Known Issues

1) Boring Location Accuracy

Over 60% of Mn/DOT borings were not originally located using a coordinate system. The effort involved in more precisely locating legacy features is beyond the scope of the available staff and funding at this time. The legacy data does however contain useful information that has allowed for the rough approximation of boring locations. The data needed for ‘one-call’ utility clearances and Minnesota Department of Health borehole sealing records, contains information based on the public-lands survey system of quadrangles, townships, and associated ranges, tiers, and township sections. Records have been maintained of the quarter-quarter-quarter-quarter [q-q-q-q] section, referred to as the legal-description, in which boreholes were advanced for all of the legacy borings. As townships are one mile square (2.59 km²), this has allowed borings to be located in discrete square plan areas of 100.6 m (330 ft.) on a side. Through the use of a computer program, all the borings with unknown coordinates, but known legal description, have been mapped arbitrarily to the NE corner point coordinate of that q-q-q-q section. At most, the locations are therefore off by a maximum of about 142 m (467 ft.), and in most cases are significantly more accurate, to an unknown precision. This coarse approximation does however make it appear in some areas that borings were advanced on a regular coordinate grid and not entirely close to features of interest. It is a reasonable assumption that the borings are in the vicinity to foundation elements of nearby structures or nearby highways on the MN trunk highway system. In these cases, the original logs should be referenced for more accurate location description information (usually station and offset from the roadway alignment used at the time of the preliminary planning for the work). Figure 1 shows how borings in the database, with the coordinate reconstruction, appear in the GI₅ application.

Figure 1. Borings that plot on a grid pattern have estimated locations based on imprecise legal description information. The maximum offset is 467 feet, although most locations are closer and can be reconstructed more accurately from original station and offset information.
2) **Occasional Erroneous Locations**

Since the establishment of the Foundations Unit in 1959, a number of methods have been used to describe the locations of soil and rock borings, and later CPT soundings, and other investigation techniques. Most of the legacy data prior to the 1990’s was located only by roadway station and offset. Later coordinates were provided in several formats, including project specific coordinates, Minnesota State Plane coordinates, Minnesota County Coordinates, latitude and longitude, and more recently- UTM. Through the course of normal work, some projects used coordinate systems from neighboring counties for convenience. In other cases the coordinate system was not recorded on the field log. Further complicating matters, dissimilar coordinate systems sometimes have existed for groups of borings within the same project and errors of transposed values were not uncommon. As a result, some borings in the database are located with accurate coordinates, but not the proper coordinate system. Several thousand boring locations have been reviewed and corrected, and the vast majority of coordinate data is correct, but errors still do exist. Figure 2 shows some outlier borings, which may be observed when using the application. Legacy data is reviewed and corrected as time and resources permit.

![Figure 2. There are some borings in the database that plot outside the state of MN; most of these coordinates are in error due to the use of the wrong coordinate system in plotting the borings. These outliers are being corrected as time and resources permit.](image-url)
Figure 3 shows some ‘suspiciously located’ borings. These borings were inaccurately located as their coordinates were obtained and reported in Ramsey County Metric, and plotted using UTM coordinated from an assumption that the original coordinates were Ramsey County US Feet. Instead of plotting south of downtown St. Paul, the borings plotted in the middle of farm fields northwest of New Ulm, MN- not particularly close to the original project site. The locations have since been corrected for these points.*

*author’s note:
These particular borings were found at random during the preparation of this document.

If you believe to have located borings that do not appear to be in the proper locations, please inform the Foundations Unit (at the contact email address on the main log-in page) and we will make an effort to review the original data for accuracy.
3) Lost Borings

Prior to the wide adoption of global positioning systems (GPS) most projects were located by traditional highway Station and Offset descriptions. Many borings described only with this information cannot now be accurately located as the original reference information (particularly that refereeing to temporary survey lines) has been lost. Some borings locations are being reconstructed by using driller’s notes that reference the distance of the borings from in-place structures or other features.

Roughly 400 borings, about 2% of our legacy boring data, are regarded as ‘lost borings’ as they do not have enough project identification to confirm their location to any meaningful accuracy without significant historical research. Many of these borings were taken for small projects, Mn/DOT facility buildings, roadway works, and specialty projects. Some were taken for large complex projects and referenced from survey lines and proposed alternate roadway centerlines for which the geometric information has been long since lost or discarded. The information pertaining to these borings is retained at our offices in the event that additional information is eventually recovered.

4) Database Entities

The database contains only borings taken by or for the Mn/DOT Foundations Unit. The database does not include borings that may have been advanced for Minnesota State Aid bridges, or those on the County or City Highway systems. Only completed project borings and CPT soundings are in the database at this time, although the database will be expanded to include geophysical surveys in the future. Note also that only borings with recoverable location data are included. The database does not contain either current or historic shallow [auger] roadway borings advanced by Mn/DOT District Soils crews. Aggregate and Quarry data is also maintained separately.

5) Database Completeness

The database contains only borings that have been assigned Mn/DOT unique numbers and are part of completed projects. Recent and ongoing projects are loaded into the database quarterly. Most borings have Adobe PDF files of the original logs or final lab logs. In some cases these electronic logs are absent, due to problems in associating the PDF name through the GI5 application. Some file names have leading zeroes, which can cause a “no PDF available message.” In other cases, two boring logs may have been recorded on the same log sheet [usually only for legacy data from a certain time period] which can cause a null return when searching for the 2nd log on a given sheet.

In other cases the logs have not yet been scanned or the original files are not available for scanning or data entry (usually do to filing or labeling errors).

Note: This document will be updated as other issues are found.
DISCLAIMER:

As the GI$^5$ system contains known location validity problems, it is important that data obtained using this system, at a minimum, be checked for reasonableness, prior to use. Mn/DOT makes no warranty as to the accuracy and/or precision of the coordinate based location information. Use proper engineering judgment in the use of the information obtained from this website.

The data presented here is intended for the use of geotechnical engineering professionals and is not intended to replace geotechnical field investigations.