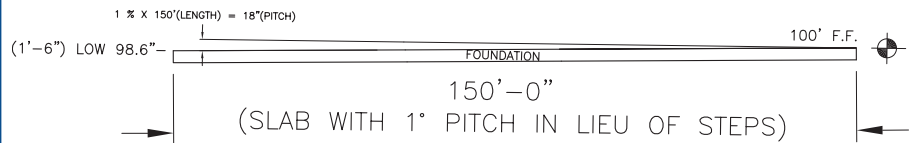
This detail depicts the foundation being poured on a 1% slope. You will need an experienced concrete contractor to pour this foundation correctly.

Exceptions:

The sloped foundation is not recommended for the office or any building that has windlock doors or special materials which may be affected adversely by the slope. Please notify your Trachte sales rep when planning a sloped foundation to ensure that the building is a suitable design for the application.



For more information view the video on trachte.com, *Erecting Your Building On A 1 Percent Slope.*



Trachte highly recommends using a lean to building, which makes the water drain only to one side of the building. This photo shows a building that is on a 1% slope and is oriented east to west so the water drains to the south side of the building.

A lean-to roof allows water to drain to the south side of a building. This method minimizes ice problems associated with the northern side building exposure (in snow areas). This method also is used if you install catch basins in every other driveway to minimize costs.



This photo illustrates a site with an excessive amount of pitch in the driveway. Steep paved areas may inconvenience customers during loading and unloading, make snow removal difficult, and possibly create a safety issue during winter weather conditions.



This site has a 4' transition from the floor height of the building on the right to the building on the left. Notice the steep driveway. This can cause problems.

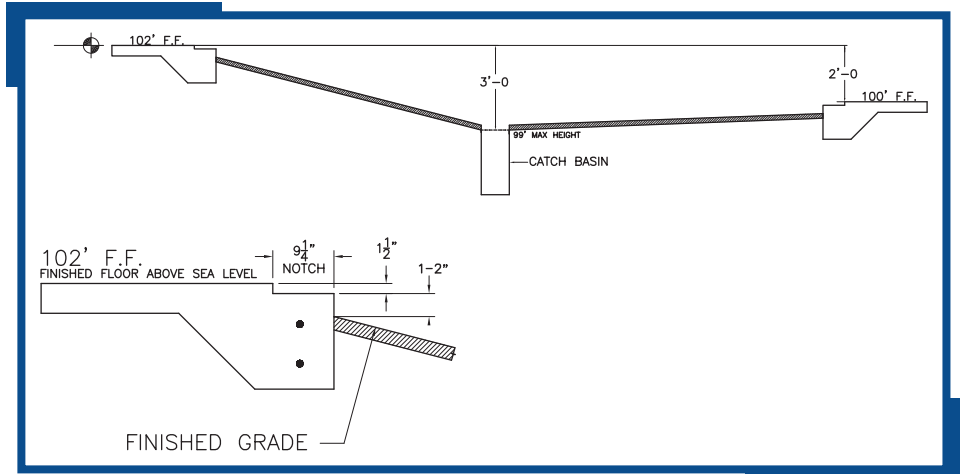
Driveways should be pitched to direct water into the catch basins. Typically, a catch basin is located at least 12" below the finished floor height of the foundation.



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This detail depicts a 2' difference in elevation between two foundations. The driveway has to be sloped accordingly to make sure the water runs to the catch basin properly.

NOTE: The notch design shown does not conform to the American Disability requirement. Please refer to the Foundation photo guide for guidance.



A retention pond holds water run off on your site. The water is either surface drained to the pond or piped from catch basins.

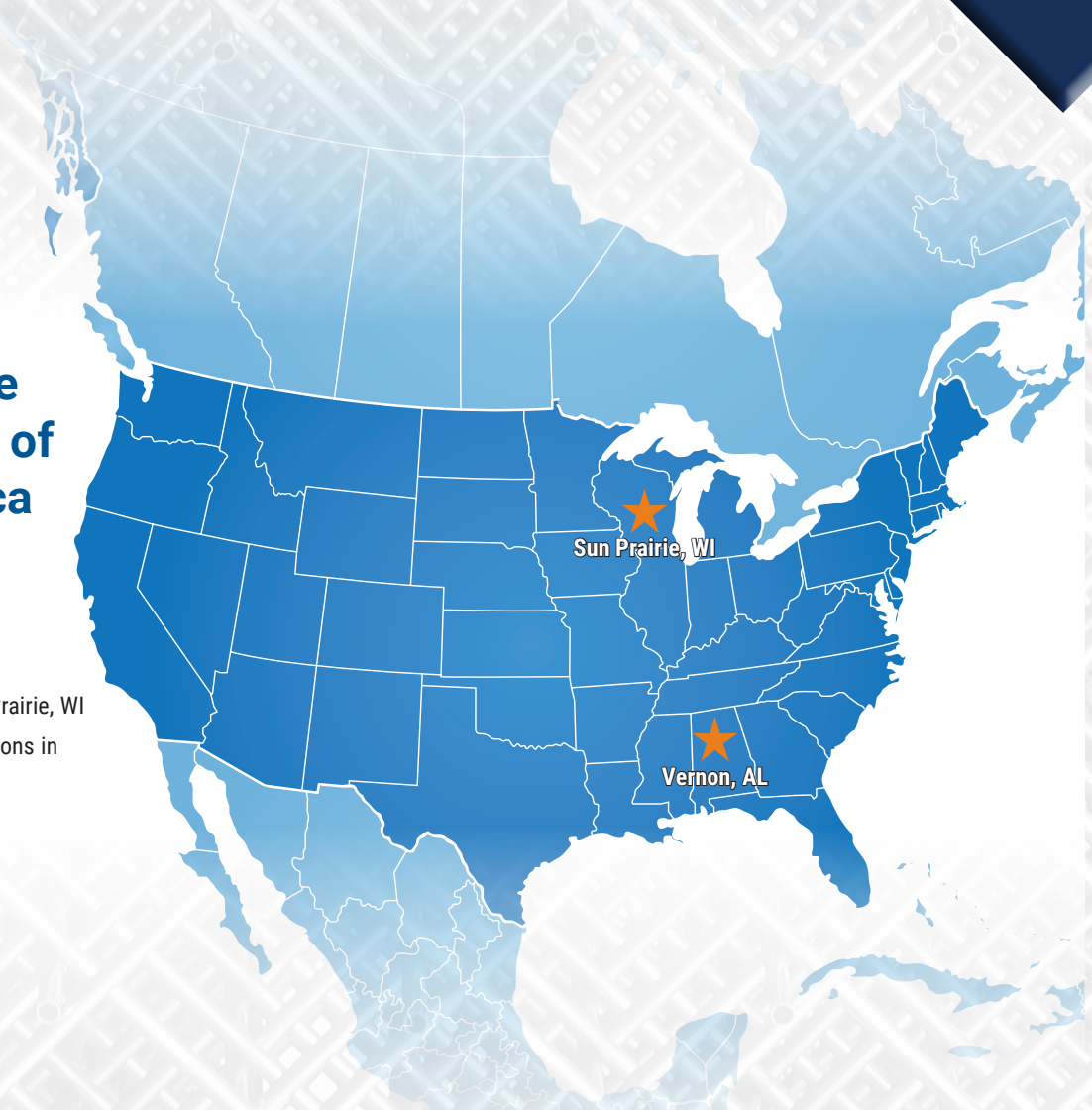
This photo is an example of a very large detention pond. The size and depth of the pond is determined by your specific site conditions.



DESIGN. MANUFACTURE. ERECT.

**We distribute
throughout all of
North America**

Trachte is headquartered in Sun Prairie, WI
and have opened additional locations in
Madison, WI and Vernon, AL.



For more information and details on Trachte self-storage systems, please contact your regional manager. Utilize our Regional Manager Locator by scanning the QR code:

