REPLACE THE EXISTING SECTION 2.7.4 WITH THE FOLLOWING:

2.7.4 Foundation Data Sheet

GENERAL

A Foundation Data Sheet will normally be part of each set of bridge construction plans where bridge foundation work is required and subsurface explorations have been completed. This sheet shows the location of the borings and/or other exploration work performed for the bridge and also the subsurface materials and conditions identified in the explorations. Foundation design details such as pile splicing, pile-footing connections etc. should typically not be shown on the Foundation Data Sheets.

The Foundation Data Sheet should usually follow the Plan and Elevation sheet (or the General Notes sheet if required). The typical Foundation Data sheet consists of a "Plan" view and an "Elevation" view (called Foundation Data). Typical example drawings are provided on the ODOT ftp site at: *ftp://ftp.odot.state.or.us/Bridge/BDDM/Example_Drawings/*. The drafting standards used for development of bridge plans, as described in the ODOT Bridge Design and Drafting Manual, should also be followed for the drafting of bridge Foundation Data Sheets. Lettering size, font and weight should be consistent with the bridge drawings. Foundation Data sheets are drawn on full size "D" sheets (22"x34") to true scale using the same title block as used for the structure drawings (AC= B_Titleblock_Bridge). See Section 2.1.3.1 of the BDDM for procedures to follow after the drawing is created.

The Plan View should show the existing structure (if applicable), the proposed structure(s) and the locations of all borings or other explorations. If possible, the structure layout shown on the Plan View (orientation and scale) should be the same as that shown on the bridge Plan & Elevation sheet.

The Elevation View is normally a profile of the main roadway (or construction) centerline showing all the subsurface information. A three line ground surface profile is preferred, if available. Consider using cross sections to illustrate subsurface data in profiles transverse to the roadway centerline (such as along bent centerlines) for wide bridges and/or where subsurface materials and conditions are highly variable transverse to the roadway centerline. The subsurface information is displayed on the Elevation View for each boring or test pit using a graphic column with soil and rock material descriptions shown alongside the column. Groundwater elevations, sampling depths and in-situ test results are also shown alongside the graphic column. The Elevation View should show a clear and concise portrayal of all subsurface information.

Subsurface interpretation, other than the interpretation required to separate material units within a given boring or test pit, should generally not be shown. Interpreted lines connecting engineering geologic units may be shown when necessary to add clarity to a drawing or in order to provide specific information for a particular feature. There may be cases where subsurface information other than that obtained from subsurface explorations is available and important enough to be shown and described on the Foundation Data sheet. In such cases, this information should also be presented and described in the project Geotechnical Report.

Foundation Data Sheet will incorporate levels used by Geo-Enviromental for sub surface drawings.

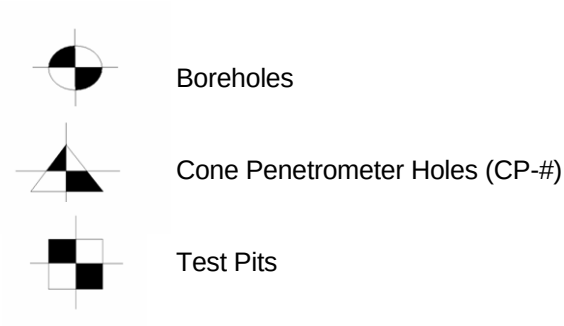
FOUNDATION DATA SHEET DEVELOPMENT PROCEDURES

The information that should be included on a Foundation Data Sheet is listed below along with some additional guidelines and explanations. It is preferred to have the Plan View consistent in appearance with the Plan View of the structure drawn on the Bridge Plan and Elevation sheet.

PLAN VIEW

1. Label this portion of the drawing "Plan", and include the true drawing scale.
2. Show the existing bridge outline (if applicable) using dashed lines and other existing features that are pertinent to the project.

3. Show the proposed bridge outline (and all bridge retaining walls) using heavy solid lines. Include all bridge bent locations and numbers for multiple span bridges.
4. Show and label the alignment to be used for construction of the bridge (usually centerline of roadway), with sufficient stationing for orientation. Orient stationing from left to right wherever possible. All alignments lending reference to the bridge should be shown and labeled. If borings are stationed from one line and the bridge from another, both alignments should be shown.
5. Cross sections are sometimes necessary to depict subsurface conditions normal to the roadway centerline or along bridge bent alignments. This is true especially for wider bridges where borings are drilled on each end of the bent or at sites where subsurface conditions are highly variable along the bent line and the variability is important in the foundation construction. Where cross sections are required, show the orientation of the cross section(s) to roadway centerline including the stationing of the intersection of the cross section with centerline. Label the cross section A – A', B – B', etc. as appropriate for reference to the Elevation View.
6. Show the location of all boreholes, test pits, cone penetrometer tests or other subsurface explorations. These locations should be identified with unique symbols depending on the type of exploration performed. Use the following symbols and include the definitions of the symbols in the legend:



Note: For cone penetrometer, pressuremeter and vane shear testing work usually only the locations of these tests are shown on the Plan View. In these cases a note should be provided on the data sheet stating that the results of these tests are available upon request.

7. Provide the survey location of each borehole (or other type exploration) directly below the borehole number. This survey information should include the Borehole Number, survey line identification, stationing of the hole and left or right offset distance. An example is as follows: **"L" Station 100+20, Lt. 15'**.
8. Show a North Arrow.
9. For waterway crossings show the outlines of creek or river banks (if applicable), the name of the river or creek and an arrow showing the direction of river or creek flow.
10. Contour lines are optional and may be shown if the clarity of the drawing is maintained. Label contour lines with elevations as necessary for orientation.
11. Do not include features or lines that are not necessary, add clutter, or distract from the purpose of the drawing.

ELEVATION VIEW

1. Label this view; "Foundation Data".
2. Elevations should be shown on both sides of the elevation view. Extend elevation lines horizontally but not through any text or through the graphic columns, as this would infer soil unit breaks.
3. Show the true horizontal and vertical scales. When the stationing is along a curve do not include a horizontal scale. Use an exaggerated vertical scale as necessary to provide additional room for text alongside the graphic column. Adjust the drawing scale to provide a balance between readability and clarity using a reasonable number of sheets.

4. Show the stationing of the profile (usually along centerline) along the bottom of the profile view.
5. A three line profile of the existing channel or ground surface should be drawn when the information is available; however the centerline profile alone is acceptable. Label each ground surface profile. If cross sections are required, use the existing ground line of the cross section and show horizontal offset distances from the roadway centerline on the cross section view.
6. Show the locations and depths of all borings or other explorations using a graphic column. Each graphic column (boring) should be lined up vertically with the same boring shown in the Plan View. Use the standard graphic symbols for soil types shown in Figure 2, "Legend of Materials" in each column to represent the subsurface material units encountered. Provide additional graphic symbols as needed for other rock units or unique soil types. The standard soil symbols can be combined (overlaid) to represent common soil types (silty CLAY, sandy SILT, Gravelly SAND, etc.). If a soil description contains "some" or more of a particular constituent (i.e. "some silt", "some gravel") then include that material symbol in graphic column for that unit. The total graphic column length should equal the depth of the exploration. Individual soil and rock layers should be delineated to scale within the column.
7. Soil and rock unit descriptions should be placed immediately adjacent to the column of the boring, next to the corresponding graphic symbol for the material unit. The unit descriptions shown on the data sheet are typically summary descriptions described as "a consolidation of information and/or revision in terminology from the Soils and Geological Exploration Logs". The description should contain all information pertinent to the construction of the foundation. Place lines connecting the unit descriptions to the corresponding graphical symbol/unit. If boreholes are located too close together to easily display the text next to the column then consider expanding the horizontal scale to provide sufficient room for the text or locating the borehole and description at a different location on the drawing with an arrow connecting it to its true location.

   Another option is to reference the graphic units in the column to a legend of material descriptions using the engineering geologic unit designation or similar link. If this format is used, always include the unit descriptions on any data sheets that have the graphic columns. Do not show just the graphic columns on individual sheets without any detailed unit descriptions.
8. The following information should be shown on the profile for each boring:

   - Boring Number, (placed directly above each hole).
   - Date boring or test pit was completed.
   - SPT "N" values (N-1, N-2, etc., see Table 1 below for examples)
   - Undisturbed samples (U-1, U-2, etc.).
   - Groundwater levels and date(s) measured.
   - Rock core runs (C-1, C-2, etc.), percent recovery, R.Q.D., rock hardness (R0, R1, etc., according to ODOT standard of practice) and unconfined compressive strength test results (if applicable).

9. Show soil sample depths (SPT and Undisturbed Samples) on the graphic column using black squares and or brackets (see example drawings).
10. Show the graphic log of soil units from cone penetrometer test (CPT) data.
11. Show rock core locations and the depths at which they were taken on the graphic column of the borehole.
12. Summarize rock core information such as core number (C-1, C-2, etc.), percentage recovered, rock hardness and R.Q.D. in tabular form as shown in Figure 3. Include unconfined compressive strength test results in the table if available. Do not combine point load test results with unconfined compressive strength test results; provide them in a separate column.

DRAWING BORDER, TITLE BLOCK AND STAMPING PROCEDURES

1. Use the same drawing border and title block as the one used for the structural drawings described in Sections 2.3 and 2.4 of the BDDM for the Foundation Data Sheet. Do not modify the title block.
2. The information in the title block should be in the following order:
    - Bridge Name
    - Project Name (Section)
    - Highway and Milepost
    - County
3. Provide the Structure Number and date the drawing was completed.
4. Provide the drawing number. The Bridge Drafter will get drawing numbers for Foundation Data sheets trying to keep the drawing numbers in consecutive order for the structure (see BDDM 2.4.1).
5. Provide sheet number. The Foundation Data sheet is usually the second or third sheet in the bridge drawings. Be sure to check with the Bridge Drafter for the correct sheet number.
6. All Foundation Data sheets must be stamped by a Professional of Record. Only one stamp should be placed on the drawing. Either the foundation (geotechnical) designer or engineering geologist may stamp the drawing.
7. All Foundation Data sheets must be checked by an independent checker familiar with the project. The checker should sign the drawing in the space marked “checker”. If the geotechnical engineer stamped the drawing, the checker may be either the project geologist or the engineer reviewing the foundation design. If the drawing is stamped by the Engineering Geologist the drawing should be checked by the project foundation designer (geotechnical engineer).
8. Calculation book number shall have a line drawn through it as shown in Figure 5.

STANDARD LEGENDS, SYMBOLS & NOTES

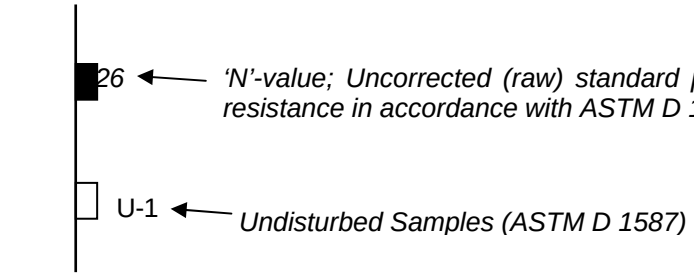
The following standards and examples are provided for use in developing Foundation Data Sheets. Refer to the data sheet examples on the Bridge Section ftp site for additional guidance.

Standard Penetration Test (“N” Values)

The Standard Penetration Test consists of driving a two inch diameter split spoon soil sampler 18 inches into the soil with a 140 lb. hammer. The number of hammer blows required to drive the sampler are recorded in 6 inch increments (3 – 6” increments total). The sum of the number of blows required for the second and third 6 inches of penetration is termed the "standard penetration resistance," or the "N” value. Typical examples encountered are shown in the table below:

SPT Test Number	Raw Test Data	Reported “N” Value
N-1	3-3-4	7
N-2	1/1.5’	1/18”
N-3	50 for 5”	50/1st 5”
N-4	6-50/2”	50/2”
N-5	1/12”–2	3/18”
N-6	2/6”-1/12”	1

Table 1: “N” value examples



C = *Core Sample (ASTM D 2113)*
R.Q.D = *Rock Quality Designation (ASTM D 6032)*
q_u = *Unconfined Compressive Strength (ASTM D 2938)*
1/4/2008 = Elevation of groundwater measured in the test hole on the date shown

Figure 1: Standard Legend

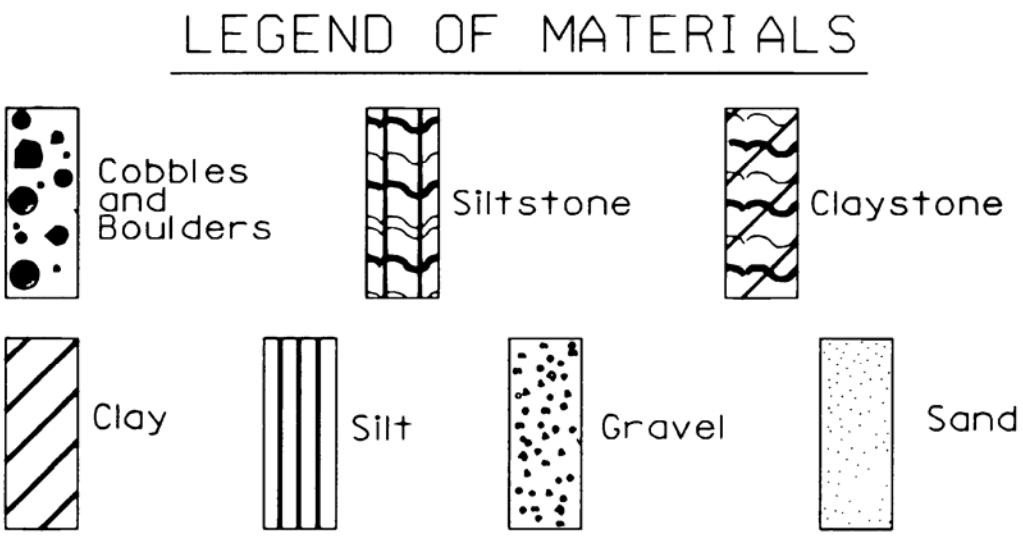


Figure 2: Standard Legend of Materials

Test Boring	Core Run	% Rec.	Hardness	R.Q.D.	q_u (psi)
BH–1	C–1 C–2	100 100	R5 R5	65 88	X
BH–2	C–1 C–2	100 100	R5 R5	75 95	X

Note: Refer to the ODOT Soil and Rock Classification Manual (1987) for a description of the terms used in this table.

Figure 3: Standard table of rock core (include unconfined compressive strength (q_u) test results if available)

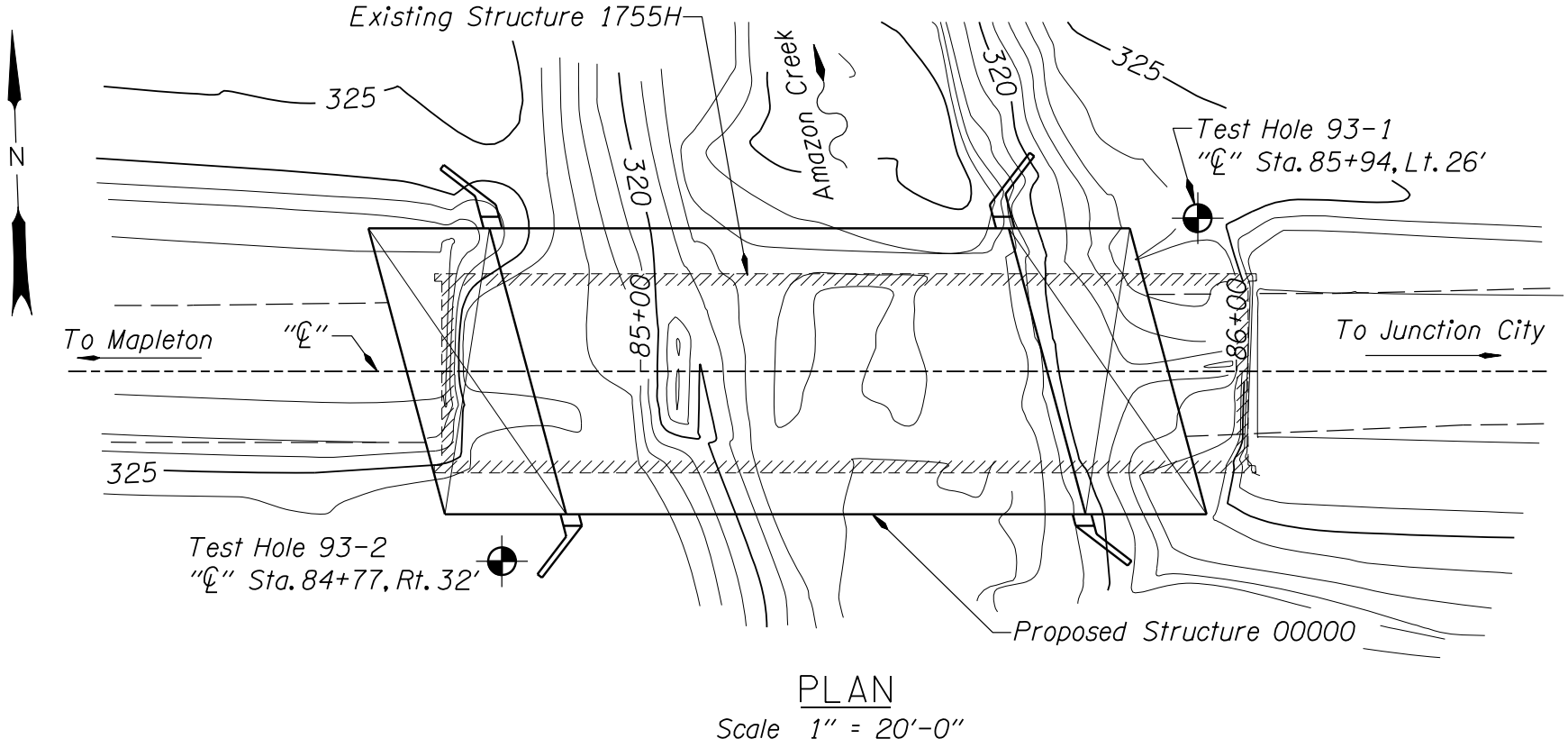
Geotechnical data shown on this drawing are a consolidation of information and/or revision in terminology from the drill logs. The drill logs and any other exploration data used in compiling this drawing are available upon request. Contractor shall refer to Geotechnical Reports and drill logs and the information contain therein.

Figure 4: Standard note for inclusion on all Foundation Data Sheets

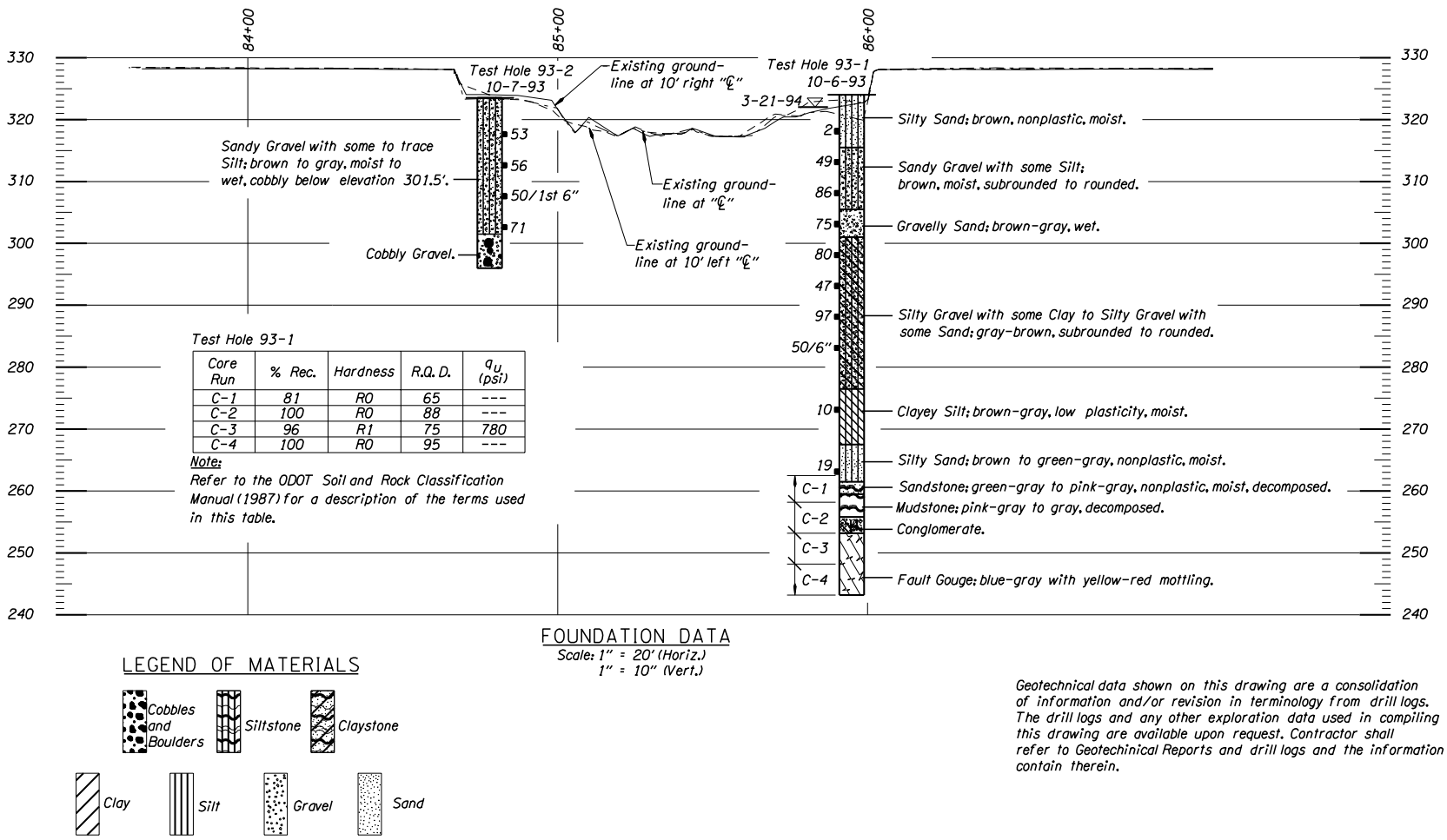
	STRUCTURE NO. 00332A	ROGUE RIVER + HWY 271 (ROCK POINT) OR234: ROGUE RIVER BRIDGE (ROCK POINT) REHAB SAMS VALLEY HIGHWAY (MP 0.09) JACKSON COUNTY	SHEET 2 OF 27
	DATE April 2009		DRAWING NO.
	CALC. BOOK -----	FOUNDATION DATA	81038

Figure 5: Title Block Example

Foundation Data Sheet Example Sections



Example of typical “Plan” view layout



Test Hole 93-1

Core Run	% Rec.	Hardness	R.Q.D.	q_u (psi)
C-1	81	R0	65	---
C-2	100	R0	88	---
C-3	96	R1	75	780
C-4	100	R0	95	---

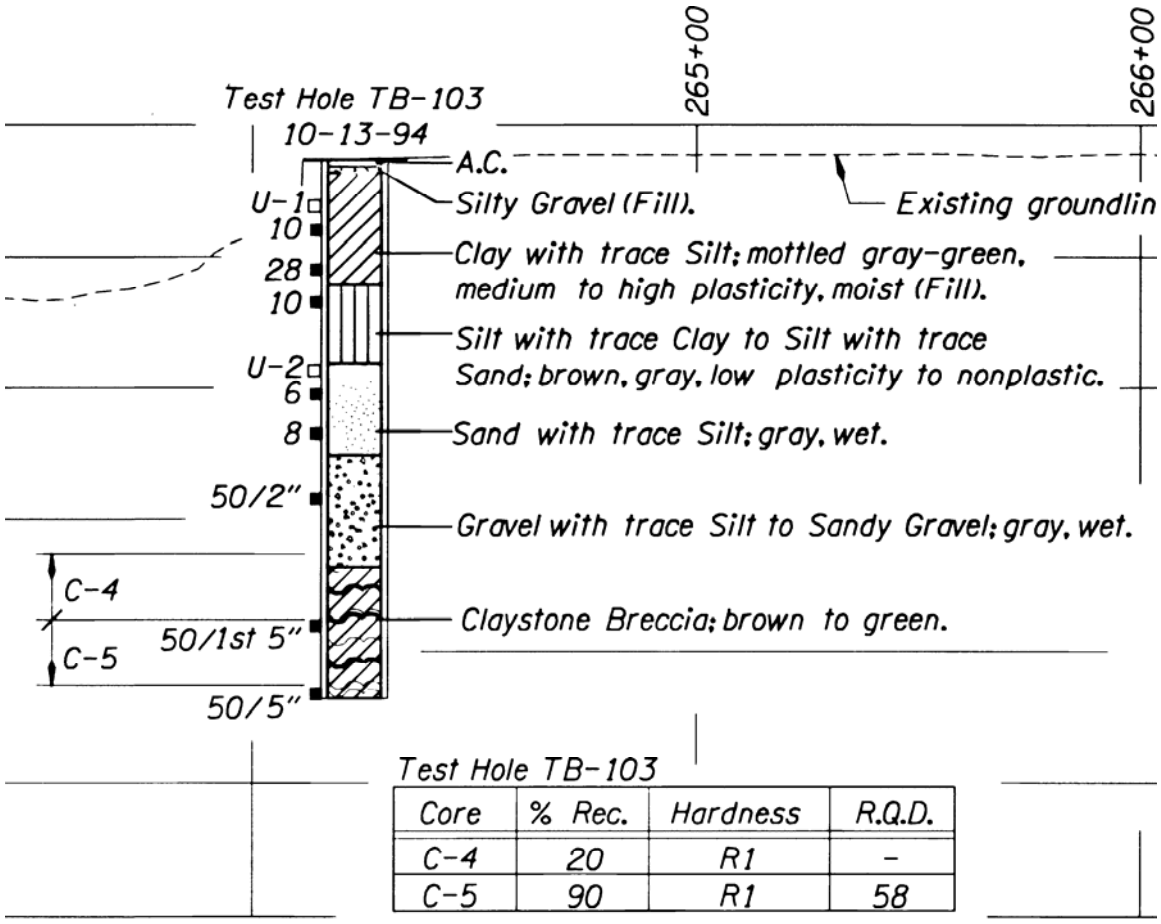
Note:
Refer to the ODOT Soil and Rock Classification Manual (1987) for a description of the terms used in this table.

FOUNDATION DATA
Scale: 1" = 20' (Horiz.)
1" = 10" (Vert.)

LEGEND OF MATERIALS

Geotechnical data shown on this drawing are a consolidation of information and/or revision in terminology from drill logs. The drill logs and any other exploration data used in compiling this drawing are available upon request. Contractor shall refer to Geotechinical Reports and drill logs and the information contain therein.

Example of typical Elevation view (Foundation Data)



Typical graphic column with soil/rock material descriptions, SPT "N" values, undisturbed ("U") samples and rock core runs