Yeh and Associates, Inc.
Consulting Engineers & Scientists

December 11, 2015

Mr. Terry Tyrrell, P.E.
AECOM Technical Services, Inc.
717 17th Street, Suite 2600
Denver, CO 80202

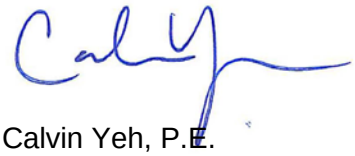
Re: Final Geotechnical Investigation Report, I-25/Crossroads Boulevard Bridge Replacement, Loveland Colorado
CDOT Project No. IM 0253-242 (20575)

Dear Mr. Tyrrell,

Attached is the subject Final Report. Please distribute this draft report accordingly for interdisciplinary review and constructability review. Please contact the undersigned if you have any questions.

For this submittal, we have followed our internal quality procedures, as outlined in our QC/QA Process letter to AECOM dated April 28, 2015.

Respectfully Submitted,
Yeh and Associates, Inc.



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Final

Geotechnical Investigation Report

I-25/Crossroads Boulevard Bridge Replacement

Loveland, Colorado

CDOT Region 4

CDOT Project No. IM 0253-242 (20575)

Yeh Project No.: 215-043

December 11, 2015

Prepared for:

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I-25/Crossroads Boulevard Bridge Replacement

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CDOT Project No. IM 0253-242 (20575)

Yeh Project No.: 215-043

December 11, 2015

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Yeh and Associates, Inc.
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1. PURPOSE AND SCOPE OF STUDY

This report presents the results of Yeh and Associates, Inc. (Yeh) geotechnical investigation and provides geotechnical engineering recommendations based on these results for the proposed I-25 and Crossroads Boulevard bridge replacement project. The purpose of this report is to provide geotechnical engineering recommendations for use by AECOM and CDOT in the design of the project. For pavement design recommendations, please refer to the "Final Pavement Design Report, I-25 and Crossroads Boulevard Bridge Replacement," submitted December 11, 2015. The project area is shown in Figure 1.

The scope of this investigation included the following tasks:

- Conduct a subsurface investigation consisting of the following:
    - 4 borings for the proposed I-25/Crossroads Boulevard bridge replacement.
    - 10 borings for retaining walls and slope stability.
    - 37 borings for pavement thickness design.
- Perform laboratory tests on samples obtained during the subsurface investigation to help determine engineering characteristics of on-site soils.
- Prepare a geotechnical investigation report that summarizes the results of the field investigation and laboratory test results and provides geotechnical recommendations for bridge foundations, and retaining wall design.
- Prepare a pavement design report.

2. PROPOSED CONSTRUCTION

The proposed I-25 and Crossroads Boulevard reconstruction will include the construction of new bridges and retaining walls between I-25 milepost 258.4 and milepost 259.8. The project alignment is shown on the Boring Location Plan, Sheet A-1 through A-6 of Appendix A.

The Structure Selection Report submitted by Felsburg Holt & Ullevig (FHU) in June 2015 identifies a reconstructed standard diamond interchange with signalized ramp terminals as the preferred configuration for the proposed interchange. This involves replacing the existing I-25 northbound and southbound bridges over Crossroads Boulevard with two new single span girder bridges. A profile of the proposed bridge is shown on the Engineering Geology sheets (Sheets A-7 and A-8 of Appendix A). Each proposed bridge will have an interim width of about 67 feet from edge of deck to edge of deck, including a 28-foot shoulder to accommodate a 12-

foot managed lane in the future. In addition, Crossroads Boulevard will be widened to four, 12-foot lanes with 5-foot bike lanes in each direction, a 6-foot median, and a 6-foot sidewalk in each direction.

The in-progress FOR Plan Set, dated November 10, 2015, identifies two retaining structures. Layouts and elevations for these walls are included in the Engineering Geology Sheets as Sheets A-9 through A-13 of Appendix A. Based on these plans, the walls will be a combination of soil nail and mechanically stabilized earth walls.

- Wall 1: Located at the south abutment of the proposed I-25 and Crossroads Boulevard bridges with heights ranging from 6 to 20 feet. This wall consists of an approximately 191.5-foot-long soil nail cut wall at the south bridge abutment and transitions to an MSE fill wall at the east and west ends. Based on the in-progress FOR plan set, the MSE wall sections are about 55.5 linear-feet-long at its eastern end and about 64 linear-feet-long at its western end for a total of approximately 311 linear feet of combined fill and cut wall.
- Wall 2: Located at the north abutment of the proposed I-25 and Crossroads Boulevard bridges with heights ranging from 6.5 to 20.5 feet. This wall consists of an approximately 193-foot-long soil nail cut wall at the north bridge abutment and transitions to an MSE fill wall at the east and west ends. The in-progress FOR plans show the MSE wall sections as about 50 linear-feet-long at its eastern end and about 60 linear-feet-long at its western end for a total of approximately 303 linear feet of combined fill and cut wall.

3. GEOLOGICAL SETTING AND SITE CONDITIONS

The project area is located in the Denver Basin along the Front Range Urban corridor. A geologic map depicting the project area is shown in Figure 2 (USGS, Colton, 1978). The Denver Basin is underlain by the Paleocene/upper Cretaceous age Denver and Arapahoe Formations. The Denver and Arapahoe Formations primarily include claystone and siltstone interbedded with sandstone, representative of shallow inland seaways, near shore, and terrestrial streambed conditions. These bedrock units are typically described as hard and indurated with a slight regional dip to the northeast.

The USGS has mapped the surficial soils along the I-25 Corridor alignment as primarily Eolium (Qe) from the Quaternary age. The Eolium is described by the USGS as a windblown deposit

generally consisting of interbedded clayey, silty, and sandy deposits that contain variable amounts of these constituents.

The bedrock units are mapped as Upper Shale Member (Kpu) and Upper Transition Member (Kptz) Pierre Shales from the Cretaceous age. The Kpu unit is described as a silty shale, and the Kptz unit is described as a clayey sandstone with thin-bedded sandy shale layers and large calcareous sandstone concretions. Based on the USGS Geologic map shown as Figure 2, outcrops of these bedrock units have been mapped north of the I-25 and UPRR Bridge and extend north of the I-25 and Crossroad's Boulevard intersection.

The mapped soils and bedrock are generally consistent with the subsurface conditions encountered in the borings drilled for the project.

4. SUBSURFACE INVESTIGATION

The subsurface investigation program included a total of 51 borings, including four bridge borings, 10 retaining wall/slope stability borings, and 37 pavement borings. Borings YA-BC-4 and YA-PNB-9 were combined as one boring because they were planned at the same location.

The borings were drilled in May and June of 2015. All borings were drilled by Terracon Consultants, Inc. as a subcontractor to Yeh using a truck mounted CME 75 drill rig and 4-inch outside diameter solid-stem augers. A representative from Yeh obtained CDOT access permits, staked the boring locations, completed utility locates at each boring location, and was on-site to observe drilling operations and log the subsurface conditions. Traffic control, as required by the CDOT access permit, was provided by Colorado Barricade and Warning Lites, Inc. of Colorado as subcontractors to Yeh. After being drilled, the borings locations were surveyed by 105 West, Inc. as a subcontractor to AECOM. Boring YA-PNB-10 was not surveyed, as the surveyors were not able to locate the borehole location. The location and elevation of boring YA-PNB-10 was estimated using existing site features and available topographic dgn files.

The locations of the borings are shown on the Boring Location Plans in Appendix A, Sheets A-1 through A-6. The boring logs are included in Appendix B, Legend and Boring Logs. The boring identifications include letter designations to indicate the type of structure in addition to number designations. For example, borings drilled as part of the southbound I-25 pavement investigation are identified as "YA-PSB." In general, the boring numbers start on the southern end of the project alignment with the numbers increasing in the northbound direction. The boring designations are described below.

- YA-BC: Borings drilled for the proposed I-25 over Crossroads Boulevard Bridge (YA-BC-1 to YA-BC-3 and YA-BC-4/YA-PNB-9).
- YA-RW: Borings drilled for the slope stability investigation (YA-RW-1 to YA-RW-4) and proposed retaining walls (YA-RW-5 to YA-RW-10).
- YA-P: Borings drilled for the pavement investigation.
    - YA-PSB, borings drilled for the southbound I-25 pavement reconstruction (YA-PSB-1 to YA-PSB-16).
    - YA-PNB, borings drilled for the northbound I-25 pavement reconstruction (YA-PNB-1 to YA-PNB-8, YA-BC-4/YA-PNB-9, and YA-PNB-10 to YA-PNB-16).
    - YA-PC, borings drilled for the Crossroads Boulevard pavement reconstruction (YA-PC-1 and YA-PC-2).
    - YA-PR, borings drilled for the I-25 ramps pavement reconstruction (YA-PR-1 to YA-PR-4).

Modified California (MC) tube samples were obtained from the borings. When sampling with the MC sampler, the penetration resistance was recorded. The Modified California penetration resistance value (N_{MC}) was recorded as the total number of blows required to advance the MC sampler the final two 6-inches of penetration using a 140-pound hammer falling from a height of 30 inches, generally following ASTM D1586, "Standard Test Method for Standard Penetration Test (SPT) and Split Spoon Barrel Sampling of Soils." The Modified California penetration resistance (N_{MC}) is identified as "Penetration Resistance (N)" on the boring logs.

Groundwater conditions were observed during drilling for all boings and are shown on the boring logs. Year-round groundwater conditions were not established as part of the field investigation. Depending on foundation elevations, groundwater may be encountered during construction. Groundwater conditions in the study area may vary considerably throughout the year. Variations can occur during different seasons, following precipitation events, due to irrigation, after construction and site grading, and due to changes in surface and subsurface drainage characteristics of the surrounding area.

5. LABORATORY TESTING

The samples collected during the subsurface investigation were transported to Yeh's laboratory in Denver, Colorado, where they were examined, and laboratory tests were assigned to samples representative of the subsurface materials encountered in the borings. The geotechnical laboratory tests included sieve analysis, Atterberg limits, natural moisture content

and dry density, swell/consolidation, and R-value. In addition, select representative samples were subjected to chemical analyses by Colorado Analytical Laboratories, Inc. to determine the water soluble sulfate content, water soluble chloride content, pH, and resistivity. The laboratory test results are included in Appendix C and are shown on the boring logs in Appendix B.

Results from Atterberg limits determination and sieve analyses were used to classify the soils according to AASHTO and the Unified Soil Classification System (USCS) standards. Atterberg limits were performed in general accordance with AASHTO T89 and T90, and sieve analyses were performed in general accordance with ASTM D421. Dry density tests and moisture content tests were performed in general accordance with ASTM D2937 and ASTM D2216, respectively.

Chemical tests were performed by Colorado Analytical Laboratories, Inc. on 12 representative samples obtained from the borings. These samples were tested to determine the concentrations of water soluble sulfates, water soluble chlorides, pH, and resistivity. The test results are presented in the Summary of Laboratory Test Results in Appendix C and on applicable boring logs included in Appendix B. See Section 13, “Other Design Considerations,” of this report for more information regarding these chemical test results.

Yeh performed 21 swell/consolidation tests on representative samples obtained in the project area to determine the swell potential of the subsurface materials. The tests were performed in general accordance with ASTM D4546 Procedure B. The swell was measured by applying a surcharge of 200 pounds per square foot (psf) to the sample and adding water, except for Boring YA-RW-6, which was tested at a surcharge of 500 psf. Test results are shown on the applicable boring logs in Appendix B, and graphical results of the swell consolidation tests are presented in Appendix C.

Table 5-1 below summarizes the swell/consolidation test results. The test results indicated that the tested subgrade materials in the project area possessed swell/consolidation potentials ranging from -0.5 percent (consolidation) to 1.8 percent (swell). This range is typically considered to represent a low to medium risk for damage due to swelling soil problems based on Table 4.9 of the 2016 CDOT Pavement Design Manual.

Table 5-1 Summary of Observed Swell Potentials

Boring	Sample Depth (ft.)	Tested Material	Surcharge Pressure (psf)	Swell (%)
YA-PNB-2	2	Clayey Sand	200	0.2
YA-PNB-4	2	Clayey Sand	200	0.8
YA-PNB-5	5	Sandy Clay	200	0.8
YA-PNB-8	2	Clayey Sand	200	0.7
YA- PNB-11	5	Sandy Clay	200	0.0
YA- PNB-15	6	Sandy Clay	200	0.3
YA-PSB-1	3	Sandy Clay	200	1.4
YA- PSB-2	3	Sandy Clay	200	1.5
YA- PSB-6	2	Clayey Sand	200	1.8
YA- PSB-9	2	Sandy Clay	200	1.5
YA- PSB-10	2	Sandy Clay	200	0.9
YA- PSB-13	5	Sandy Clay	200	0.0
YA- PSB-14	2	Sandy Clay	200	0.1
YA- PSB-16	2	Clayey Sand	200	0.9
YA-PC-1	2	Clayey Sand	200	0.4
YA-PC-2	2	Sandy Claystone	200	1.3
YA-RW-1	2	Sandy Clay	200	1.7
YA-RW-2	2	Clayey Sand	200	0.4
YA-RW-4	5	Sandy Clay	200	0.3
YA-RW-5	5	Sandy Clay	200	0.2
YA-RW-6	4	Silty Sand	500	-0.5

6. SUBSURFACE CONDITIONS

A total of 51 borings were drilled along the proposed project alignment; four bridge borings, 10 retaining wall/slope stability borings, and 37 pavement borings. The general boring locations are shown on Sheets A-1 through A-6 in Appendix A, Boring Location Plan.

Data obtained from CDOT indicates that existing concrete pavements in the project area have been rubbilized and capped with 5 inches HMA asphalt. For more information about the existing pavements along the alignment, please refer to the "Final Pavement Design Report, I-25 and Crossroads Boulevard Bridge Replacement," submitted December 11, 2015.

The subsurface conditions along the I-25 mainline alignment generally consisted of about 3.5 to 11 feet of medium stiff to very stiff sandy clay and clayey sand fill underlain by either native stiff to very stiff sandy clay and loose to medium dense clayey sand or very hard bedrock. The depths of fill, when encountered, were generally greater at the southern portion of the alignment near the UPRR, with fill depths up to 11 feet below existing grade observed. At the northern portion of the alignment, observed fill depths were generally shallower, with fill depths of up to 3.5 feet below existing grade. The fill and native soils were underlain by sandstone and claystone bedrock at depths ranging from 2 feet to 29 feet below existing grade.

Bedrock along the I-25 mainline alignment was encountered at depths ranging from approximately 29 feet below existing grade at the southern end of the alignment (Boring YA-RW-2) to 2 feet below existing grade near the I-25 and Crossroads interchange (Boring YA-RW-8). The observed bedrock elevations ranged from a low elevation of approximately 4,994 feet at Boring YA-RW-2 and generally increased in elevation towards the north. The highest observed bedrock elevation of approximately 5,068 feet was observed in Boring YA-PNB-12 near the north end of the alignment. The bedrock generally consisted of hard to very hard sandy claystone and clayey sandstone. The surveyed existing ground surface elevation, the approximate depth to bedrock, and the approximate elevation of the top of bedrock at each boring location are presented in Table 6-1. In addition, groundwater observations, if encountered at the time the borings were drilled, are also included in Table 6-1.

Four bridge borings (YA-BC-1 through YA-BC-3 and YA-BC-4/YA-PNB-9) were drilled near the I-25 over Crossroads Boulevard Bridge. The subsurface conditions observed in borings drilled in this area generally consisted of about 5 to 13 feet of stiff to very stiff sandy clay fill underlain by native medium stiff to very stiff sandy clay and loose clayey sand. The existing grade at the

location of the borings for the I-25 Southbound lanes (Borings YA-BC-1 and YA-BC-3) are at elevation 5,058.4 feet and 5,059.3 feet, respectively. The existing grades at the locations of the borings for the I-25 Northbound lanes (Borings YA-BC-2 and YA-BC-4/YA-PNB-9) are approximately 8 feet higher at 5,066.3 feet and 5,067.3 feet, respectively. The native soils were underlain by sandstone and claystone bedrock at depths ranging from 6.5 to 14.5 feet below existing grade (between approximately elevations 5,052 feet and 5,054 feet).

Groundwater conditions were observed during drilling for all borings and are summarized in Table 6-1. At the time of drilling, groundwater was observed in Borings YA-BC-1 through YA-BC-4 between about 6.5 feet and 14.5 feet below existing grade, or between approximately elevations 5,026 feet and 5,033 feet.

Table 6-1 Summary of Observed Bedrock and Groundwater Conditions

Boring No.	Surveyed Ground Surface Elevation (ft.)	Approx. Depth to Top of Bedrock[1] (ft.)	Approx. Top of Bedrock Elevation[1] (ft.)	Approx. Depth to Observed GW[1] (ft.)	Approx. Elevation to Observed GW[1] (ft.)
Bridge Borings					
YA-BC-1	5,058.4	6.5	5,052	30.5	5,028
YA-BC-2	5,066.3	14.5	5,052	34	5,032.5
YA-BC-3	5,059.3	7	5,052.5	33	5,026.5
YA-BC-4/ YA-PNB-9	5,067.3	13	5,054.5	34	5,033.5
Retaining Wall/Slope Stability Borings					
YA-RW-1	5,026.1	29	4,997	Not Encountered	
YA-RW-2	5,022.7	29	4,994	Not Encountered	
YA-RW-3	5,019.8	25	4,995	Not Encountered	
YA-RW-4	5,018	20	4,998	Not Encountered	
YA-RW-5	5,051.7	8	5,044	Not Encountered	
YA-RW-6	5,054	7	5,047	Not Encountered	
YA-RW-7	5,043.8	2.5	5,041.5	Not Encountered	
YA-RW-8	5,048	2	5,046	Not Encountered	
YA-RW-9	5,038.9	5	5,034	Not Encountered	
YA-RW-10	5,050.5	3	5,047.5	Not Encountered	
Pavement Borings					
YA-PC-1	5,040.8	3	5,038	Not Encountered	
YA-PC-2	5,045	2	5,043	Not Encountered	
YA-PNB-12	5,077.9	10	5,068	Not Encountered	
[2]YA-PSB-4	5,022.2	5	5,017	Not Encountered	
[2]YA-PSB-5	5,031.8	10	5,022	Not Encountered	
YA-PSB-13	5,070.9	9	5,062	Not Encountered	
YA-PSB-15	5,073.7	9	5,065	Not Encountered	
[2]YA-PR-1	5,048.3	3.5	5,045	Not Encountered	
[2]YA-PR-2	5,051.7	2	5,050	Not Encountered	
[2]YA-PR-3	5,051.4	2.5	5,049	Not Encountered	

Notes: 1) Bedrock and groundwater depths and elevations are based on observations made during drilling and are presented to the nearest 0.5 foot.
2) Borings YA-PSB-4 and YA-PSB-5 encountered weathered bedrock to the bottom of the boring. Borings YA-PR-1, YA-PR-2, and YA-PR-3 encountered 1.5 feet, 3 feet, and 2 feet of weathered bedrock, respectively.

7. SEISMIC CONSIDERATIONS

No current active faults are known to exist in the immediate vicinity of the I-25 and Crossroads Boulevard project vicinity. It is believed that there is a low likelihood of a highly damaging earthquake occurring in the near future.

Based on the results of the subsurface investigation, the project site is classified as Site Class C, in accordance with the Method B procedure specified in AASHTO Table C3.10.3.1-1. The peak ground acceleration (PGA) and the short- and long- period spectral acceleration coefficients (S_s and S_1, respectively) for soft rock (site class B) were determined using the USGS Seismic Design Parameters Version 2.10 for an event with a 7 percent probability of exceedance in 75 years. An event with this probability of exceedance has a return period of about 1,034 years. The seismic design parameters for soft rock (site class B) are presented in Table 7-1. USGS seismic design parameters for Site Class C were obtained by adjusting the seismic design parameters for Site Class B in accordance with AASHTO Section 3.10.3.2 and are presented in Table 7-2.

Table 7-1 Seismic Design Parameters for Site Class B

PGA (0.0 sec)	S_S (0.2 sec)	S_1 (1.0 sec)
0.058 g	0.124 g	0.033 g

Table 7-2 Design Parameters Adjusted for Site Class C

A_S (0.0 sec)	S_{DS} (0.2 sec)	S_{D1} (1.0 sec)	Seismic Zone
0.069 g	0.149 g	0.057 g	1

8. BRIDGE FOUNDATION RECOMMENDATIONS

Based on the in-progress FOR plans dated November 10, 2015, the single span I-25 over Crossroads Boulevard Bridge abutments will be supported on drilled caissons founded in bedrock. A profile of the proposed bridge is shown on the Engineering Geology sheet, included as Sheets A-7 and A-8 of Appendix A. If driven piles are considered as a bridge foundation option, we should be notified to provide additional driven pile recommendations. Specific design recommendations for drilled caisson foundations subjected to axial and lateral loads are presented in the following subsections of this report. Generally, the soil and bedrock properties are estimated from uncorrected blow count data and material descriptions contained in the Yeh borings.

The recommendations contained herein generally comply with the AASHTO Load-Resistance Factor Design (LRFD) Bridge Design Specifications, 7th Edition, 2014 with 2015 Interim Revisions (AASHTO, 2015) and a CDOT research report by Abu-Hejleh, et. Al (2003).

8.1 Drilled Caissons

Drilled caisson construction should be in accordance with Section 503 of the CDOT Standard Specifications.

1. The design approach for soil-like claystone in Abu-Hejleh, et. al. (2003) recommends the use of an updated Colorado SPT-based (UCSB) design method where the nominal resistance (side and tip resistances) of a drilled caisson is proportional to penetration resistance. Table 8-1 presents the recommended nominal values for side and tip resistances in bedrock. Estimated elevations for the top of bedrock observed in the borings are listed in Table 6-1 and are shown on the boring logs. The "factored" bearing capacity is the product of the nominal bearing capacity and a resistance factor. Per AASHTO, the recommended resistance factors for side and tip resistances are 0.60 and 0.55, respectively, for intermediate geomaterials (claystone/sandstone bedrock). Adjustments to the load and/or resistance factors may be required per AASHTO Section 10.5.5.2.4 if the drilled caissons are considered non-redundant.

Table 8-1 Recommended Nominal Side and Tip Resistances for Drilled Caissons

Hard to Very Hard Bedrock	Nominal Resistance (ksf)
Side Resistance	7.5
Tip Resistance	92

2. The drilled caisson recommendations for tip and side resistances are applicable for bedrock only. The side resistance developed in the overburden soils should be neglected.
3. Soil nail walls are proposed at the bridge abutments near the proposed caissons. We recommend that drilled caissons extend below the base of the soil nail walls and that all vertical and lateral resistance be neglected for any portion of the caisson which is above the base of the soil nail walls.
4. The upper 2 feet of bedrock shall not be used for capacity estimates due to the likelihood of disturbance and possible future weathering.

5. To account for axial group effects, the minimum spacing requirements between drilled caissons should be three diameters from center-to-center. If the caissons are spaced closer than three diameters from center-to-center, the reduction factor should be evaluated.
6. The Contractor should construct the drilled caissons using means and methods that maintain a stable hole in granular soils that may be below the groundwater elevation such as using temporary steel casing or other methods with the Engineer's approval.
7. Drilled caisson construction should not disturb previously installed caissons. For caissons spaced less than four diameters center-to-center, the construction sequence may need to be adjusted or temporary steel casing may be required to preserve caisson excavation stability and to prevent communication between caissons during excavation and concrete placement. Any drilled caisson which is located within four diameters of a previously installed caisson should allow a minimum of three days for the concrete in the previously installed caisson to cure prior to installation of the new caisson.
8. Each drilled caisson excavation should be carefully observed by a qualified representative of a Registered Professional Engineer. The bottom of all drilled caissons should be founded in hard to very hard bedrock (blow counts greater than 50).

8.2 Deep Foundation Lateral Support

The input parameters provided in Table 8-2 are recommended for use with the computer program LPILE to develop the soil models used to determine the H-piles' and drilled caissons' response to lateral loading. The table describes the values associated with the soil types encountered in the borings. Individual soil layers and their extents can be averaged or distinguished by referring to the boring logs. The soils and/or bedrock materials prone to future disturbance, such as from scour, utility excavations, or frost heave, should be neglected in the lateral pile analyses.

For consideration of group effects, AASHTO Section 10.7.2.4 recommends the use of p-multipliers based on orientation of load and spacing between deep foundation elements (applies to both drilled caissons and driven piles) or by considering the extent of overlapping shear zones using strain wedge theory.

Table 8-2 LPILE Parameters

Soil Type	LPILE Soil Criteria	Effective Unit Weight, (pcf)	Friction Angle, (deg.)	Undrained Cohesion, c (psf)	Strain Factor, ε50	p-y Modulus, k (pci)
Class 1 Structure Backfill	Sand (Reese)	135	34	----	----	225
Fill/Native Clayey Sand (above GWT[1])	Sand (Reese)	125	30	----	----	90
Fill/Native Sandy Clay (above GWT[1])	Stiff Clay w/o Free Water (Welch & Reese)	120	----	2,000	0.007	----
Hard to Very Hard Bedrock	Stiff Clay w/o Free Water (Welch & Reese)	125	----	8,000	0.004	----

[1]GWT – Groundwater Table

9. RETAINING WALL RECOMMENDATIONS

We understand that soil nail walls and MSE walls will be used at the bridge abutments as shown in the Engineering Geology sheets included as Sheets A-9 to A-13 of Appendix A. The following section provides foundation recommendations for these structures. The recommendations contained herein generally comply with the AASHTO LRFD Bridge Design Specifications (AASHTO, 2015).

Any subgrade soils and fill placed beneath foundations or behind walls should be in accordance with the recommendations in Section 11.2, “Subgrade Preparation and Fill Materials.”

9.1 Lateral Earth Pressures

External loads considered in the analyses of retaining walls should consist of earth pressure loads and traffic loads. Drainage details, such as strip drains and perforated pipes, should be provided behind walls.

We recommend that CDOT Class 1 Structure Backfill be used as backfill when placed adjacent to or beneath the walls. All fill placed beneath or adjacent to a retaining wall should be compacted to at least 95 percent of the maximum dry density determined by the Modified Proctor Test (AASHTO T-180), in accordance with Section 206 of the CDOT Standard Specifications. An experienced geotechnical engineer should review the soil types proposed for use as backfill to determine if the design assumptions are valid.

Typically, a structure requires a lateral movement or rotation of 0.1 percent to 0.4 percent of the structure's height to mobilize the shear strength of the retained soils and develop the active pressure condition. Structures that meet this criteria can be designed for the active earth pressure condition. Structures that are unable to move this amount should be designed for at-rest conditions.

To determine the active, at-rest, or passive lateral earth pressures used for the design of the abutment walls, we recommend using an assumed effective angle of internal friction of 34 degrees for CDOT Class 1 Structure Backfill. We recommend using a unit weight of 135 pounds per cubic foot (pcf) for Class 1 Structure Backfill. For existing natural soil and bedrock, we recommend using an angle of internal friction of 30 degrees and a unit weight of 130 pcf.

The active lateral earth pressure coefficient may be determined using AASHTO Article 3.11.5.3 for specific wall backslopes and interface friction values. In all cases, the calculated active earth pressure used for design should not be less than an equivalent fluid density of 38 pcf. The retaining wall design should also consider lateral earth pressures induced by additional surcharge loads above the top of the retaining wall, such as from earthen embankments, pavements, or loads due to traffic.

These earth pressure recommendations assume the following conditions:

- For uneven or varying backslopes, the surcharge effects of the backslope should be considered based on the specific site conditions.
- Hydrostatic (seepage) pressures should not be allowed to develop in the active soil wedge. We recommend that the wall designer include appropriate drainage elements that are typically installed near the back and bottom of retaining walls, such as geocomposite strip drains, perforated pipes, filter materials and/or weep holes to control surface and groundwater flows.

9.2 MSE Wall Recommendations

Based on preliminary FOR plans dated November 10, 2015, MSE walls will be used to retain fill portions of the bridge abutments. We recommend that the length of MSE reinforcing elements be a minimum of 8 feet long, 70 percent of the wall design height, or the length required to satisfy internal stability requirements, whichever is greater.

Resistance to sliding at the bottom of the MSE wall can be calculated based on a coefficient of friction or adhesion at the interface between the MSE reinforced soil and the foundation materials. To determine the sliding resistance, we recommend using a nominal coefficient of friction of 0.53 between Class 1 structure backfill and silty clay/clayey sand. Per Table 11.5.6-1 of AASHTO (AASHTO, 2015), a resistance factor of 1.0 should be used. We recommend that passive resistance due to wall embedment should be ignored. In addition, the retaining wall should be designed to limit the resultant, eccentric, unfactored force applied to the foundation soil such that it occurs within the central portion of the reinforcement length.

We recommend that the nominal bearing resistance be determined using the recommendations below. Per Table 11.5.7-1 of AASHTO (AASHTO, 2015), a resistance factor of 0.65 should be used for the bearing resistance of MSE retaining walls.

- For MSE walls bearing in sandy clay: $q_n = 0.26*B + 3.6$ (in ksf)
  Where B is the MSE reinforcement length in feet
- For MSE walls bearing in bedrock: $q_n = 30$ ksf

Per AASHTO Section 11.10.2.2, the MSE wall should be embedded a minimum of 2 feet below the nearest adjacent grade, and a minimum horizontal bench width of 4 feet should be provided in front of walls founded on slopes. Since the final grading in front of the walls will slope away from the retaining wall, the stabilizing effect of embedment should be ignored.

9.3 Soil Nail Wall Recommendations

Based on preliminary FOR plans dated November 10, 2015, soil nail walls will be used for cut portions of the bridge abutments. The design and construction of soil nail walls should be in accordance with FHWA Publication No. FHWA-NHI-14-007 – Geotechnical Engineering Circular No. 7 (GEC 7), Soil Nail Walls.

We recommend using an estimated maximum ultimate bond stress between 25 pounds per square inch (psi) and 30 psi for nail design for nails embedded in bedrock. For nails embedded in the sandy clay, we recommend using an estimated maximum ultimate bond stress between 8 psi and 10 psi. The bond stress values assume typical gravity/low pressure grouting methods. The wall designer shall determine the frequency, spacing, and orientation of the nails, but vertical and horizontal nail spacing typically ranges from 4 to 6 feet installed at an inclination angle of 15 degrees as measured from horizontal. We recommend that the inclination angle be no flatter than 12 degrees as measured from horizontal. Verification and proof tests should be performed in the field in accordance with GEC 7.

We anticipate that soil nail lengths will be between about 70 and 95 percent of the wall height. Because bedrock may be within two feet of the ground surface, excavation and soil nail installation methods capable of managing claystone and/or sandstone bedrock should be considered for construction purposes.

9.4 Global Stability

We evaluated global stability of the proposed MSE and soil nail walls using the limit equilibrium method of slices and the computer program Slide version 6.0 by Rocscience, Inc. The cross sections provided by AECOM on December 1, 2015 were used in the analyses.

For our analyses, the AASHTO Specifications (AASHTO, 2015) indicate that the overall (global) stability of earth slopes should be investigated using a resistance factor of 0.65 where the slope contains or supports a structural element. For overall global stability, resistance factors were inverted to get a factor of safety (FOS) corresponding to that calculated by limiting equilibrium. A resistance factor of 0.65 corresponded to a FOS of 1.54.

To evaluate global stability, we assumed that internal failure would not occur through the reinforced zone of MSE walls or through the soil nails of soil nail walls. The shear strength of the materials was evaluated using correlations with blow counts and the identified material properties.

We recommend that MSE reinforcement lengths and soil nail lengths be at least 0.7H, where H is the height of the wall. The results of our global stability analyses indicate that a minimum factor of safety of 1.54 is maintained for walls with MSE reinforcement lengths and soil nail lengths that are at least 70 percent of the wall height (0.7H) at the wall locations indicated in the plans.

10. DRAINAGE CONSIDERATIONS

Collecting and diverting water away from all walls, foundations, and paved areas is extremely important to their performance. Proper drainage should be installed such that no ponding water will occur on or immediately adjacent to walls, foundations, and pavement areas. Landscape sprinklers should be frequently checked for leaks and maintained in good working order. Surface water should be captured and directed away from the walls, foundations, and pavements. Surface features that could retain water in areas adjacent to the walls, foundations, and paved areas should be sealed or eliminated.

11. SITE GRADING

11.1 Temporary Excavation and Cut/Fill Slopes

All site excavation and embankment grading should be in accordance with Section 203 of the CDOT Standard Specifications.

We recommend that permanent, unretained cut and fill slopes in the project area should not be steeper than 2 horizontal to 1 vertical (2H:1V). Based on the available cross sections in the FIR plans, cut and fill slopes along the proposed I-25 alignment were generally less than 2H:1V. We identified a critical cross section at Station 3520+00 to have an approximate slope of 1.8H:1V. We evaluated the global stability for a permanent 2H:1V slope and for the proposed 1.8H:1V critical cross section at Station 3520+00 using the computer program Slide Version 6.0. The results of the global stability analyses indicate that permanent 2H:1V unretained slopes and the proposed slope at cross section 3520+00 are feasible if constructed in accordance with our recommendations. Materials placed as embankment fill should be in accordance with the "Subgrade Preparation and Fill Materials" section of this report and should have a maximum of 65 percent passing #200 sieve with a maximum PI of 20. Embankment fill placed on existing slopes that are steeper than 4H:1V should be properly benched in accordance with section 203.06 of the CDOT Standard Specifications.

Cut slopes should be protected from surface water runoff to prevent erosion and slope failure. Good surface drainage should be provided around all permanent cuts and fills to direct surface runoff away from the slope faces. Proper design of drainage should include prevention of ponding of water on or immediately adjacent to structures. In areas where sidewalks or paving do not immediately adjoin the structures, we recommend that protective slopes be provided with a minimum grade of approximately 5 percent for at least 5 feet from the walls. All landscape sprinkler heads adjacent to structure areas should be frequently checked for leaks and maintained in good working order. Fill slopes, cut slopes, and other stripped areas should be protected against erosion by re-vegetation or other methods.

We anticipate that unshored, temporary excavation slopes will be used when the excavation does not undermine existing structures, interfere with other construction, or extend beyond construction limits. The Contractor is responsible for temporary excavation slopes and should observe the nature and conditions of the materials encountered during excavation, including groundwater. If temporary excavations are made, they should be protected from surface water runoff to prevent erosion and slope failure. All construction traffic should be set back from the

edge of temporary slopes a minimum of 5 feet, and excavated material, stockpiles of construction materials, and construction equipment should not be placed closer to the edge of any excavation than the depth of excavation. We recommend that the contractor perform periodic, daily monitoring of excavations and cut slopes to check for developing displacement, deformations, bulges, and/or cracks in the soil.

11.2 Subgrade Preparation and Fill Materials

Preparation of subgrade soils for pavements require additional attention. Please refer to the "Final Pavement Design Report, I-25 and Crossroads Boulevard Bridge Replacement," submitted December 11, 2015 for more information.

Existing soils beneath foundations and walls should be free of all organics, topsoil, debris, and loose, soft, or wet material, and any ponding water should be drained from the area. If rubble, concrete, or asphalt debris larger than 3 inches in equivalent diameter is encountered, it should be removed. Subgrade soils should then be scarified a minimum of 6 inches, moisture conditioned, and recompacted, as specified in Section 206.03 of the CDOT Standard Specifications prior to placing fill. Areas which pump or deform during the subgrade preparation process should be reworked if possible, or removed, replaced, and recompacted. The subgrade preparation process should be observed by an experienced geotechnical engineer or engineer's representative.

Imported fill placed beneath walls and foundations should meet the requirements of Section 703.08 (Class I Structure Backfill) of the CDOT Standard Specifications. Imported fill should be compacted to at least 95 percent of the maximum modified proctor dry density (AASHTO T180) and should be moisture conditioned to within 2 percent of the optimum moisture content.

Reconditioned on-site soils and/or imported fill meeting the requirements specified in Section 203.03 of the CDOT Standard Specifications can be used as embankment fill. In addition, we recommend that all materials proposed for use as embankment fill shall have a maximum of 65 percent passing #200 sieve, have a PI less than 20, and shall not contain organic matter, debris, or materials larger than 3 inches in diameter. Claystone materials, if encountered, should not be used as fill of any kind for this project. All materials proposed for use as embankment fill should be tested to demonstrate that they meet the classification requirements described herein prior to being used.

Materials used as embankment fill should be moisture conditioned to within 2 percent of the optimum moisture content and recompacted to at least 95 percent of the maximum standard proctor dry density (AASHTO T99) for cohesive materials and recompacted to at least 95 percent of the maximum modified proctor dry density (AASHTO T180) for granular materials, in accordance with Section 203.07 of the CDOT Standard Specifications. Embankment fill placed on existing slopes that are steeper than 4H:1V should be properly benched in accordance with section 203.06 of the CDOT Standard Specifications.

All compaction should be performed in lifts that are 8 inches or less in loose thickness. Backfill materials should have a Class 0 severity of sulfate exposure based on Table 601-4 of the CDOT Standard Specifications. Fill materials should be tested for severity of sulfate exposure prior to placement. We recommend that soil excavation and the placement and compaction of materials behind retaining walls and beneath structures be observed and evaluated by an experience geotechnical engineer or engineer's representative.

12. OTHER DESIGN CONSIDERATIONS

Representative samples of the subsurface materials collected at various depths below existing grade were tested to determine the water soluble sulfate and water soluble chloride concentrations, resistivity, and pH. The test results are summarized in Table 12-1 below. Chemical test results are also presented on applicable boring logs in Appendix B and in the laboratory test results in Appendix C.

The results shown in Table 12-1 should be taken into consideration during the concrete design and selection process and while determining appropriate types of metal or concrete materials to be used in contact with these soils. Based on these test results, the soils along the alignment present a low potential for sulfate attack on concrete, and special sulfate resistance concrete mix designs are not required. The designer should refer to Sections 601, 603, and 624 of the CDOT Standard Specifications for design requirements regarding concrete, metal, and buried pipes to be used in contact with these soils.

Table 12-1 Summary of Chemical Test Results

Boring	Test Depth (ft.)	Water Soluble Sulfate (%)	Water Soluble Chlorides (%)	pH	Resistivity (ohm-cm)
YA-BC-1	3	0.032	0.0162	8.0	685
YA-BC-4	9	0.014	0.0111	8.0	825
YA-RW-6	2	0.009	0.0573	8.4	646
YA-PNB-5	10	0.008	0.0021	7.0	754
YA-PNB-6	2.2 – 5	0.044	0.0081	10.1	1721
YA-PNB-12	2.1 – 5	0.038	0.0208	9.3	1107
YA-PSB-1	3 – 5	0.024	0.0119	8.7	941
YA-PSB-5	2.5 – 5	0.024	0.0202	8.2	726
YA-PSB-10	2.3 – 5	0.039	0.0168	10.4	1567
YA-PC-2	0.5 – 5	0.069	0.0152	8.0	533
YA-PR-1	0.5 – 5	0.007	0.0325	7.9	954
YA-PR-4	0.5 – 5	0.007	0.0153	8.1	1504

13. LIMITATIONS

This geotechnical investigation report was prepared for the exclusive use of the AECOM and the I-25/Crossroads Boulevard Bridge Replacement design team. Within the limitations of the scope, schedule, and budget, the work presented in this report was performed in accordance with generally accepted principles and practices in this area at the time this report was prepared. We make no other warranty, either express or implied.

The classifications, conclusions, and recommendations submitted in this report are based on the data obtained from published and unpublished maps, reports, and geotechnical analyses, and our exploratory boring program. Our conclusions and recommendations assume that these borings are representative of the subsurface conditions throughout the project site. Our conclusions and recommendations are based on our understanding of the project as described in this report and the site conditions as interpreted from the field explorations. This data may

not necessarily reflect variations in the subsurface conditions and water levels occurring at other locations.

The nature and extent of subsurface variations may not become evident until excavation is performed. Variations in the data may also occur with the passage of time. If during construction, fill, soil, rock, or groundwater conditions appear to be different from those described in this report, this office should be advised immediately so we can review these conditions and reconsider our recommendations. If there is a substantial lapse of time between the submission of this report and the start of work at the site, or if site conditions have changed because of natural forces or construction operations at or adjacent to the site, we recommend that this report be reviewed to determine the applicability of the conclusions and recommendations concerning the changed conditions or time lapse. We recommend on-site observation of foundation excavations and foundation subgrade conditions by an experienced geotechnical engineer or engineer's representative.

The scope of work of this preliminary investigation did not include hazardous materials sampling or environmental sampling, investigation, or analyses. In addition, we did not evaluate the site for potential impacts to natural resources, including wetlands, endangered species, or environmentally critical areas.

14. REFERENCES

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Figure 1 Site Vicinity Map (Google Earth)

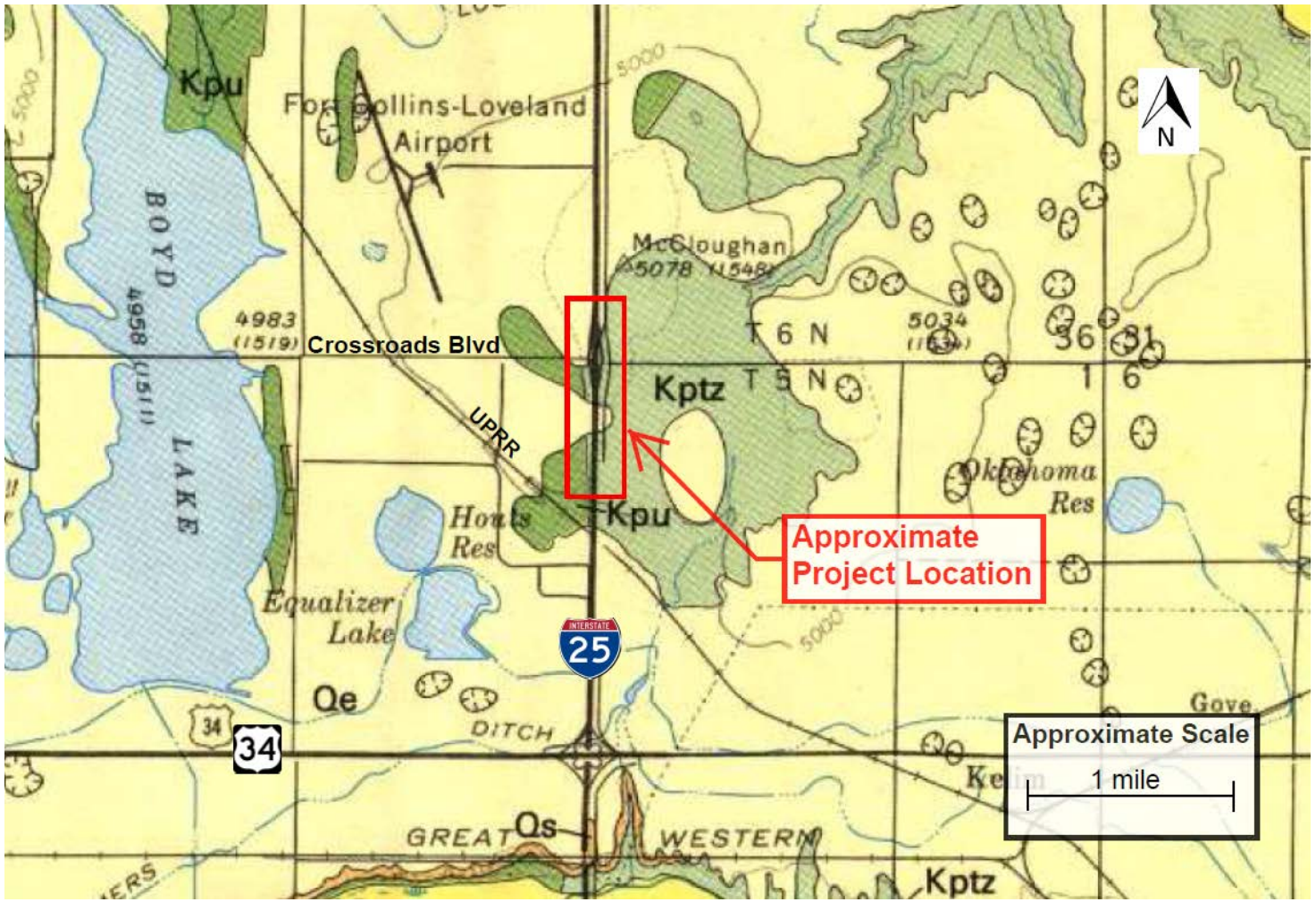
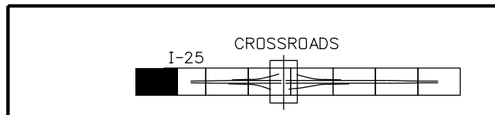


Figure 2 Geologic Map of Area (USGS, Colton, 1978)

Appendix A

BORING LOCATION PLANS AND ENGINEERING GEOLOGY SHEETS

- Sheets A-1 to A-6: Boring Location Plans
- Sheets A-7 & A-8: Bridge Engineering Geology Sheets
- Sheets A-9 to A-13: Wall Engineering Geology Sheets



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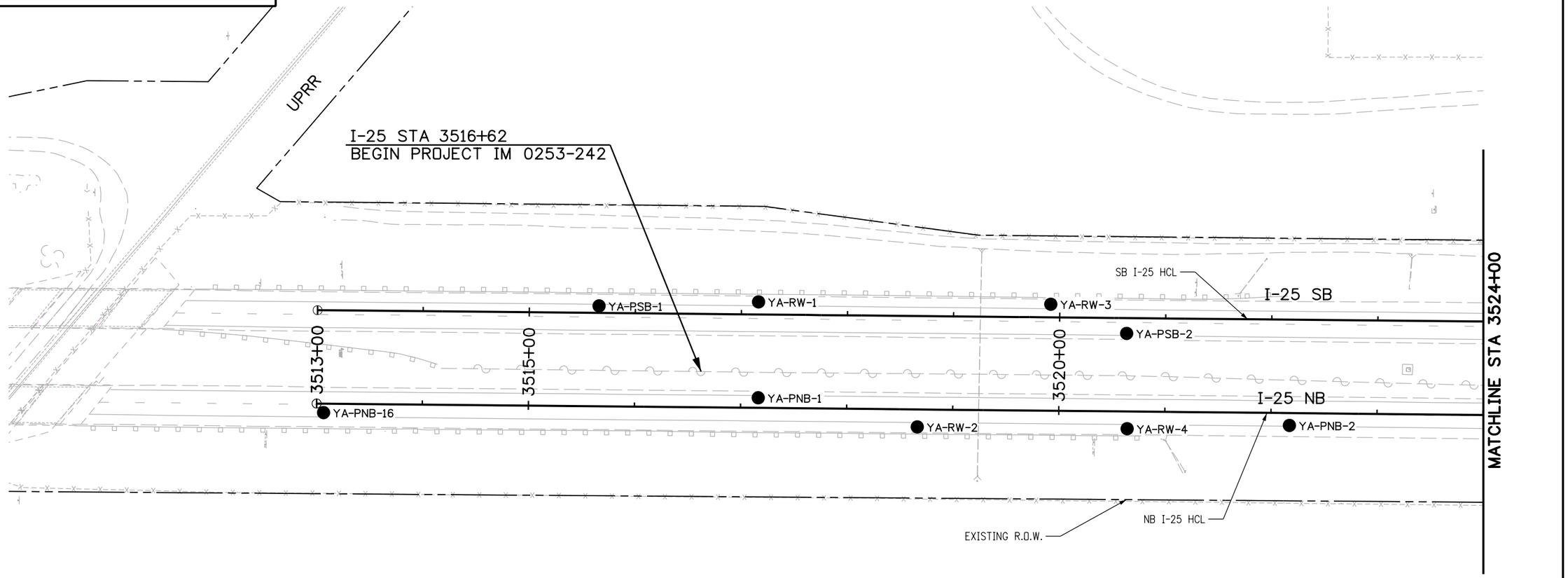

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Detailer:	MJW		
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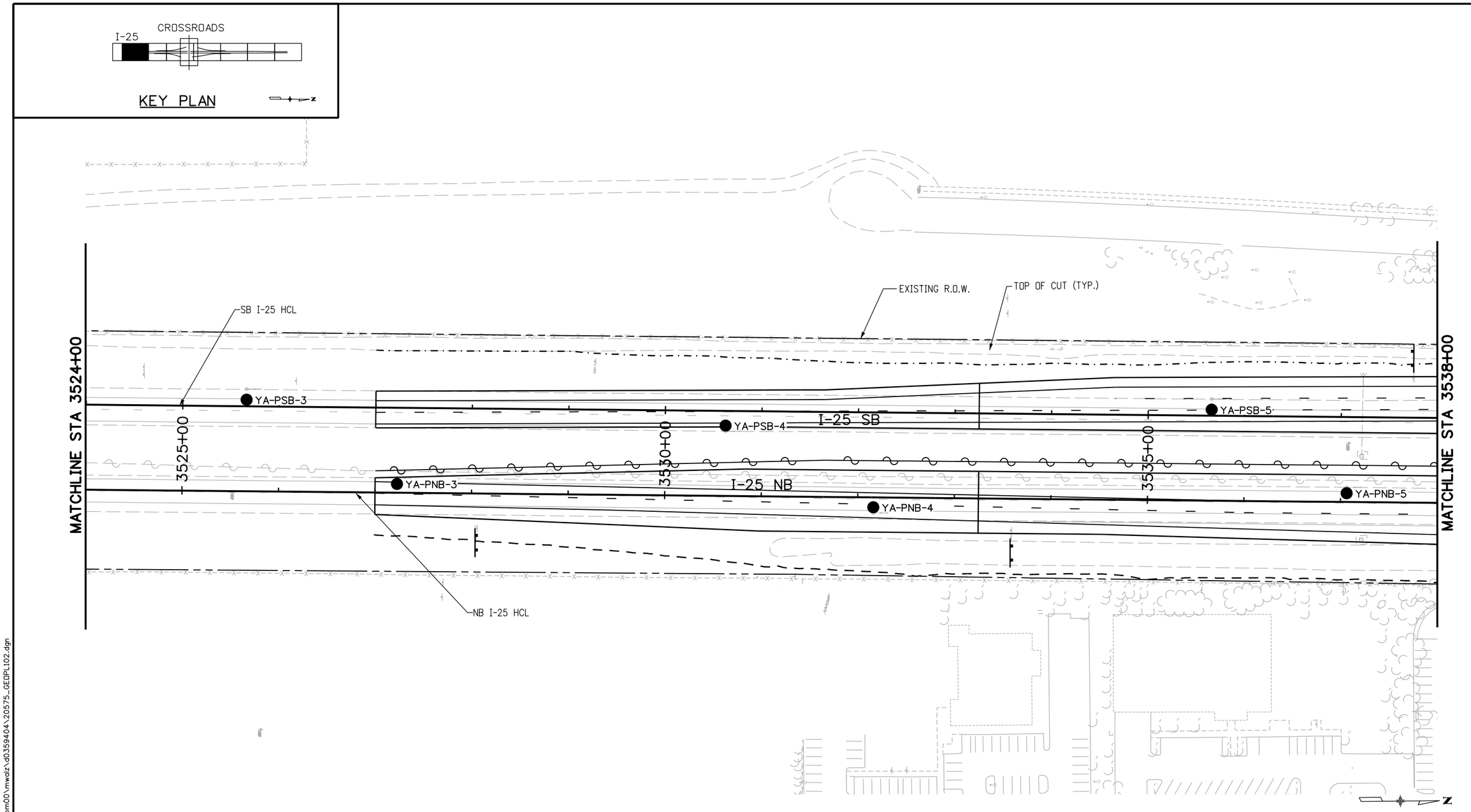

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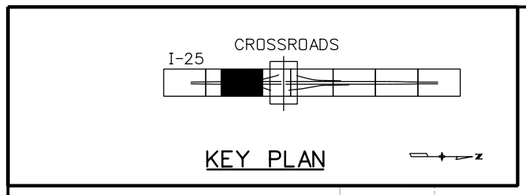

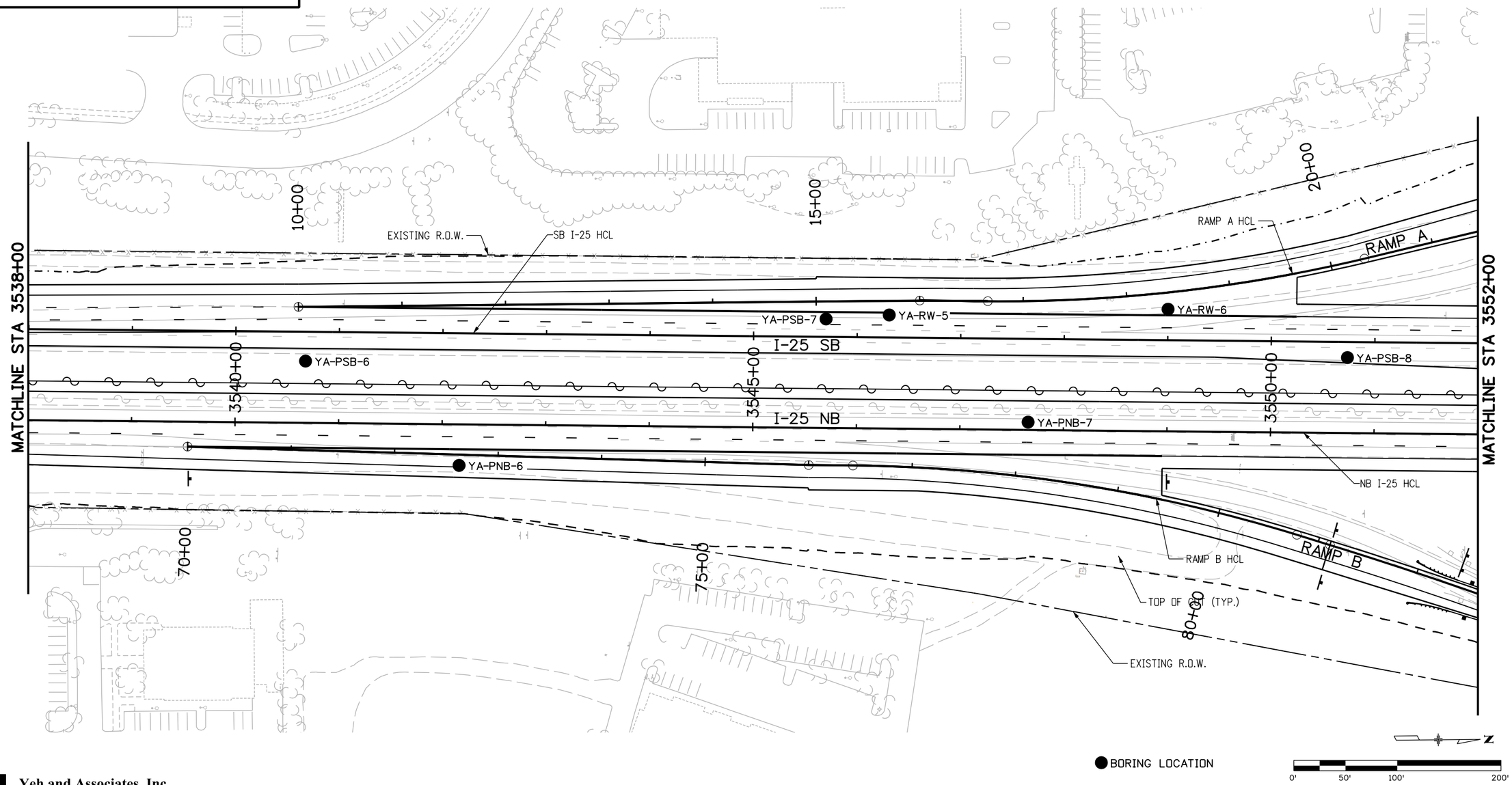

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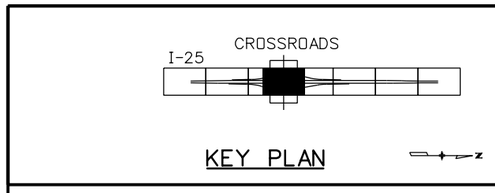

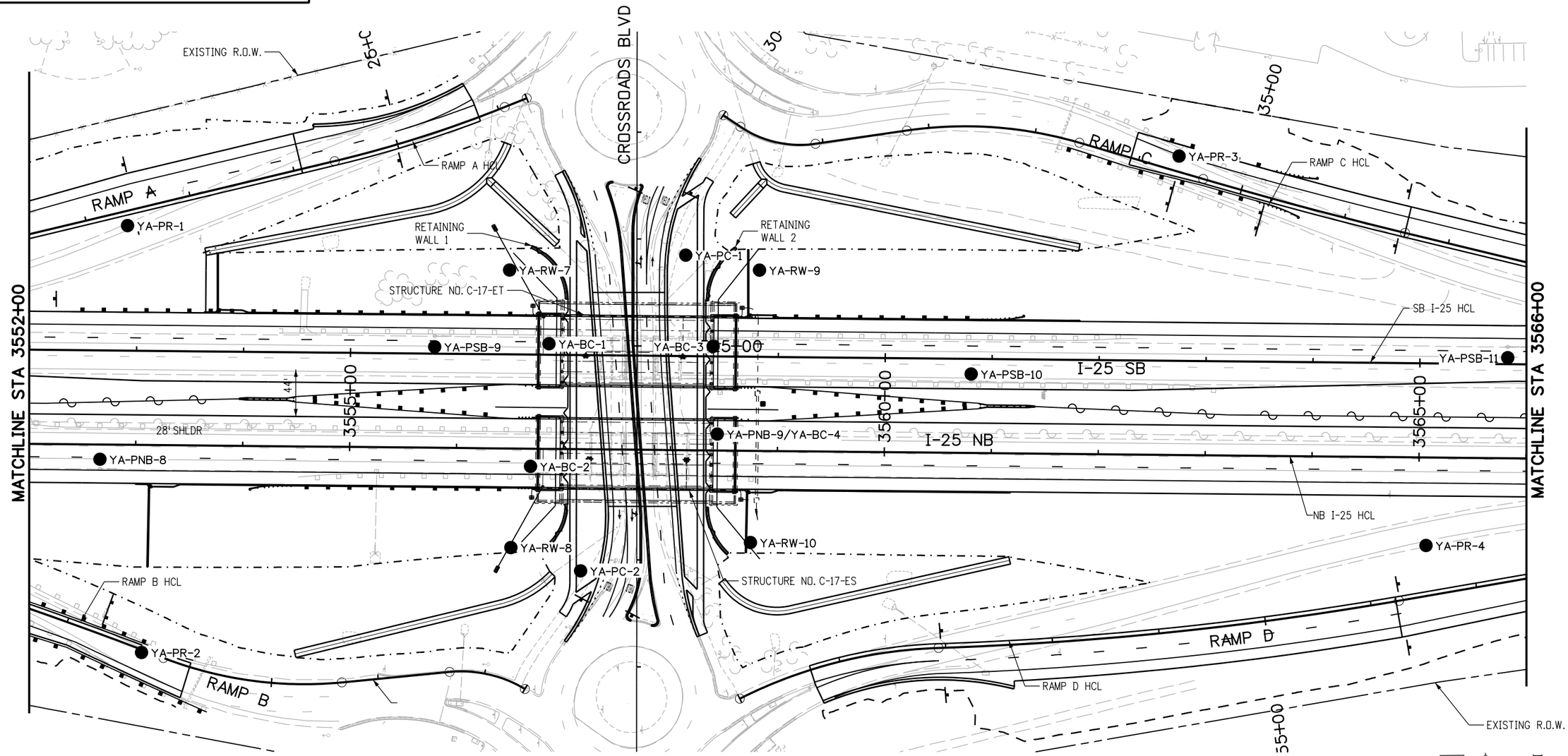

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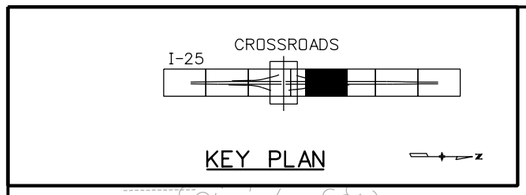

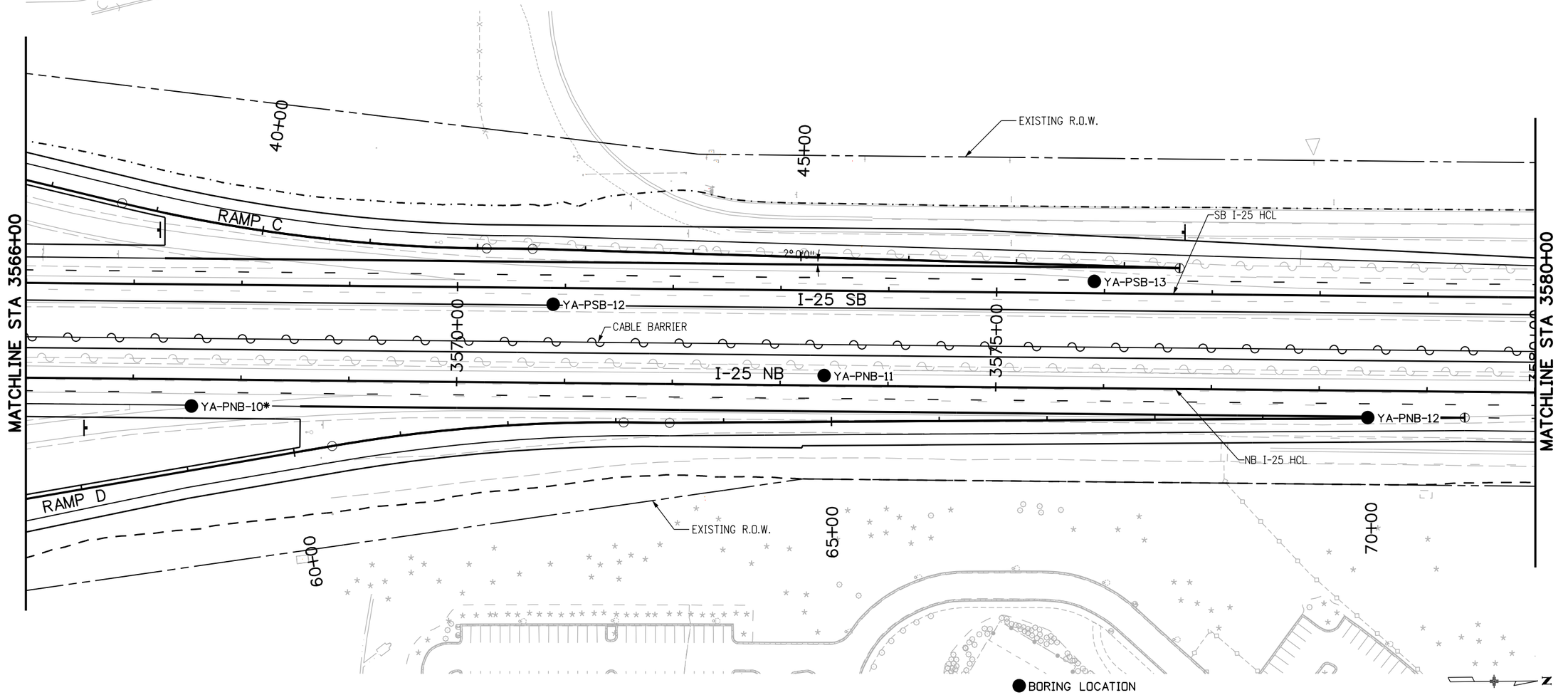

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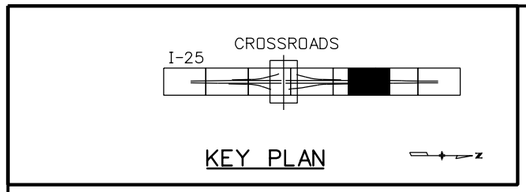

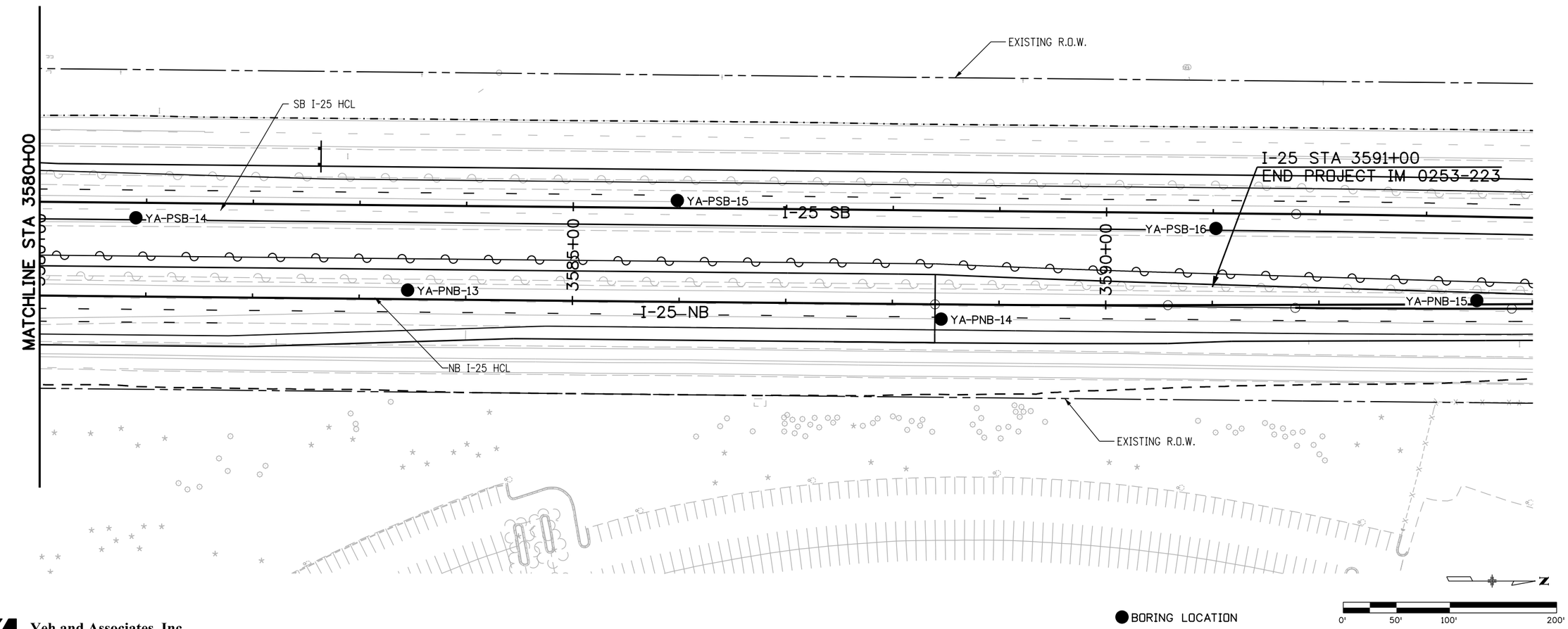

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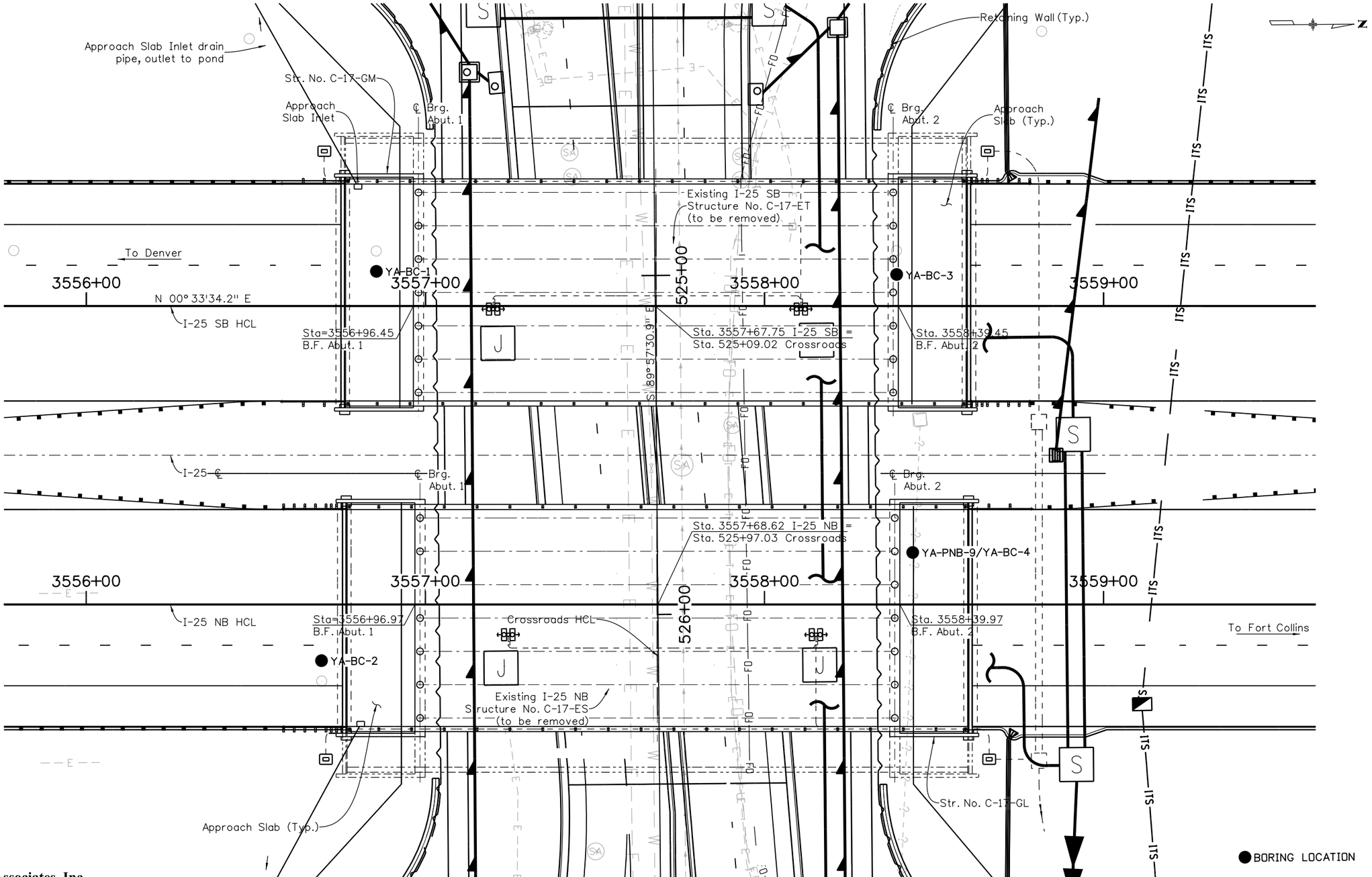

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Suite 600
Centennial, CO 80111
(303) 721-1440

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
2207 East Highway 402
Loveland, CO 80537
Phone: 970-622-1268 FAX: 970-669-0289
Region 4 JFF

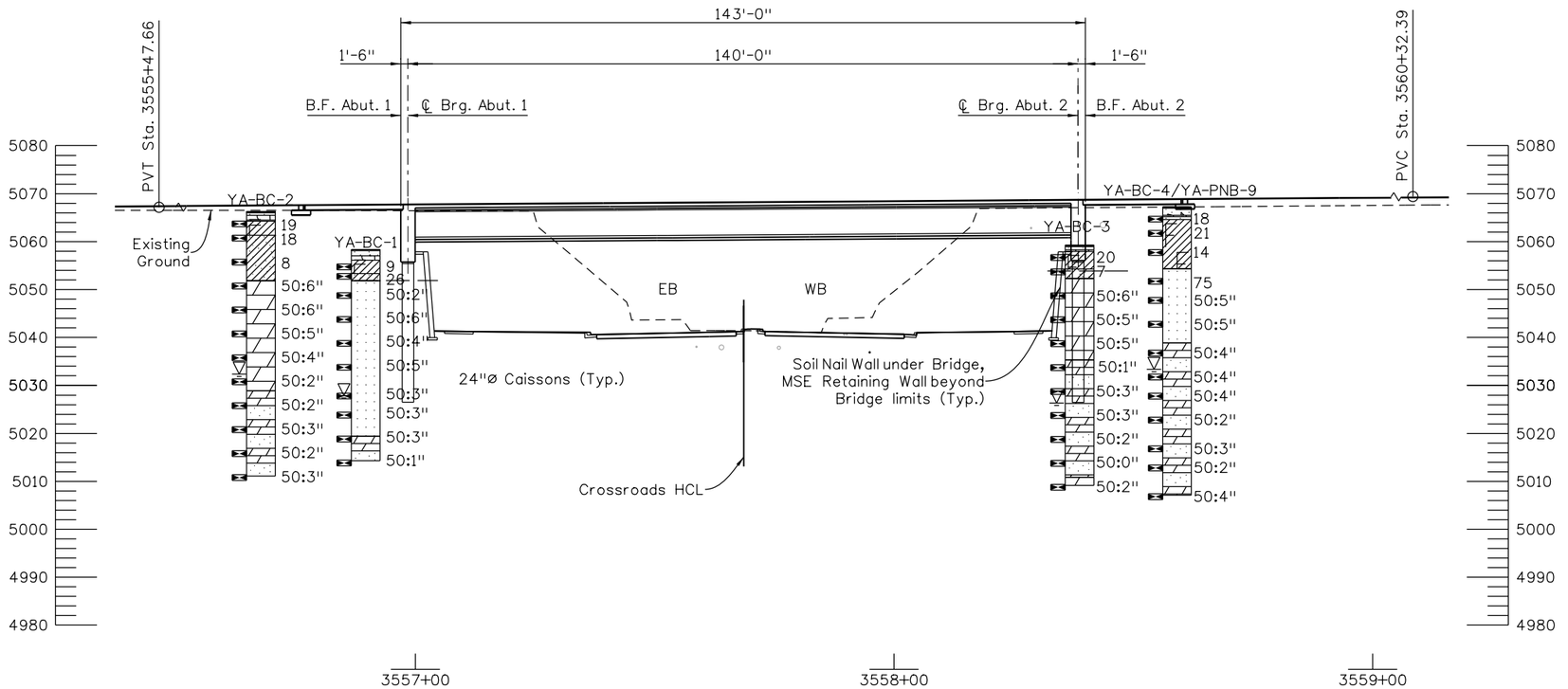
As Constructed
No Revisions:
Revised:
Void:

CROSSROADS BRIDGE REPLACEMENT
I-25 OVER CROSSROADS
ENGINEERING GEOLOGY (1 OF 2)

Designer:	M. Kiefer	Structure Numbers	C-17-GL
Detailer:	M. Walz		C-17-GM
Sheet Subset:	BRIDGE	Subset Sheets:	B03 of 4

Project No./Code
IM 0253-242
20575
Sheet Number A-7

Mike Walz 9:22:57 AM c:\pwworking\aecom00\mwalz\d0359404\20575_GEO_GL01.dgn

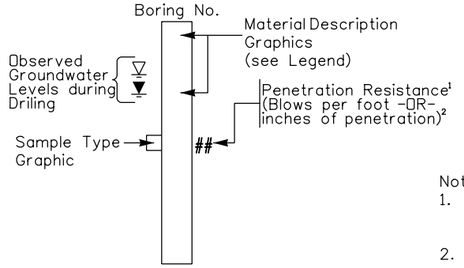


SECTION

(Taken at I-25 NB HCL, SB Bridge Similar)

Asphalt
Concrete
Fill with Gravel as major soil
Fill with Clay as major soil
USCS Low Plasticity Sandy Clay
Fill with Sand as major soil
USCS Clayey Sand
Alternating layers of sandstone and claystone
CLAYSTONE
Sandstone

TYPICAL BOREHOLE LOG



Notes:
1. Penetration resistance was measured during sampling with a Modified California Sampler. The Modified California penetration resistance value (Nmc) is identified as "N" on the logs.
2. e.g. A value of 50/3 or 50:3 indicates that 50 blows were applied to the sampler, with a penetration of 3 inches.

Yeh and Associates, Inc.
Consulting Engineers & Scientists

Design	INITIAL	DATE
Designed By	JVL	10/15
Checked By	CAD	11/15

Detail	INITIAL	DATE
Detailed By	RAD	10/15
Checked By	JVL	11/15

Quantities	INITIAL	DATE
Quantities By	JVL	11/15
Checked By	RAD	11/15

Print Date: 12/8/2015
File Name: 20575_GEO_GL02.dgn
Horiz. Scale: NTS Vert. Scale: As Noted
Staff Bridge Branch - Unit 0224 Unit Leader: AJP

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Sheet Revisions		
Date:	Comments	Init.

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Phone: 970-622-1268 FAX: 970-669-0289
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No Revisions:
Revised:
Void:

CROSSROADS BRIDGE REPLACEMENT
I-25 OVER CROSSROADS
ENGINEERING GEOLOGY (2 OF 2)

Designer:	M. Kiefer	Structure Numbers	C-17-GL
Detailer:	M. Walz		C-17-GM
Sheet Subset:	BRIDGE	Subset Sheets:	B04 of 4

Project No./Code
IM 0253-242
20575
Sheet Number A-8

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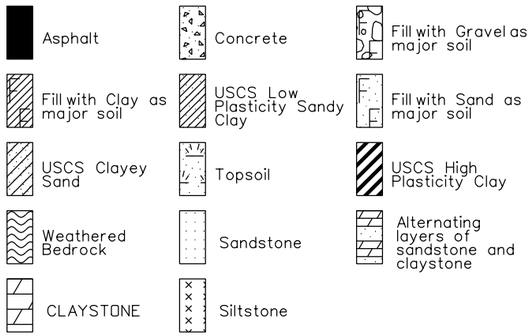

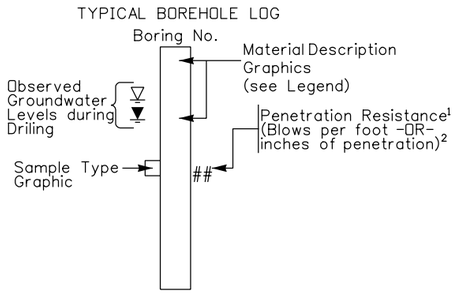

Notes:
1. Penetration resistance was measured during sampling with a Modified California Sampler. The Modified California penetration resistance value (Nmc) is identified as "N" on the logs.
2. e.g. A value of 50/3 or 50:3 indicates that 50 blows were applied to the sampler, with a penetration of 3 inches.

Revision Dates (Preliminary Stage Only): MM/YY

Design	INITIAL	DATE
Designed By	XXX	MM/YY
Checked By	XXX	MM/YY

Detail	INITIAL	DATE
Detailed By	XXX	MM/YY
Checked By	XXX	MM/YY

Quantities	INITIAL	DATE
Quantities By	XXX	MM/YY
Checked By	XXX	MM/YY

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Print Date: 12/8/2015
File Name: 20575_GEO_WallLegend.dgn
Horiz. Scale: 1:100 Vert. Scale: As Noted
Unit Information: 4310 Unit Leader Initials: JFF

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Sheet Revisions

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No Revisions:
Revised:
Void:

CROSSROADS BRIDGE REPLACEMENT
WALL ENGINEERING GEOLOGY
LEGEND

Designer: MLK
Detailer: MJW
Sheet Subset:
Structure Numbers:
Subset Sheets:

Project No./Code
IM 0253-242
20575
Sheet Number A-9

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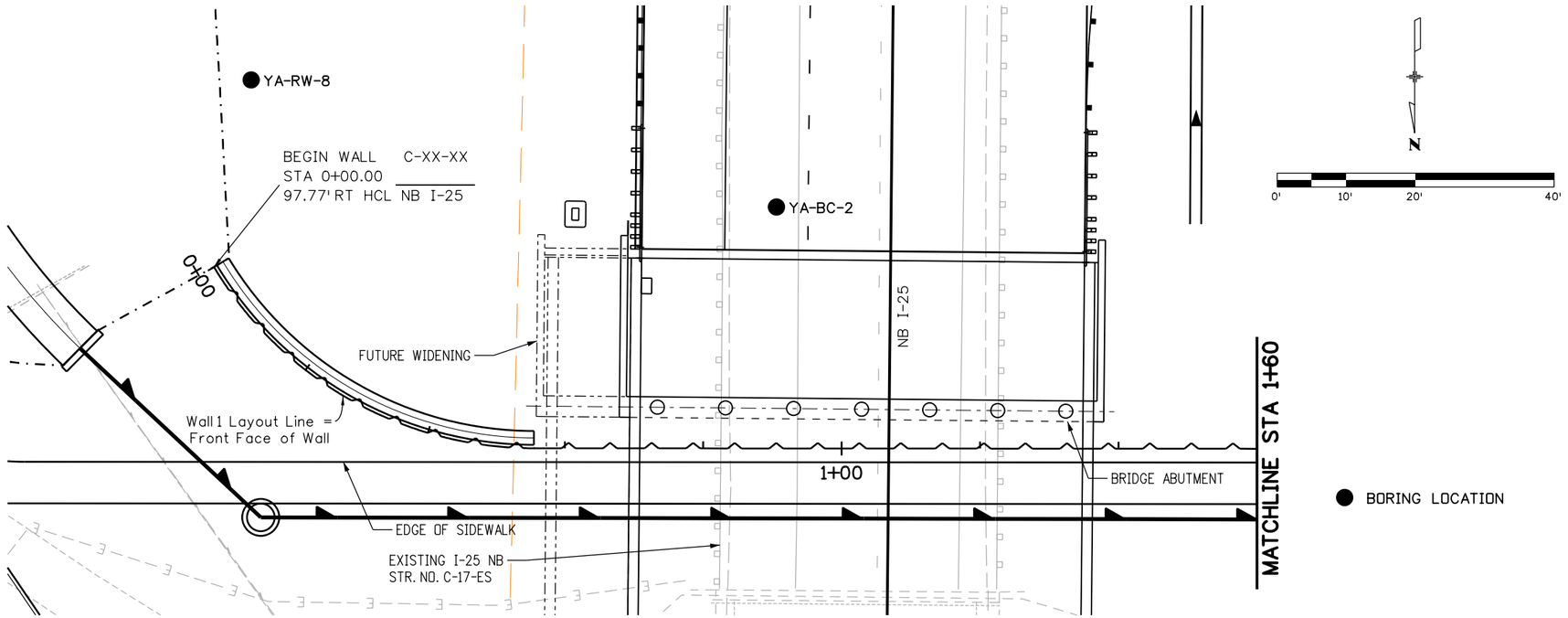
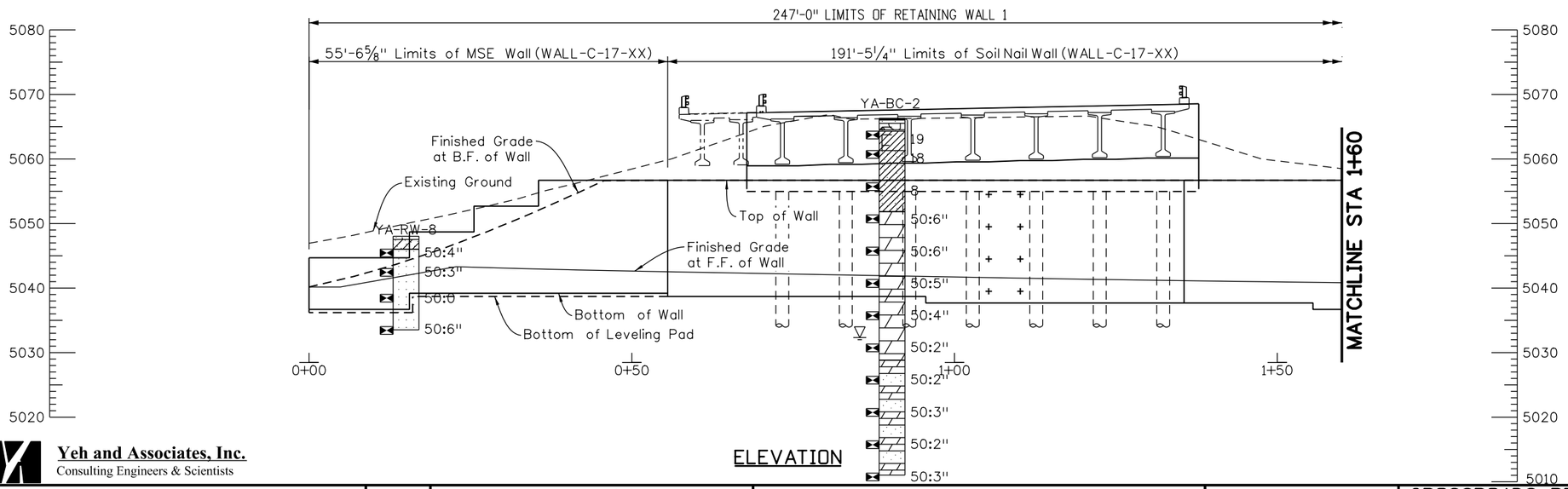


PLAN



ELEVATION

(Preliminary Stage Only)

Revision Dates
MM/YY

Quantities	INITIAL	DATE
Quantities By	XXX	MM/YY
Checked By	XXX	MM/YY

Detail	INITIAL	DATE
Detailed By	XXX	MM/YY
Checked By	XXX	MM/YY

Design	INITIAL	DATE
Designed By	XXX	MM/YY
Checked By	XXX	MM/YY

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Print Date: 12/8/2015	
File Name: 20575_GEO_WL101.dgn	
Horiz. Scale: 1:20	Vert. Scale: As Noted
Unit Information: 4310	Unit Leader Initials: JFF

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Date:	Comments	Init.

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Region 4 JFF

As Constructed

No Revisions:
Revised:
Void:

CROSSROADS BRIDGE REPLACEMENT
WALL 1
ENGINEERING GEOLOGY

Designer:	M. Kiefer	Structure Numbers	WALL-C-17-XX
Detailer:	M. Walz		
Sheet Subset:	WALL	Subset Sheets:	W3 of 8

Project No./Code
IM 0253-242
20575
Sheet Number A-10

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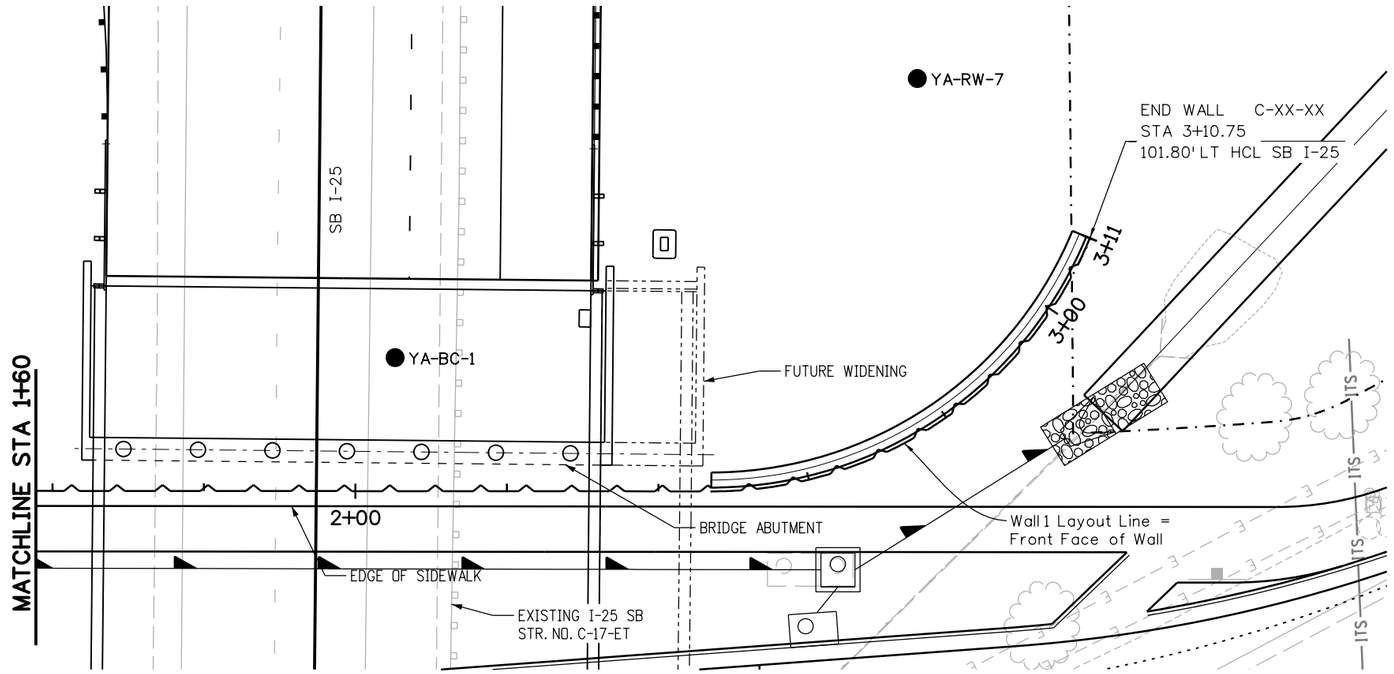
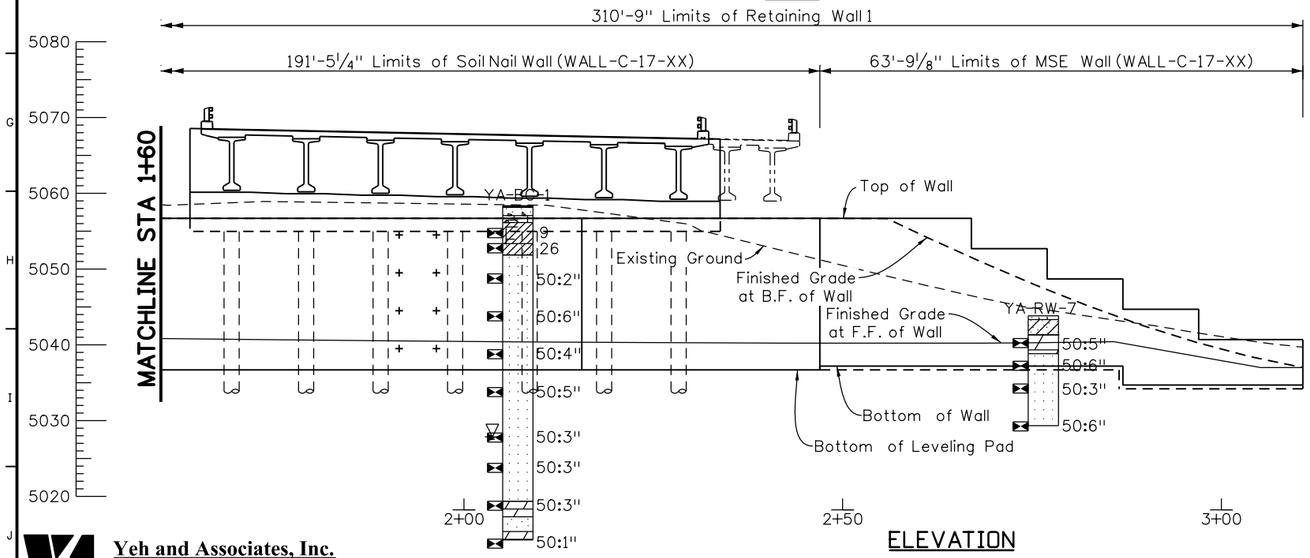


PLAN

● BORING LOCATION



ELEVATION

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Design	INITIAL	DATE
Designed By	XXX	MM/YY
Checked By	XXX	MM/YY

Detail	INITIAL	DATE
Detailed By	XXX	MM/YY
Checked By	XXX	MM/YY

Quantities	INITIAL	DATE
Quantities By	XXX	MM/YY
Checked By	XXX	MM/YY

Revision Dates (Preliminary Stage Only)

MM/YY

Print Date: 12/8/2015	
File Name: 20575_GEO_WL102.dgn	
Horiz. Scale: 1:20	Vert. Scale: As Noted
Unit Information: 4310	Unit Leader Initials: JFF

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Revised:
Void:

CROSSROADS BRIDGE REPLACEMENT
WALL 1
ENGINEERING GEOLOGY

Designer:	M. Kiefer	Structure Numbers	WALL-C-17-XX
Detailer:	M. Walz		
Sheet Subset:	WALL	Subset Sheets:	W4 of 8

Project No./Code
IM 0253-242
20575
Sheet Number A-11

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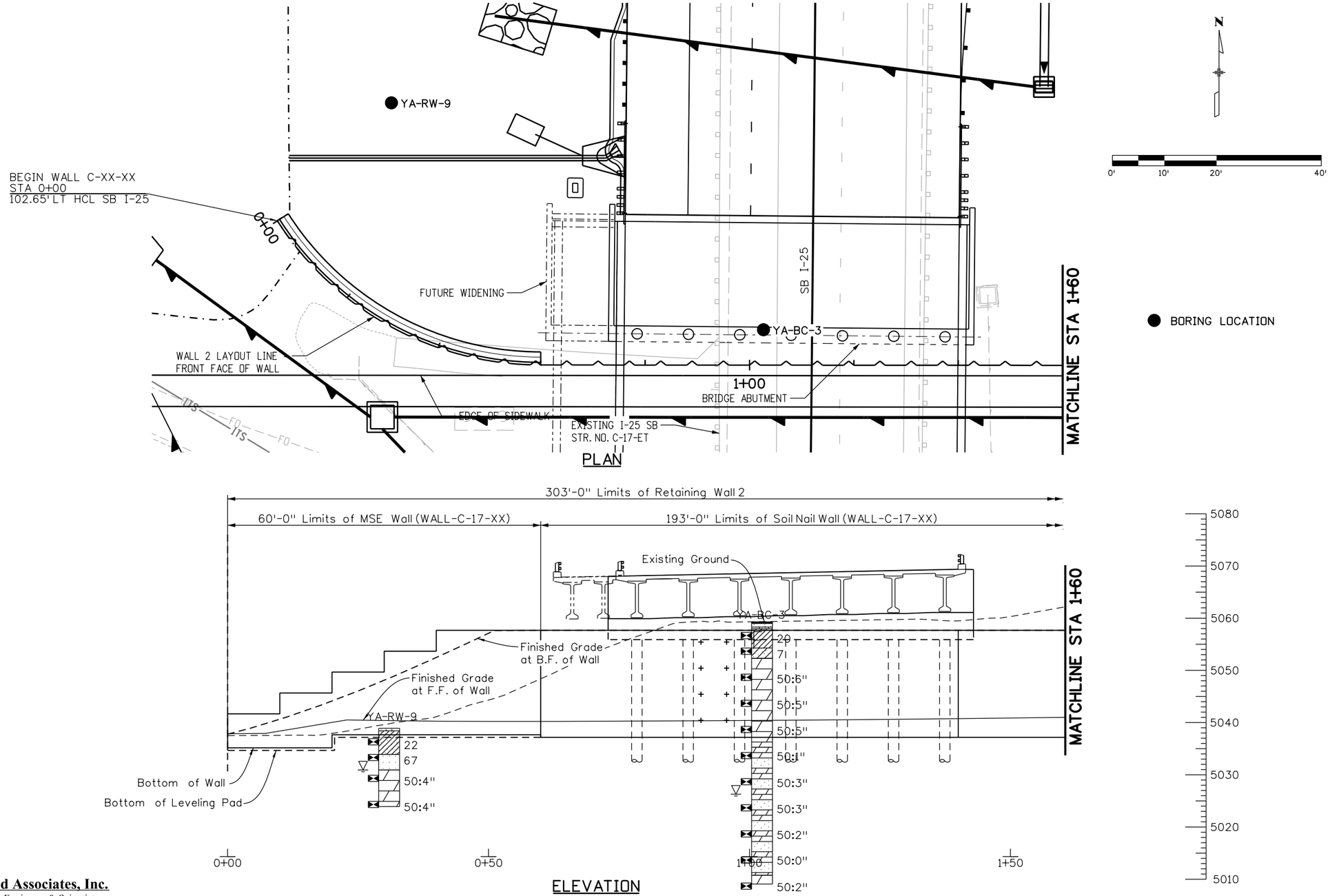

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Design			Detail			Quantities		
	INITIAL	DATE		INITIAL	DATE		INITIAL	DATE
Designed By	XXX	MM/YY	Detailed By	XXX	MM/YY	Quantities By	XXX	MM/YY
Checked By	XXX	MM/YY	Checked By	XXX	MM/YY	Checked By	XXX	MM/YY

Revision Dates (Preliminary Stage Only)
MM/YY

Print Date: 12/8/2015	
File Name: 20575_GEO_WL201.dgn	
Horiz. Scale: 1:20	Vert. Scale: As Noted
Unit Information: 4310	Unit Leader Initials: JFF

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Date:	Comments	Init.

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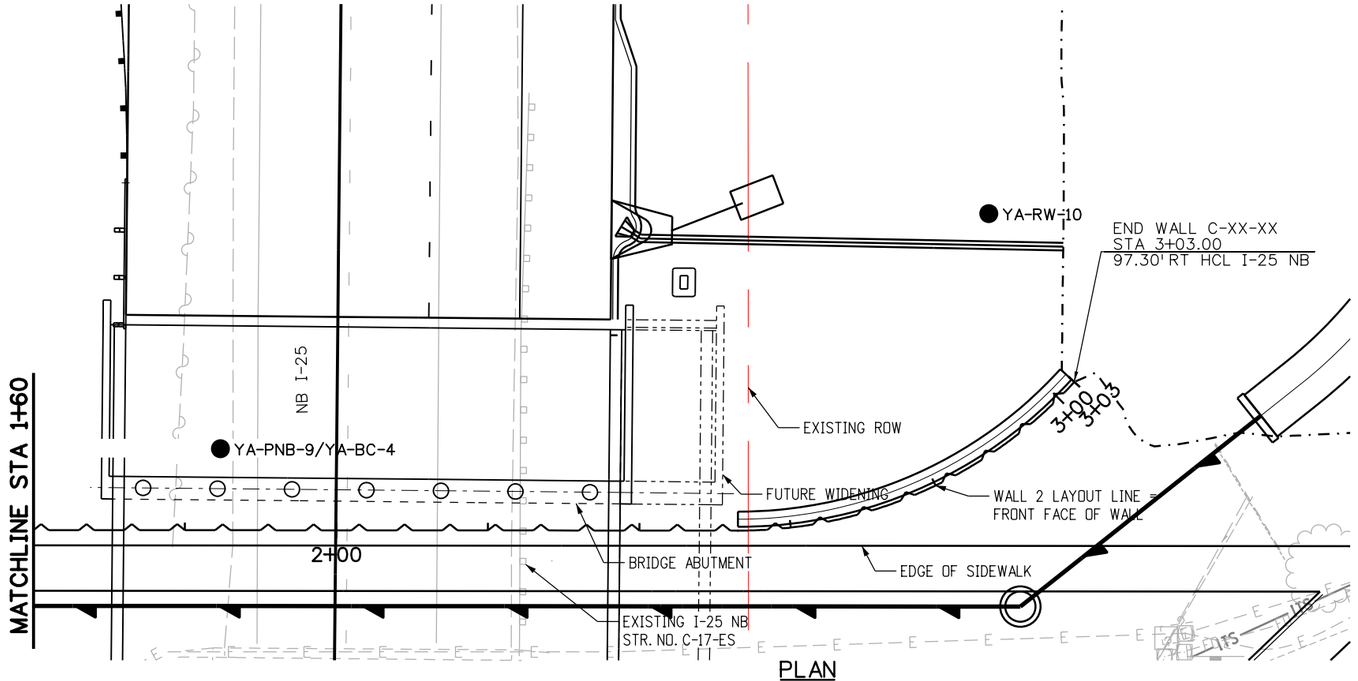
No Revisions:
Revised:
Void:

CROSSROADS BRIDGE REPLACEMENT
WALL 2
ENGINEERING GEOLOGY

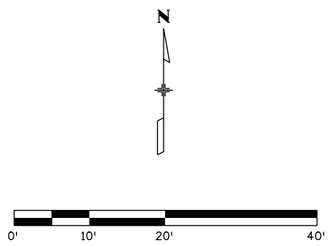
Designer:	M. Kiefer	Structure Numbers	WALL-C-17-XX
Detailer:	M. Walz		
Sheet Subset:	WALL	Subset Sheets:	W5 of 8

Project No./Code
IM 0253-242
20575
Sheet Number A-12

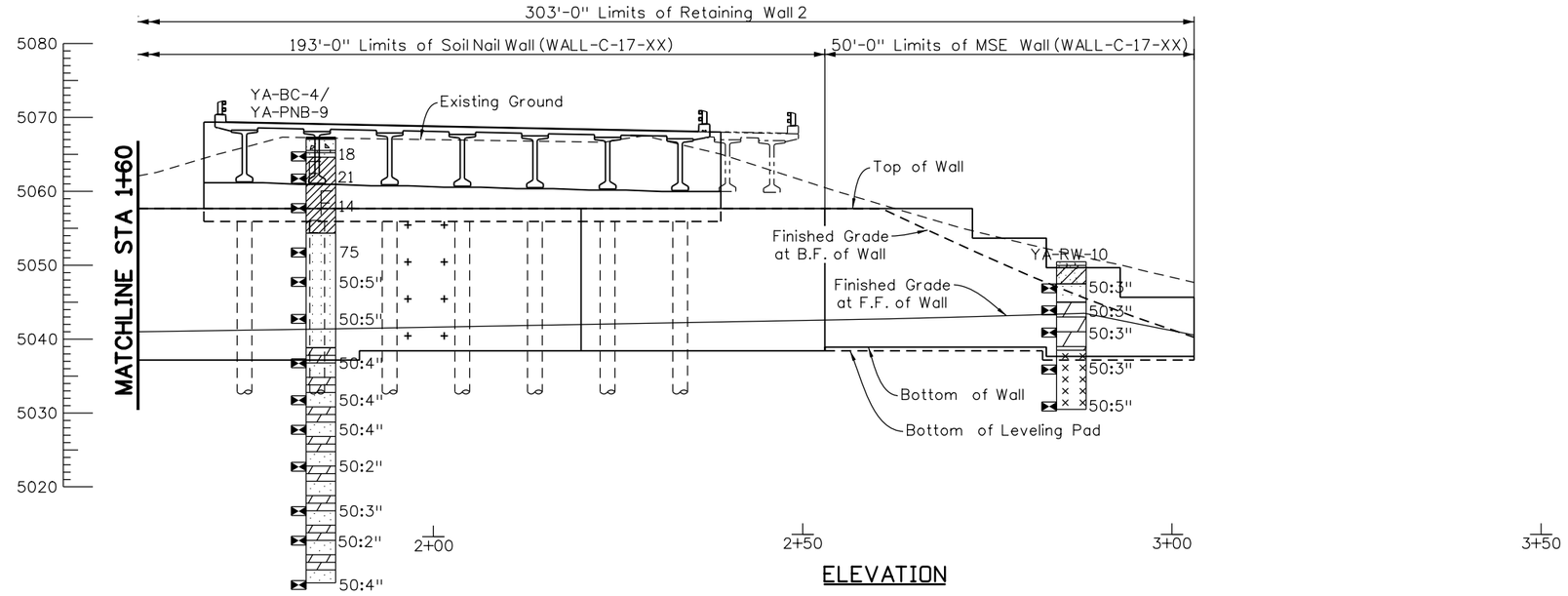
Mike Walz 8:31:44 AM c:\pwworking\aecom00\mwalz\d0359404\20575_GEO_WL201.dgn



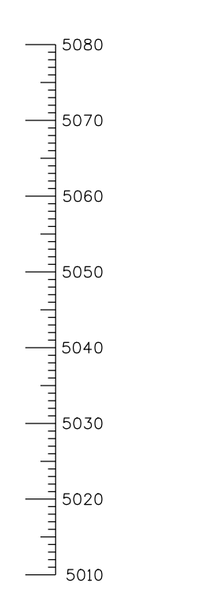
PLAN



● BORING LOCATION



ELEVATION



Yeh and Associates, Inc.
Consulting Engineers & Scientists

Revision Dates (Preliminary Stage Only)	
MM/YY	

Quantities			Detail			Design		
	INITIAL	DATE		INITIAL	DATE		INITIAL	DATE
Quantities By	XXX	MM/YY	Detailed By	XXX	MM/YY	Designed By	XXX	MM/YY
Checked By	XXX	MM/YY	Checked By	XXX	MM/YY	Checked By	XXX	MM/YY

Print Date: 12/8/2015
File Name: 20575_GEO_WL202.dgn
Horiz. Scale: 1:20 Vert. Scale: As Noted
Unit Information: 4310 Unit Leader Initials: JFF

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Sheet Revisions		
Date:	Comments	Init.

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Region 4
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Phone: 970-622-1268 FAX: 970-669-0289
JFF

As Constructed
No Revisions:
Revised:
Void:

CROSSROADS BRIDGE REPLACEMENT
WALL 2
ENGINEERING GEOLOGY

Designer:	M. Kiefer	Structure Numbers	WALL-C-17-XX
Detailer:	M. Walz		
Sheet Subset:	WALL	Subset Sheets:	W6 of 8

Project No./Code
IM 0253-242
20575
Sheet Number A-13

Mike Walz 8:58:43 AM c:\pwworking\aecom00\mwalz\d0359404\20575_GEO_WL202.dgn

Appendix B

LEGEND AND BORING LOGS

Yeh and Associates, Inc.
Consulting Engineers & Scientists

Project: I-25/Crossroads Bridge Replacement

Project Number: 215-043

Legend for Symbols Used on Borehole Logs

Sample Types


Auger Cuttings


Bulk Sample of auger/odex cuttings


Modified California Sampler (2.5 inch OD, 2.0 inch ID)

Lithology Symbols (see Boring Logs for complete descriptions)


Asphalt


USCS High Plasticity Clay


USCS Low Plasticity Sandy Clay


Concrete


Fill with Clay as major soil


Fill with Gravel as major soil


Fill with Sand as major soil


USCS Clayey Sand


USCS Silty Sand


Topsoil


Weathered Bedrock


CLAYSTONE


Sandstone


Alternating layers of sandstone and claystone


Siltstone

Lab Test Standards

Moisture Content	ASTM D2216
Dry Density	ASTM D7263
Sand/Fines Content	ASTM D421, ASTM C136, ASTM D1140
Atterberg Limits	ASTM D4318
AASHTO Class.	AASHTO M145, ASTM D3282
USCS Class.	ASTM D2487

(Fines = % Passing #200 Sieve
Sand = % Passing #4 Sieve, but not passing #200 Sieve)

Other Lab Test Abbreviations

pH	Soil pH (AASHTO T289-91)
S	Water-Soluble Sulfate Content (AASHTO T290-91, ASTM D4327)
Chl	Water-Soluble Chloride Content (AASHTO T291-91, ASTM D4327)
S/C	Swell/Consolidation (ASTM D4546)
UCCS	Unconfined Compressive Strength (ASTM D2166)
R-Value	Resistance R-Value (ASTM D2844)
DS (C)	Direct Shear cohesion (ASTM D3080)
DS (phi)	Direct Shear friction angle (ASTM D3080)
Re	Electrical Resistivity (AASHTO T288-91)
PtL	Point Load Strength Index (ASTM D5731)

Notes

1. Samples obtained using a Modified California sampler, drive depth was 12 inches, and "Penetration Resistance" refers to the sum of all blows. Where blow counts were more than 50 for the last increment, the blows and length for the last increment are reported under "Penetration Resistance."

2. The Modified California sampler used to obtain samples is a 2.5-inch OD, 2.0-inch ID (1.95-inch ID with liners), split-barrel sampler with internal liners, as per ASTM D3550. Sampler is driven with a 140-pound hammer, dropped 30 inches per blow.

Yeh and Associates, Inc.
Consulting Engineers & Scientists

Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-BC-1**

Boring Began: 6/1/2015
Boring Completed: 6/1/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 44.1 ft
Ground Elevation: 5058.4 ft
Coordinates: N: 253703.3 E: 188498.7
Location: SB I-25, Approx. Station 3556+90
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 70 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels:			
Symbol	▽		
Depth	30.5 ft	-	-
Date	6/1/15	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.2 ft. 2" ASPHALT.									
						0.2 - 1.3 ft. 13" CONCRETE.									
						1.3 - 2.1 ft. 10" BASE COURSE.									
						2.1 - 5.0 ft. sandy CLAY FILL, brown mottled with gray, stiff.									
5055			7-2	9											
	5		11-15	26		**5.0 - 6.5 ft. sandy CLAY**, tan, very stiff, rust stained.	17.4	109.0	0	47	53	41	21	A-7-6 (8) CL	
						6.5 - 39.0 ft. SILTY SANDSTONE, tan, very hard, rust stained.									
5050			37-50:2"	50:2"											
	10														
5045			50:6"	50:6"											
	15														
5040			50:4"	50:4"			14.4	111.1	0	60	40	NV	NP	A-4 (0) SM	
	20														
5035			50:5"	50:5"											
	25														
5030															
	▽30		50:3"	50:3"			17.2	104.1							
5025															
			50:3"	50:3"											

BORING LOG 2015 CROSSROADS GINT - NEW TEMPLATE.GPJ 2015 YEH ASSOCIATES TEMPLATE.GDT 2015 LIBRARY.GLB 8/18/15

Yeh and Associates, Inc.
Consulting Engineers & Scientists

Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-BC-1**

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5020															
	40		50:3"	50:3"		**39.0 - 44.1 ft. SANDSTONE INTERBEDDED WITH CLAYSTONE**, tan and brown, very hard, rust stained.	17.9	107.0							
5015			50:1"	50:1"		Bottom of Hole at 44.1 ft.									
5010															
5005															
5000															
4995															
4990															
4985															

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Yeh and Associates, Inc.
Consulting Engineers & Scientists

Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-BC-2**

Boring Began: 5/31/2015
Boring Completed: 5/31/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 55.3 ft
Ground Elevation: 5066.3 ft
Coordinates: N: 253686.0 E: 188625.3
Location: NB I-25, Approx. Station 3556+70
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 60's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels:			
Symbol	▽		
Depth	34.0 ft	-	-
Date	5/31/15	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5065						**0.0 - 0.3 ft. 3" ASPHALT**.									
						0.3 - 0.8 ft. 7" CONCRETE.									
						0.8 - 1.8 ft. 12" BASE COURSE.									
			9-10	19		**1.8 - 2.0 ft. silty SAND FILL**, brown, medium dense.									
	5					**2.0 - 5.0 ft. sandy CLAY FILL**, brown mottled with gray, very stiff, organic material.									
			8-10	18		**5.0 - 14.5 ft. sandy CLAY**, tan, medium stiff to very stiff.	18.4	109.6	0	25	75	43	23	A-7-6 (16) CL	
5060															
	10		4-4	8											
5055															
	15		50:6"	50:6"		**14.5 - 37.5 ft. SANDY CLAYSTONE**, tan, very hard, rust stained with iron nodules.	16.1	115.6							
5050															
	20		50:6"	50:6"											
5045															
	25		50:5"	50:5"			15.8	109.7	0	31	69	37	17	A-6 (10) CL	
5040															
	30		50:4"	50:4"											
5035															

▽

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Yeh and Associates, Inc.
Consulting Engineers & Scientists

Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-BC-2**

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5030			50:2"	50:2"											
						37.5 - 55.3 ft. CLAYSTONE INTERBEDDED WITH SANDSTONE, tan, very hard, thin laminations.									
5025	40		50:2"	50:2"			16.1	108.0	0	19	81	39	20	A-6 (15) CL	
5020	45		50:3"	50:3"											
5015	50		50:2"	50:2"			16.5	111.3							
	55		50:3"	50:3"											
5010						Bottom of Hole at 55.3 ft.									
5005															
5000															
4995															
4990															

BORING LOG 2015 CROSSROADS GINT - NEW TEMPLATE.GPJ 2015 YEH ASSOCIATES TEMPLATE.GDT 2015 LIBRARY.GLB 8/18/15

Yeh and Associates, Inc.
Consulting Engineers & Scientists

Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-BC-3**

Boring Began: 6/1/2015
Boring Completed: 6/1/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 50.2 ft
Ground Elevation: 5059.3 ft
Coordinates: N: 253856.7 E: 188500.1
Location: SB I-25, Approx. Station 3558+40
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 72 degrees, humid
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels:			
Symbol	▽		
Depth	33.0 ft	-	-
Date	6/1/15	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5059.3	0				FILL	**0.0 - 0.3 ft. 3" ASPHALT**.									
					FILL	**0.3 - 1.0 ft. 9" CONCRETE**.									
					FILL	**1.0 - 1.3 ft. 3" BASE COURSE**.									
			8-12	20	FILL	**1.3 - 5.0 ft. sandy CLAY FILL**, brown mottled with tan, very stiff.									
5055	5		3-4	7		**5.0 - 7.0 ft. clayey SAND**, tan, loose, rust stained.	23.4	92.7	0	52	48	43	21	A-7-6 (6) SC	
						7.0 - 24.0 ft. SANDY CLAYSTONE, tan, very hard, rust stained.									
5050	10		50:6"	50:6"											
5045	15		50:5"	50:5"			15.3	111.5	0	49	51	38	16	A-6 (5) CL	
5040	20		50:5"	50:5"											
5035	25		50:1"	50:1"		**24.0 - 48.5 ft. SANDSTONE INTERBEDDED WITH CLAYSTONE**, tan to brown, very hard, fine grained, rust stained with iron nodules.									
5030	30		50:3"	50:3"			16.9	107.0	0	26	74	37	15	A-6 (10) CL	
5025		▽													

BORING LOG 2015 CROSSROADS GINT - NEW TEMPLATE.GPJ 2015 YEH ASSOCIATES TEMPLATE.GDT 2015 LIBRARY.GLB 8/18/15

Yeh and Associates, Inc.
Consulting Engineers & Scientists

Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-BC-3**

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifi-cations	Field Notes and Other Lab Tests
5020	40		50:2"	50:2"			20.0	104.0							
5015	45		50:0"	50:0"											
5010	50		50:2"	50:2"		**48.5 - 50.2 ft. SANDY CLAYSTONE**, gray and white, very hard.									
						Bottom of Hole at 50.2 ft.									
5005															
5000															
4995															
4990															
4985															

BORING LOG 2015 CROSSROADS GINT - NEW TEMPLATE.GPJ 2015 YEH ASSOCIATES TEMPLATE.GDT 2015 LIBRARY.GLB 8/18/15

Yeh and Associates, Inc.
Consulting Engineers & Scientists

Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043

Boring No.: **YA-BC-4/YA-PNB-9**

Boring Began: 5/27/2015
Boring Completed: 5/28/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 60.3 ft
Ground Elevation: 5067.3 ft
Coordinates: N: 253860.6 E: 188589.1
Location: NB I-25, Approx. Station 3558+40, Coincides with YA-PNB-9
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 70's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels:			
Symbol	▽		
Depth	34.0 ft	-	-
Date	5/28/15	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.3 ft. 4" ASPHALT.									*CA sample at 2 ft likely contains base course
						0.3 - 1.8 ft. 18" CONCRETE.									
5065			10-8	18		**1.8 - 2.1 ft. 3" BASE COURSE**.	4.8		38	53	9	NV	NP	A-1-a (0) SP-SM	
						2.1 - 2.7 ft. silty SAND FILL with gravel, brown, medium dense.									
						2.7 - 6.0 ft. sandy CLAY FILL, brown mottled with gray, stiff to very stiff, calcareous.			14	46	40	37	20	A-6 (3) SC	Bulk sample from 2.1 ft to 5 ft
	5		8-13	21											
5060						**6.0 - 13.0 ft. sandy CLAY**, brown, medium dense.									
	10		6-8	14											
5055						**13.0 - 28.5 ft. SILTY SANDSTONE**, tan, hard to very hard, rust stained.									
	15		25-50	75			17.6	104.8	0	52	48	NV	NP	A-4 (0) SM	
5050															
			50:5"	50:5"											
	20														
5045															
			50:5"	50:5"			17.1	111.2	0	58	42	NV	NP	A-4 (0) SM	
	25														
5040															
						28.5 - 60.3 ft. SANDSTONE INTERBEDDED WITH CLAYSTONE, tan mottled with gray, very hard, thin interbeds (<0.5"), rust stained, calcareous w/ trace lignite at bottom of boring.									
	30		50:4"	50:4"											
5035		▽													

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-BC-4/YA-PNB-9**

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5030	35		50:4"	50:4"			16.7	110.2							
5025	40		50:4"	50:4"											
5020	45		50:2"	50:2"											
5015	50		50:3"	50:3"			15.8	112.2	0	25	75	39	17	A-6 (12) CL	
5010	55		50:2"	50:2"			19.8	106.2							
5005	60		50:4"	50:4"		Bottom of Hole at 60.3 ft.									
5000															
4995															

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-1**

Boring Began: 6/2/2015
Boring Completed: 6/2/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 40.4 ft
Ground Elevation: 5026.1 ft
Coordinates: N: 249734.1 E: 188464.3
Location: SB I-25, Approx. Station 3517+20
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 70 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5025						**0.0 - 0.3 ft. 3" ASPHALT**.									
						0.3 - 1.5 ft. 15" CONCRETE.									
						1.5 - 2.0 ft. 6" BASE COURSE.									
			11-9	20		**2.0 - 24.0 ft. sandy CLAY FILL**, tan to dark brown, very stiff, calcareous.	16.7	114.2	1	28	71	41	25	A-7-6 (16) CL	S/C=1.7%
	5		10-11	21											
5020															
	10		12-17	29		Rust stains observed in sample at about 9 ft. Increased sand content observed between 10 and 12.5 ft.	18.9	108.6	0	49	51	35	17	A-6 (5) CL	
5015															
	15		14-18	32		Organics (straw) observed in sample at about 15 ft.									
5010															
	20		9-8	17			16.6	111.4	0	34	66	42	23	A-7-6 (13) CL	
5005															
	25		17-23	40		**24.0 - 29.0 ft. sandy CLAY**, brown, hard.									
5000															
	30		23-38	61		**29.0 - 40.4 ft. SANDY CLAYSTONE**, tan, hard to very hard, calcareous.	14.1	117.5	0	43	57	32	12	A-6 (4) CL	
4995															

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-1**

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifi-cations	Field Notes and Other Lab Tests
4990			50:6"	50:6"											
	40		50:5"	50:5"		Bottom of Hole at 40.4 ft.	12.5	107.6							
4985															
4980															
4975															
4970															
4965															
4960															
4955															
4950															

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-2**

Boring Began: 5/31/2015
Boring Completed: 5/31/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 40.5 ft
Ground Elevation: 5022.7 ft
Coordinates: N: 249883.7 E: 188582.0
Location: NB I-25, Approx. Station 3518+60
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 60 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" ASPHALT.									
						0.5 - 1.3 ft. 10" CONCRETE.									
						1.3 - 2.0 ft. 8" BASE COURSE.									
5020			7-10	17		**2.0 - 3.0 ft. clayey SAND FILL** with gravel, brown mottled with tan, medium dense.	15.4	114.1	10	43	47	40	22	A-6 (6) SC	**CA sample at 2 ft contains base course** S/C=0.4%
	5		9-12	21		**3.0 - 19.5 ft. sandy CLAY FILL**, brown mottled with tan, very stiff.									
5015															
	10		14-12	26		Rust stain stains observed in sample at about 10 ft.									
5010															
	15		14-15	29			19.4	107.0	0	29	71	38	20	A-6 (12) CL	
5005															
	20		19-12	31		**19.5 - 29.0 ft. sandy CLAY**, brown to dark brown, very stiff, calcareous.									
5000															
	25		11-11	22			16.5	111.6	0	26	74	42	26	A-7-6 (18) CL	
4995															
	30		34-50:2"	50:2"		**29.0 - 40.5 ft. SANDY CLAYSTONE**, tan, hard to very hard, rust stained, calcareous.									
4990															

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-2**

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifi-cations	Field Notes and Other Lab Tests
4985	40		50:5"	50:5"			6.4	125.6	0	19	81	35	17	A-6 (12) CL	
			50:6"	50:6"		Bottom of Hole at 40.5 ft.									

4980
4975
4970
4965
4960
4955
4950

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-3**

Boring Began: 5/28/2015
Boring Completed: 5/28/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 35.3 ft
Ground Elevation: 5019.8 ft
Coordinates: N: 250009.6 E: 188466.5
Location: SB I-25, Approx. Station 3519+90
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.7 ft. 8" ASPHALT.									
						0.7 - 2.2 ft. 18" CONCRETE.									
			7-6	13		**2.2 - 3.0 ft. silty SAND FILL** with gravel, brown, medium dense.									
5015	5		7-10	17		**3.0 - 18.0 ft. sandy CLAY FILL**, brown to dark brown, very stiff, calcareous, increasing sand with depth.									
5010	10		14-20	34		Rust stains with iron nodules observed in sample at about 10 ft.	17.5	110.2	0	49	51	40	20	A-7-6 (7) CL	
5005	15		15-17	32											
						18.0 - 25.0 ft. sandy CLAY, dark brown, high plasticity, very stiff, decreased sand content after about 18 ft.									
5000	20		13-12	25		Rust stains observed in sample at about 20 ft.	21.1	104.2	0	18	82	55	32	A-7-6 (28) CH	
4995	25		25-35	60		**25.0 - 30.0 ft. SANDY SILTSTONE**, tan, hard, calcareous, rust stains observed in sample at about 25 ft.	14.9	117.8	0	40	60	NV	NP	A-4 (0) ML	
4990	30		50:4"	50:4"		**30.0 - 35.3 ft. SANDY CLAYSTONE**, tan, very soft.	10.8	124.7							
4985	35		50:4"	50:4"		Bottom of Hole at 35.3 ft.									

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-4**

Boring Began: 5/31/2015
Boring Completed: 5/31/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 30.4 ft
Ground Elevation: 5018.0 ft
Coordinates: N: 250081.5 E: 188583.7
Location: NB I-25, Approx. Station 3520+60
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 60 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.4 ft. 5" ASPHALT.									
						0.4 - 1.4 ft. 12" CONCRETE.									
						1.4 - 2.1 ft. 8" BASE COURSE.									
5015			16-19	35		**2.1 - 3.0 ft. silty SAND FILL** with gravel, brown, medium dense.									
	5					**3.0 - 13.5 ft. sandy CLAY FILL**, brown to tan, very stiff, organics (rootlets) observed in sample at about 5 ft.									
			13-14	27			18.2	109.5	0	43	57	39	22	A-6 (6) CL	S/C=0.3%
5010															
	10		16-12	28											
5005						**13.5 - 20.0 ft. silty SAND**, brown, dense.									
	15		24-20	44			10.5	118.0	0	50	50	NV	NP	A-4 (0) SM	
5000															
	20		50:6"	50:6"		**20.0 - 30.4 ft. SANDY CLAYSTONE**, brown, very hard, calcareous, rust stains observed in sample at about 20 ft.	12.3	118.0							
4995															
	25		50:6"	50:6"											
4990															
	30		50:5"	50:5"			12.9	120.9	0	39	61	33	15	A-6 (7) CL	
4985						Bottom of Hole at 30.4 ft.									

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-5**

Boring Began: 5/28/2015
Boring Completed: 5/28/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 19.3 ft
Ground Elevation: 5051.7 ft
Coordinates: N: 252648.8 E: 188482.8
Location: SB I-25, Approx. Station 3546+30
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels:			
Symbol	▽		
Depth	18.0 ft	-	-
Date	5/28/15	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5050						**0.0 - 0.4 ft. 5" ASPHALT**.									
						0.4 - 1.9 ft. 18" CONCRETE.									
						1.9 - 2.2 ft. 3" BASE COURSE.									
			3-4	7		**2.2 - 2.5 ft. silty SAND FILL** trace gravel, brown.									
	5					**2.5 - 4.0 ft. sandy CLAY FILL**, brown, medium stiff, calcareous.									
			3-4	7		**4.0 - 8.0 ft. sandy CLAY** trace gravel, brown, medium stiff.	18.3	92.3	2	25	73	38	24	A-6 (15) CL	S/C=0.2%
5045															
			31-50:4"	50:4"		**8.0 - 19.3 ft. SILTY SANDSTONE**, tan, hard to very hard, claystone interbeds and rust stains observed in sample at about 9 ft.	15.3		0	54	46	NV	NP	A-4 (0) SM	
	10														
5040															
			50:5"	50:5"											
	15														
5035		▽													
			50:4"	50:4"			16.8	108.3							
						Bottom of Hole at 19.3 ft.									
5030															
5025															
5020															

BORING LOG 2015 CROSSROADS GINT - NEW TEMPLATE.GPJ 2015 YEH ASSOCIATES TEMPLATE.GDT 2015 LIBRARY.GLB 8/18/15

Yeh and Associates, Inc.
Consulting Engineers & Scientists

Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-6**

Boring Began: 5/28/2015
Boring Completed: 5/28/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 20.5 ft
Ground Elevation: 5054.0 ft
Coordinates: N: 252918.1 E: 188477.3
Location: SB I-25, Approx. Station 3549+00
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 55 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5050	0					**0.0 - 0.4 ft. 5" ASPHALT**.									
						0.4 - 1.4 ft. 12" CONCRETE.									
						1.4 - 2.0 ft. 7" BASE COURSE.									
			4-5	9		**2.0 - 4.5 ft. silty SAND FILL** with gravel, brown, loose to medium dense.	5.3								pH=8.4 S=0.009% Chl=0.0573% Re=646ohm·cm
	5		8-18	26		**4.5 - 7.0 ft. clayey SAND**, tan, medium dense.	13.6	115.0	0	63	37	NV	NP	A-4 (0) SM	S/C=-0.5%
5045						**7.0 - 20.5 ft. SANDY CLAYSTONE**, tan, very hard, with sandstone interbeds, rust stained with iron nodules, calcareous.									
	10		50:6"	50:6"			16.4	106.2							
5040															
	15		50:5"	50:5"			16.1	114.2	0	49	51	36	18	A-6 (6) CL	
5035															
	20		50:6"	50:6"											
						Bottom of Hole at 20.5 ft.									
5030															
5025															
5020															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-7**

Boring Began: 6/8/2015
Boring Completed: 6/8/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 550 Rubber Tire
Hammer Type: Automatic (hydraulic)

Total Depth: 14.5 ft
Ground Elevation: 5043.8 ft
Coordinates: N: 253666.5 E: 188435.7
Location: SW of Proposed South Abutment for SB I-25/Crossroads Bridge
Logged By: B. Janini
Final By: R.Desterhouse

Weather Notes: Clear, 70's
Inclination from Horiz.: Vertical
Night Work: ☐

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" TOPSOIL.									
						0.5 - 2.0 ft. clayey SAND FILL, brown.									
						2.0 - 2.5 ft. clayey SAND, brown.									
5040			25-50:5"	50:5"		**2.5 - 5.0 ft. SANDY CLAYSTONE**, brown, hard to very hard.	15.9	110.7	0	21	79	42	22	A-7-6 (17) CL	
	5					**5.0 - 14.5 ft. SILTY SANDSTONE**, brown, very hard.									
			50:6"	50:6"											
5035			30-50:3"	50:3"			17.5	96.1	0	51	49	NV	NP	A-4 (0) SM	
	10														
5030			50:6"	50:6"											

Bottom of Hole at 14.5 ft.

5025
5020
5015
5010

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-8**

Boring Began: 6/8/2015
Boring Completed: 6/8/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 550 Rubber Tire
Hammer Type: Automatic (hydraulic)

Total Depth: 14.5 ft
Ground Elevation: 5048.0 ft
Coordinates: N: 253667.6 E: 188695.2
Location: SE of Proposed South Abutment for NB I-25/Crossroads Bridge
Logged By: B. Janini
Final By: R.Desterhouse

Weather Notes: Clear, 70's
Inclination from Horiz.: Vertical
Night Work: ☐

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" TOPSOIL. **0.5 - 2.0 ft. clayey SAND FILL**, brown.									
5045			28-50:4"	50:4"		**2.0 - 14.5 ft. CLAYEY SANDSTONE**, brown, very hard.	14.5	118.4	0	55	45	39	20	A-6 (5) SC	
	5		28-50:3"	50:3"			13.3	113.3	0	59	41	36	19	A-6 (5) SC	
5040															
	10		50:0	50:0											
5035			50:6"	50:6"											

Bottom of Hole at 14.5 ft.

5030
5025
5020
5015

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-9**

Boring Began: 6/8/2015
Boring Completed: 6/8/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 550 Rubber Tire
Hammer Type: Automatic (hydraulic)

Total Depth: 14.8 ft
Ground Elevation: 5038.9 ft
Coordinates: N: 253900.2 E: 188435.8
Location: NW of Proposed North Abutment for SB I-25/Crossroads Bridge
Logged By: B. Janini
Final By: R.Desterhouse

Weather Notes: Clear, 70's
Inclination from Horiz.: Vertical
Night Work: ☐

Groundwater Levels:			
Symbol	▽		
Depth	8.0 ft	-	-
Date	6/8/15	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" TOPSOIL.									
						0.5 - 1.5 ft. sandy CLAY FILL, brown.									
			9-13	22		**1.5 - 5.0 ft. sandy CLAY**, brown, very stiff.	16.7	113.5	0	49	51	40	21	A-6 (7) CL	
5035	5		17-50	67		**5.0 - 8.0 ft. SANDY SILTSTONE**, brown, hard.	16.6	110.9	0	14	86	NV	NP	A-4 (0) ML	
5030	10		18-50:4"	50:4"		**8.0 - 15.0 ft. SANDY CLAYSTONE**, brown, very hard.									
5025			20-50:4"	50:4"			17.1	111.0	2	42	56	40	20	A-6 (7) CL	
5020						Bottom of Hole at 14.8 ft.									
5015															
5010															
5005															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-RW-10**

Boring Began: 6/8/2015
Boring Completed: 6/8/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 550 Rubber Tire
Hammer Type: Automatic (hydraulic)

Total Depth: 19.4 ft
Ground Elevation: 5050.5 ft
Coordinates: N: 253891.7 E: 188690.6
Location: NE of Proposed North Abutment for NB I-25/Crossroads Bridge
Logged By: B. Janini
Final By: R.Desterhouse

Weather Notes: Clear, 70's
Inclination from Horiz.: Vertical
Night Work: ☐

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5050						**0.0 - 0.5 ft. 6" TOPSOIL**.									
						0.5 - 3.0 ft. clayey SAND FILL, gray, very dense, trace organics.									
			50:3"	50:3"		**3.0 - 5.5 ft. CLAYEY SANDSTONE**, gray, very hard.	5.5		5	49	46	39	21	A-6 (6) SC	
5045	5														
			25-50:3"	50:3"		**5.5 - 15.0 ft. SANDY CLAYSTONE**, brown, very hard.	16.0	100.3	0	40	60	39	19	A-6 (9) CL	
			30-50:3"	50:3"											
5040	10														
			50:3"	50:3"											
5035	15					**15.0 - 19.4 ft. SANDY SILTSTONE**, brown, very hard.									
			50:5"	50:5"			17.5	101.8	0	17	83	NV	NP	A-4 (0) ML	
						Bottom of Hole at 19.4 ft.									
5030															
5025															
5020															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PC-1**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5040.8 ft
Coordinates: N: 253831.2 E: 188421.8
Location: Approx. Station 3558+10
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5040						**0.0 - 0.6 ft. 8" TOPSOIL**.									***CA Sample at 2 ft contains base course**
						0.6 - 3.0 ft. clayey SAND FILL w/ gravel, tan, loose, organics (rootlets).									
			7-5	12			13.9	115.9	22	35	43	35	15	A-6 (3) SC	S/C=0.4%
	5					**3.0 - 6.0 ft. SANDY CLAYSTONE**, tan, very hard.			1	41	58	37	22	A-6 (9) CL	**Bulk Sample from 1 ft to 5 ft**
5035			50-45	95											

Bottom of Hole at 6.0 ft.

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PC-2**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 10.3 ft
Ground Elevation: 5045.0 ft
Coordinates: N: 253732.8 E: 188717.0
Location: Approx. Station 3557+10
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" TOPSOIL.									
						0.5 - 2.0 ft. clayey SAND, tan to dark brown.									
			40-50:3"	50:3"		**2.0 - 5.0 ft. SANDY CLAYSTONE**, brown, very hard.	13.7	117.8	0	64	36	39	21	A-6 (3) SC	S/C=1.3%
									1	47	52	38	24	A-6 (3) CL	**Bulk Sample from 0.5 ft to 5 ft** pH=8 S=0.069% Chl=0.0152% R-Value=23 Re=533ohm·cm
5040	5		50:5"	50:5"		**5.0 - 10.3 ft. SILTY SANDSTONE**, tan to brown, very hard, rust stained.	16.6	112.9	0	65	35	NV	NP	A-2-4 (0) SM	
5035	10		50:4"	50:4"		Bottom of Hole at 10.3 ft.									
5030															
5025															
5020															
5015															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-1**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5026.4 ft
Coordinates: N: 249733.8 E: 188548.6
Location: Approx. Station 3517+10
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5025						**0.0 - 0.7 ft. 8" ASPHALT**.									***CA sample at 2 ft contains base course**
						0.7 - 2.2 ft. 18" CONCRETE.									
			5-9	14		**2.2 - 2.7 ft. 5" BASE COURSE**.	16.6	111.5	11	43	46	35	15	A-6 (3) CL	
	5					**2.7 - 6.0 ft. clayey SAND FILL** with gravel, tan, stiff, rust stained.			9	60	31	38	19	A-2-6 (1) SC	**Bulk sample from 2.7 ft to 5 ft**
			6-10	16											
5020						Bottom of Hole at 6.0 ft.									
5015															
5010															
5005															
5000															
4995															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-2**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5015.1 ft
Coordinates: N: 250234.5 E: 188581.6
Location: Approx. Station 3522+20
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 55
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.7 ft. 8" ASPHALT.									***CA sample at 2 ft contains base course**
						0.7 - 2.0 ft. 16" CONCRETE.									
			12-15	27		**2.0 - 2.2 ft. 2" BASE COURSE**.	16.2	115.4	0	48	52	37	15	A-6 (5) CL	S/C=0.2%
						2.2 - 6.0 ft. clayey SAND FILL with gravel, brown mottled with tan, very stiff, rust stained.			12	42	46	37	21	A-6 (5) SC	**Bulk sample from 2.2 ft to 5 ft**
5010	5		7-12	19											

Bottom of Hole at 6.0 ft.

5005
5000
4995
4990
4985

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-3**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5016.5 ft
Coordinates: N: 250739.8 E: 188558.8
Location: Approx. Station 3525+60
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5015						**0.0 - 0.7 ft. 8" ASPHALT**.									***CA sample at 2 ft contains base course**
						0.7 - 2.2 ft. 18" CONCRETE.									
			17-26	43		**2.2 - 2.5 ft. 3" BASE COURSE**.	3.9	135.2	32	51	17	NV	NP	A-1-b (0) SM	
						2.5 - 4.7 ft. clayey SAND FILL with gravel, brown, dense.			11	54	35	38	24	A-2-6 (3) SC	**Bulk sample from 2.5 ft to 5 ft**
	5		4-9	13		**4.7 - 6.0 ft. sandy CLAY FILL**, tan to brown, stiff.									
5010						Bottom of Hole at 6.0 ft.									
5005															
5000															
4995															
4990															
4985															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-4**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5027.2 ft
Coordinates: N: 251233.1 E: 188595.0
Location: Approx. Station 3532+20
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5025						**0.0 - 0.7 ft. 8" ASPHALT**.									***CA sample at 2 ft contains base course**
						0.7 - 2.0 ft. 16" CONCRETE.									
			14-14	28		**2.0 - 2.5 ft. 6" BASE COURSE**.	6.7	129.3	27	50	23	36	20	A-2-6 (0) SC	S/C=0.8%
	5					**2.5 - 6.0 ft. clayey SAND FILL** with gravel, brown mottled with tan, medium dense, rust stained.			10	49	41	43	25	A-7-6 (5) SC	**Bulk sample from 2.5 ft to 5 ft**
			7-8	15											
						Bottom of Hole at 6.0 ft.									
5020															
5015															
5010															
5005															
5000															
4995															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-5**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 11.0 ft
Ground Elevation: 5039.5 ft
Coordinates: N: 251723.4 E: 188568.5
Location: Approx. Station 3537+10
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.7 ft. 8" ASPHALT.									
						0.7 - 2.2 ft. 18" CONCRETE.									
			14-8	22		**2.2 - 2.7 ft. 6" BASE COURSE**.									
5035	5					**2.7 - 11.0 ft. sandy CLAY FILL**, trace gravel, olive gray mottled with tan, stiff to very stiff, rust stained.			3	33	64	37	21	A-6 (11) CL	**Bulk sample from 2.7 ft to 5 ft**
			6-9	15			18.7	105.2	0	52	48	37	19	A-6 (5) SC	S/C=0.8%
5030	10		9-11	20			17.8	106.4							pH=7 S=0.008% Chl=0.0021% Re=754ohm·cm

Bottom of Hole at 11.0 ft.

Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-6**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5051.0 ft
Coordinates: N: 252233.3 E: 188620.1
Location: Approx. Station 3542+20
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5050						**0.0 - 0.8 ft. 10" ASPHALT**.									***CA sample at 2 ft contains base course**
						0.8 - 1.8 ft. 12" CONCRETE.									
						1.8 - 2.2 ft. 4" BASE COURSE.									
			19-15	34		**2.2 - 6.0 ft. clayey SAND FILL** with gravel, brown, medium dense, organics (rootlets).	8.6	125.1	15	58	27	41	25	A-2-7 (0) SC	
	5								9	50	41	36	19	A-6 (3) SC	**Bulk sample from 2.2 ft to 5 ft**
5045			5-8	13											pH=10.1 S=0.044% Chl=0.0081% R-Value=30 Re=1721ohm·cm

Bottom of Hole at 6.0 ft.

5040
5035
5030
5025
5020

BORING LOG 2015 CROSSROADS GINT - NEW TEMPLATE.GPJ 2015 YEH ASSOCIATES TEMPLATE.GDT 2015 LIBRARY.GLB 8/18/15

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-7**

Boring Began: 5/27/2015
Boring Completed: 5/27/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5062.8 ft
Coordinates: N: 252782.9 E: 188579.3
Location: Approx. Station 3547+70
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 72 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.7 ft. 8" ASPHALT.									***CA sample at 2 ft contains base course**
						0.7 - 2.2 ft. 18" CONCRETE.									
5060			18-17	35		**2.2 - 2.7 ft. 6" BASE COURSE**.	6.2	134.4	26	53	21	27	11	A-2-6 (0) SC	
	5					**2.7 - 5.5 ft. clayey SAND FILL** with gravel, dark brown to tan, medium dense.			8	57	35	39	22	A-6 (2) SC	**Bulk sample from 2.7 ft to 5 ft**
			5-11	16		**5.5 - 6.0 ft. sandy CLAY**, brown mottled with tan, stiff.									
5055						Bottom of Hole at 6.0 ft.									
5050															
5045															
5040															
5035															
5030															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-8**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5065.8 ft
Coordinates: N: 253283.4 E: 188621.7
Location: Approx. Station 3552+70
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5065						**0.0 - 0.5 ft. 6" ASPHALT**. **0.5 - 2.0 ft. 18" CONCRETE**.									***CA sample at 2 ft contains base course**
			14-11	25		**2.0 - 2.3 ft. 3" BASE COURSE**.	15.8	113.0	5	30	65	39	22	A-6 (12) CL	S/C=0.7%
	5					**2.3 - 6.0 ft. clayey SAND FILL** with gravel, dark brown to gray, medium dense.			10	48	42	36	22	A-6 (5) SC	**Bulk sample from 2.3 ft to 5 ft**
5060			9-12	21											

Bottom of Hole at 6.0 ft.

5055
5050
5045
5040
5035

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-10**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: Approx. 5071 ft (not surveyed)
Coordinates: N: 254770.8 E: 188638.0
Location: Approx. Station 3567+70
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifi-cations	Field Notes and Other Lab Tests
						0.0 - 0.7 ft. 8" ASPHALT.									
						0.7 - 2.2 ft. 18" CONCRETE.									
			17-11	28		**2.2 - 2.5 ft. 4" BASE COURSE**.	6.1	132.1	28	49	23	27	11	A-2-6 (0) SC	***CA sample at 2 ft contains base course**
						2.5 - 6.0 ft. sandy CLAY FILL with gravel, dark brown to tan, medium stiff.									
	5		4-5	9											

Bottom of Hole at 6.0 ft.

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-11**

Boring Began: 5/27/2015
Boring Completed: 5/27/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5074.1 ft
Coordinates: N: 255357.7 E: 188604.8
Location: Approx. Station 3573+40
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 70 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" ASPHALT. **0.5 - 3.0 ft. 18" CONCRETE**.									
5070			17-5	22		**3.0 - 3.3 ft. 4" BASE COURSE**. **3.3 - 5.0 ft. clayey SAND FILL** with gravel, brown, medium dense.			9	51	40	38	22	A-6 (4) SC	**Bulk sample from 3.3 ft to 5 ft**
	5		6-8	14		**5.0 - 6.0 ft. sandy CLAY FILL**, brown, stiff.	19.6	105.2	0	30	70	36	21	A-6 (12) CL	S/C=0%
						Bottom of Hole at 6.0 ft.									
5065															
5060															
5055															
5050															
5045															
5040															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-12**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 11.0 ft
Ground Elevation: 5077.9 ft
Coordinates: N: 255861.8 E: 188654.7
Location: Approx. Station 3578+40
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed			
Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.7 ft. 8" ASPHALT.									
						0.7 - 1.7 ft. 12" CONCRETE.									
						1.7 - 2.1 ft. 5" BASE COURSE.									
5075			17-11	28		**2.1 - 5.5 ft. clayey SAND FILL** with gravel, reddish brown to brown, medium dense.	4.7	116.1	36	52	12	NV	NP	A-1-a (0) SP-SM	***CA sample at 2 ft contains base course**
	5								10	42	48	44	26	A-7-6 (8) SC	**Bulk sample from 2.1 ft to 5 ft**
			5-9	14		**5.5 - 10.0 ft. sandy CLAY**, tan, stiff to hard.									pH=9.3 S=0.038% Chl=0.0208% R-Value=16 Re=1107ohm·cm
5070	10		20-30	50		**10.0 - 11.0 ft. SANDY CLAYSTONE**, brown, hard.									

Bottom of Hole at 11.0 ft.

5065
5060
5055
5050
5045

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-13**

Boring Began: 5/27/2015
Boring Completed: 5/27/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5081.8 ft
Coordinates: N: 256362.2 E: 188614.4
Location: Approx. Station 3583+50
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 70 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5080						**0.0 - 0.7 ft. 8" ASPHALT**.									***CA sample at 2 ft contains base course**
						0.7 - 2.0 ft. 16" CONCRETE.									
			13-13	26		**2.0 - 2.3 ft. 4" BASE COURSE**.	22.2	124.2	31	67	2	NV	NP	A-1-b (0) SM	
						2.3 - 2.8 ft. silty SAND FILL, dark brown, medium dense.									
	5					**2.8 - 6.0 ft. clayey SAND FILL** with gravel, tan, medium dense.			16	52	32	42	24	A-2-7 (2) SC	**Bulk sample from 2.3 ft to 5 ft**
			9-11	20											
5075						Bottom of Hole at 6.0 ft.									
5070															
5065															
5060															
5055															
5050															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-14**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5082.0 ft
Coordinates: N: 256862.3 E: 188657.6
Location: Approx. Station 3588+50
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 52 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5080						**0.0 - 0.5 ft. 6" ASPHALT**. **0.5 - 2.0 ft. 18" CONCRETE**.									***CA sample at 2 ft contains base course**
			14-13	27		**2.0 - 2.2 ft. 2" BASE COURSE**.	8.7	123.7	21	44	35	41	24	A-2-7 (3) SC	
	5					**2.2 - 6.0 ft. clayey SAND FILL** with gravel, dark brown mottled with gray, very stiff.			10	51	39	36	23	A-6 (4) SC	**Bulk sample from 2.2 ft to 5 ft**
			10-11	21											
						Bottom of Hole at 6.0 ft.									
5075															
5070															
5065															
5060															
5055															
5050															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-15**

Boring Began: 5/27/2015
Boring Completed: 5/27/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 11.0 ft
Ground Elevation: 5081.6 ft
Coordinates: N: 257364.6 E: 188624.1
Location: Approx. Station 3593+50
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 70 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed			
Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5080						**0.0 - 0.7 ft. 8" ASPHALT**.									***CA Sample at 2 ft contains base course**
						0.7 - 1.7 ft. 12" CONCRETE.									
						1.7 - 2.1 ft. 5" BASE COURSE.									
			19-17	36		**2.1 - 3.0 ft. silty SAND FILL**, brown to dark brown, dense, recycled asphalt layer 2.5-2.8'.	4.2	134.9	39	46	15	NV	NP	A-1-a (0) SM	
	5					**3.0 - 4.5 ft. clayey SAND FILL** with some gravel, brown.			6	49	45	36	20	A-6 (5) SC	**Bulk sample from 2.1 ft to 5 ft**
5075			5-8	13		**4.5 - 7.5 ft. sandy CLAY FILL**, brown, stiff.	18.9	104.8	1	28	71	34	18	A-6 (11) CL	S/C=0.3%
						7.5 - 11.0 ft. sandy CLAY, tan mottled with brown, stiff.									
	10		5-6	11											
5070						Bottom of Hole at 11.0 ft.									
5065															
5060															
5055															
5050															

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PNB-16**

Boring Began: 5/26/2015
Boring Completed: 5/26/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5029.7 ft
Coordinates: N: 249324.0 E: 188574.5
Location: Approx. Station 3513+10
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: Cool, 50's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" ASPHALT.									***CA sample at 2 ft contains base course**
						0.5 - 1.8 ft. 16" CONCRETE.									
						1.8 - 2.2 ft. 4" BASE COURSE.									
			14-9	23		**2.2 - 3.0 ft. silty SAND FILL**, brown, medium dense.	4.4		37	52	11	NV	NP	A-1-a (0) SW-SM	
5025	5					**3.0 - 6.0 ft. clayey SAND FILL** with some gravel, brown to tan, medium dense.			6	48	46	38	20	A-6 (5) SC	**Bulk sample from 2.2 ft to 5 ft**
			14-13	27											

Bottom of Hole at 6.0 ft.

5020
5015
5010
5005
5000
4995

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-1**

Boring Began: 5/20/2015
Boring Completed: 5/20/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 45
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5028.4 ft
Coordinates: N: 249583.8 E: 188464.1
Location: Approx. Station 3515+60
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 30 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 1.5 ft. 18" ASPHALT.									
						1.5 - 2.3 ft. 10" CONCRETE.									
						2.3 - 3.0 ft. 8" BASE COURSE.									
5025			10-15	25	FILL	**3.0 - 6.0 ft. sandy CLAY FILL**, brown, very stiff.	18.4	115.5	0	26	74	41	23	A-7-6 (16) CL	S/C=1.4%
	5				FILL				0	25	75	40	25	A-6 (17) CL	**Bulk sample from 3 ft to 5 ft** pH=8.7 S=0.024% Chl=0.0119% R-Value=15 Re=941ohm·cm
			7-11	18	FILL										

Bottom of Hole at 6.0 ft.

5020
5015
5010
5005
5000
4995

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-2**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5018.5 ft
Coordinates: N: 250081.1 E: 188499.9
Location: Approx. Station 3520+60
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" ASPHALT.									
						0.5 - 2.0 ft. 18" CONCRETE.									
						2.0 - 2.7 ft. 8" BASE COURSE.									
5015			5-12	17	FILL	**2.7 - 6.0 ft. sandy CLAY FILL**, dark brown, very stiff, trace organics.	18.2	112.2	0	15	85	44	28	A-7-6 (23) CL	S/C=1.5%
	5		7-11	18	FILL				4	38	58	38	21	A-6 (9) CL	**Bulk sample from 2.7 ft to 5 ft**

Bottom of Hole at 6.0 ft.

5010
5005
5000
4995
4990
4985

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-3**

Boring Began: 5/20/2015
Boring Completed: 5/20/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 45
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5013.4 ft
Coordinates: N: 250584.0 E: 188466.6
Location: Approx. Station 3525+70
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 30 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifi-cations	Field Notes and Other Lab Tests
						0.0 - 1.5 ft. 18" ASPHALT.									
						1.5 - 2.3 ft. 10" CONCRETE.									
						2.3 - 3.0 ft. 8" BASE COURSE.									
5010			11-13	24	FILL	**3.0 - 6.0 ft. sandy CLAY FILL**, brown to dark brown, very stiff, organics (rootlets) and construction debris (styrofoam) observed at about 3 ft, calcareous.	17.2	110.9	1	24	75	39	22	A-6 (15) CL	
	5								1	28	71	38	21	A-6 (13) CL	**Bulk sample from 3 ft to 5 ft**
			10-16	26											

Bottom of Hole at 6.0 ft.

5005
5000
4995
4990
4985
4980

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Yeh and Associates, Inc.
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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-4**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5022.2 ft
Coordinates: N: 251080.1 E: 188510.4
Location: Approx. Station 3530+60
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50 degrees, cloudy
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5020						**0.0 - 0.7 ft. 8" ASPHALT**.									
						0.7 - 2.3 ft. 20" CONCRETE.									
			9-12	21		**2.3 - 2.5 ft. 2" BASE COURSE**.	17.5	103.9	0	43	57	48	28	A-7-6 (13) CL	
						2.5 - 5.0 ft. clayey SAND FILL with some gravel, tan, medium dense.			5	47	48	37	20	A-6 (6) SC	**Bulk sample from 2.5 ft to 5 ft**
	5		11-15	26		**5.0 - 6.0 ft. Weathered Silty SANDSTONE**, tan, firm, rust stained, calcareous.	11.8	123.0	0	46	54	NV	NP	A-4 (0) SM	
5015						Bottom of Hole at 6.0 ft.									
5010															
5005															
5000															
4995															
4990															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-5**

Boring Began: 5/20/2015
Boring Completed: 5/20/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 45
Hammer Type: Automatic (hydraulic)

Total Depth: 11.0 ft
Ground Elevation: 5031.8 ft
Coordinates: N: 251583.6 E: 188476.9
Location: Approx. Station 3535+70

Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 30 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5030						**0.0 - 0.5 ft. 6" ASPHALT**.									
						0.5 - 2.0 ft. 18" CONCRETE.									
						2.0 - 2.5 ft. 6" BASE COURSE.									
			5-10	15	FILL	**2.5 - 6.0 ft. sandy CLAY FILL**, brown, high plasticity, stiff, organics (rootlets), calcareous.	25.3	101.8	0	17	83	59	38	A-7-6 (33) CH	
	5								1	22	77	48	27	A-7-6 (21) CL	**Bulk sample from 2.5 ft to 5 ft** pH=8.2 S=0.024% Chl=0.0202% R-Value=12 Re=726ohm·cm
5025			9-15	24		**6.0 - 10.0 ft. sandy CLAY**, very stiff.									
	10		10-21	31		**10.0 - 11.0 ft. Weathered clayey SANDSTONE**, tan, medium hard, rust stained, calcareous.									
5020						Bottom of Hole at 11.0 ft.									
5015															
5010															
5005															
5000															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-6**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5042.3 ft
Coordinates: N: 252085.0 E: 188520.4
Location: Approx. Station 3540+70
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50's, cloudy
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" ASPHALT.									***CA sample at 2 ft contains base course**
						0.5 - 2.0 ft. 18" CONCRETE.									
5040			7-8	15		**2.0 - 2.3 ft. 4" BASE COURSE**.	16.8	110.8	6	17	77	44	28	A-7-6 (20) CL	S/C=1.8%
						2.3 - 6.0 ft. clayey SAND FILL with some gravel, tan, medium dense.									
	5								6	60	34	44	27	A-2-7 (3) SC	**Bulk sample from 2.3 ft to 5 ft**
			6-8	14											
						Bottom of Hole at 6.0 ft.									
5035															
5030															
5025															
5020															
5015															
5010															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-7**

Boring Began: 5/20/2015
Boring Completed: 5/20/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 45
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5050.6 ft
Coordinates: N: 252587.7 E: 188479.7
Location: Approx. Station 3545+70
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 35 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5050						**0.0 - 0.8 ft. 10" ASPHALT**.									
						0.8 - 2.3 ft. 18" CONCRETE.									
						2.3 - 2.8 ft. 6" BASE COURSE.									
			4-6	10	FILL	**2.8 - 6.0 ft. sandy CLAY FILL**, brown to dark brown, medium stiff to stiff, organics (rootlets).	22.6	100.7	0	13	87	43	24	A-7-6 (21) CL	
	5								4	23	73	29	11	A-6 (6) CL	**Bulk sample from 2.8 ft to 5 ft**
5045			4-4	8											

Bottom of Hole at 6.0 ft.

5040
5035
5030
5025
5020

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-8**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5056.1 ft
Coordinates: N: 253091.3 E: 188531.0
Location: Approx. Station 3550+70
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50's, cloudy
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5055						**0.0 - 0.7 ft. 8" ASPHALT**.									
						0.7 - 2.1 ft. 18" CONCRETE.									
			7-13	20		**2.1 - 2.4 ft. 4" BASE COURSE**.	17.6	113.8	0	12	88	44	27	A-7-6 (24) CL	
						2.4 - 3.0 ft. sandy CLAY FILL, tan, stiff to very stiff.			7	52	41	40	21	A-6 (4) SC	**Bulk sample from 2.4 ft to 5 ft**
	5		5-9	14		**3.0 - 6.0 ft. clayey SAND FILL**with gravel, brown, medium dense.									
5050						Bottom of Hole at 6.0 ft.									
5045															
5040															
5035															
5030															
5025															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-9**

Boring Began: 5/20/2015
Boring Completed: 5/20/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 45
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5058.0 ft
Coordinates: N: 253596.4 E: 188497.5
Location: Approx. Station 3555+80
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 30's
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.2 ft. 2" ASPHALT.									
						0.2 - 1.4 ft. 15" CONCRETE.									
						1.4 - 2.0 ft. 7" BASE COURSE.									
5055			7-10	17	FILL	**2.0 - 5.0 ft. sandy CLAY FILL**, brown to tan, very stiff, organics (rootlets).	18.2	110.5	0	14	86	48	30	A-7-6 (26) CL	S/C=1.5%
	5				FILL				2	20	78	44	26	A-7-6 (19) CL	**Bulk sample from 1.8 ft to 5 ft**
			6-12	18		**5.0 - 6.0 ft. silty SAND**, brown, medium dense.	20.8	105.9	0	54	46	NV	NP	A-4 (0) SM	

Bottom of Hole at 6.0 ft.

5050
5045
5040
5035
5030
5025

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-10**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5062.0 ft
Coordinates: N: 254098.1 E: 188539.9
Location: Approx. Station 3560+80
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 51 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed			
Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5060						**0.0 - 0.5 ft. 6" ASPHALT**.									
						0.5 - 1.8 ft. 16" CONCRETE.									
						1.8 - 2.3 ft. 6" BASE COURSE.									
			6-6	12	FILL	**2.3 - 6.0 ft. sandy CLAY FILL**, brown to tan, stiff.	14.3	114.2	14	20	66	49	32	A-7-6 (19) CL	S/C=0.9%
	5								7	38	55	45	27	A-7-6 (11) CL	**Bulk sample from 2.3 ft to 5 ft** pH=10.4 S=0.039% Chl=0.0168% R-Value=14 Re=1567ohm·cm
			6-4	10											
5055						Bottom of Hole at 6.0 ft.									
5050															
5045															
5040															
5035															
5030															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-11**

Boring Began: 5/20/2015
Boring Completed: 5/20/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 45
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5064.6 ft
Coordinates: N: 254599.8 E: 188507.7
Location: Approx. Station 3565+80
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 40 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifi-cations	Field Notes and Other Lab Tests
						0.0 - 0.7 ft. 8" ASPHALT.									
						0.7 - 2.3 ft. 20" CONCRETE.									
						2.3 - 2.8 ft. 6" BASE COURSE.									
			5-13	18	FILL	**2.8 - 6.0 ft. sandy CLAY FILL**, brown, very stiff, calcareous.	17.7	112.3	0	34	66	39	23	A-6 (13) CL	
5060	5				FILL				2	29	69	56	39	A-7-6 (25) CH	**Bulk sample from 2.8 ft to 5 ft**
			7-14	21	FILL										

Bottom of Hole at 6.0 ft.

5055 5050 5045 5040 5035 5030

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-12**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5068.3 ft
Coordinates: N: 255106.3 E: 188550.7
Location: Approx. Station 3570+90

Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 51 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.7 ft. 8" ASPHALT.									
						0.7 - 1.3 ft. 8" CONCRETE.									
						1.3 - 2.0 ft. 8" BASE COURSE.									
			6-9	15		**2.0 - 4.0 ft. clayey SAND FILL** with gravel, brown and gray, medium dense.	22.0	107.2	0	21	79	36	21	A-6 (13) CL	
5065									11	48	41	47	27	A-7-6 (6) SC	**Bulk sample from 2 ft to 5 ft**
	5					**4.0 - 6.0 ft. sandy CLAY** with gravel, brown to dark brown, very stiff.									
			8-12	20			14.5	106.2	7	31	62	41	26	A-7-6 (13) CL	
5060						Bottom of Hole at 6.0 ft.									
5055															
5050															
5045															
5040															
5035															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-13**

Boring Began: 5/20/2015
Boring Completed: 5/20/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 45
Hammer Type: Automatic (hydraulic)

Total Depth: 10.5 ft
Ground Elevation: 5070.9 ft
Coordinates: N: 255608.2 E: 188513.5
Location: Approx. Station 3575+90
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 40 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5070						**0.0 - 0.5 ft. 6" ASPHALT**.									
						0.5 - 1.8 ft. 16" CONCRETE.									
						1.8 - 2.3 ft. 6" BASE COURSE.									
			7-14	21	FILL	**2.3 - 4.0 ft. sandy CLAY FILL**, brown, very stiff.	19.6	108.9	0	18	82	43	25	A-7-6 (20) CL	
						4.0 - 9.0 ft. sandy CLAY, brown, stiff.			1	27	72	38	21	A-6 (13) CL	**Bulk sample from 2.3 ft to 5 ft**
	5		6-8	14			22.1	102.7	0	35	65	36	17	A-6 (9) CL	S/C=0%
5065															
	10		50:6"	50:6"		**9.0 - 10.5 ft. CLAYEY SANDSTONE**, tan, very hard, rust stained.									
5060						Bottom of Hole at 10.5 ft.									
5055															
5050															
5045															
5040															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-14**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5074.0 ft
Coordinates: N: 256107.4 E: 188560.4
Location: Approx. Station 3580+90
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50's, cloudy
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.7 ft. 8" ASPHALT.									
						0.7 - 2.2 ft. 18" CONCRETE.									
			6-14	20		**2.2 - 2.7 ft. 6" BASE COURSE**.	23.6	99.1	0	16	84	40	19	A-6 (16) CL	S/C=0.1%
5070					FF	**2.7 - 6.0 ft. sandy CLAY FILL**, tan to dark brown, very stiff.			7	37	56	43	25	A-6 (11) CL	**Bulk sample from 2.7 ft to 5 ft**
	5		7-12	19	FF										

Bottom of Hole at 6.0 ft.

5065
5060
5055
5050
5045
5040

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-15**

Boring Began: 5/20/2015
Boring Completed: 5/20/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 45
Hammer Type: Automatic (hydraulic)

Total Depth: 9.8 ft
Ground Elevation: 5073.7 ft
Coordinates: N: 256615.1 E: 188527.3
Location: Approx. Station 3586+00
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 45 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 5" ASPHALT.									
						0.5 - 1.8 ft. 16" CONCRETE.									
						1.8 - 2.4 ft. 8" BASE COURSE.									
5070	5		10-10	20		**2.4 - 4.0 ft. clayey SAND FILL** with gravel, brown, medium dense, calcareous.	20.8	104.4	0	30	70	43	26	A-7-6 (16) CL	
						4.0 - 9.0 ft. sandy CLAY, brown, medium stiff.			4	56	40	34	16	A-6 (2) SC	**Bulk sample from 2.4 ft to 5 ft**
			2-3	5											
5065			31-50:4"	50:4"		**9.0 - 9.8 ft. CLAYEY SANDSTONE**, brown to tan, very hard.									
						Bottom of Hole at 9.8 ft.									
5060															
5055															
5050															
5045															
5040															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PSB-16**

Boring Began: 5/18/2015
Boring Completed: 5/17/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5073.7 ft
Coordinates: N: 257120.0 E: 188569.5
Location: Approx. Station 3591+00
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 53 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.3 ft. 4" ASPHALT.									
						0.3 - 1.8 ft. 18" CONCRETE.									
						1.8 - 2.1 ft. 4" BASE COURSE.									
			4-10	14		**2.1 - 4.0 ft. clayey SAND FILL**, trace gravel, tan to light brown, medium dense, trace organics.	17.1	115.2	0	16	84	43	29	A-7-6 (16) CL	S/C=0.9%
5070									5	60	35	42	24	A-7-6 (3) SC	**Bulk sample from 2.1 ft to 5 ft**
	5		3-4	7		**4.0 - 6.0 ft. clayey SAND**, light brown, loose.									
						Bottom of Hole at 6.0 ft.									
5065															
5060															
5055															
5050															
5045															
5040															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PR-1**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 5.8 ft
Ground Elevation: 5048.3 ft
Coordinates: N: 253309.2 E: 188394.1
Location: Approx. Station 3552+90, Existing SB I-25 On-Ramp
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50 degrees
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" ASPHALT.									
						0.5 - 3.5 ft. silty SAND FILL with gravel, brown to dark brown, medium dense.	13.6		16	69	15	NV	NP	A-1-b (0) SM	
			14-9	23			4.4	114.2	34	49	17	NV	NP		
5045									6	52	42	38	20	A-6 (4) SC	**Bulk sample from 0.5 ft to 5 ft** pH=7.9 S=0.007% Chl=0.0325% R-Value=29 Re=954ohm·cm
	5		45-50:3"	50:3"		**3.5 - 5.0 ft. Weathered clayey SANDSTONE**, brown to tan, medium hard.									
						5.0 - 5.8 ft. CLAYEY SANDSTONE, brown to tan, very hard.									
						Bottom of Hole at 5.8 ft.									
5040															
5035															
5030															
5025															
5020															
5015															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PR-2**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 5.8 ft
Ground Elevation: 5051.7 ft
Coordinates: N: 253322.3 E: 188793.4
Location: Approx. Station 3553+10, Existing NB I-25 Off-Ramp
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50 degrees, cloudy
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5050						**0.0 - 0.7 ft. 8" ASPHALT**.									
						0.7 - 2.0 ft. sandy CLAY FILL with gravel, brown.									
			21-19	40		**2.0 - 5.0 ft. Weathered silty SANDSTONE**, tan, medium hard.	5.3	120.4	23	67	10	NV	NP	A-1-b (0) SP-SM	
									4	30	66	31	16	A-6 (8) CL	**Bulk sample from 0.7 ft fo 5 ft**
	5		30-50:3"	50:3"		**5.0 - 5.8 ft. SILTY SANDSTONE**, tan, very hard, rust stained.	14.4	114.2	0	65	35	NV	NP	A-2-4 (0) SM	
5045						Bottom of Hole at 5.8 ft.									
5040															
5035															
5030															
5025															
5020															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PR-3**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 5.8 ft
Ground Elevation: 5051.4 ft
Coordinates: N: 254292.5 E: 188329.2
Location: Approx. Station 3562+80, Existing SB I-25 Off-Ramp
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50 degrees, cloudy
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed			
Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
5050						**0.0 - 0.5 ft. 6" ASPHALT**.									
						0.5 - 2.5 ft. sandy GRAVEL FILL, brown to dark brown, dense.	6.2	128.2	63	35	2	NV	NP	A-1-a (0)	
			25-21	46			4.1		39	54	7	NV	NP	SW-SM	
						2.5 - 4.5 ft. weathered clayey SANDSTONE, dark brown, medium hard.			16	68	16	34	18	A-2-6 (0) SC	**Bulk sample from 0.5 ft to 5 ft**
	5					**4.5 - 5.8 ft. CLAYEY SANDSTONE**, tan, very hard.									
			40-50:4"	50:4"			16.2	112.3	0	65	35	33	11	A-2-6 (0) SC	
5045						Bottom of Hole at 5.8 ft.									
5040															
5035															
5030															
5025															
5020															

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Project Name: I-25/Crossroads Bridge Replacement

Project Number: 215-043 *Boring No.:* **YA-PR-4**

Boring Began: 5/18/2015
Boring Completed: 5/18/2015
Drilling Method(s): Solid-Stem Auger (4" OD)
Driller: Terracon
Drill Rig: CME 75
Hammer Type: Automatic (hydraulic)

Total Depth: 6.0 ft
Ground Elevation: 5064.6 ft
Coordinates: N: 254523.4 E: 188693.3
Location: Approx. Station 3565+10, Existing NB I-25 On-Ramp
Logged By: R. Borst
Final By: M. Boyd

Weather Notes: 50 degrees, cloudy
Inclination from Horiz.: Vertical
Night Work: ☑

Groundwater Levels: Not Observed			
Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/ Advancement Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
						0.0 - 0.5 ft. 6" ASPHALT.									
						0.5 - 3.0 ft. gravelly SAND FILL with silt, brown, medium dense.									
			13-12	25			5.8		33	57	10	NV	NP	A-1-b (0) SW-SM	
						3.0 - 5.5 ft. gravelly SAND FILL with clay, brown.			24	61	15	34	18	A-2-6 (0) SC	**Bulk sample from 0.5 ft to 5 ft** pH=8.1 S=0.007% Chl=0.0153% R-Value=46 Re=1504ohm·cm
5060	5		5-6	11		**5.5 - 6.0 ft. sandy CLAY**, dark brown, stiff.	17.1	110.7	0	22	78	45	28	A-7-6 (21) CL	
						Bottom of Hole at 6.0 ft.									

5055
5050
5045
5040
5035
5030

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Appendix C

LABORATORY TEST RESULTS

YEH & ASSOCIATES, INC

Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-BC-1	3	–	–	–	–	–	–	–	–	–	8.0	0.032	685	0.0162	–	–	–	–
YA-BC-1	5	CA	17.4	109.0	0	47	53	41	20	21	–	–	–	–	–	–	A-7-6 (8)	CL
YA-BC-1	19	CA	14.4	111.1	0	60	40	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	SM (Bedrock)
YA-BC-1	30	CA	17.2	104.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-BC-1	39	CA	17.9	107.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-BC-2	5	CA	18.4	109.6	0	25	75	43	20	23	–	–	–	–	–	–	A-7-6 (16)	CL
YA-BC-2	15	CA	16.1	115.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-BC-2	25	CA	15.8	109.7	0	31	69	37	20	17	–	–	–	–	–	–	A-6 (10)	CL (Bedrock)
YA-BC-2	40	CA	16.1	108.0	0	19	81	39	19	20	–	–	–	–	–	–	A-6 (15)	CL (Bedrock)
YA-BC-2	50	CA	16.5	111.3	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-BC-3	5	CA	23.4	92.7	0	52	48	43	22	21	–	–	–	–	–	–	A-7-6 (6)	SC
YA-BC-3	15	CA	15.3	111.5	0	49	51	38	22	16	–	–	–	–	–	–	A-6 (5)	CL (Bedrock)
YA-BC-3	30	CA	16.9	107.0	0	26	74	37	22	15	–	–	–	–	–	–	A-6 (10)	CL (Bedrock)
YA-BC-3	40	CA	20.0	104.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-BC-4	2	CA	4.8	–	38	53	9	NV	NP	NP	–	–	–	–	–	–	A-1-a (0)	SP-SM
YA-BC-4	9	–	–	–	–	–	–	–	–	–	8.0	0.014	825	0.0111	–	–	–	–

YEH & ASSOCIATES, INC

Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-BC-4	15	CA	17.6	104.8	0	52	48	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	SM (Bedrock)
YA-BC-4	24	CA	17.1	111.2	0	58	42	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	SM (Bedrock)
YA-BC-4	35	CA	16.7	110.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-BC-4	50	CA	15.8	112.2	0	25	75	39	22	17	–	–	–	–	–	–	A-6 (12)	CL (Bedrock)
YA-BC-4	54	CA	19.8	106.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–

YEH & ASSOCIATES, INC

Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-RW-1	2	CA	16.7	114.2	1	28	71	41	16	25	–	–	–	–	1.7	–	A-7-6 (16)	CL
YA-RW-1	10	CA	18.9	108.6	0	49	51	35	18	17	–	–	–	–	–	–	A-6 (5)	CL
YA-RW-1	20	CA	16.6	111.4	0	34	66	42	19	23	–	–	–	–	–	–	A-7-6 (13)	CL
YA-RW-1	30	CA	14.1	117.5	0	43	57	32	20	12	–	–	–	–	–	–	A-6 (4)	CL (Bedrock)
YA-RW-1	40	CA	12.5	107.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-RW-2	2	CA	15.4	114.1	10	43	47	40	18	22	–	–	–	–	0.4	–	A-6 (6)	SC
YA-RW-2	15	CA	19.4	107.0	0	29	71	38	18	20	–	–	–	–	–	–	A-6 (12)	CL
YA-RW-2	25	CA	16.5	111.6	0	26	74	42	16	26	–	–	–	–	–	–	A-7-6 (18)	CL
YA-RW-2	35	CA	6.4	125.6	0	19	81	35	18	17	–	–	–	–	–	–	A-6 (12)	CL (Bedrock)
YA-RW-3	10	CA	17.5	110.2	0	49	51	40	20	20	–	–	–	–	–	–	A-7-6 (7)	CL
YA-RW-3	20	CA	21.1	104.2	0	18	82	55	23	32	–	–	–		–	–	A-7-6 (28)	CH
YA-RW-3	25	CA	14.9	117.8	0	40	60	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	ML (Bedrock)
YA-RW-3	30	CA	10.8	124.7	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-RW-4	5	CA	18.2	109.5	0	43	57	39	17	22	–	–	–	–	0.3	–	A-6 (6)	CL
YA-RW-4	15	CA	10.5	118.0	0	50	50	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	SM (Bedrock)
YA-RW-4	20	CA	12.3	118.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-RW-4	30	CA	12.9	120.9	0	39	61	33	18	15	–	–	–	–	–	–	A-6 (7)	CL (Bedrock)

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Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-RW-5	5	CA	18.3	92.3	2	25	73	38	14	24	–	–	–	–	0.2	–	A-6 (15)	CL
YA-RW-5	9	CA	15.3	–	0	54	46	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	SM (Bedrock)
YA-RW-5	19	CA	16.8	108.3	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-RW-6	2	CA	5.3	–	–	–	–	–	–	–	8.4	0.009	646	0.0573	–	–	–	–
YA-RW-6	4	CA	13.6	115.0	0	63	37	NV	NV	NP	–	–	–	–	-0.5	–	A-4 (0)	SM
YA-RW-6	10	CA	16.4	106.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
YA-RW-6	15	CA	16.1	114.2	0	49	51	36	18	18	–	–	–	–	–	–	A-6 (6)	CL (Bedrock)
YA-RW-7	3	CA	15.9	110.7	0	21	79	42	20	22	–	–	–	–	–	–	A-7-6 (17)	CL (Bedrock)
YA-RW-7	9	CA	17.5	96.1	0	51	49	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	SM (Bedrock)
YA-RW-8	2	CA	14.5	118.4	0	55	45	39	19	20	–	–	–	–	–	–	A-6 (5)	SC (Bedrock)
YA-RW-8	5	CA	13.3	113.3	0	59	41	36	17	19	–	–	–	–	–	–	A-6 (5)	SC (Bedrock)
YA-RW-9	2	CA	16.7	113.5	0	49	51	40	19	21	–	–	–	–	–	–	A-6 (7)	CL
YA-RW-9	5	CA	16.6	110.9	0	14	86	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	ML (Bedrock)
YA-RW-9	14	CA	17.1	111.0	2	42	56	40	20	20	–	–	–	–	–	–	A-6 (7)	CL (Bedrock)
YA-RW-10	3	CA	5.5	–	5	49	46	39	18	21	–	–	–	–	–	–	A-6 (6)	SC
YA-RW-10	6	CA	16.0	100.3	0	40	60	39	20	19	–	–	–	–	–	–	A-6 (9)	CL (Bedrock)
YA-RW-10	19	CA	17.5	101.8	0	17	83	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	ML (Bedrock)

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Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-PNB-1	2.7-5	Bulk	–	–	9	60	31	38	19	19	–	–	–	–	–	–	A-2-6 (1)	SC
YA-PNB-1	2.2	CA	16.6	111.5	11	43	46	35	20	15	–	–	–	–	–	–	A-6 (3)	CL
YA-PNB-2	2.2-5	Bulk	–	–	12	42	46	37	16	21	–	–	–	–	–	–	A-6 (5)	SC
YA-PNB-2	2	CA	16.2	115.4	0	48	52	37	22	15	–	–	–	–	0.2	–	A-6 (5)	CL
YA-PNB-3	2.5-5	Bulk	–	–	11	54	35	38	14	24	–	–	–	–	–	–	A-2-6 (3)	SC
YA-PNB-3	2.2	CA	3.9	135.2	32	51	17	NV	NP	NP	–	–	–	–	–	–	A-1-b (0)	SM
YA-PNB-4	2.5-5	Bulk	–	–	10	49	41	43	18	25	–	–	–	–	–	–	A-7-6 (5)	SC
YA-PNB-4	2	CA	6.7	129.3	27	50	23	36	16	20	–	–	–	–	0.8	–	A-2-6 (0)	SC
YA-PNB-5	2.7-5	Bulk	–	–	3	33	64	37	16	21	–	–	–	–	–	–	A-6 (11)	CL
YA-PNB-5	5	CA	18.7	105.2	0	52	48	37	18	19	–	–	–	–	0.8	–	A-6 (5)	SC
YA-PNB-5	10	CA	17.8	106.4	–	–	–	–	–	–	7.0	0.008	754	0.0021	–	–	–	–
YA-PNB-6	2.2-5	Bulk	–	–	9	50	41	36	17	19	10.1	0.044	1721	0.0081	–	30	A-6 (3)	SC
YA-PNB-6	2	CA	8.6	125.1	15	58	27	41	16	25	–	–	–	–	–	–	A-2-7 (0)	SC
YA-PNB-7	2.7-5	Bulk	–	–	8	57	35	39	17	22	–	–	–	–	–	–	A-6 (2)	SC
YA-PNB-7	2.2	CA	6.2	134.4	26	53	21	27	16	11	–	–	–	–	–	–	A-2-6 (0)	SC
YA-PNB-8	2.3-5	Bulk	–	–	10	48	42	36	14	22	–	–	–	–	–	–	A-6 (5)	SC

YEH & ASSOCIATES, INC

Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-PNB-8	2	CA	15.8	113.0	5	30	65	39	17	22	–	–	–	–	0.7	–	A-6 (12)	CL
YA-PNB-9/ YA-BC-4	2.1-5	Bulk	–	–	14	46	40	37	17	20	–	–	–	–	–	–	A-6 (3)	SC
YA-PNB-10	2.2	CA	6.1	132.1	28	49	23	27	16	11	–	–	–	–	–	–	A-2-6 (0)	SC
YA-PNB-11	3.3-5	Bulk	–	–	9	51	40	38	16	22	–	–	–	–	–	–	A-6 (4)	SC
YA-PNB-11	5	CA	19.6	105.2	0	30	70	36	15	21	–	–	–	–	0.0	–	A-6 (12)	CL
YA-PNB-12	2.1-5	Bulk	–	–	10	42	48	44	18	26	9.3	0.038	1107	0.0208	–	16	A-7-6 (8)	SC
YA-PNB-12	2	CA	4.7	116.1	36	52	12	NV	NP	NP	–	–	–	–	–	–	A-1-a (0)	SP-SM
YA-PNB-13	2.3-5	Bulk	–	–	16	52	32	42	18	24	–	–	–	–	–	–	A-2-7 (2)	SC
YA-PNB-13	2	CA	22.2	124.2	31	67	2	NV	NP	NP				–	–	–	A-1-b (0)	SM
YA-PNB-14	2.2-5	Bulk	–	–	10	51	39	36	13	23	–	–	–	–	–	–	A-6 (4)	SC
YA-PNB-14	2	CA	8.7	123.7	21	44	35	41	17	24	–	–	–	–	–	–	A-2-7 (3)	SC
YA-PNB-15	2.1-5	Bulk	–	–	6	49	45	36	16	20	–	–	–	–	–	–	A-6 (5)	SC
YA-PNB-15	2	CA	4.2	134.9	39	46	15	NV	NP	NP	–	–	–	–	–	–	A-1-a (0)	SM
YA-PNB-15	6	CA	18.9	104.8	1	28	71	34	16	18	–	–	–	–	0.3	–	A-6 (11)	CL
YA-PNB-16	2.2-5	Bulk	–	–	6	48	46	38	18	20	–	–	–	–	–	–	A-6 (5)	SC
YA-PNB-16	2	CA	4.4	–	37	52	11	NV	NP	NP	–	–	–	–	–	–	A-1-a (0)	SW-SM

YEH & ASSOCIATES, INC

Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-PSB-1	3-5	Bulk	–	–	0	25	75	40	15	25	8.7	0.024	941	0.0119	–	15	A-6 (17)	CL
YA-PSB-1	3	CA	18.4	115.5	0	26	74	41	18	23	–	–	–	–	1.4	–	A-7-6 (16)	CL
YA-PSB-2	2.7-5	Bulk	–	–	4	38	58	38	17	21	–	–	–	–	–	–	A-6 (9)	CL
YA-PSB-2	2	CA	18.2	112.2	0	15	85	44	16	28	–	–	–	–	1.5	–	A-7-6 (23)	CL
YA-PSB-3	3-5	Bulk	–	–	1	28	71	38	17	21	–	–	–	–	–	–	A-6 (13)	CL
YA-PSB-3	3	CA	17.2	110.9	1	24	75	39	17	22	–	–	–	–	–	–	A-6 (15)	CL
YA-PSB-4	2.5-5	Bulk	–	–	5	47	48	37	17	20	–	–	–	–	–	–	A-6 (6)	SC
YA-PSB-4	2.3	CA	17.5	103.9	0	43	57	48	20	28	–	–	–	–	–	–	A-7-6 (13)	CL
YA-PSB-4	5	CA	11.8	123.0	0	46	54	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	SM
YA-PSB-5	2.5-5	Bulk	–	–	1	22	77	48	21	27	8.2	0.024	726	0.0202	–	12	A-7-6 (21)	CL
YA-PSB-5	3	CA	25.3	101.8	0	17	83	59	21	38	–	–	–	–	–	–	A-7-6 (33)	CH
YA-PSB-6	2.3-5	Bulk	–	–	6	60	34	44	17	27	–	–	–	–	–	–	A-2-7 (3)	SC
YA-PSB-6	2	CA	16.8	110.8	6	17	77	44	16	28	–	–	–	–	1.8	–	A-7-6 (20)	CL
YA-PSB-7	2.8-5	Bulk	–	–	4	23	73	29	18	11	–	–	–	–	–	–	A-6 (6)	CL
YA-PSB-7	3	CA	22.6	100.7	0	13	87	43	19	24	–	–	–	–	–	–	A-7-6 (21)	CL
YA-PSB-8	2.4-5	Bulk	–	–	7	52	41	40	19	21	–	–	–	–	–	–	A-6 (4)	SC

YEH & ASSOCIATES, INC

Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-PSB-8	2.1	CA	17.6	113.8	0	12	88	44	17	27	–	–	–	–	–	–	A-7-6 (24)	CL
YA-PSB-9	2-5	Bulk	–	–	2	20	78	44	18	26	–	–	–	–	–	–	A-7-6 (19)	CL
YA-PSB-9	2	CA	18.2	110.5	0	14	86	48	18	30	–	–	–	–	1.5	–	A-7-6 (26)	CL
YA-PSB-9	5	CA	20.8	105.9	0	54	46	NV	NP	NP	–	–	–	–	–	–	A-4 (0)	SM
YA-PSB-10	2.3-5	Bulk	–	–	7	38	55	45	18	27	10.4	0.039	1567	0.0168	–	14	A-7-6 (11)	CL
YA-PSB-10	2	CA	14.3	114.2	14	20	66	49	17	32	–	–	–	–	0.9	–	A-7-6 (19)	CL
YA-PSB-11	2.8-5	Bulk	–	–	2	29	69	56	17	39	–	–	–	–	–		A-7-6 (25)	CH
YA-PSB-11	3	CA	17.7	112.3	0	34	66	39	16	23	–	–	–	–	–	–	A-6 (13)	CL
YA-PSB-12	2-5	Bulk	–	–	11	48	41	47	20	27	–	–	–	–	–	–	A-7-6 (6)	SC
YA-PSB-12	2	CA	22.0	107.2	0	21	79	36	15	21	–	–	–	–	–	–	A-6 (13)	CL
YA-PSB-12	5	CA	14.5	106.2	7	31	62	41	15	26	–	–	–	–	–	–	A-7-6 (13)	CL
YA-PSB-13	2.5-5	Bulk	–	–	1	27	72	38	17	21	–	–	–	–	–	–	A-6 (13)	CL
YA-PSB-13	2.5	CA	19.6	108.9	0	18	82	43	18	25	–	–	–	–	–	–	A-7-6 (20)	CL
YA-PSB-13	5	CA	22.1	102.7	0	35	65	36	19	17	–	–	–	–	0.0	–	A-6 (9)	CL
YA-PSB-14	2.7-5	Bulk	–	–	7	37	56	43	18	25	–	–	–	–	–	–	A-7-6 (11)	CL
YA-PSB-14	2.2	CA	23.6	99.1	0	16	84	40	21	19	–	–	–	–	0.1	–	A-6 (16)	CL

YEH & ASSOCIATES, INC

Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

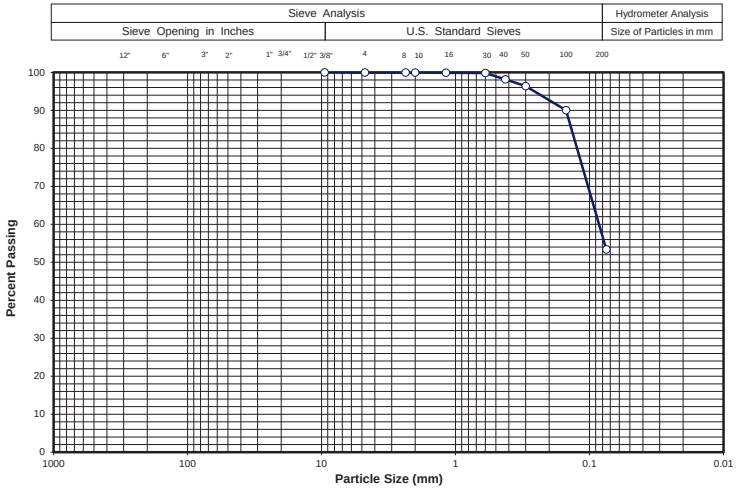
Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-PSB-15	2.4-5	Bulk	–	–	4	56	40	34	18	16	–	–	–	–	–	–	A-6 (2)	SC
YA-PSB-15	2.4	CA	20.8	104.4	0	30	70	43	17	26	–	–	–	–	–	–	A-7-6 (16)	CL
YA-PSB-16	2.1-5	Bulk	–	–	5	60	35	42	18	24	–	–	–	–	–	–	A-7-6 (3)	SC
YA-PSB-16	2.2	CA	17.1	115.2	0	16	84	43	14	29	–	–	–	–	0.9	–	A-7-6 (16)	CL
YA-PC-1	1-5	Bulk	–	–	1	41	58	37	15	22	–	–	–	–	–	–	A-6 (9)	CL
YA-PC-1	2	CA	13.9	115.9	22	35	43	35	20	15	–	–	–	–	0.4	–	A-6 (3)	SC
YA-PC-2	0.5-5	Bulk	–	–	1	47	52	38	14	24	8.0	0.069	533	0.0152	–	23	A-6 (3)	CL
YA-PC-2	2	CA	13.7	117.8	0	64	36	39	18	21	–	–	–	–	1.3	–	A-6 (3)	SC (Bedrock)
YA-PC-2	5	CA	16.6	112.9	0	65	35	NV	NP	NP	–	–	–	–	–	–	A-2-4 (0)	SM (Bedrock)
YA-PR-1	0.5-5	Bulk	–	–	6	52	42	38	18	20	7.9	0.007	954	0.0325	–	29	A-6 (4)	SC
YA-PR-1	2	CA	4.4	114.2	34	49	17	NV	NP	NP	–	–	–	–	–	–	A-1-b (0)	SM
YA-PR-1	2	CA	13.6	–	16	69	15	NV	NP	NP	–	–	–	–	–	–	A-1-b (0)	SM
YA-PR-2	0.7-5	Bulk	–	–	4	30	66	31	15	16	–	–	–	–	–	–	A-6 (8)	CL
YA-PR-2	2	CA	5.3	120.4	23	67	10	NV	NP	NP	–	–	–	–	–	–	A-1-b (0)	SP-SM (Bedrock)
YA-PR-2	5	CA	14.4	114.2	0	65	35	NV	NP	NP	–	–	–	–	–	–	A-2-4 (0)	SM
YA-PR-3	0.4-5	Bulk	–	–	16	68	16	34	16	18	–	–	–	–	–	–	A-2-6 (0)	SC

YEH & ASSOCIATES, INC

Summary of Laboratory Test Results

Project No: 215-043 Project Name: I-25 Crossroad Bridge Replacement Date: 5/25/2015

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate %	Resistivity ohm.cm	Water Soluble Chloride %	% Swell (+) / Consoli-dation (-)	R-Value	CLASSIFICATION	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI							AASHTO	USCS
YA-PR-3	2	CA	4.1	–	39	54	7	NV	NP	NP	–	–	–	–	–	–	A-1-a (0)	SW-SM
YA-PR-3	2	CA	6.2	128.2	63	35	2	NV	NP	NP	–	–	–	–	–	–	A-1-a (0)	GW
YA-PR-3	5	CA	16.2	112.3	0	65	35	33	22	11	–	–	–	–	–	–	A-2-6 (0)	SC (Bedrock)
YA-PR-4	0.5-5	Bulk	–	–	24	61	15	34	16	18	8.1	0.007	1504	0.0153	–	46	A-2-6 (0)	SC
YA-PR-4	2	CA	5.8	–	33	57	10	NV	NP	NP	–	–	–	–	–	–	A-1-b (0)	SW-SM
YA-PR-4	5	CA	17.1	110.7	0	22	78	45	17	28	–	–	–	–	–	–	A-7-6 (21)	CL



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	100
#10	100
#40	98
#200	53

Gravel (%)	0	LL	41	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	47	PL	20	Sample ID:	YA-BC-1
Fines (%)	53	PI	21	Sample Depth (ft.):	5

Sample Description: **A-7-6 (7) / CL**

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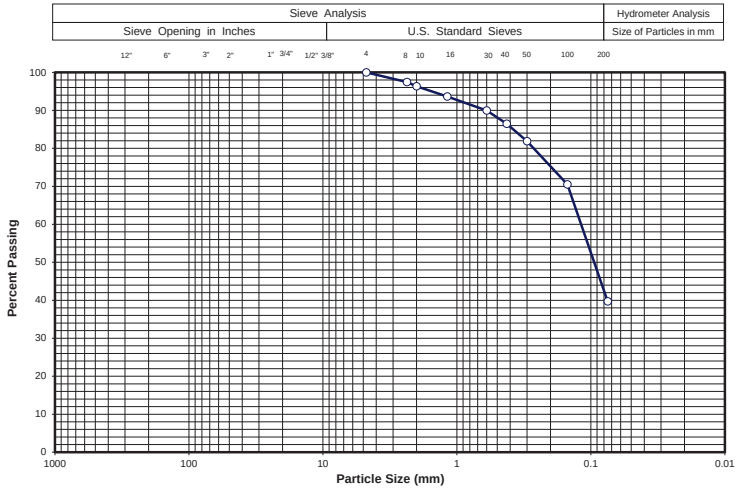
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/16/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	96
#40	86
#200	40

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	60	PL	NP	Sample ID:	YA-BC-1
Fines (%)	40	PI	NP	Sample Depth (ft.):	19

Sample Description: **A-4 (0) / SM**

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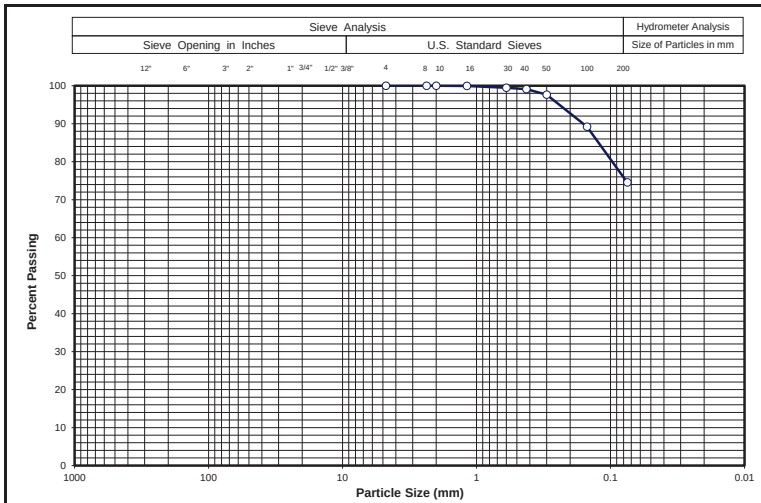
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/16/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	75

Gravel (%)	0	LL	43	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	25	PL	20	Sample ID:	YA-BC-2
Fines (%)	75	PI	23	Sample Depth (ft.):	5

Sample Description: **A-7-6 (16) / CL**

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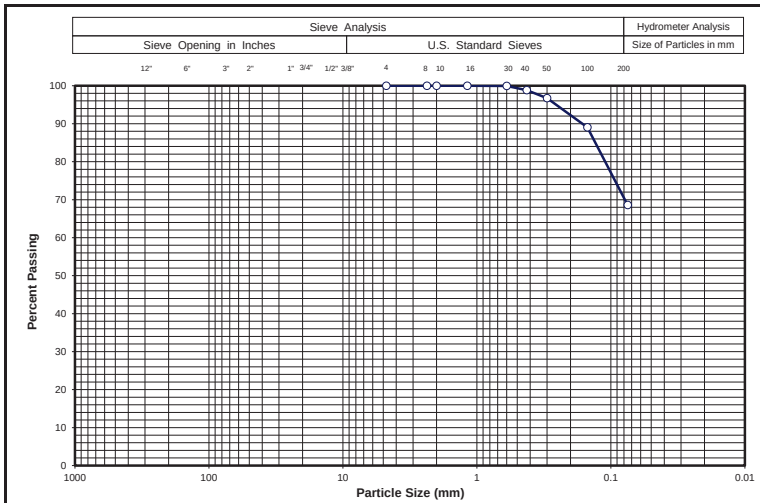
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Masoud		
Date:	07/13/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	69

Gravel (%)	0	LL	37	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	31	PL	20	Sample ID:	YA-BC-2
Fines (%)	69	PI	17	Sample Depth (ft.):	25

Sample Description: **A-6 (10) / CL**

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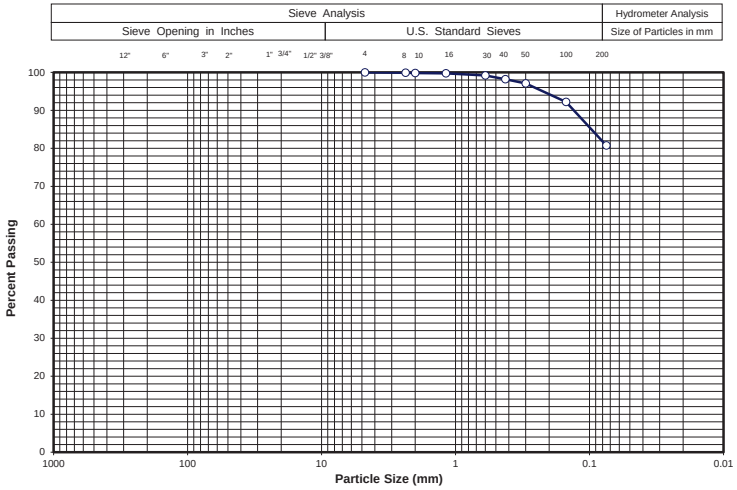
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Masoud		
Date:	07/13/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	98
#200	81

Gravel (%)	0	LL	39	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	19	PL	20	Sample ID:	YA-BC-2
Fines (%)	81	PI	19	Sample Depth (ft.):	40

Sample Description: **A-6 (15) / CL**

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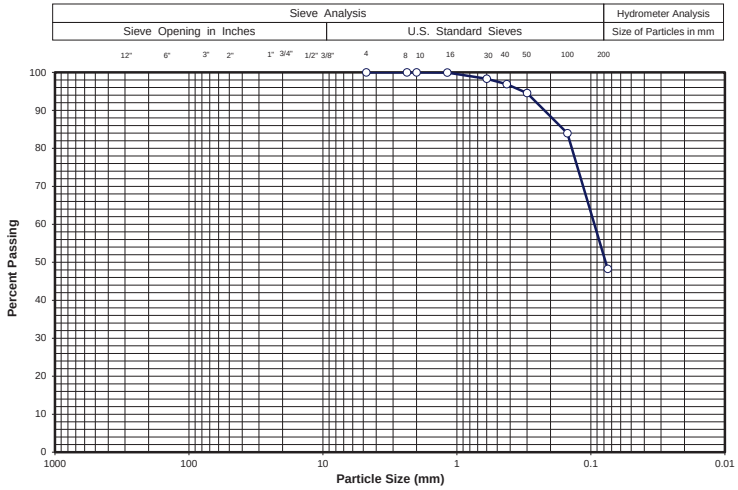
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	07/13/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	97
#200	48

Gravel (%)	0	LL	43	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	52	PL	22	Sample ID:	YA-BC-3
Fines (%)	48	PI	21	Sample Depth (ft.):	5

Sample Description: **A-7-6 (6) / SC**

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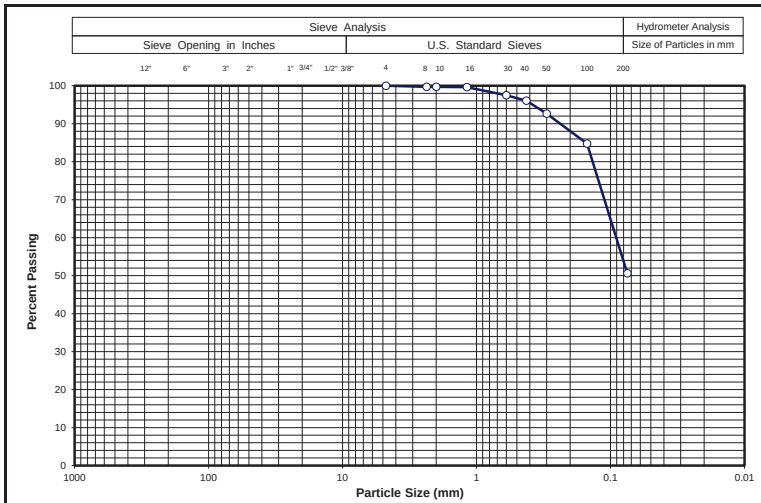
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/16/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	96
#200	51

Gravel (%)	0	LL	38	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	49	PL	22	Sample ID:	YA-BC-3
Fines (%)	51	PI	16	Sample Depth (ft.):	15

Sample Description: **A-6 (5) / CL**

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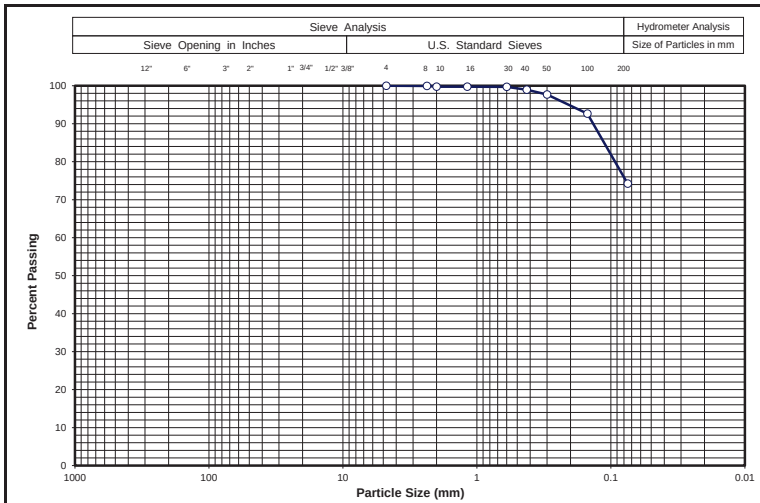
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/16/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	74

Gravel (%)	0	LL	37	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	26	PL	22	Sample ID:	YA-BC-3
Fines (%)	74	PI	15	Sample Depth (ft.):	30

Sample Description: **A-6 (10) / CL**

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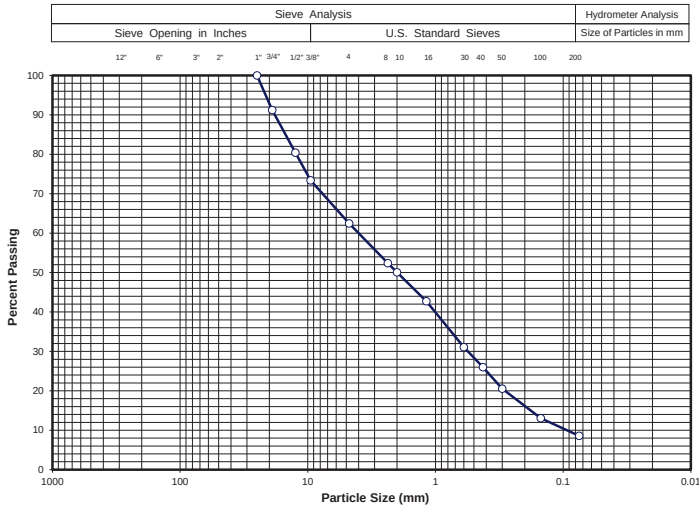
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/16/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	62
#10	50
#40	26
#200	9

Gravel (%)	38	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	54	PL	NP	Sample Id:	YA-BC-4	Depth (ft)	2
Fines (%)	9	PI	NP	Soil Class.	A-1-a (0) / SP-SM		
Sample Description:							

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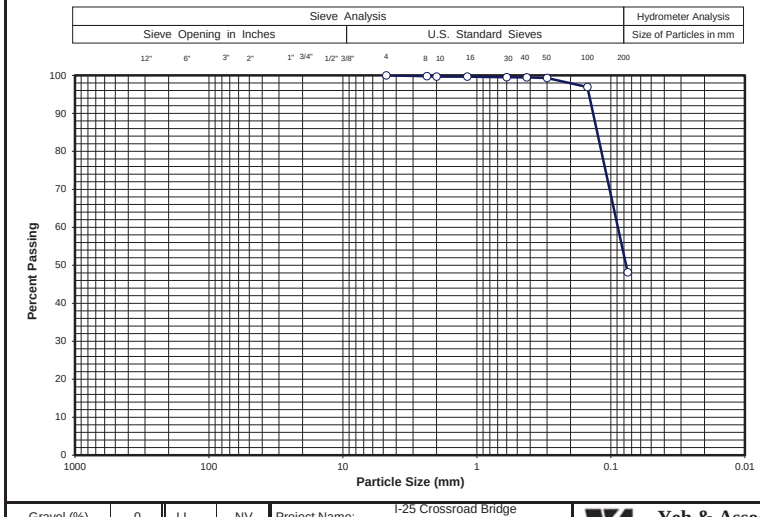
SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/19/15		

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	48

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	52	PL	NP	Sample ID:	YA-BC-4		
Fines (%)	48	PI	NP	Sample Depth (ft.):	15		
Sample Description:	**A-4 (0) / SM**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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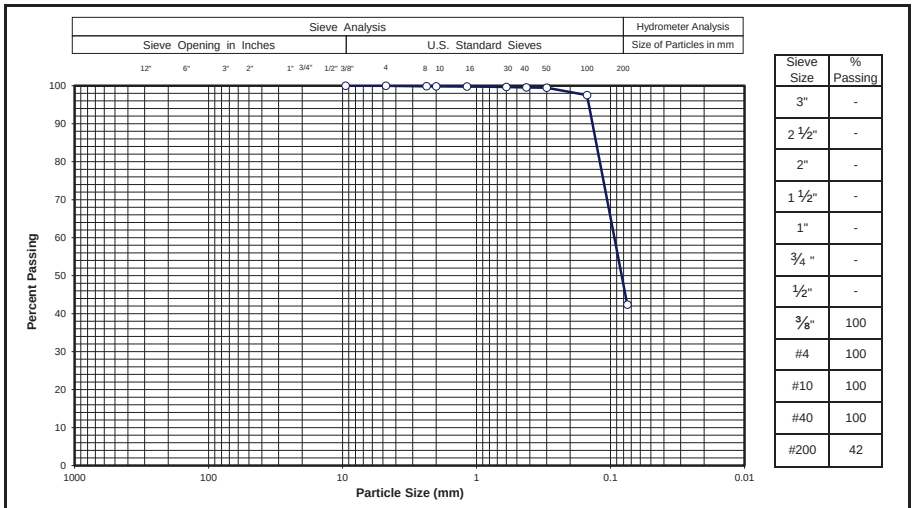

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	100
#10	100
#40	100
#200	42

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	58	PL	NP	Sample ID:	YA-BC-4		
Fines (%)	42	PI	NP	Sample Depth (ft.):	24		
Sample Description:	**A-4 (0) / SM**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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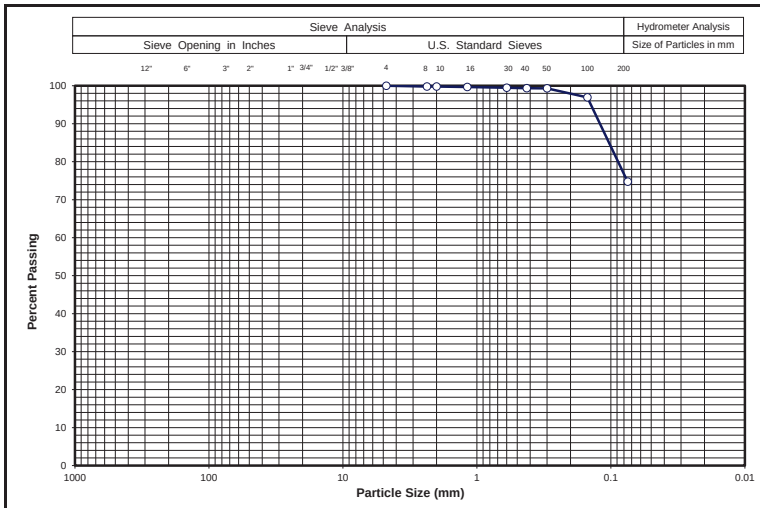

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	75

Gravel (%)	0	LL	39	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	25	PL	22	Sample ID:	YA-BC-4		
Fines (%)	75	PI	17	Sample Depth (ft.):	50		
Sample Description:	**A-6 (12) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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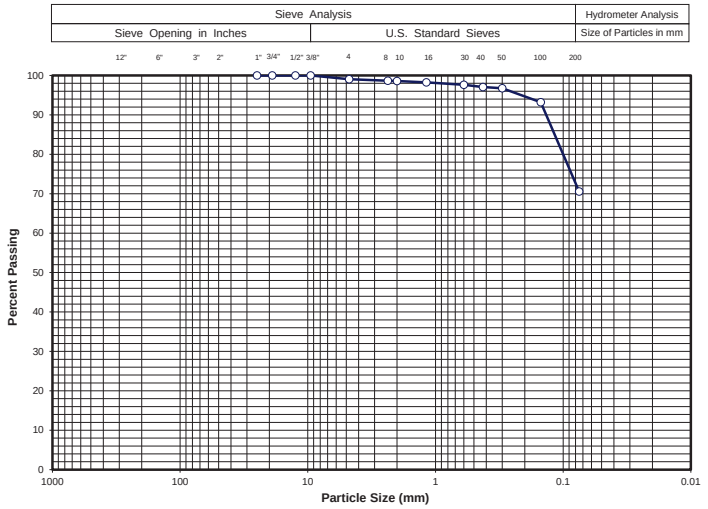

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	99
#10	99
#40	97
#200	71

Gravel (%)	1	LL	41	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	28	PL	16	Sample Id:	YA-RW-1	Depth (ft)	2
Fines (%)	71	PI	25	Soil Class.	A-7-6 (6) / CL		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
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Date:	06/19/15		

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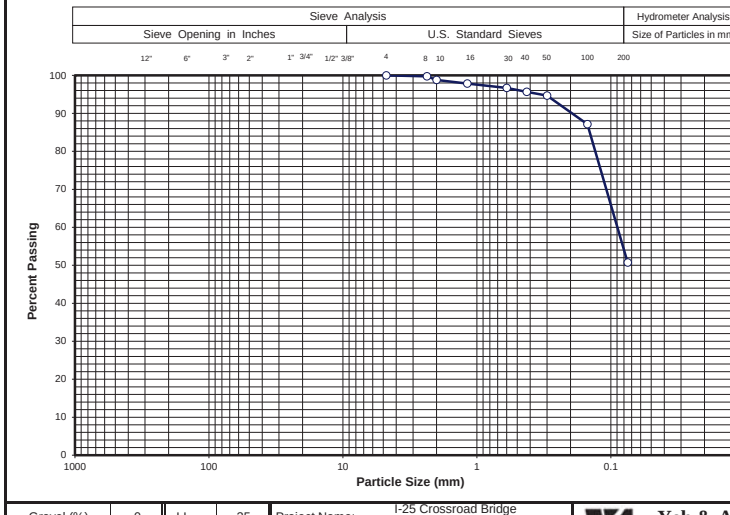

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	99
#40	96
#200	51

Gravel (%)	0	LL	35	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	49	PL	18	Sample ID:	YA-RW-1		
Fines (%)	51	PI	17	Sample Depth (ft.):	10		
Sample Description:	**A-6 (5) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/19/15		

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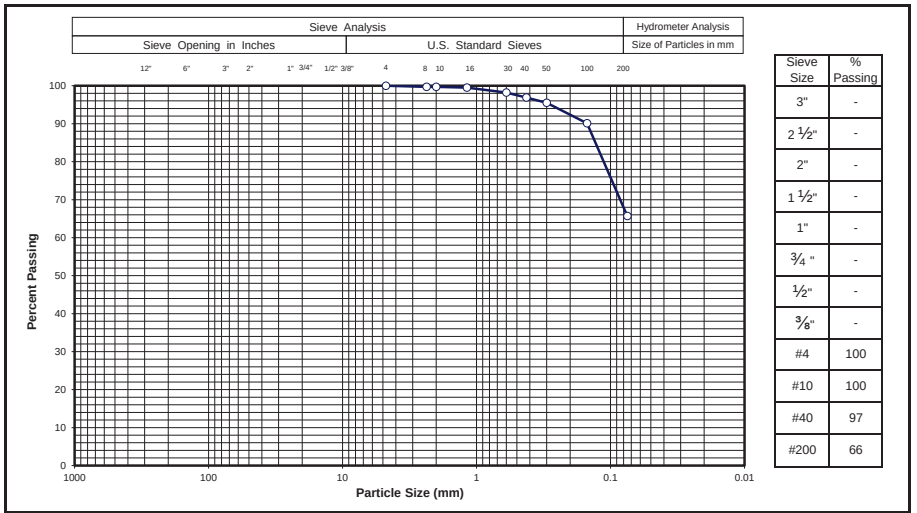

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	97
#200	66

Gravel (%)	0	LL	42	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	34	PL	19	Sample ID:	YA-RW-1		
Fines (%)	66	PI	23	Sample Depth (ft.):	20		
Sample Description:	**A-7-6 (13) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/19/15		

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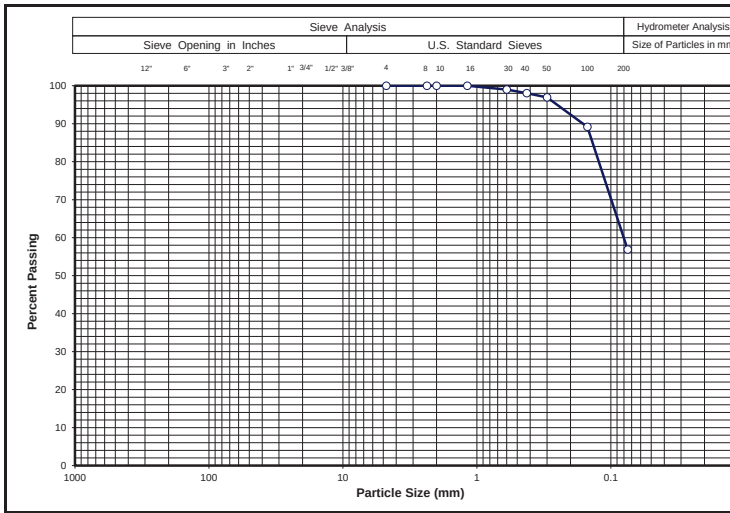

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	98
#200	57

Gravel (%)	0	LL	32	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	43	PL	20	Sample ID:	YA-RW-1		
Fines (%)	57	PI	12	Sample Depth (ft.):	30		
Sample Description:	**A-6 (4) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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Date:	06/19/15		

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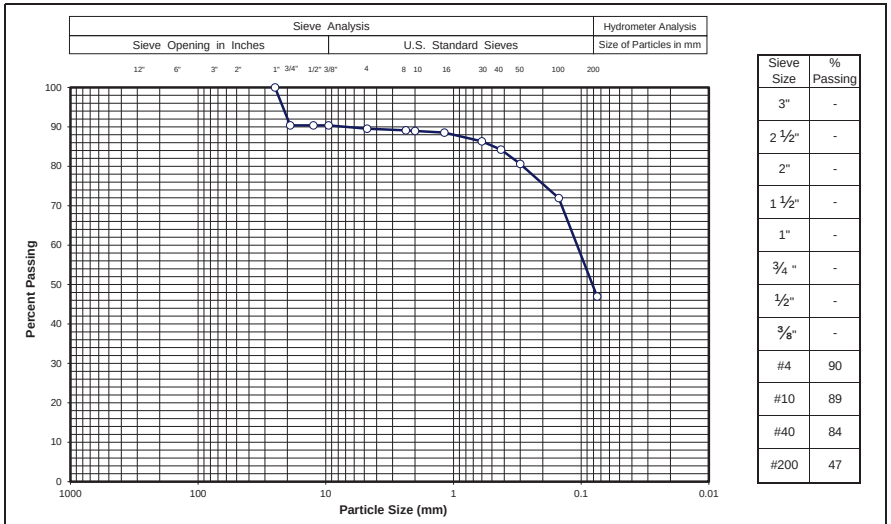

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	90
#10	89
#40	84
#200	47

Gravel (%)	10	LL	40	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	43	PL	18	Sample Id:	YA-RW-2	Depth (ft)	2
Fines (%)	47	PI	22	Soil Class.	A-6 (6) / SC		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/19/15		

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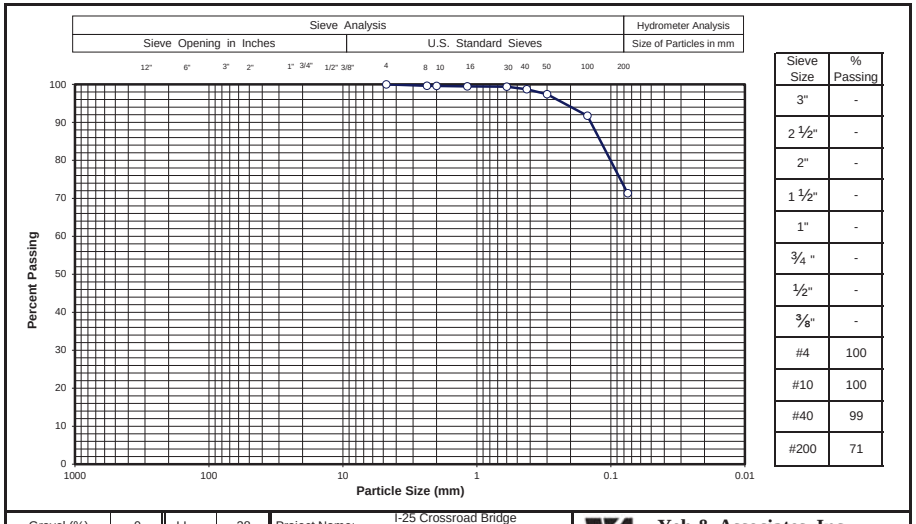

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	71

Gravel (%)	0	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	29	PL	18	Sample ID:	YA-RW-2		
Fines (%)	71	PI	20	Sample Depth (ft.):	15		
Sample Description:	**A-6 (12) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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Date:	06/16/15		

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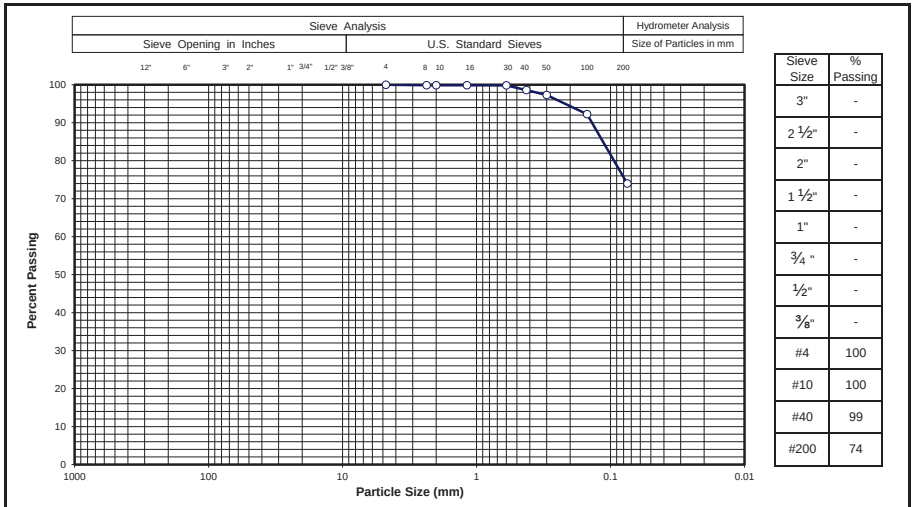

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	74

Gravel (%)	0	LL	42	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	26	PL	16	Sample ID:	YA-RW-2		
Fines (%)	74	PI	26	Sample Depth (ft.):	25		
Sample Description:	**A-7-6 (18) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/16/15		

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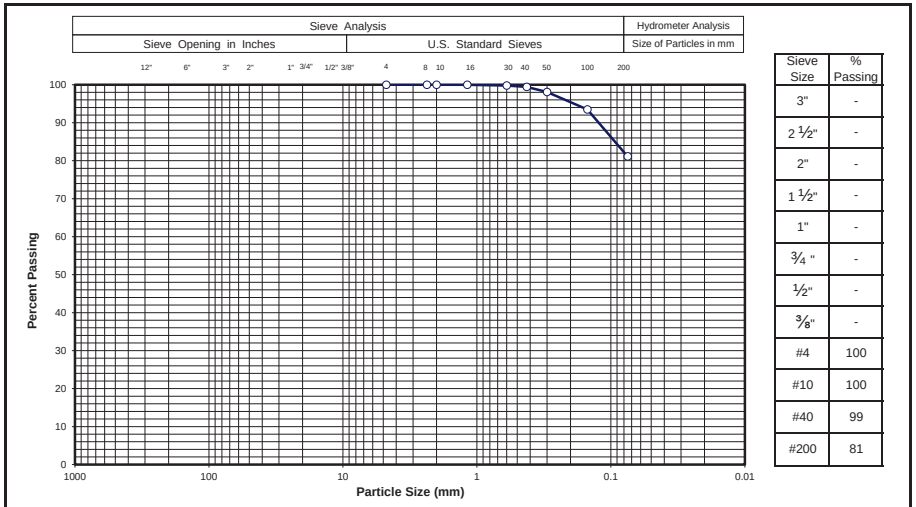

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	81

Gravel (%)	0	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	19	PL	18	Sample ID:	YA-RW-2		
Fines (%)	81	PI	20	Sample Depth (ft.):	35		
Sample Description:	**A-6 (15) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/16/15		

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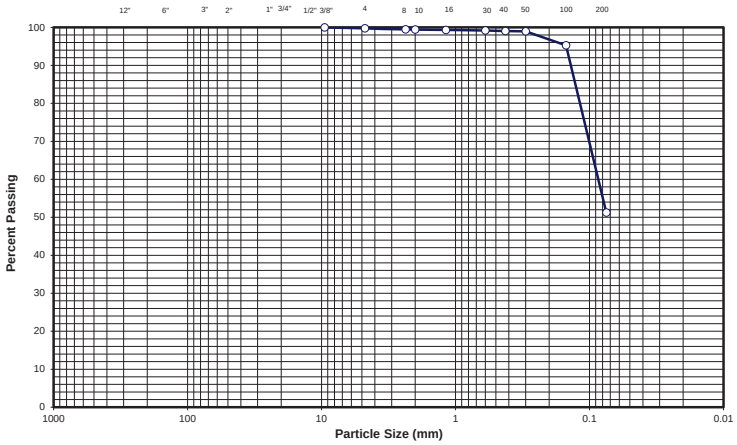
Sieve Analysis | Hydrometer Analysis

Sieve Opening in Inches | U.S. Standard Sieves | Size of Particles in mm



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	100
#10	99
#40	99
#200	51

Gravel (%)	0	LL	40	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	49	PL	20	Sample ID:	YA-RW-3
Fines (%)	51	PI	20	Sample Depth (ft.):	10

Sample Description: **A-6 (7) / CL**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/30/15	Figure No.:	-

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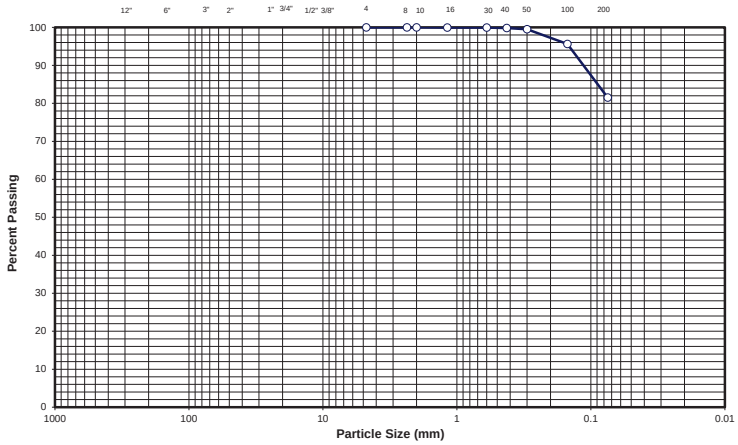
Sieve Analysis | Hydrometer Analysis

Sieve Opening in Inches | U.S. Standard Sieves | Size of Particles in mm



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	82

Gravel (%)	0	LL	55	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	18	PL	23	Sample ID:	YA-RW-3
Fines (%)	82	PI	32	Sample Depth (ft.):	20

Sample Description: **A-7-6 (28) / CH**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/30/15	Figure No.:	-

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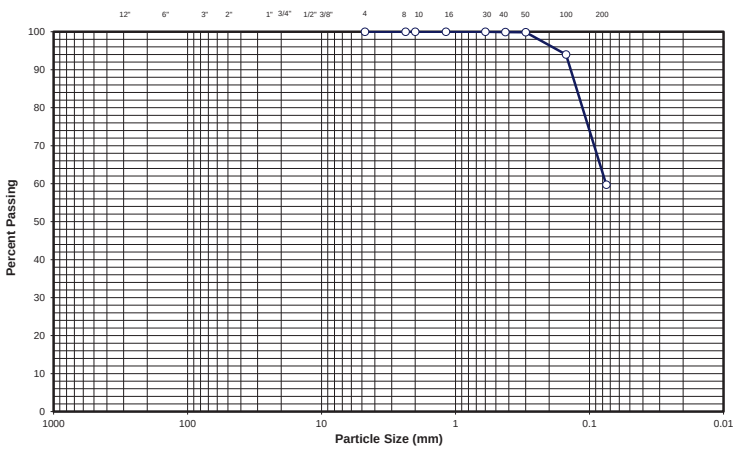
Sieve Analysis | Hydrometer Analysis

Sieve Opening in Inches | U.S. Standard Sieves | Size of Particles in mm



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	60

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	40	PL	NP	Sample ID:	YA-RW-3
Fines (%)	60	PI	NP	Sample Depth (ft.):	25

Sample Description: **A-4 (0) / ML**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/30/15	Figure No.:	-

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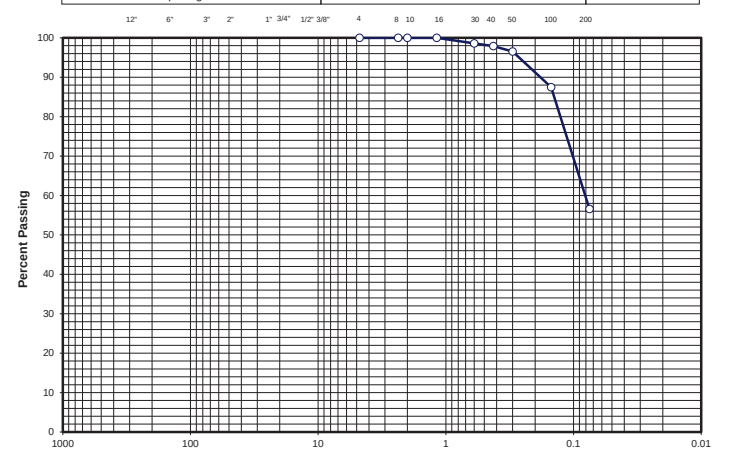
Sieve Analysis | Hydrometer Analysis

Sieve Opening in Inches | U.S. Standard Sieves | Size of Particles in mm



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	98
#200	57

Gravel (%)	0	LL	39	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	43	PL	17	Sample Id:	YA-RW-4
Fines (%)	57	PI	22	Depth (ft)	5
				Soil Class.	A-6 (16) / CL

Sample Description:

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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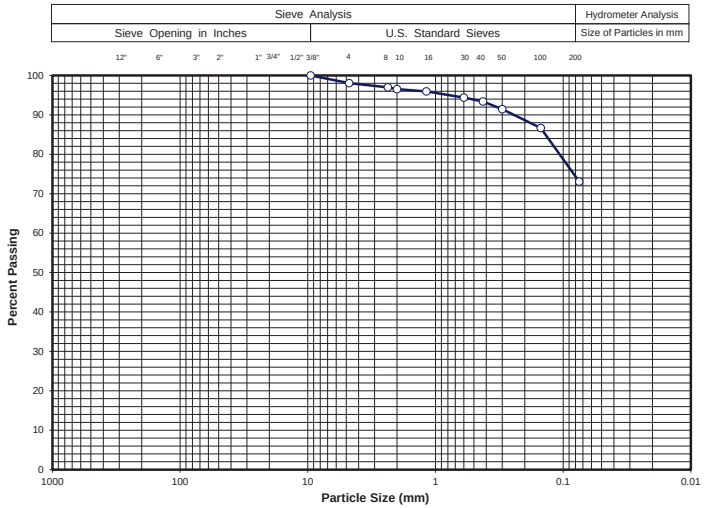

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	98
#10	97
#40	93
#200	73

Gravel (%)	2	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	25	PL	14	Sample Id:	YA-RW-5	Depth (ft)	5
Fines (%)	73	PI	24	Soil Class.	A-6 (15) / CL		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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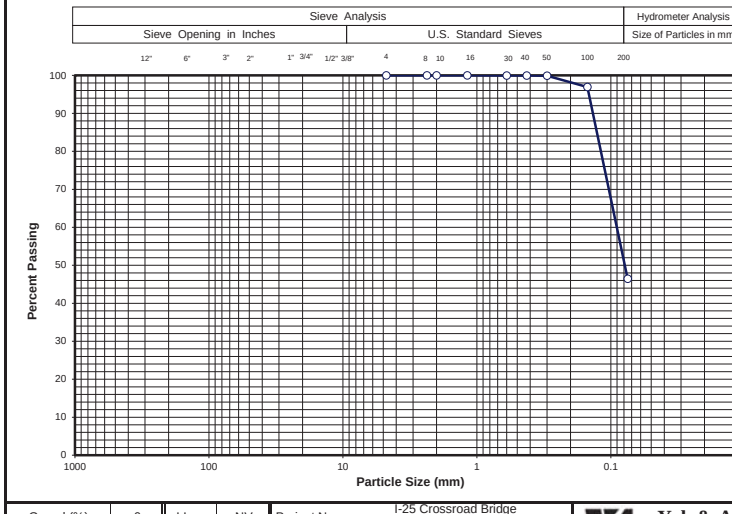

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	46

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	54	PL	NP	Sample ID:	YA-RW-5		
Fines (%)	46	PI	NP	Sample Depth (ft.):	9		
Sample Description:	**A-4 (0) / SM**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/02/15	Figure No.:	-

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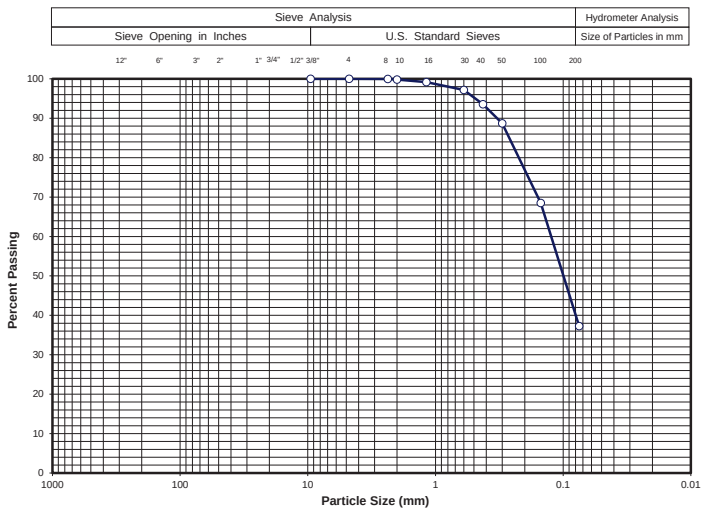

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	94
#200	37

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	63	PL	NP	Sample Id:	YA-RW-6	Depth (ft)	4
Fines (%)	37	PI	NP	Soil Class.	A-4 (15) / SM		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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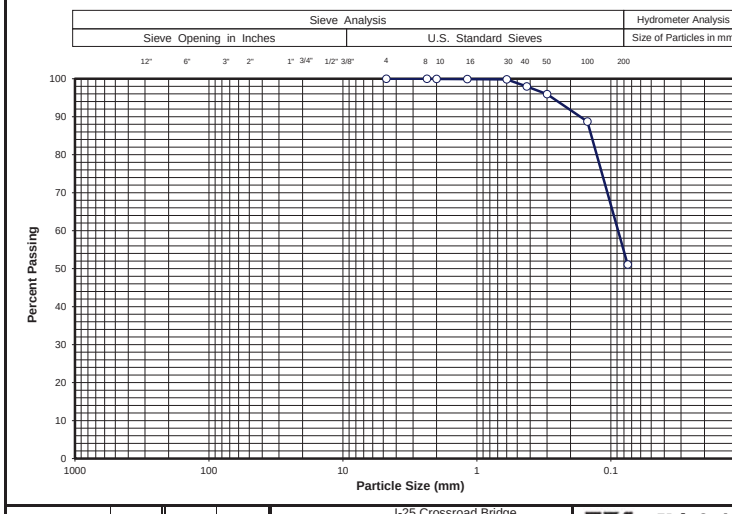

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	98
#200	51

Gravel (%)	0	LL	36	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	49	PL	18	Sample ID:	YA-RW-6		
Fines (%)	51	PI	18	Sample Depth (ft.):	15		
Sample Description:	**A-6 (6) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	07/15/15	Figure No.:	-

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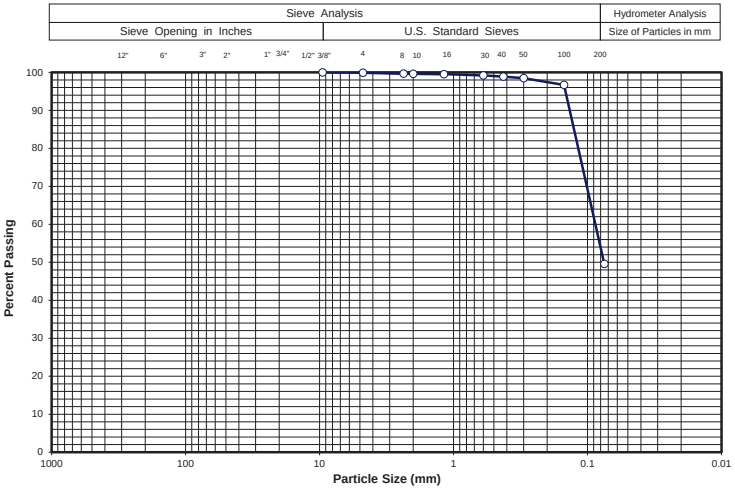

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	100
#10	100
#40	99
#200	50

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	50	PL	NP	Sample ID:	YA-RW-7
Fines (%)	50	PI	NP	Sample Depth (ft.):	9

Sample Description: **A-4 (0) / SM**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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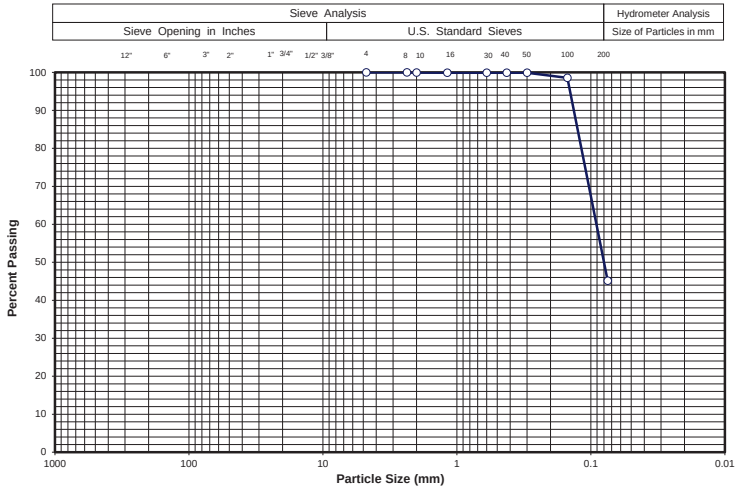

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	45

Gravel (%)	0	LL	39	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	55	PL	22	Sample ID:	YA-RW-8
Fines (%)	45	PI	17	Sample Depth (ft.):	2

Sample Description: **A-4 (0) / SM**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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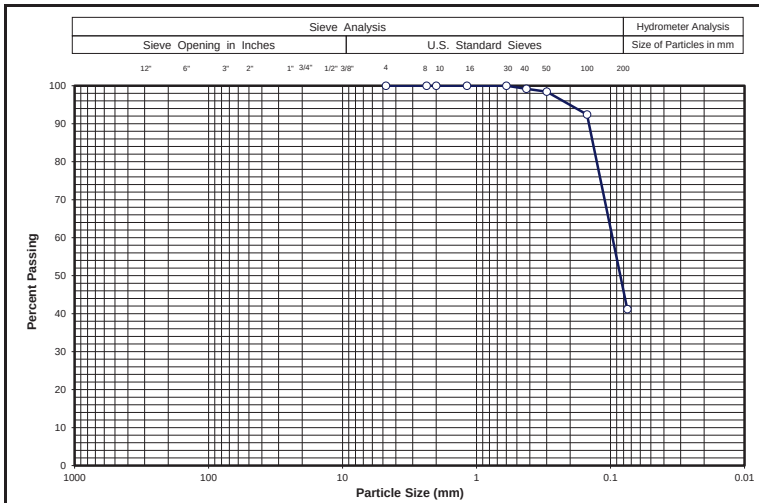

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	41

Gravel (%)	0	LL	36	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	59	PL	17	Sample ID:	YA-RW-8
Fines (%)	41	PI	19	Sample Depth (ft.):	5

Sample Description: **A-6 (3) / SC**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/16/15	Figure No.:	-

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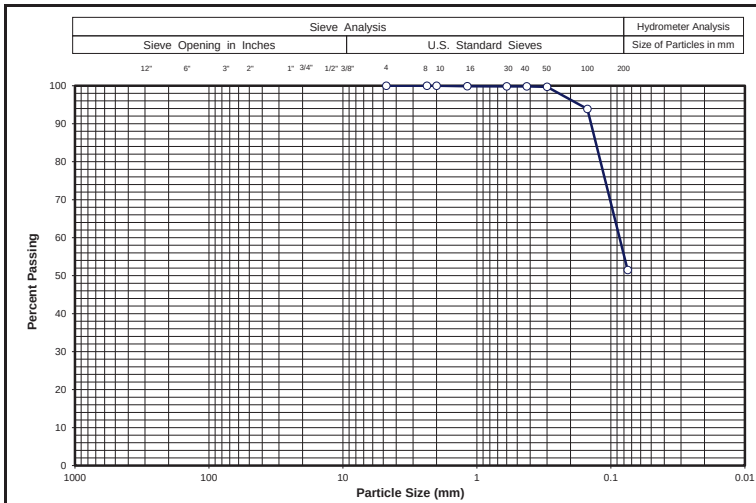

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	51

Gravel (%)	0	LL	40	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	49	PL	21	Sample ID:	YA-RW-9
Fines (%)	51	PI	19	Sample Depth (ft.):	2

Sample Description: **A-4 (0) / SM**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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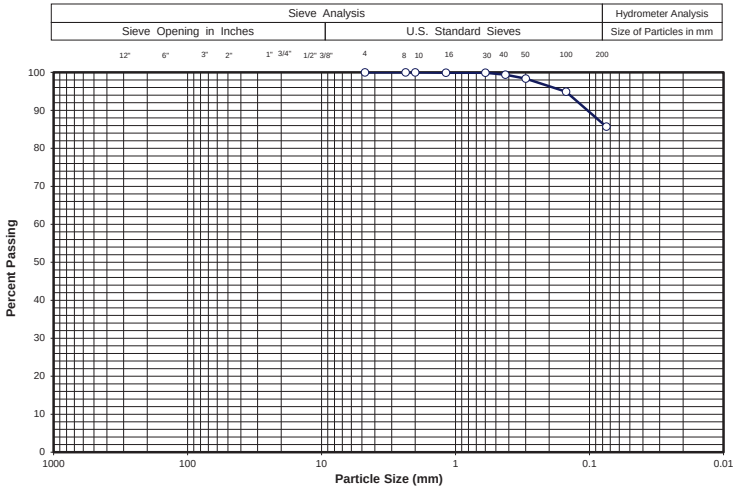

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	86

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	14	PL	NP	Sample ID:	YA-RW-9
Fines (%)	86	PI	NP	Sample Depth (ft.):	5

Sample Description: **A-4 (0) / ML**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
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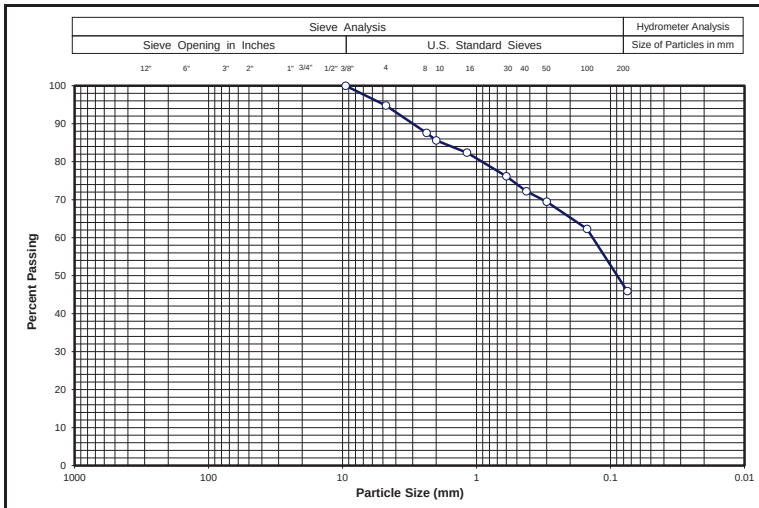

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	95
#4	86
#10	72
#40	46
#200	46

Gravel (%)	5	LL	39	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	49	PL	18	Sample ID:	YA-RW-10
Fines (%)	46	PI	21	Sample Depth (ft.):	3

Sample Description: **A-6 (6) / SC**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/16/15	Figure No.:	-

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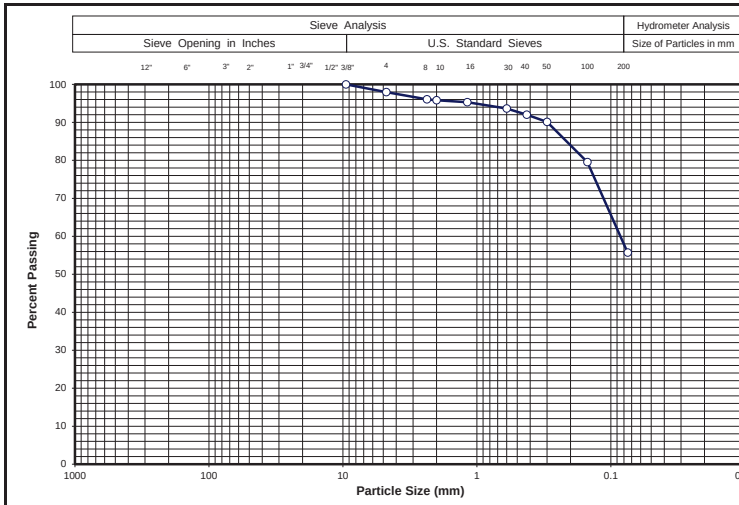

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	98
#10	96
#40	92
#200	56

Gravel (%)	2	LL	40	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	42	PL	20	Sample ID:	YA-RW-9
Fines (%)	56	PI	20	Sample Depth (ft.):	14

Sample Description: **A-6 (8) / CL**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/16/15	Figure No.:	-

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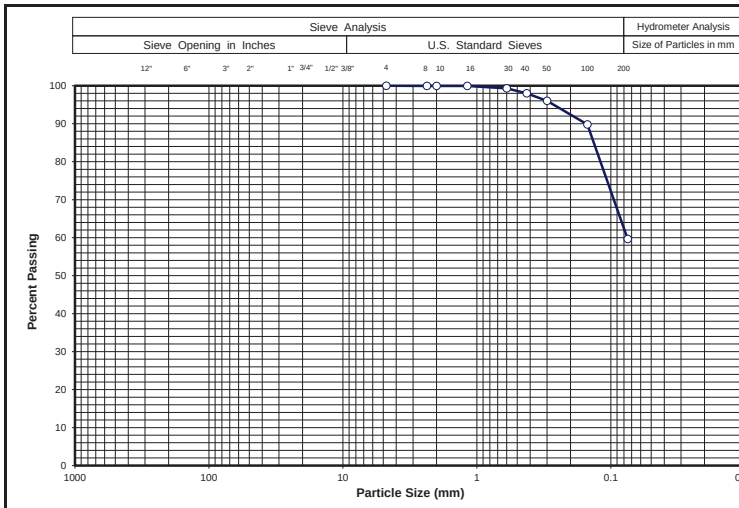

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	98
#200	60

Gravel (%)	0	LL	39	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	40	PL	20	Sample ID:	YA-RW-10
Fines (%)	60	PI	19	Sample Depth (ft.):	6

Sample Description: **A-6 (9) / CL**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/16/15	Figure No.:	-

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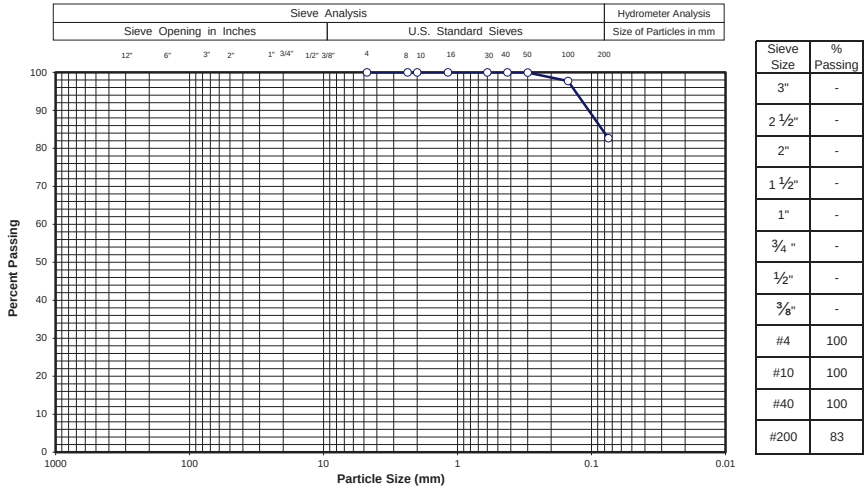

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	83

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	17	PL	NP	Sample ID:	YA-RW-10
Fines (%)	83	PI	NP	Sample Depth (ft.):	19
Sample Description:	**A-4 (0) / ML**				

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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Date:	05/25/15	Figure No.:	-

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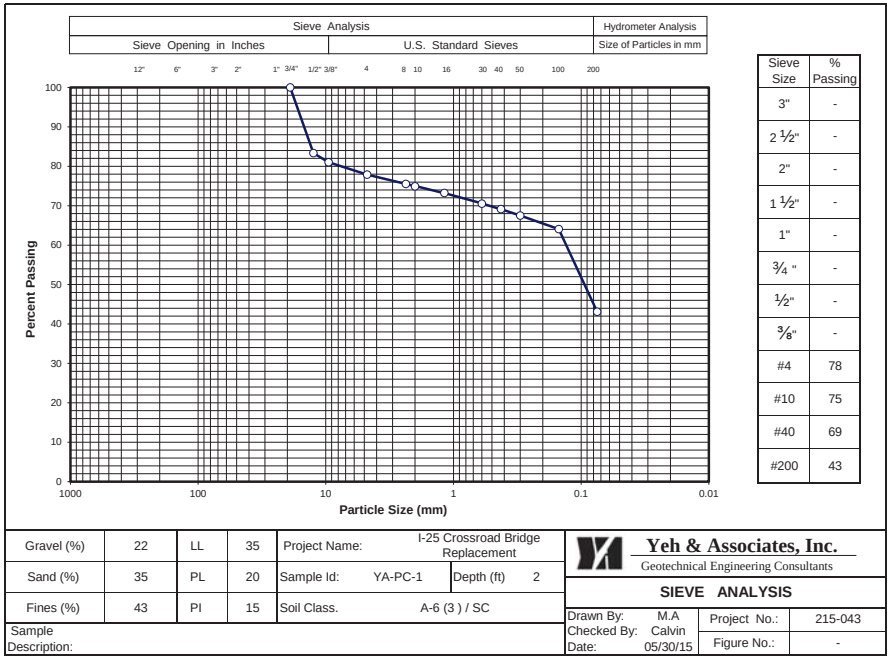

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	78
#10	75
#40	69
#200	43

Gravel (%)	22	LL	35	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	35	PL	20	Sample Id:	YA-PC-1	Depth (ft)	2
Fines (%)	43	PI	15	Soil Class.	A-6 (3) / SC		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
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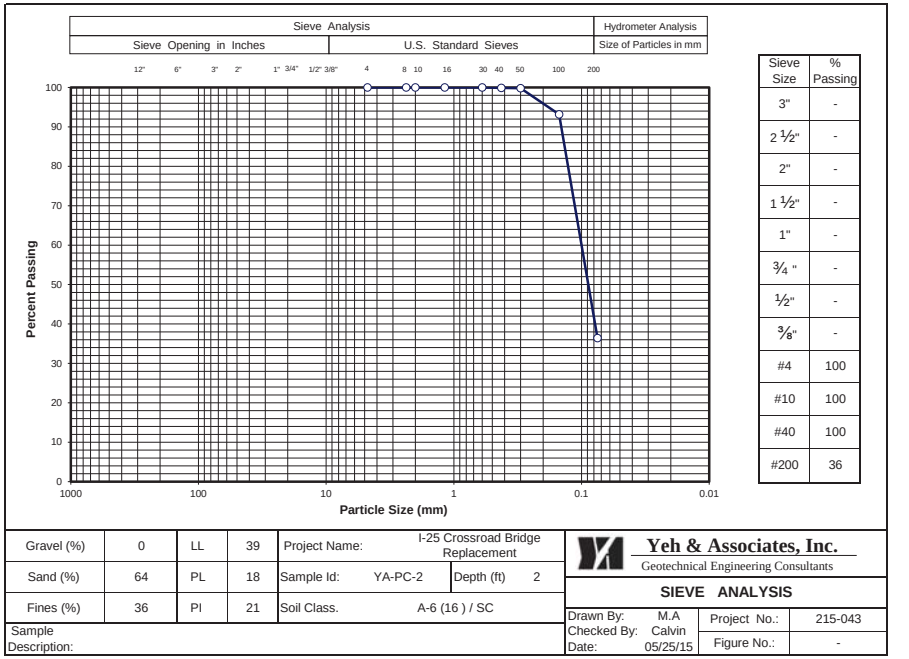

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	36

Gravel (%)	0	LL	39	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	64	PL	18	Sample Id:	YA-PC-2	Depth (ft)	2
Fines (%)	36	PI	21	Soil Class.	A-6 (16) / SC		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
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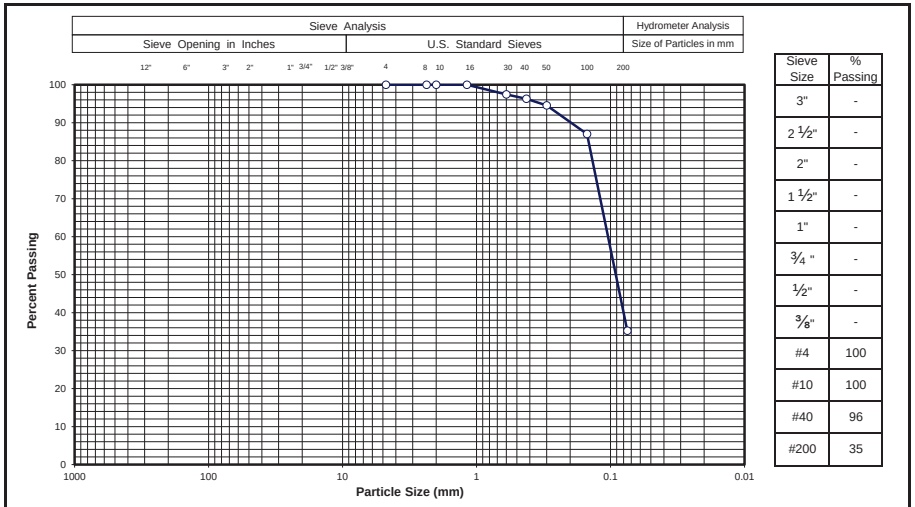

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	96
#200	35

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	65	PL	NP	Sample ID:	YA-PC-2		
Fines (%)	35	PI	NP	Sample Depth (ft.):	5		
Sample Description:	**A-2-4 (0) / SM**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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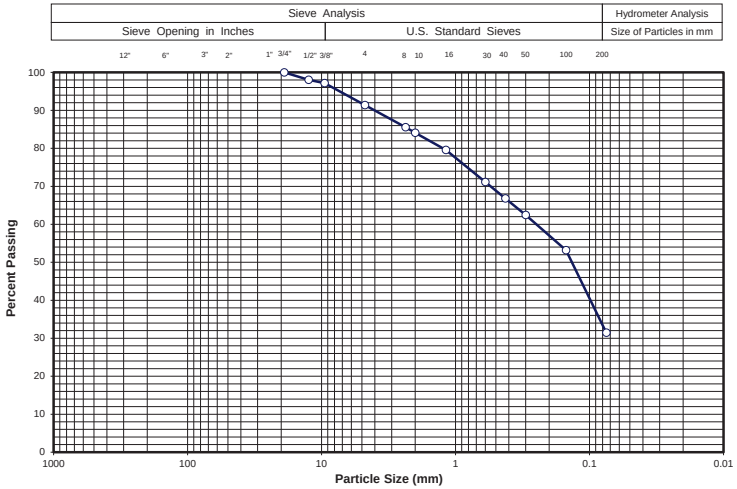

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	98
⅜"	97
#4	91
#10	84
#40	67
#200	31

Gravel (%)	9	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	60	PL	19	Sample ID:	YA-PNB-1		
Fines (%)	31	PI	19	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-2-6 (1) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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Date:	06/07/15		

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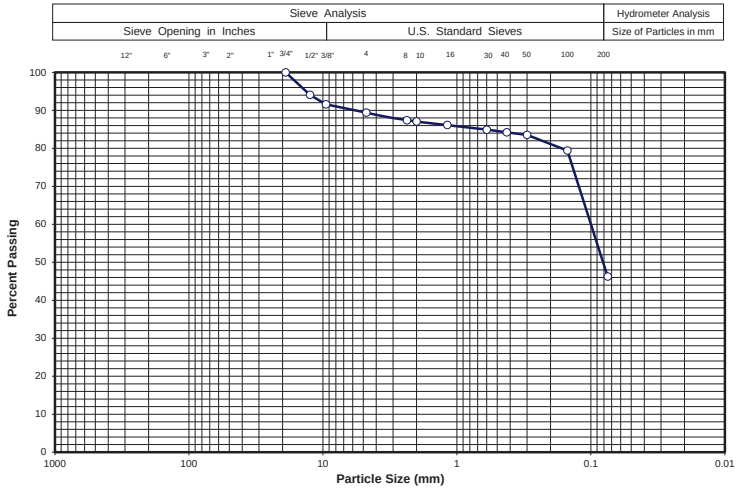

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	94
⅜"	92
#4	89
#10	87
#40	84
#200	46

Gravel (%)	11	LL	35	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	43	PL	20	Sample ID:	YA-PNB-1		
Fines (%)	46	PI	15	Sample Depth (ft.):	2		
Sample Description:	**A-6 (3) / SC**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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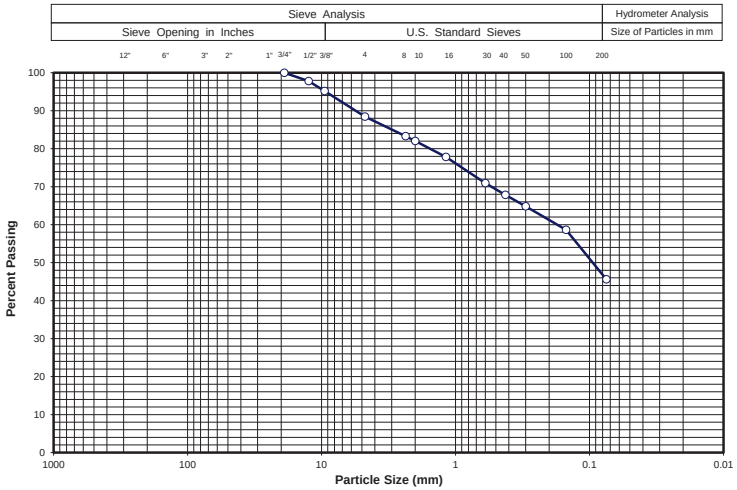

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	98
⅜"	95
#4	88
#10	82
#40	68
#200	46

Gravel (%)	12	LL	37	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	42	PL	16	Sample ID:	YA-PNB-2		
Fines (%)	46	PI	21	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (5) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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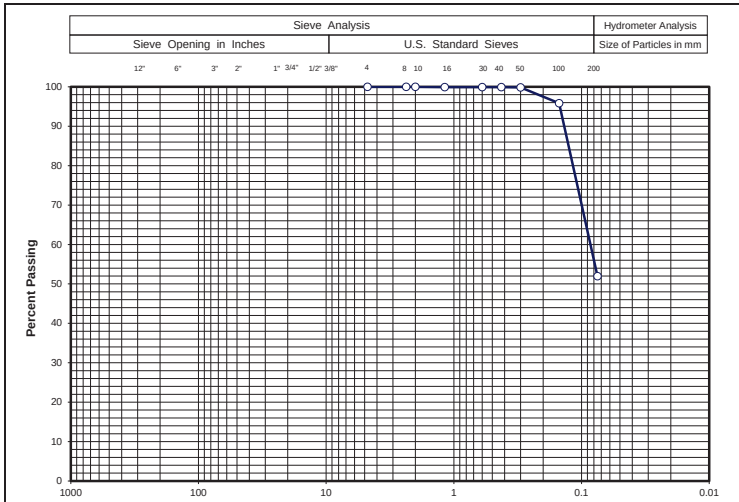

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	52

Gravel (%)	0	LL	37	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	48	PL	22	Sample Id:	YA-PNB-2	Depth (ft)	2
Fines (%)	52	PI	15	Soil Class.	A-6 (5) / CL		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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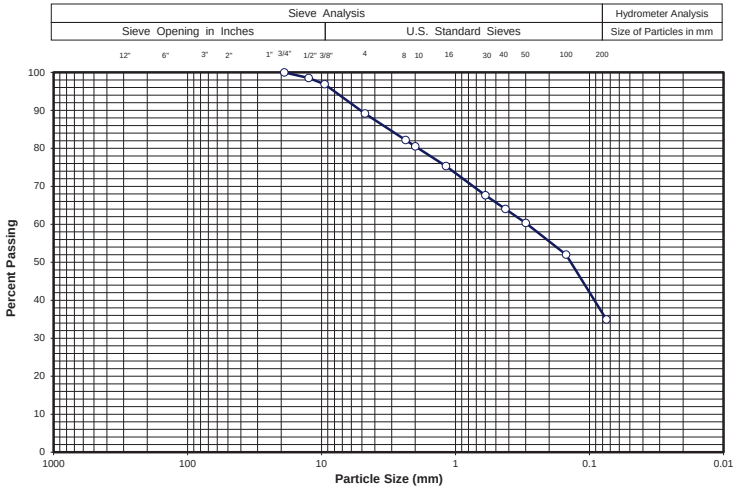

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	97
#4	89
#10	81
#40	64
#200	35

Gravel (%)	11	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	54	PL	14	Sample ID:	YA-PNB-3		
Fines (%)	35	PI	24	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-2-6 (3) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
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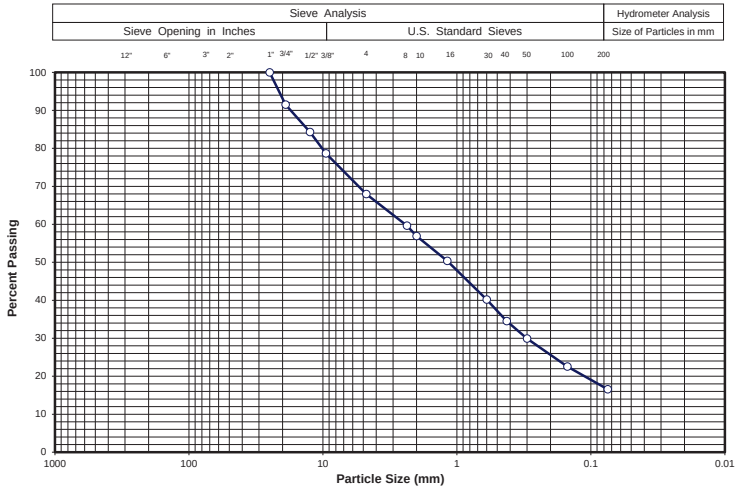

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	100
¾ "	92
½"	84
⅜"	79
#4	68
#10	57
#40	34
#200	17

Gravel (%)	32	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	51	PL	NP	Sample ID:	YA-PNB-3		
Fines (%)	17	PI	NP	Sample Depth (ft.):	2		
Sample Description:	**A-1-b (0) / SM**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/30/15		

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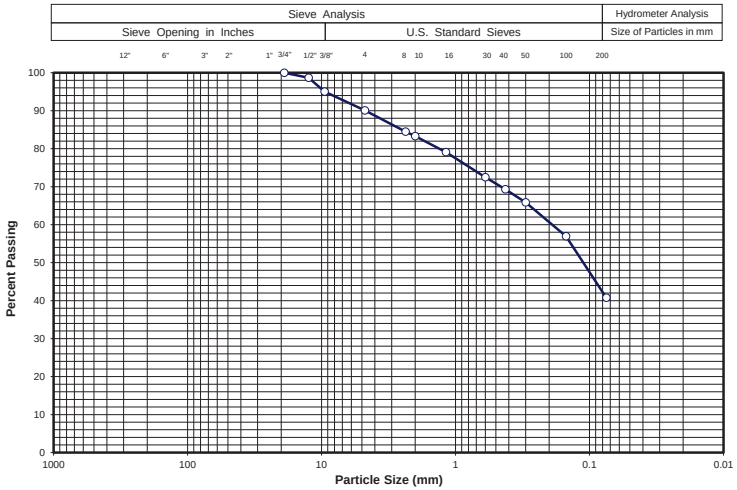

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	95
#4	90
#10	83
#40	69
#200	41

Gravel (%)	10	LL	43	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	49	PL	18	Sample ID:	YA-PNB-4		
Fines (%)	41	PI	25	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-7-6 (5) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
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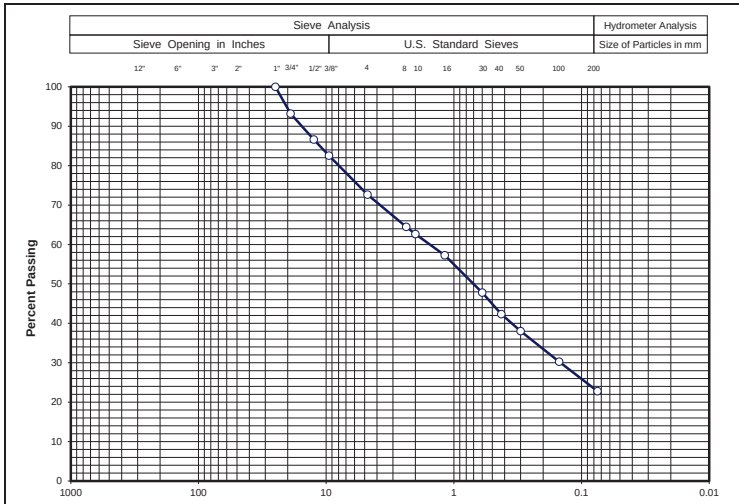

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	43
#4	73
#10	63
#40	42
#200	23

Gravel (%)	27	LL	36	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	50	PL	16	Sample Id:	YA-PNB-4	Depth (ft)	2
Fines (%)	23	PI	20	Soil Class.	A-2-6 (0) / SC		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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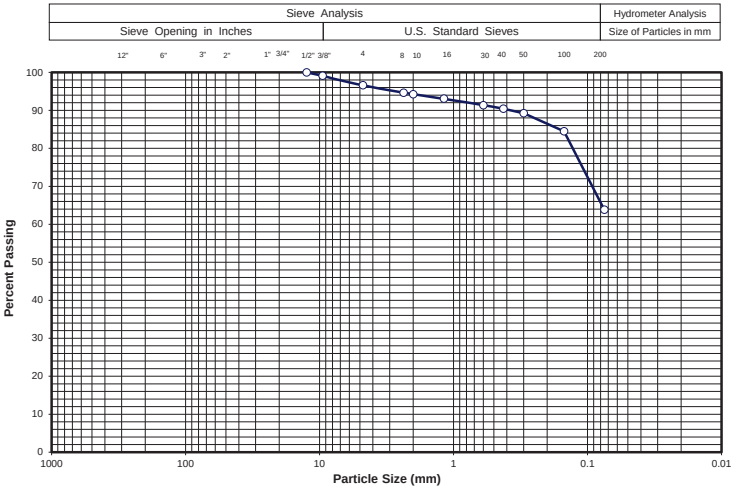

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	99
#4	97
#10	94
#40	90
#200	64

Gravel (%)	3	LL	37	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	33	PL	16	Sample ID:	YA-PNB-5		
Fines (%)	64	PI	21	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (11) / CL						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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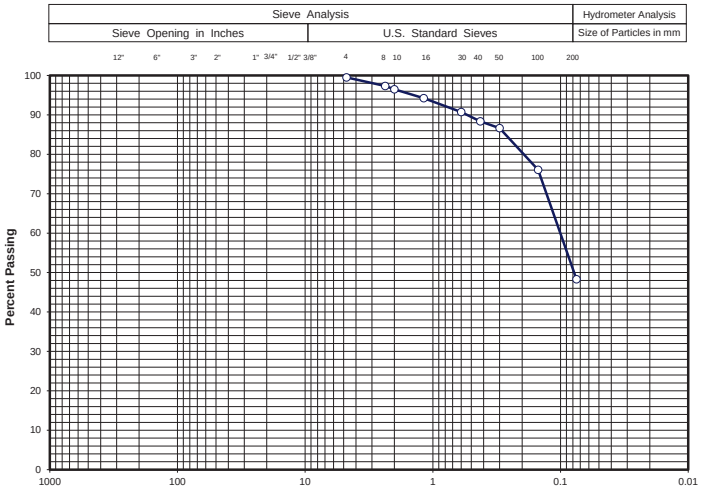

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	96
#40	88
#200	48

Gravel (%)	0	LL	37	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	51	PL	18	Sample Id:	YA-PNB-5	Depth (ft)	5
Fines (%)	48	PI	19	Soil Class.	A-6 (5) / SC		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/30/15		

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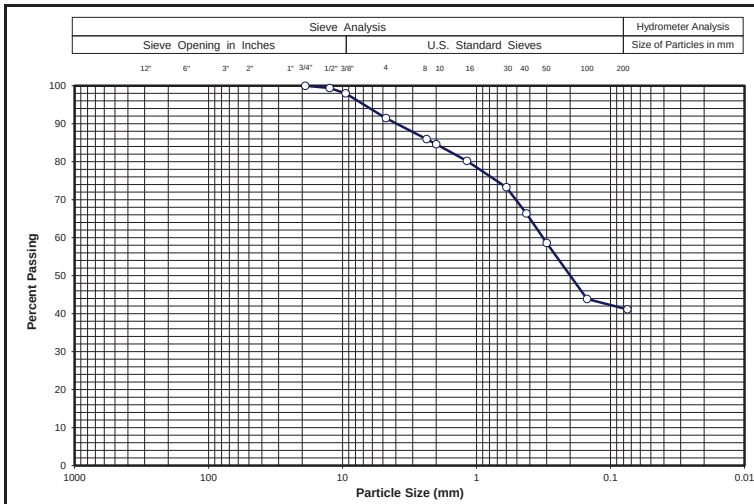

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	98
#4	91
#10	85
#40	66
#200	41

Gravel (%)	9	LL	36	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	50	PL	17	Sample ID:	YA-PNB-6		
Fines (%)	41	PI	19	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (3) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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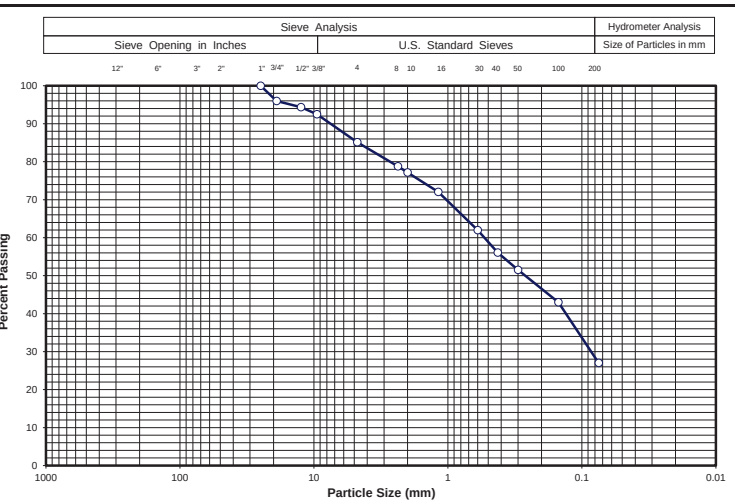

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	100
¾ "	96
½"	94
⅜"	92
#4	85
#10	77
#40	56
#200	27

Gravel (%)	15	LL	41	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	58	PL	16	Sample ID:	YA-PNB-6		
Fines (%)	27	PI	25	Sample Depth (ft.):	2		
Sample Description:	**A-2-7 (0) / SC**						

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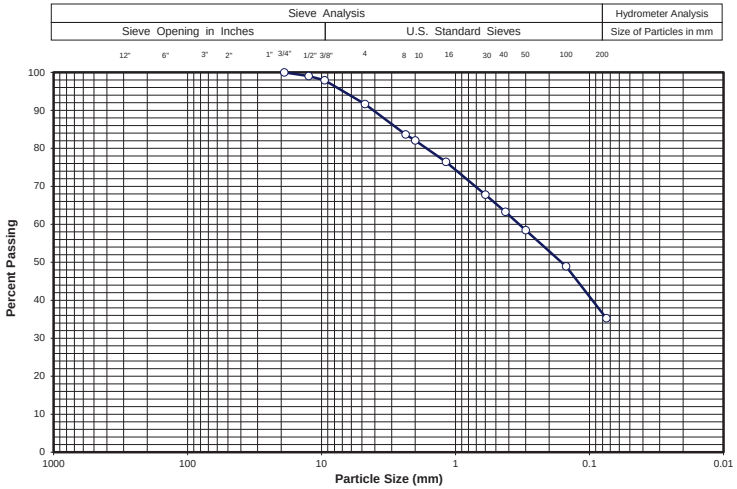
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/30/15		

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	98
#4	92
#10	82
#40	63
#200	35

Gravel (%)	8	LL	39	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	57	PL	17	Sample ID:	YA-PNB-7		
Fines (%)	35	PI	22	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (2) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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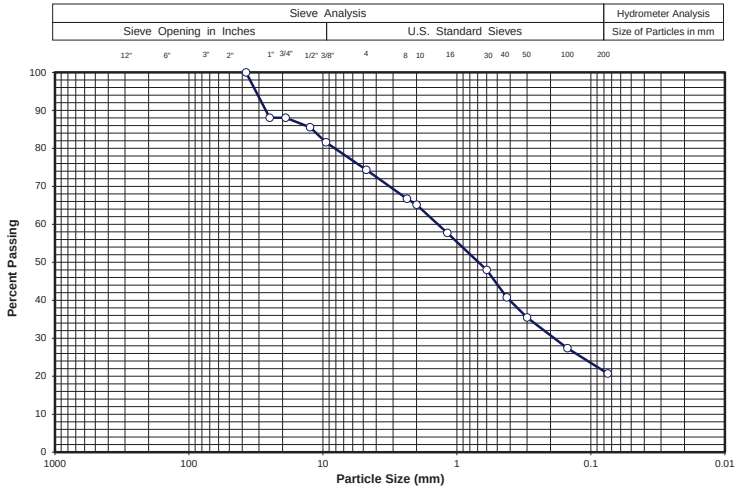

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	100
1"	88
¾ "	88
½"	86
⅜"	82
#4	74
#10	65
#40	41
#200	21

Gravel (%)	26	LL	27	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	53	PL	16	Sample ID:	YA-PNB-7		
Fines (%)	21	PI	11	Sample Depth (ft.):	2		
Sample Description:	**A-2-6 (0) / SC**						

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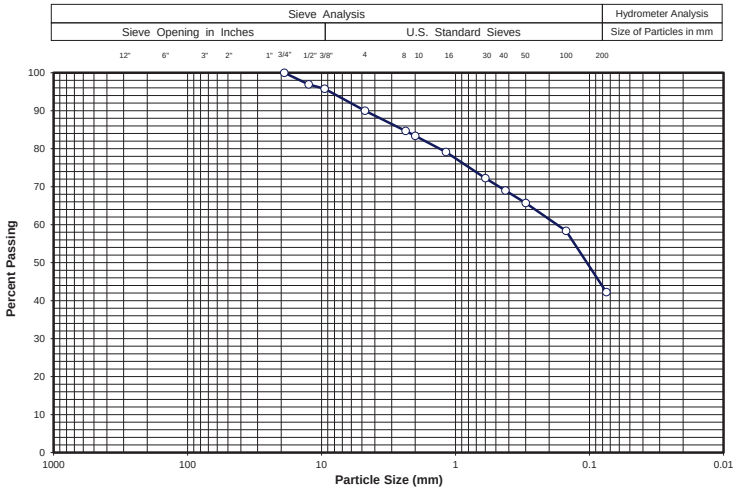
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	97
⅜"	96
#4	90
#10	83
#40	69
#200	42

Gravel (%)	10	LL	36	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	48	PL	14	Sample ID:	YA-PNB-8		
Fines (%)	42	PI	22	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (5) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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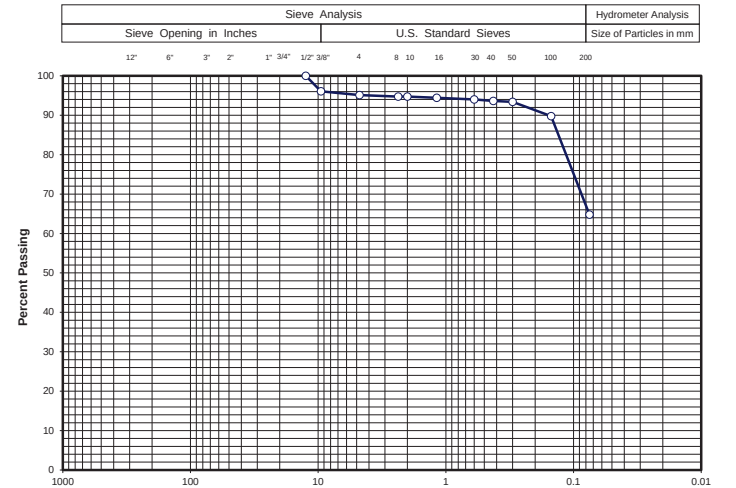

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	95
#10	95
#40	94
#200	65

Gravel (%)	5	LL	39	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	30	PL	17	Sample Id:	YA-PNB-8	Depth (ft)	2
Fines (%)	65	PI	22	Soil Class.	A-6 (12) / CL		
Sample Description:							

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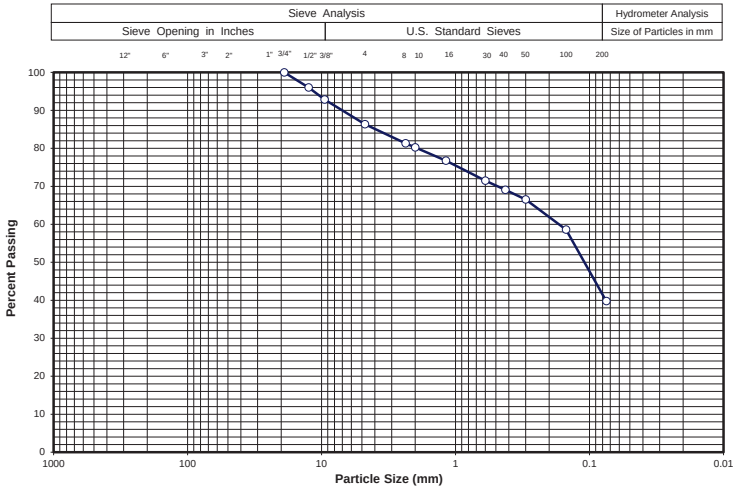
SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	96
⅜"	93
#4	86
#10	80
#40	69
#200	40

Gravel (%)	14	LL	37	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	46	PL	17	Sample ID:	YA-PNB-9		
Fines (%)	40	PI	20	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (3) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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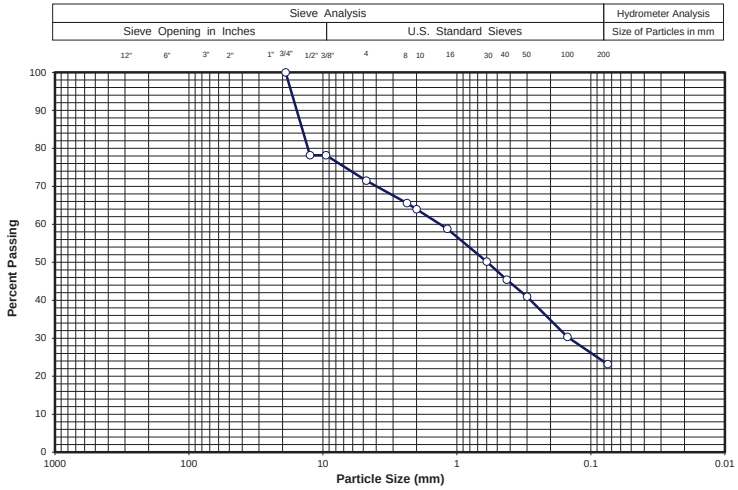

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	78
⅜"	78
#4	72
#10	64
#40	45
#200	23

Gravel (%)	28	LL	27	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	49	PL	16	Sample ID:	YA-PNB-10		
Fines (%)	23	PI	11	Sample Depth (ft.):	2		
Sample Description:	**A-2-6 (0) / SC**						

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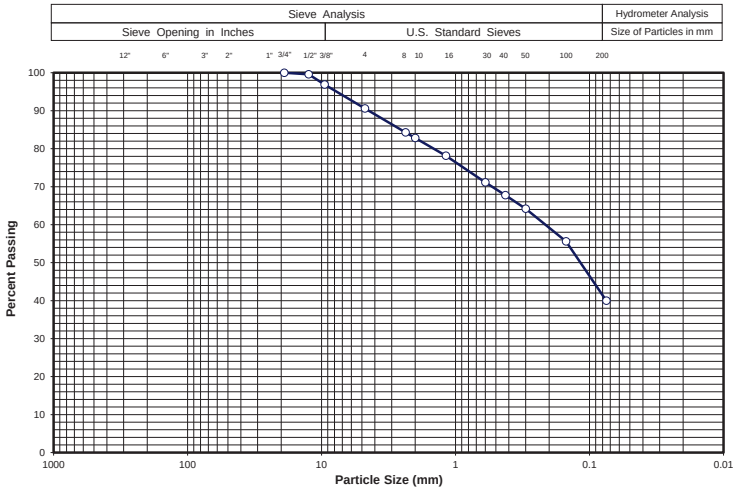
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/30/15		

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	100
⅜"	97
#4	91
#10	83
#40	68
#200	40

Gravel (%)	9	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	51	PL	16	Sample ID:	YA-PNB-11		
Fines (%)	40	PI	22	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (4) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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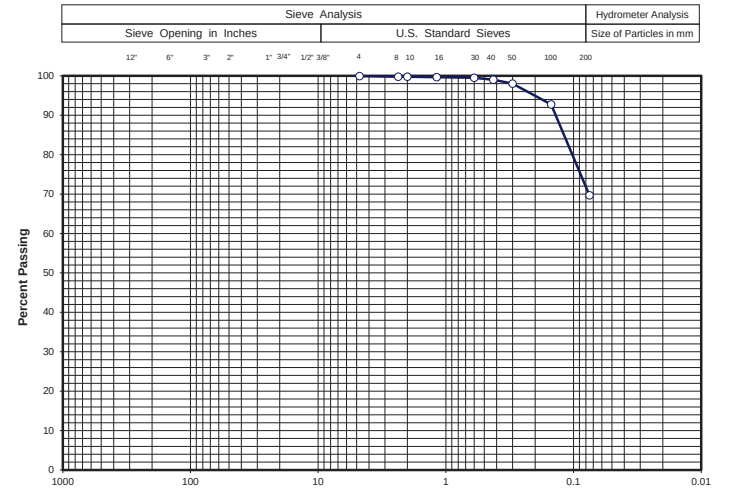

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	70

Gravel (%)	0	LL	36	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	30	PL	15	Sample Id:	YA-PNB-11	Depth (ft)	5
Fines (%)	70	PI	21	Soil Class.	A-6 (16) / CL		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
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Date:	06/19/15		

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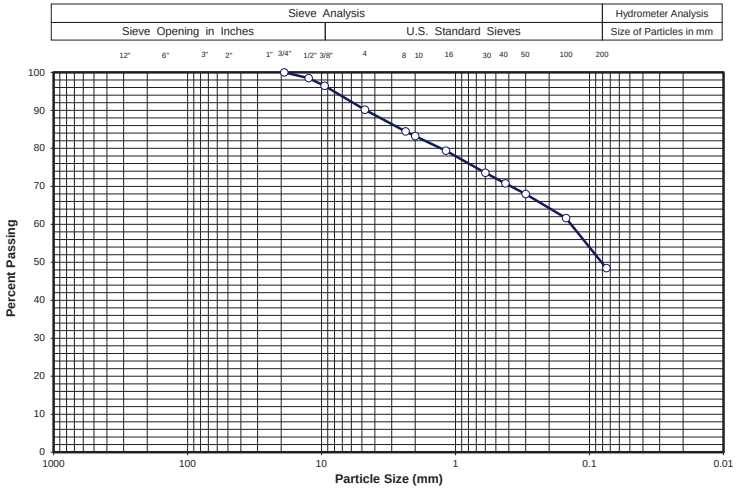

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	98
⅜"	96
#4	90
#10	83
#40	71
#200	48

Gravel (%)	10	LL	44	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	42	PL	18	Sample ID:	YA-PNB-12		
Fines (%)	48	PI	26	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-7-6 (8) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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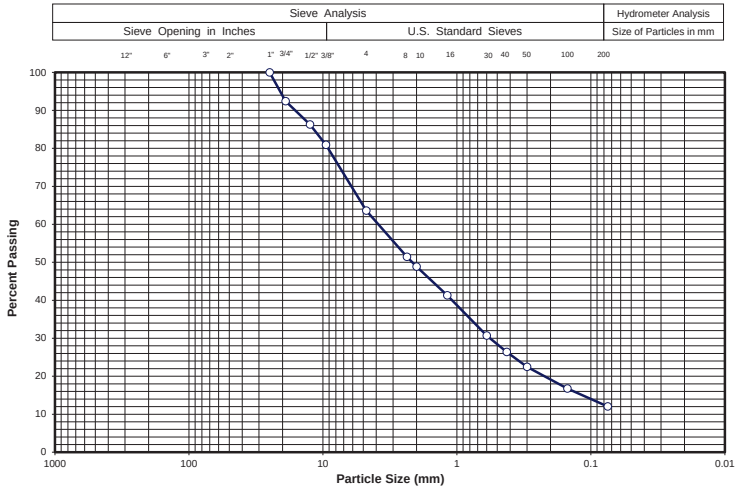

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	100
¾ "	92
½"	86
⅜"	81
#4	64
#10	49
#40	26
#200	12

Gravel (%)	36	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	52	PL	NP	Sample ID:	YA-PNB-12		
Fines (%)	12	PI	NP	Sample Depth (ft.):	2		
Sample Description:	**A-1-a (0) / SP-SM**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/30/15		

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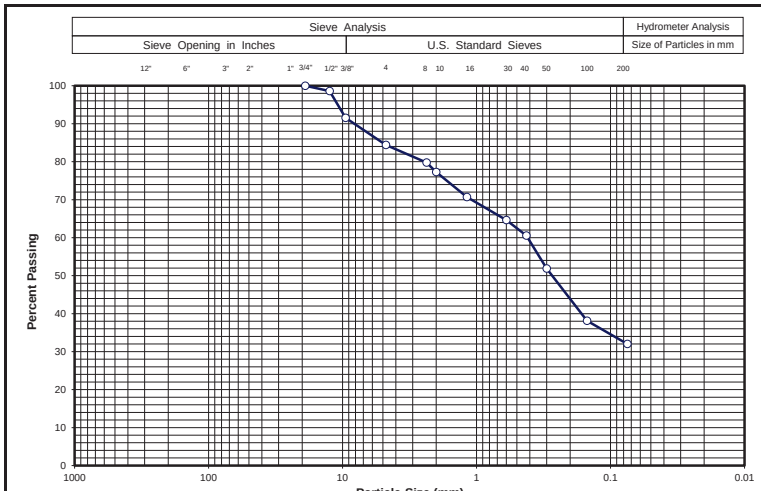

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	92
#4	84
#10	77
#40	61
#200	32

Gravel (%)	16	LL	42	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	52	PL	18	Sample ID:	YA-PNB-13		
Fines (%)	32	PI	24	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-2-7 (2) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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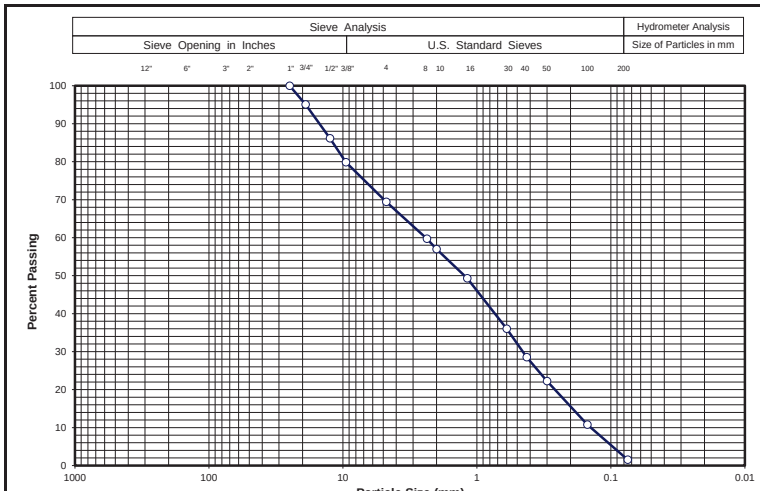

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	100
¾ "	95
½"	86
⅜"	80
#4	69
#10	57
#40	29
#200	2

Gravel (%)	31	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	67	PL	NP	Sample ID:	YA-PNB-13		
Fines (%)	2	PI	NP	Sample Depth (ft.):	2		
Sample Description:	**A-1-b (0) / SP**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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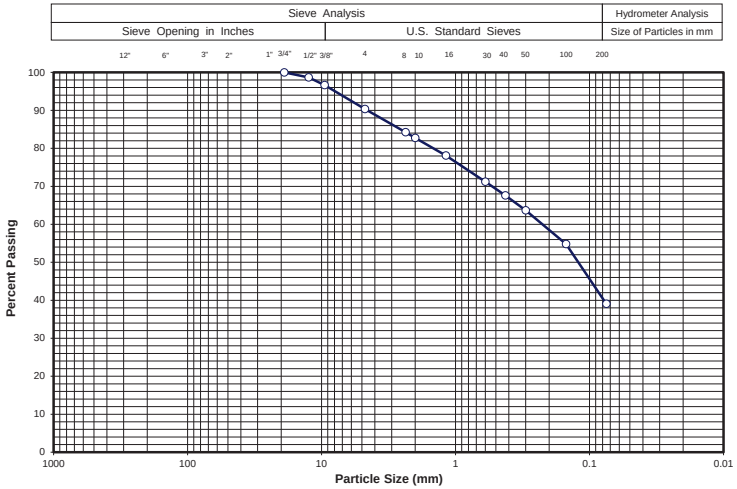

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	97
#4	90
#10	83
#40	68
#200	39

Gravel (%)	10	LL	36	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	51	PL	13	Sample ID:	YA-PNB-14		
Fines (%)	39	PI	23	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (4) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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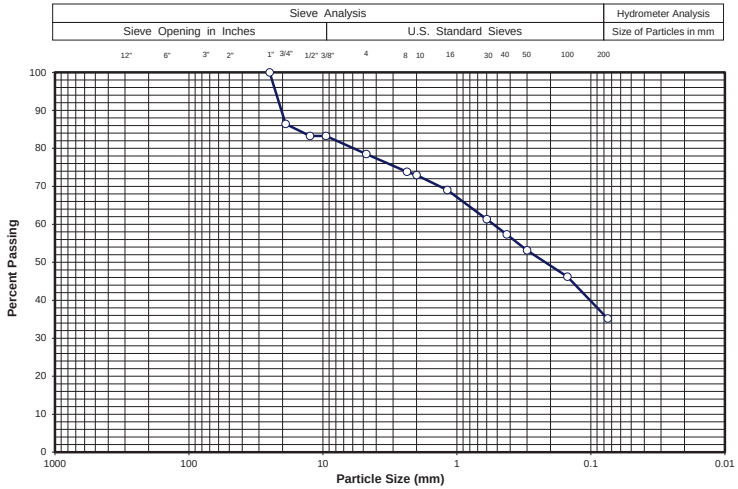

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	100
¾ "	86
½"	83
⅜"	83
#4	79
#10	73
#40	57
#200	35

Gravel (%)	21	LL	41	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	44	PL	17	Sample ID:	YA-PNB-14		
Fines (%)	35	PI	24	Sample Depth (ft.):	2		
Sample Description:	**A-2-7 (3) / SC**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/30/15		

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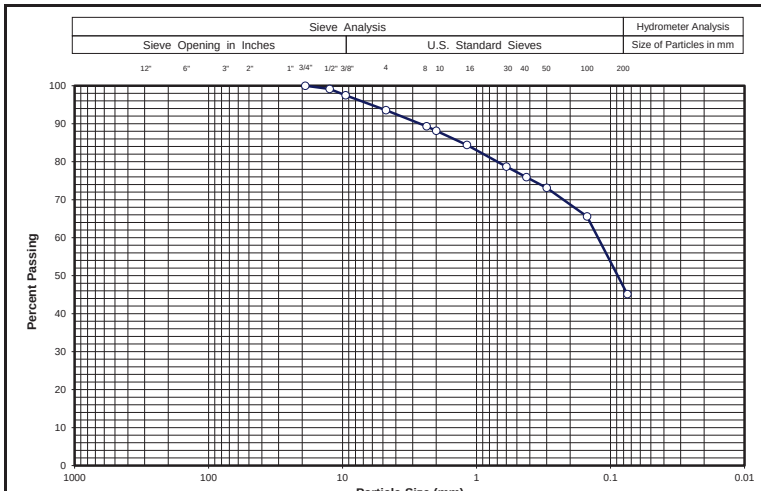

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	98
#4	94
#10	88
#40	76
#200	45

Gravel (%)	6	LL	36	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	49	PL	16	Sample ID:	YA-PNB-15		
Fines (%)	45	PI	20	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (5) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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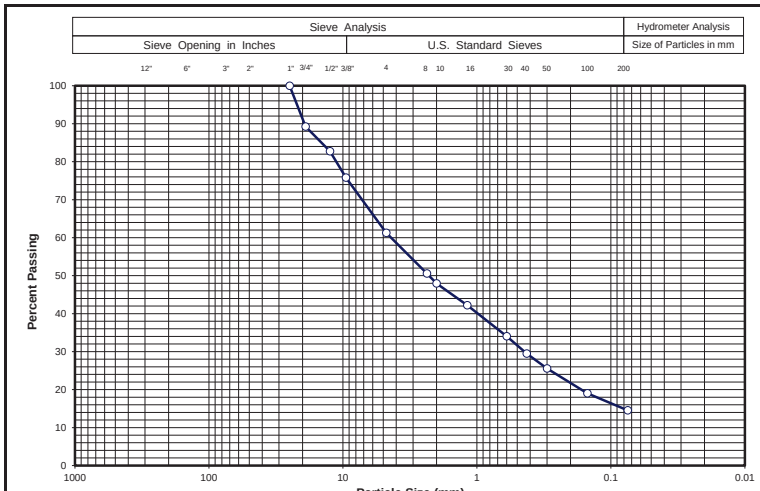

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	100
¾ "	89
½"	83
⅜"	76
#4	61
#10	48
#40	29
#200	15

Gravel (%)	39	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	46	PL	NP	Sample ID:	YA-PNB-15		
Fines (%)	15	PI	NP	Sample Depth (ft.):	2		
Sample Description:	**A-1-a (0) / SM**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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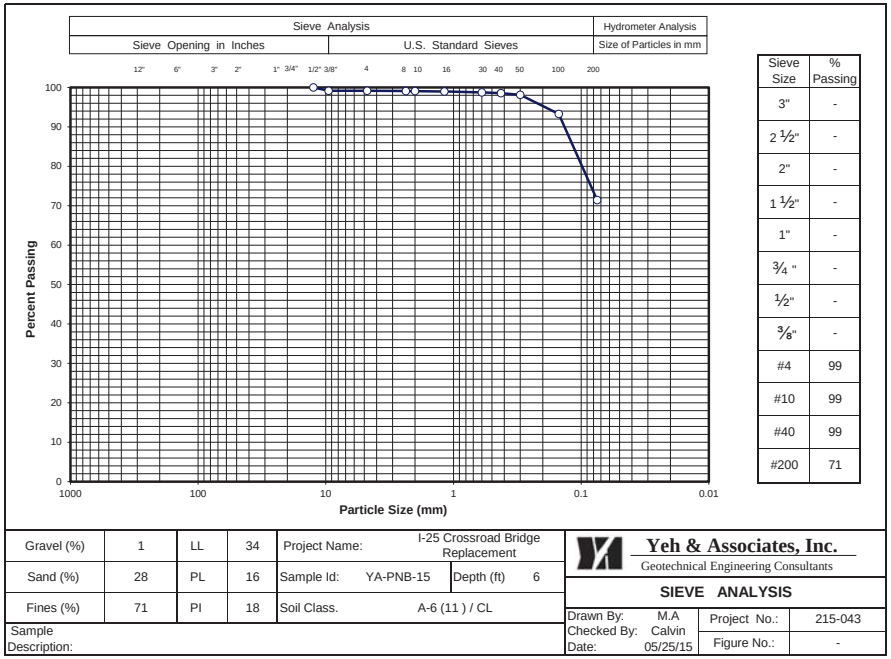

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	99
#10	99
#40	99
#200	71

Gravel (%)	1	LL	34	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	28	PL	16	Sample Id:	YA-PNB-15	Depth (ft)	6
Fines (%)	71	PI	18	Soil Class.	A-6 (11) / CL		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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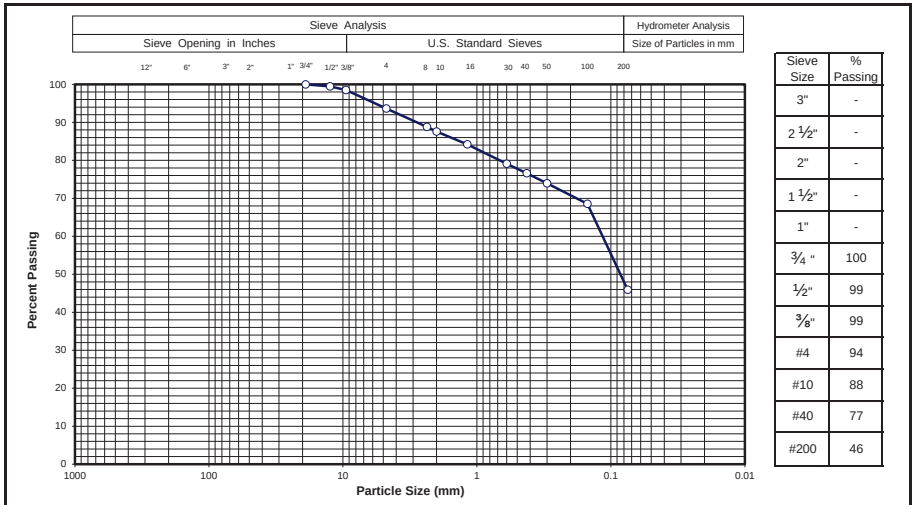

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	99
#4	94
#10	88
#40	77
#200	46

Gravel (%)	6	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	48	PL	18	Sample ID:	YA-PNB-16		
Fines (%)	46	PI	20	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (5) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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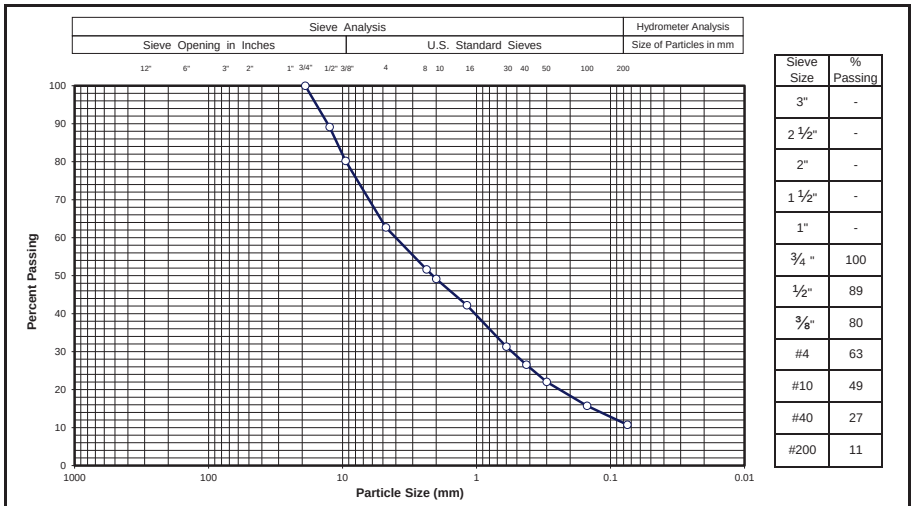

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	89
⅜"	80
#4	63
#10	49
#40	27
#200	11

Gravel (%)	37	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	52	PL	NP	Sample ID:	YA-PNB-16		
Fines (%)	11	PI	NP	Sample Depth (ft.):	2		
Sample Description:	**A-1-a (0) / SW-SM**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/30/15		

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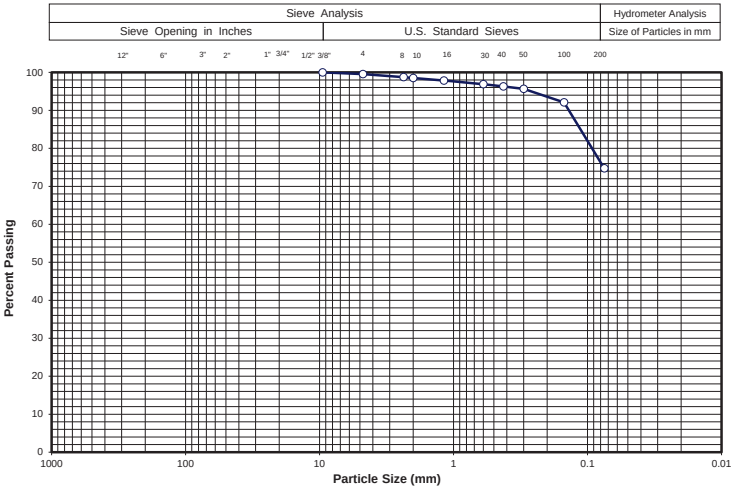

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	100
#10	99
#40	96
#200	75

Gravel (%)	0	LL	40	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	25	PL	15	Sample ID:	YA-PSB-1		
Fines (%)	75	PI	25	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (17) / CL						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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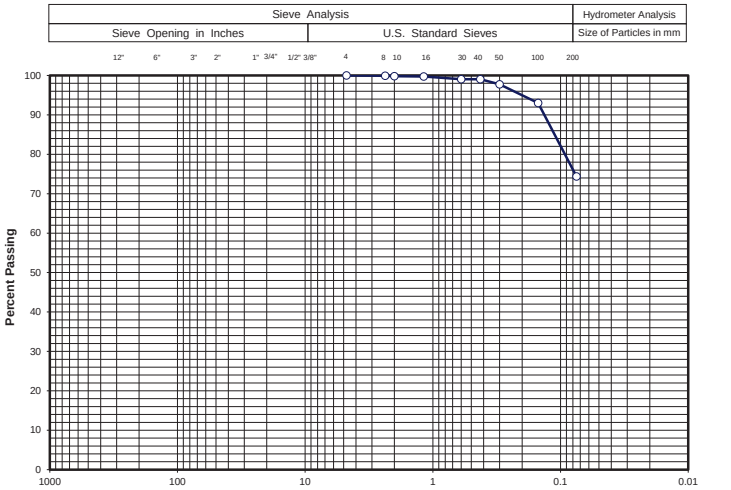

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	74

Gravel (%)	0	LL	41	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	26	PL	18	Sample Id:	YA-PSB-1	Depth (ft)	3
Fines (%)	74	PI	23	Soil Class.	A-7-6 (26) / CL		
Sample Description:							

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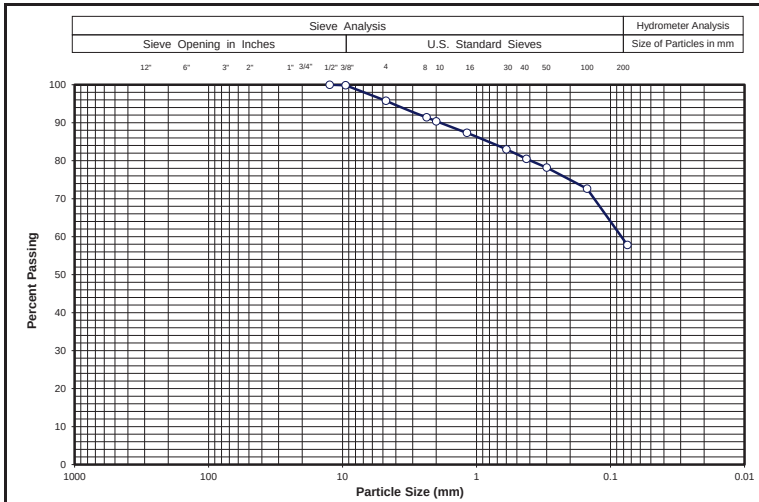
SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/28/15		

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	100
#4	96
#10	90
#40	80
#200	58

Gravel (%)	4	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	38	PL	17	Sample ID:	YA-PSB-2		
Fines (%)	58	PI	21	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (9) / CL						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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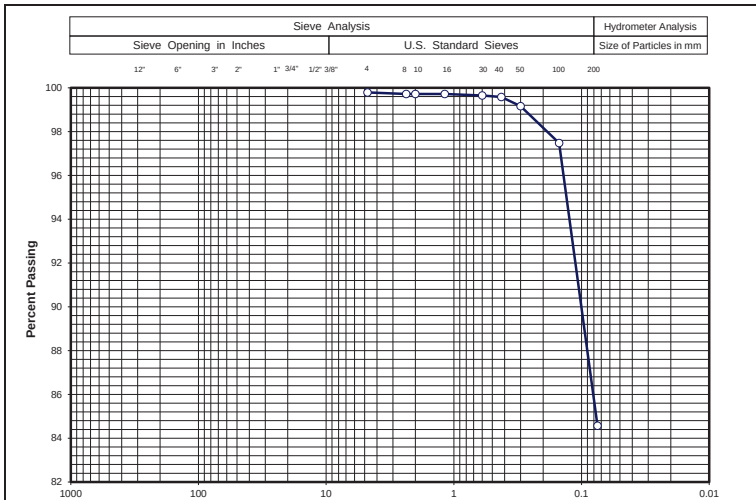

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	85

Gravel (%)	0	LL	44	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	15	PL	16	Sample Id:	YA-PSB-2	Depth (ft)	2
Fines (%)	85	PI	28	Soil Class.	A-7-6 (23) / CL		
Sample Description:							

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Drawn By:	M.A	Project No.:	215-043
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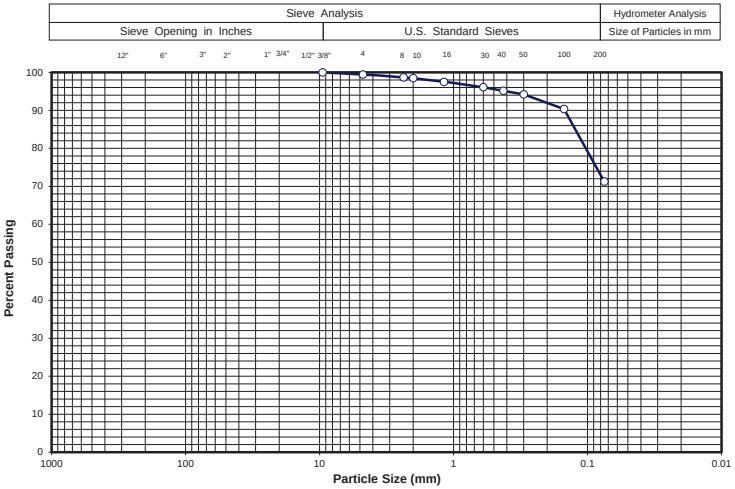

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	99
#10	98
#40	95
#200	71

Gravel (%)	1	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	28	PL	17	Sample ID:	YA-PSB-3		
Fines (%)	71	PI	21	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (13) / CL						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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Date:	06/07/15		

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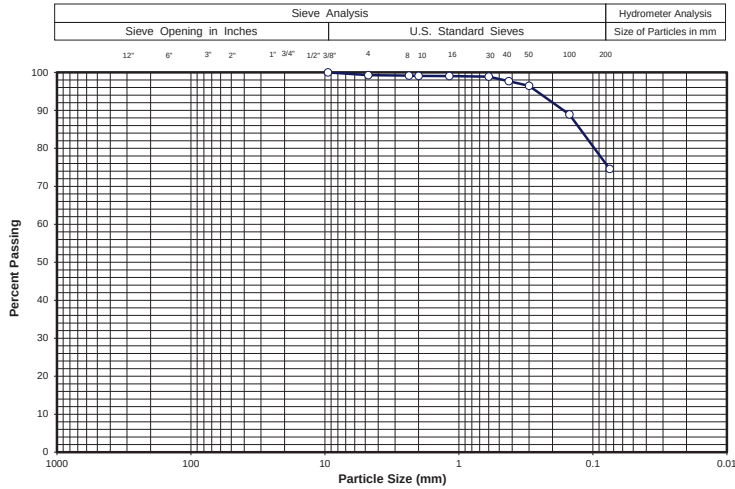

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	99
#10	99
#40	98
#200	75

Gravel (%)	1	LL	39	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	24	PL	17	Sample ID:	YA-PSB-3		
Fines (%)	75	PI	22	Sample Depth (ft.):	3		
Sample Description:	**A-6 (15) / CL**						

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Drawn By:	MA	Project No.:	215-043
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Date:	05/25/15		

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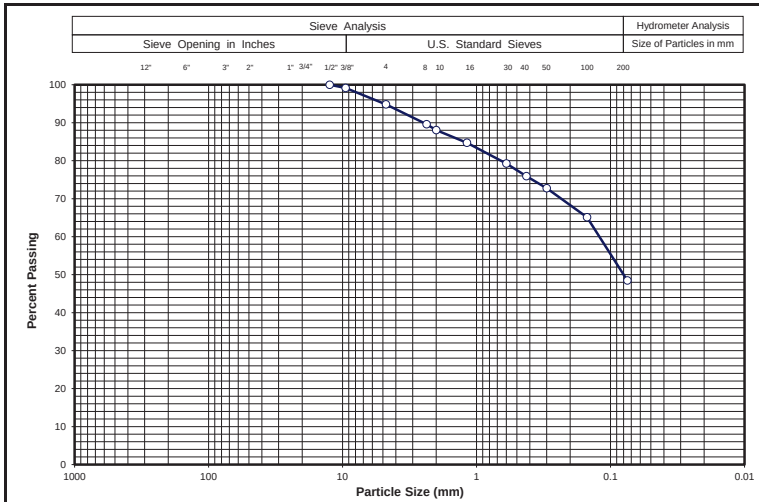

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	99
#4	95
#10	88
#40	76
#200	48

Gravel (%)	5	LL	37	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	47	PL	17	Sample ID:	YA-PSB-4		
Fines (%)	48	PI	20	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (6) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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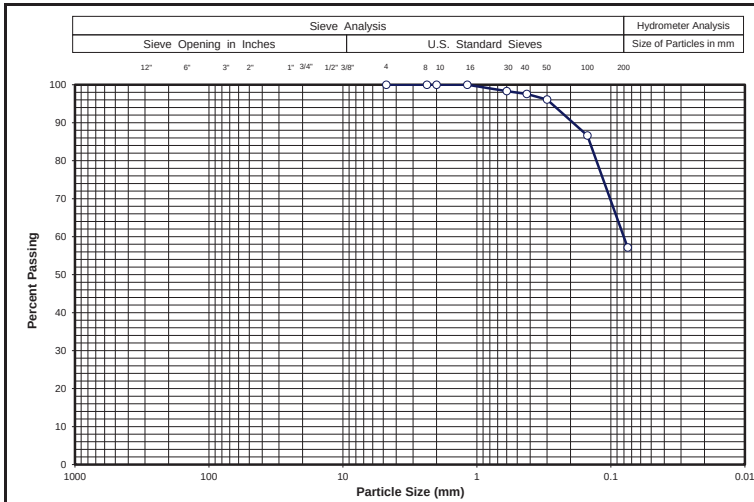

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	98
#200	57

Gravel (%)	0	LL	48	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	43	PL	20	Sample ID:	YA-PSB-4		
Fines (%)	57	PI	28	Sample Depth (ft.):	2		
Sample Description:	**A-7-6 (13) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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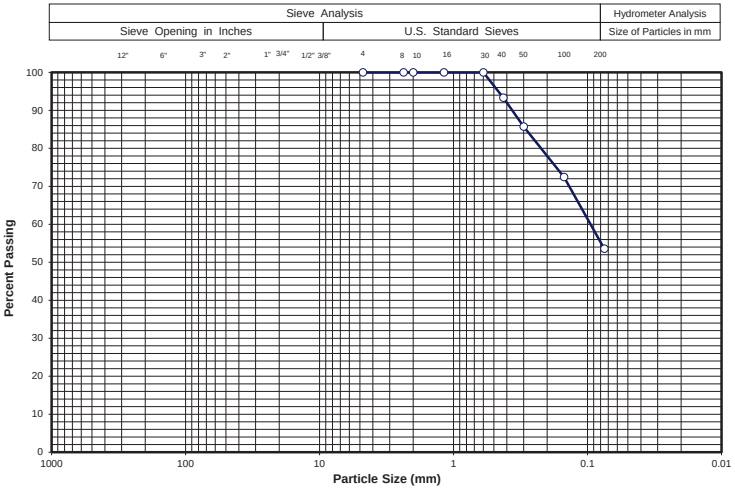

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	93
#200	54

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	46	PL	NP	Sample ID:	YA-PSB-4
Fines (%)	54	PI	NP	Sample Depth (ft.):	5

Sample Description: **A-4 (0) / ML**

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SIEVE ANALYSIS

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Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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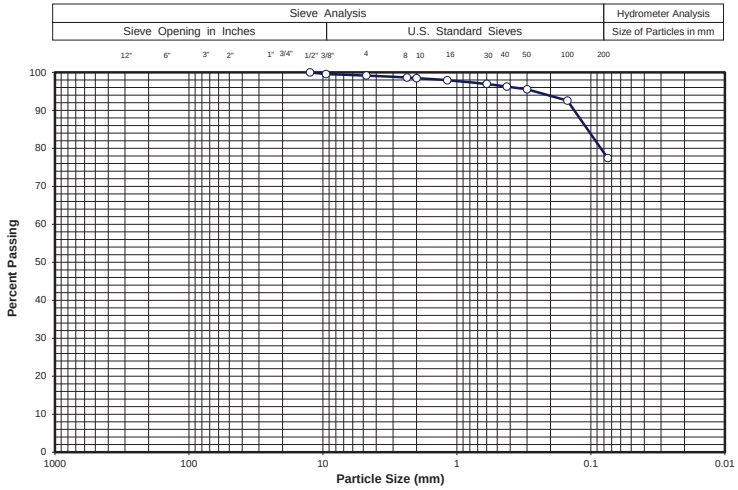

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	100
#4	99
#10	98
#40	96
#200	77

Gravel (%)	1	LL	48	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	22	PL	21	Sample ID:	YA-PSB-5
Fines (%)	77	PI	27	Sample Depth (ft.):	2-5
				Sample Type:	Bulk

Sample Description: A-7-6 (21) / CL

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SIEVE ANALYSIS

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Date:	06/07/15	Figure No.:	-

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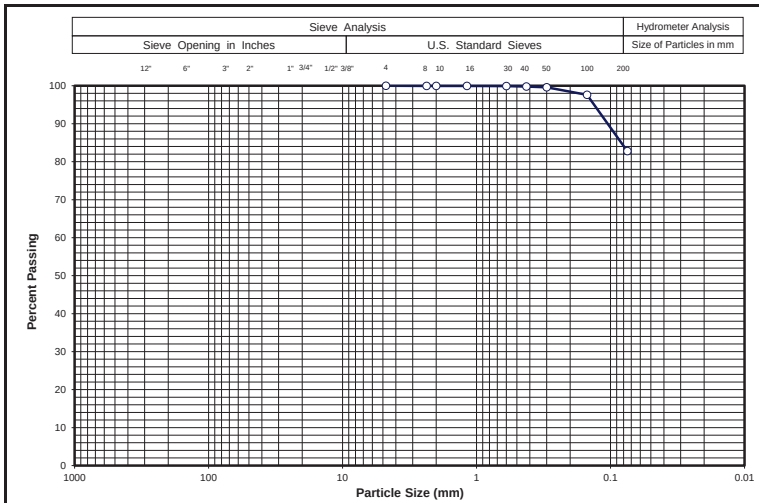

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	83

Gravel (%)	0	LL	59	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	17	PL	21	Sample ID:	YA-PSB-5
Fines (%)	83	PI	38	Sample Depth (ft.):	3

Sample Description: **A-7-6 (33) / CH**

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Date:	05/25/15	Figure No.:	-

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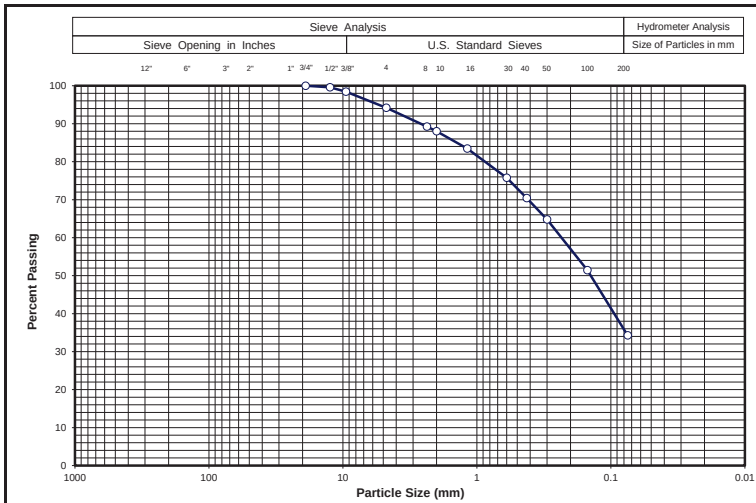

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	100
⅜"	98
#4	94
#10	88
#40	70
#200	34

Gravel (%)	6	LL	44	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	60	PL	17	Sample ID:	YA-PSB-6
Fines (%)	34	PI	27	Sample Depth (ft.):	
				Sample Type:	Bulk

Sample Description: A-2-7 (3) / SC

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SIEVE ANALYSIS

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Date:	06/09/15	Figure No.:	-

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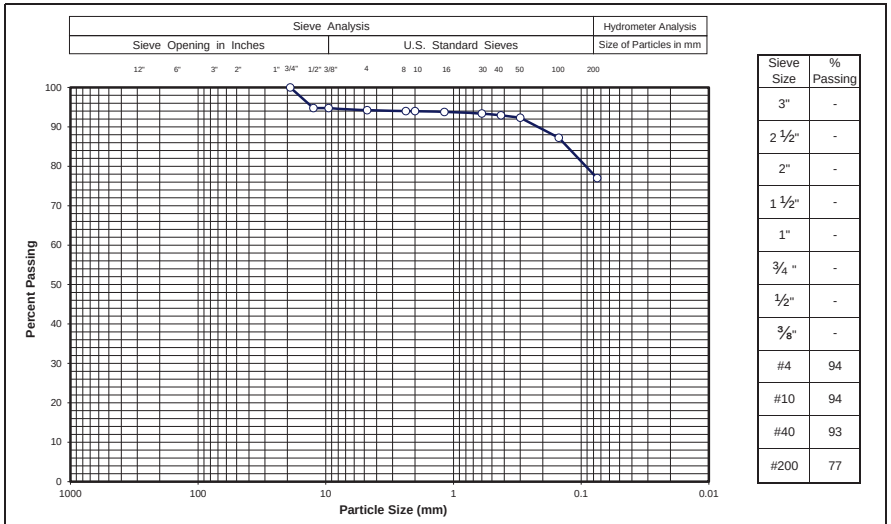

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	94
#10	94
#40	93
#200	77

Gravel (%)	6	LL	44	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	17	PL	16	Sample Id:	YA-PSB-6	Depth (ft)	2
Fines (%)	77	PI	28	Soil Class.	A-7-6 (20) / CL		
Sample Description:							

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SIEVE ANALYSIS

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Date:	05/25/15		

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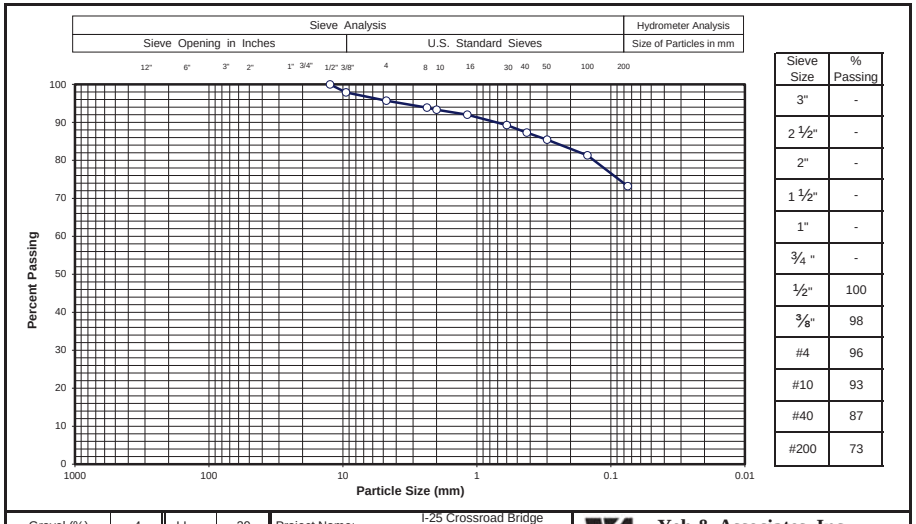

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	98
#4	96
#10	93
#40	87
#200	73

Gravel (%)	4	LL	29	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	23	PL	18	Sample ID:	YA-PSB-7		
Fines (%)	73	PI	11	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-6 (6) / CL						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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Date:	06/07/15		

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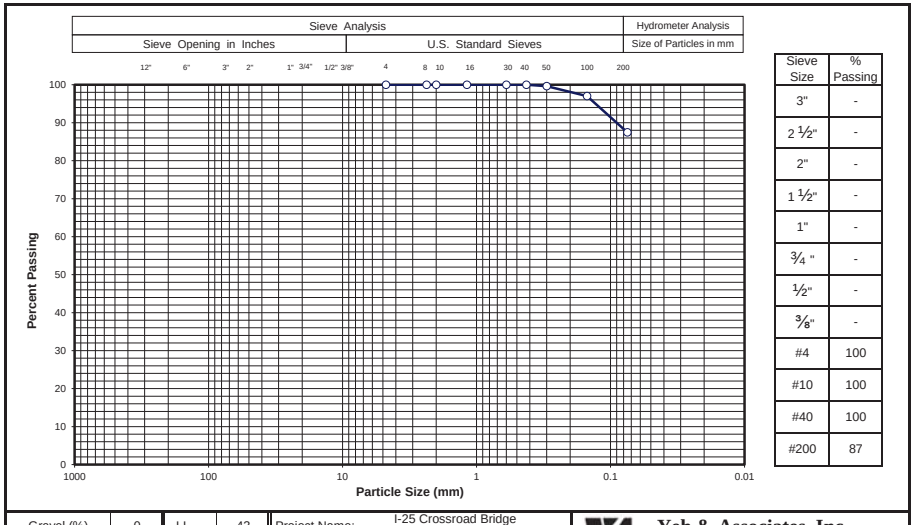

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	87

Gravel (%)	0	LL	43	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	13	PL	19	Sample ID:	YA-PSB-7		
Fines (%)	87	PI	24	Sample Depth (ft.):	3		
Sample Description:	**A-7-6 (21) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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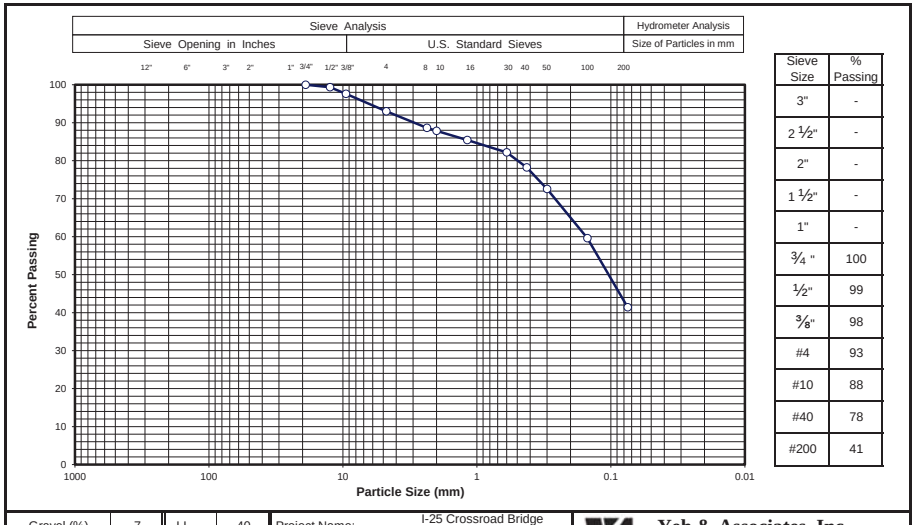

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	98
#4	93
#10	88
#40	78
#200	41

Gravel (%)	7	LL	40	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	52	PL	19	Sample ID:	YA-PSB-8		
Fines (%)	41	PI	21	Sample Depth (ft.):		Sample Type:	Bulk
Sample Description:	A-6 (4) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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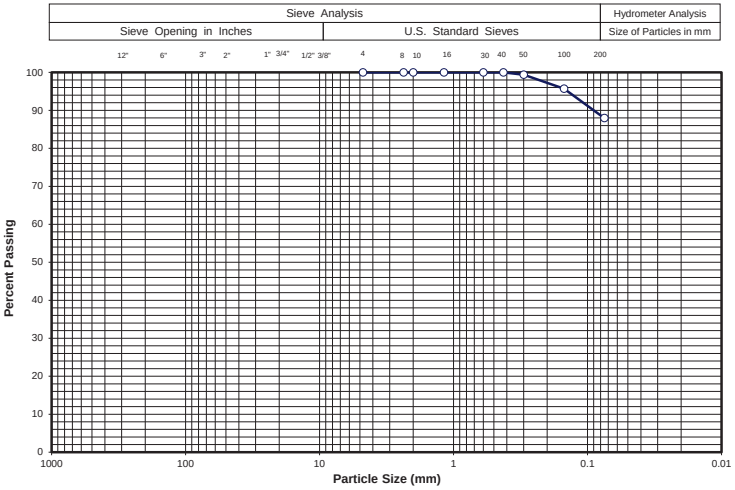

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	88

Gravel (%)	0	LL	44	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	12	PL	17	Sample ID:	YA-PSB-8
Fines (%)	88	PI	27	Sample Depth (ft.):	2
Sample Description:	**A-7-6 (24) / CL**				

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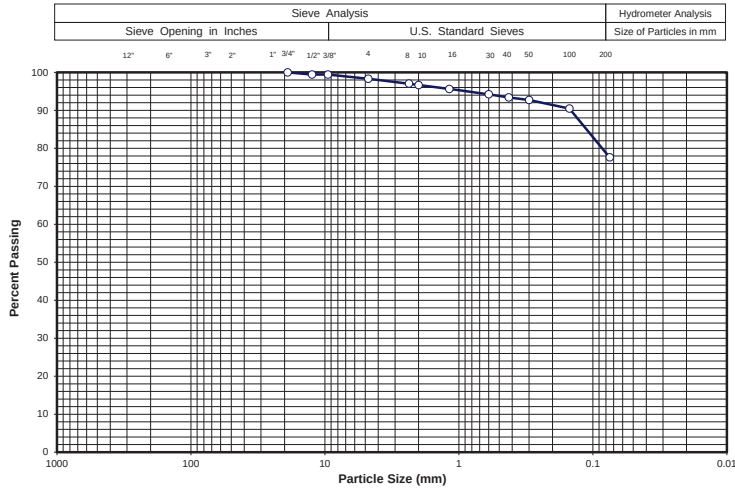

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	99
#4	98
#10	97
#40	93
#200	78

Gravel (%)	2	LL	44	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	20	PL	18	Sample ID:	YA-PSB-9		
Fines (%)	78	PI	26	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-7-6 (19) / CL						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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Date:	06/07/15	Figure No.:	-

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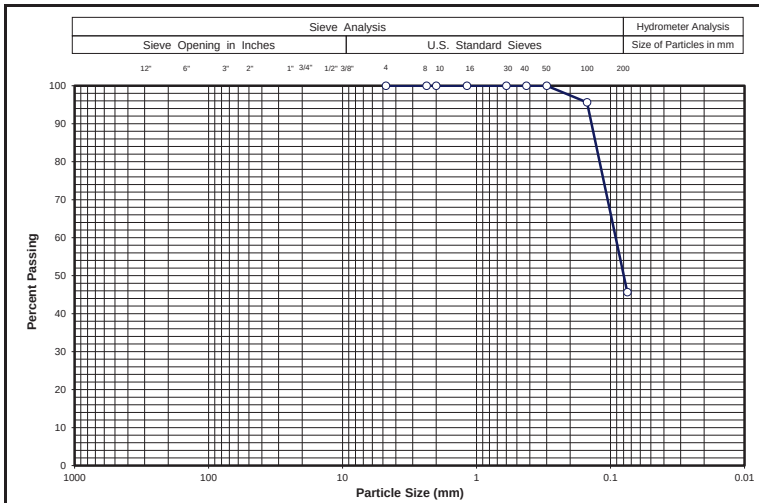

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	46

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	54	PL	NP	Sample ID:	YA-PSB-9
Fines (%)	46	PI	NP	Sample Depth (ft.):	5
Sample Description:	**A-4 (0) / SM**				

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
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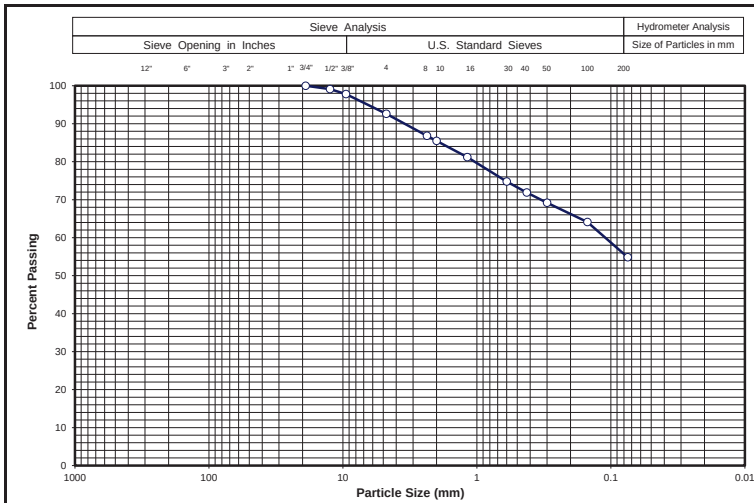

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	98
#4	93
#10	85
#40	72
#200	55

Gravel (%)	7	LL	45	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	38	PL	18	Sample ID:	YA-PSB-10		
Fines (%)	55	PI	27	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-78-6 (11) / CL						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
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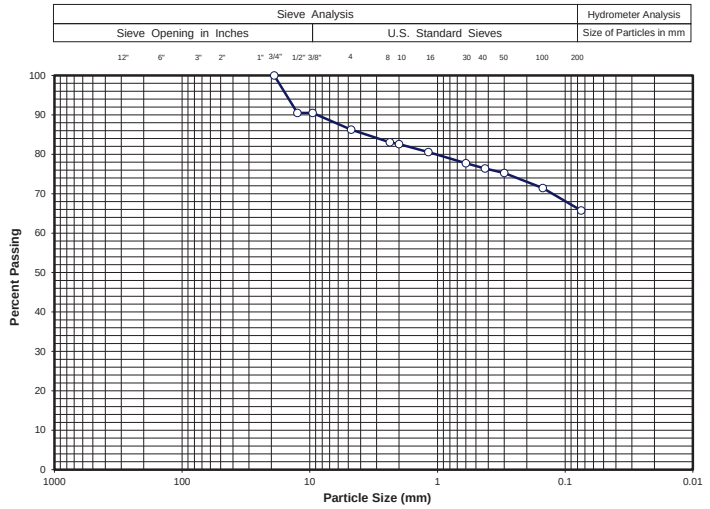

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	86
#10	83
#40	76
#200	66

Gravel (%)	14	LL	49	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	21	PL	17	Sample Id:	YA-PSB-10	Depth (ft)	2
Fines (%)	66	PI	32	Soil Class.	A-7-6 (19) / CL		
Sample Description:							

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SIEVE ANALYSIS

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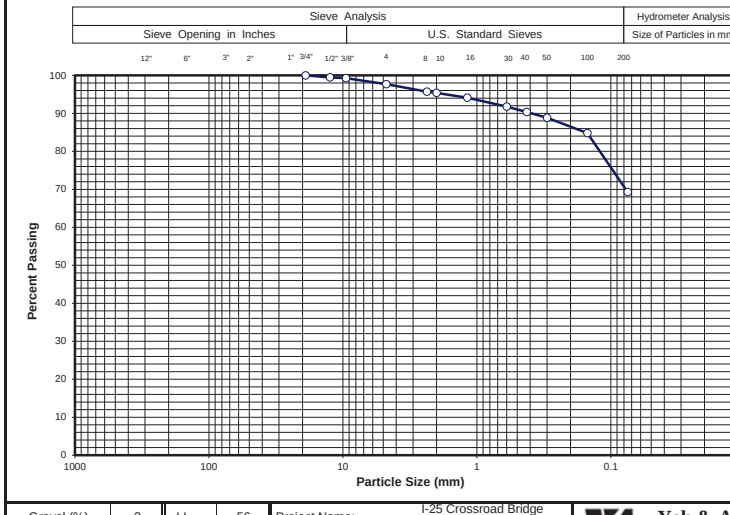

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	99
#4	98
#10	95
#40	90
#200	69

Gravel (%)	2	LL	56	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	29	PL	17	Sample ID:	YA-PSB-11		
Fines (%)	69	PI	39	Sample Depth (ft.):		Sample Type:	Bulk
Sample Description:	A-7-6 (25) / CH						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/09/15		

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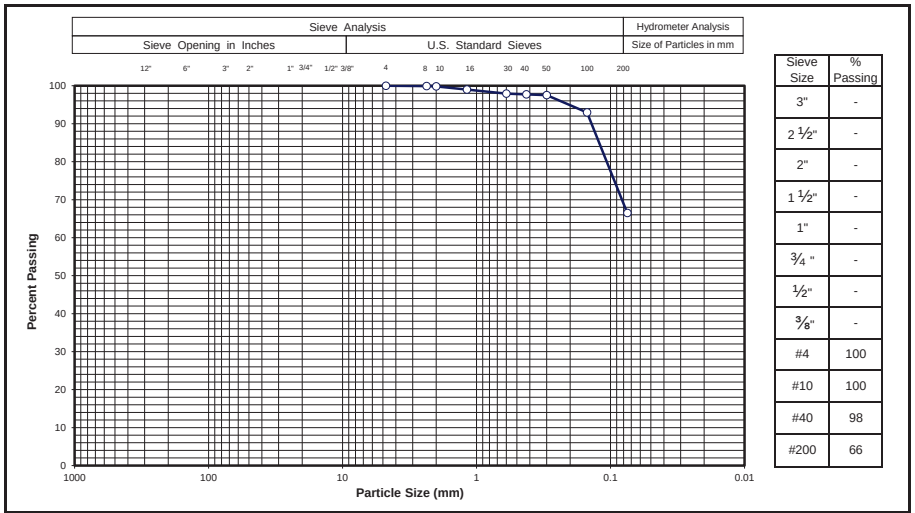

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	98
#200	66

Gravel (%)	0	LL	39	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	34	PL	16	Sample ID:	YA-PSB-11		
Fines (%)	66	PI	23	Sample Depth (ft.):	3		
Sample Description:	**A-6 (13) / CL**						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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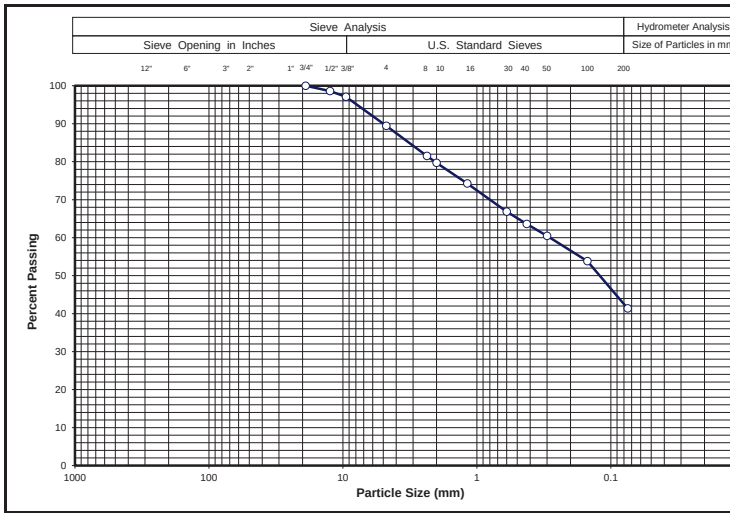

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	99
⅜"	97
#4	89
#10	80
#40	64
#200	41

Gravel (%)	11	LL	47	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	48	PL	20	Sample ID:	YA-PSB-12		
Fines (%)	41	PI	27	Sample Depth (ft.):		Sample Type:	Bulk
Sample Description:	A-7-6 (6) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/09/15		

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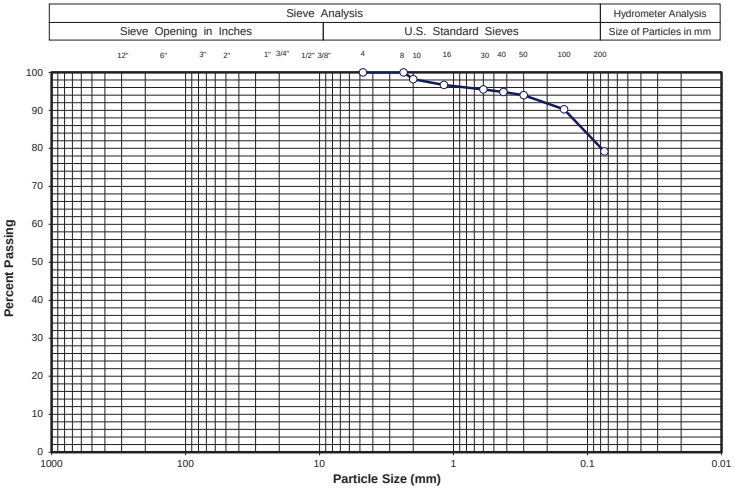

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	98
#40	95
#200	79

Gravel (%)	0	LL	36	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	21	PL	15	Sample ID:	YA-PSB-12
Fines (%)	79	PI	21	Sample Depth (ft.):	2

Sample Description: **A-6 (15) / CL**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	I-Ping		
Date:	05/28/15	Figure No.:	-

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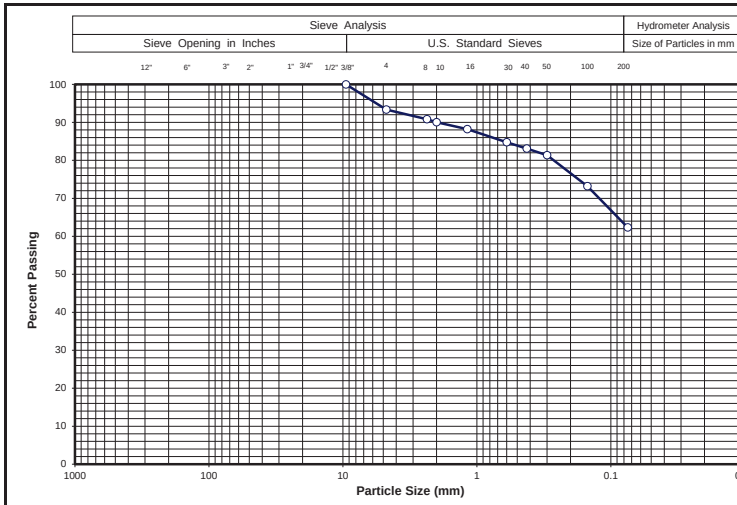

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	93
#10	90
#40	83
#200	62

Gravel (%)	7	LL	41	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	31	PL	15	Sample ID:	YA-PSB-12
Fines (%)	62	PI	26	Sample Depth (ft.):	5

Sample Description: **A-7-6 (13) / C**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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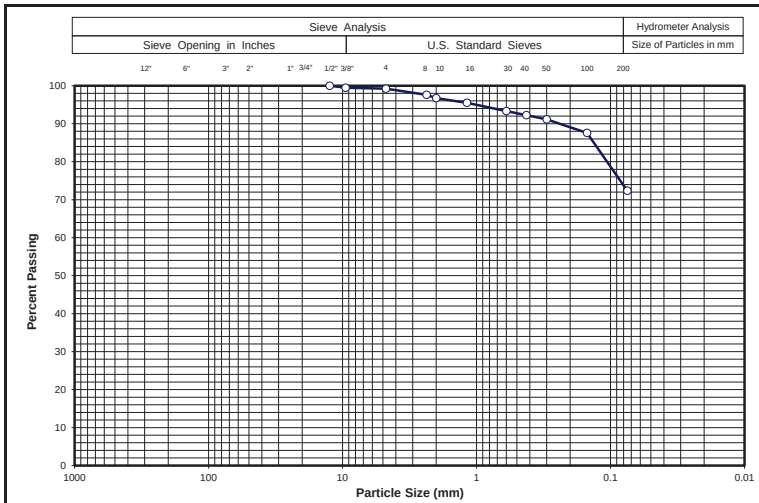

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	99
#4	99
#10	97
#40	92
#200	72

Gravel (%)	1	LL	38	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	27	PL	17	Sample ID:	YA-PSB-13
Fines (%)	72	PI	21	Sample Depth (ft.):	Sample Type: Bulk

Sample Description: A-6 (13) / CL

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/09/15	Figure No.:	-

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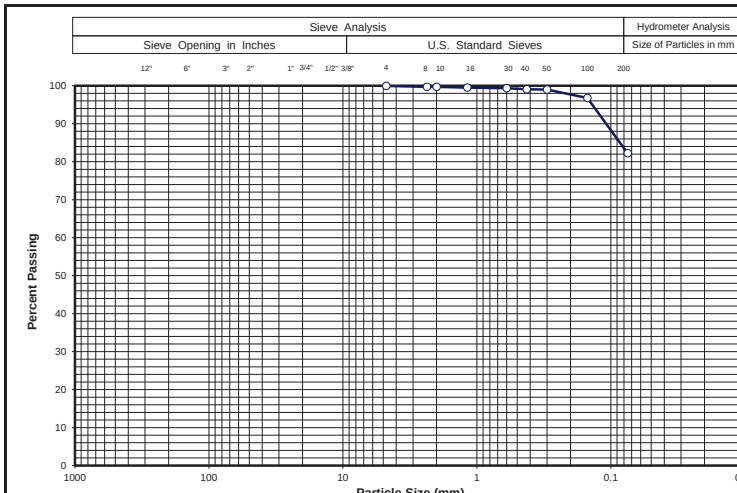

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	82

Gravel (%)	0	LL	43	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	18	PL	18	Sample ID:	YA-PSB-13
Fines (%)	82	PI	25	Sample Depth (ft.):	2

Sample Description: **A-7-6 (20) / CL**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/28/15	Figure No.:	-

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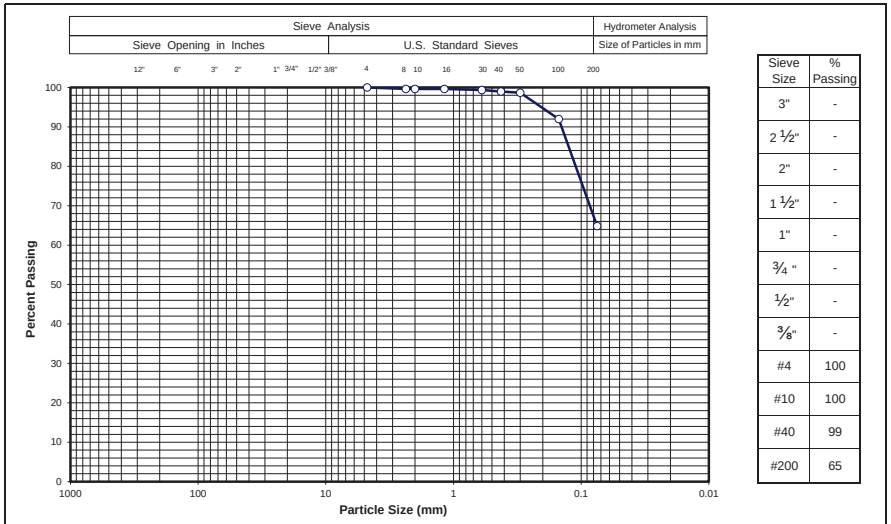

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	65

Gravel (%)	0	LL	36	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	35	PL	19	Sample Id:	YA-PSB-13	Depth (ft)	5
Fines (%)	65	PI	17	Soil Class.	A-6 (9) / CL		
Sample Description:							

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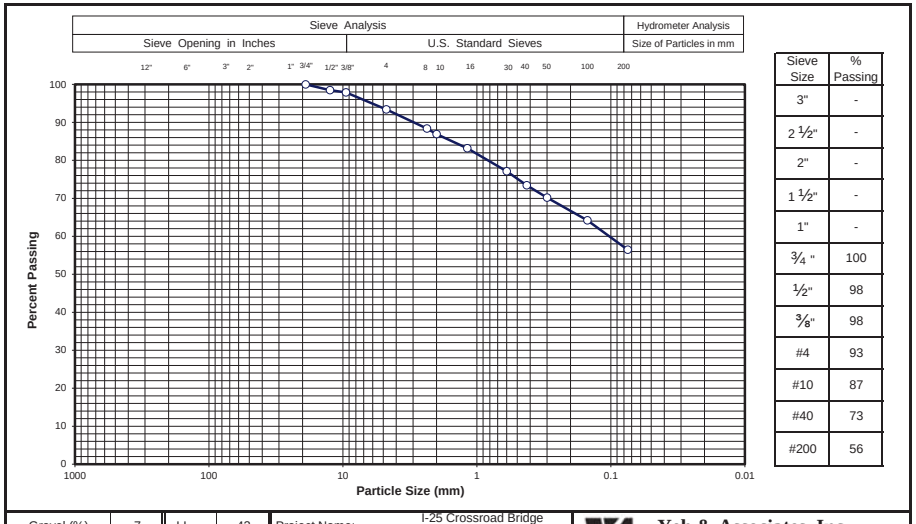
SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	12/18/14		

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	98
⅜"	98
#4	93
#10	87
#40	73
#200	56

Gravel (%)	7	LL	43	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	37	PL	18	Sample ID:	YA-PSB-14		
Fines (%)	56	PI	25	Sample Depth (ft.):	2-5	Sample Type:	Bulk
Sample Description:	A-7-6 (11) / CL						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/07/15		

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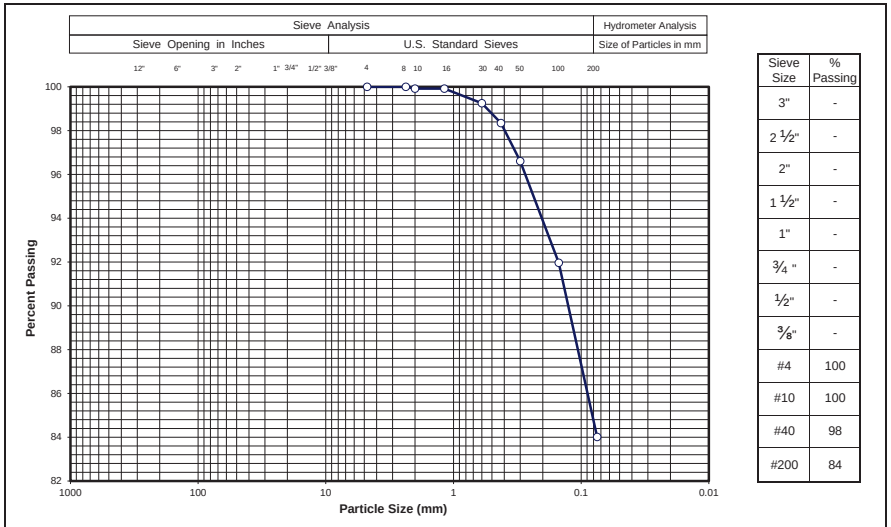

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	98
#200	84

Gravel (%)	0	LL	40	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	16	PL	21	Sample Id:	YA-PSB-14	Depth (ft)	2
Fines (%)	84	PI	19	Soil Class.	A-6 (16) / CL		
Sample Description:							

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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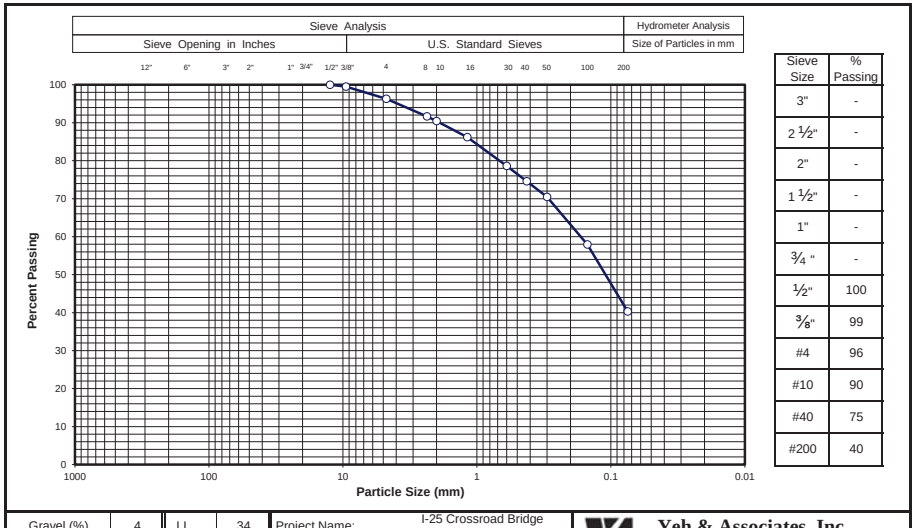

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	99
#4	96
#10	90
#40	75
#200	40

Gravel (%)	4	LL	34	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	56	PL	18	Sample ID:	YA-PSB-15		
Fines (%)	40	PI	16	Sample Depth (ft.):		Sample Type:	Bulk
Sample Description:	A-6 (2) / SC						

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/09/15		

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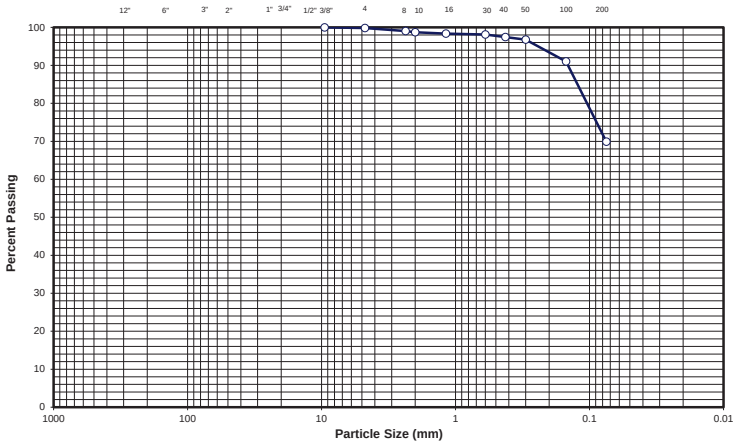

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	100
#4	100
#10	99
#40	97
#200	70

Gravel (%)	0	LL	43	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	30	PL	17	Sample ID:	YA-PSB-15
Fines (%)	70	PI	26	Sample Depth (ft.):	2
Sample Description:	**A-7-6 (16) / CL**				

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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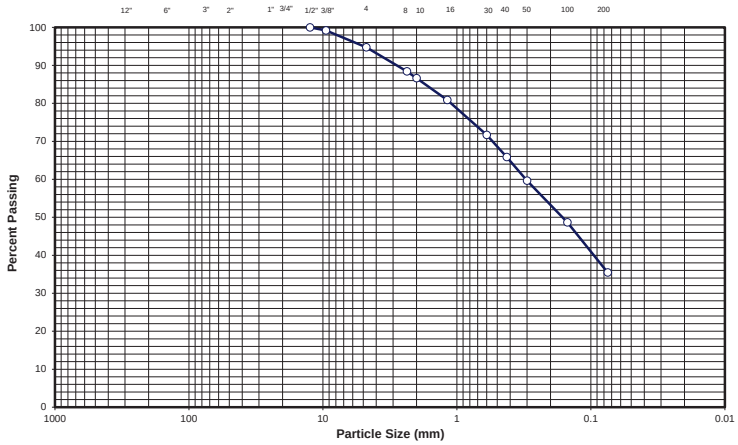

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	99
#4	95
#10	87
#40	66
#200	35

Gravel (%)	5	LL	42	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	60	PL	18	Sample ID:	YA-PSB-16
Fines (%)	35	PI	24	Sample Depth (ft.):	Sample Type: Bulk
Sample Description:	A-7-6 (3) / SCL				

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/07/15	Figure No.:	-

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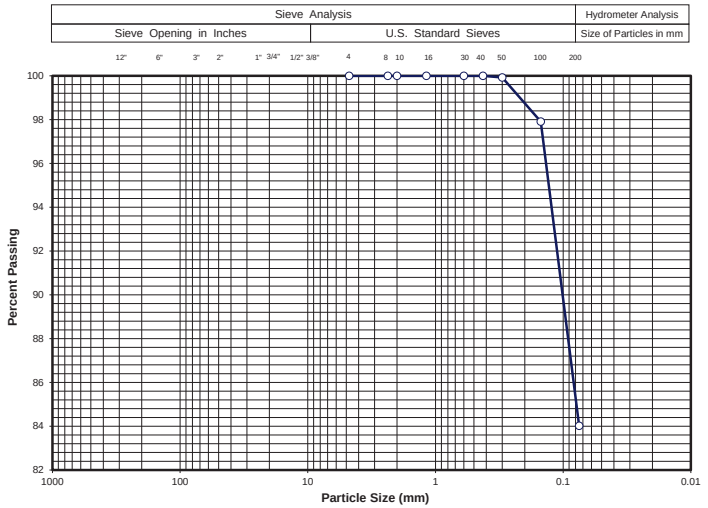

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	100
#200	84

Gravel (%)	0	LL	43	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	16	PL	14	Sample Id: YA-PSB-16	Depth (ft) 2
Fines (%)	84	PI	29	Soil Class.	A-7-6 (24) / CL
Sample Description:					

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SIEVE ANALYSIS

Drawn By:	M.A	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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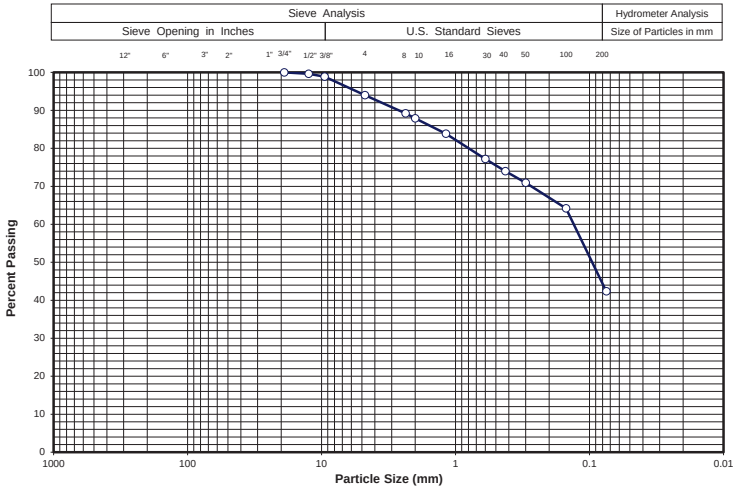

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	100
⅜"	99
#4	94
#10	88
#40	74
#200	42

Gravel (%)	6	LL	38	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	52	PL	18	Sample ID:	YA-PR-1		
Fines (%)	42	PI	20	Sample Depth (ft.):		Sample Type:	Bulk

Sample Description: A-6 (4) / SC

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/09/15		

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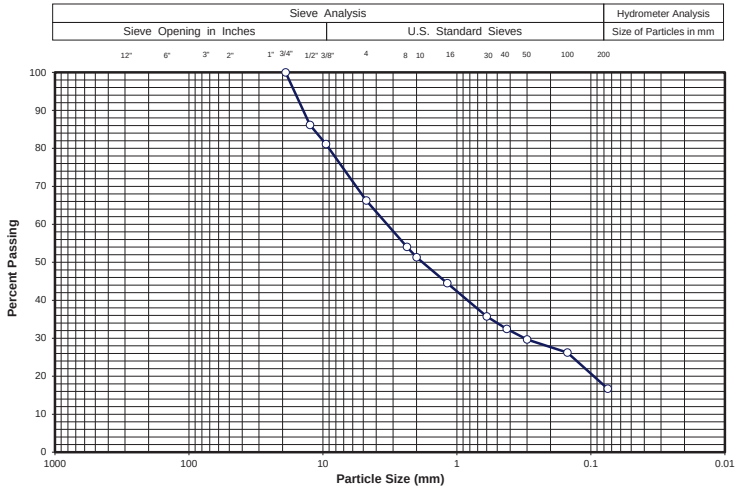

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	86
⅜"	81
#4	66
#10	51
#40	32
#200	17

Gravel (%)	34	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	49	PL	NP	Sample ID:	YA-PR-1 (sample 1)		
Fines (%)	17	PI	NP	Sample Depth (ft.):	2		

Sample Description: **A-1-b (0) / SM**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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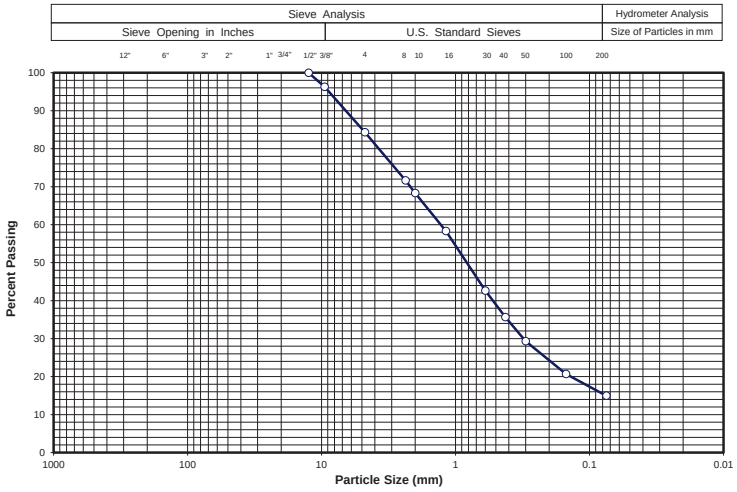

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	96
#4	84
#10	68
#40	36
#200	15

Gravel (%)	16	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	69	PL	NP	Sample ID:	YA-PR-1 (sample 2)		
Fines (%)	15	PI	NP	Sample Depth (ft.):	2		

Sample Description: **A-1-b (0) / SM**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	05/25/15		

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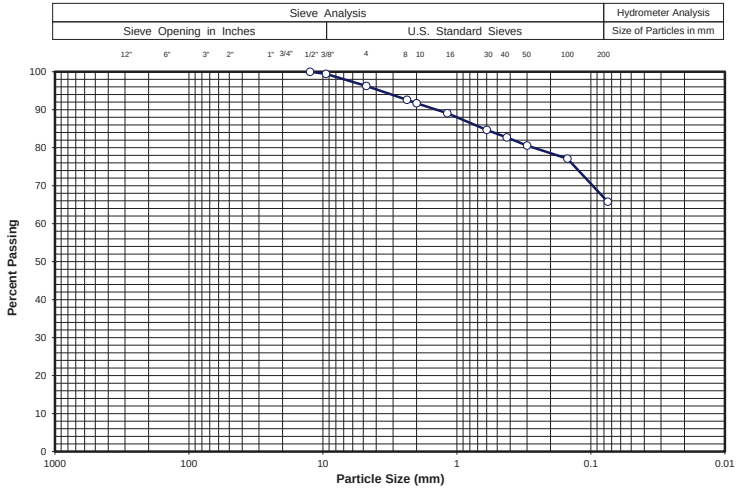

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	99
#4	96
#10	92
#40	83
#200	66

Gravel (%)	4	LL	31	Project Name:	I-25 Crossroad Bridge Replacement		
Sand (%)	30	PL	15	Sample ID:	YA-PR-2		
Fines (%)	66	PI	16	Sample Depth (ft.):		Sample Type:	Bulk

Sample Description: A-6 (8) / CL

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin	Figure No.:	-
Date:	06/09/15		

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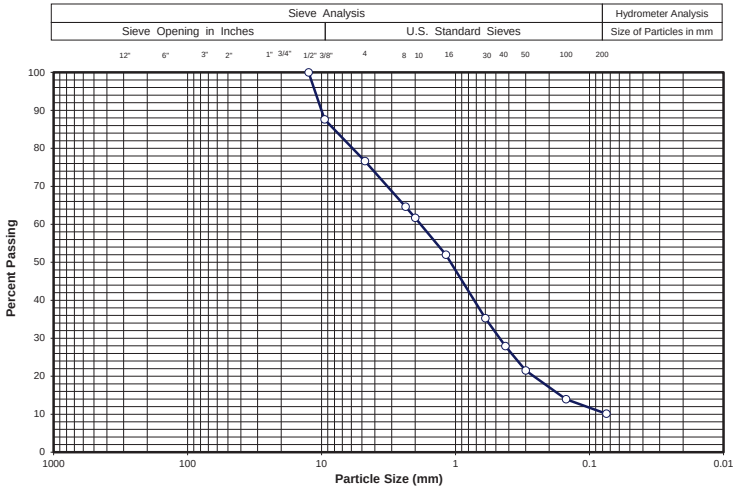

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	100
⅜"	88
#4	77
#10	62
#40	28
#200	10

Gravel (%)	23	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	67	PL	NP	Sample ID:	YA-PR-2
Fines (%)	10	PI	NP	Sample Depth (ft.):	2

Sample Description: **A-1-b (0) / SP-SM**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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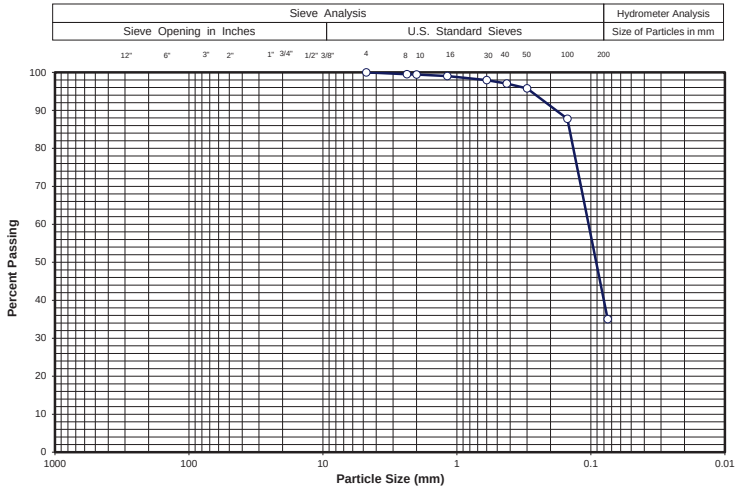

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	99
#40	97
#200	35

Gravel (%)	0	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	65	PL	NP	Sample ID:	YA-PR-2
Fines (%)	35	PI	NP	Sample Depth (ft.):	5

Sample Description: **A-2-4 (0) / SM**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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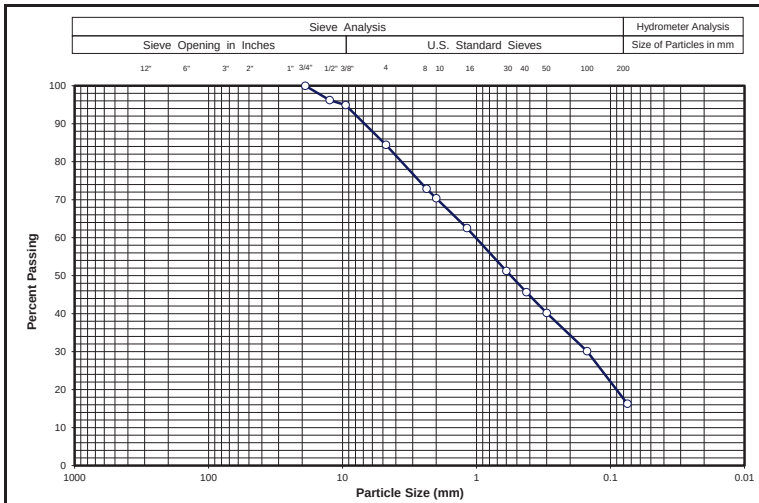

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	96
⅜"	95
#4	84
#10	70
#40	46
#200	16

Gravel (%)	16	LL	34	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	68	PL	16	Sample ID:	YA-PR-3
Fines (%)	16	PI	18	Sample Depth (ft.):	Sample Type: Bulk

Sample Description: A-2-6 (0) / SC

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/09/15	Figure No.:	-

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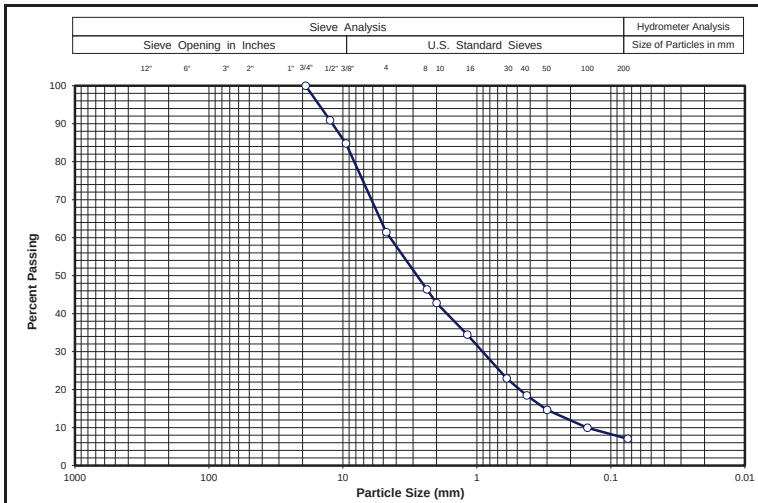

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	91
⅜"	85
#4	61
#10	43
#40	18
#200	7

Gravel (%)	39	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	54	PL	NP	Sample ID:	YA-PR-3 (sample 1)
Fines (%)	7	PI	NP	Sample Depth (ft.):	2

Sample Description: **A-1-a (0) / SW-SM**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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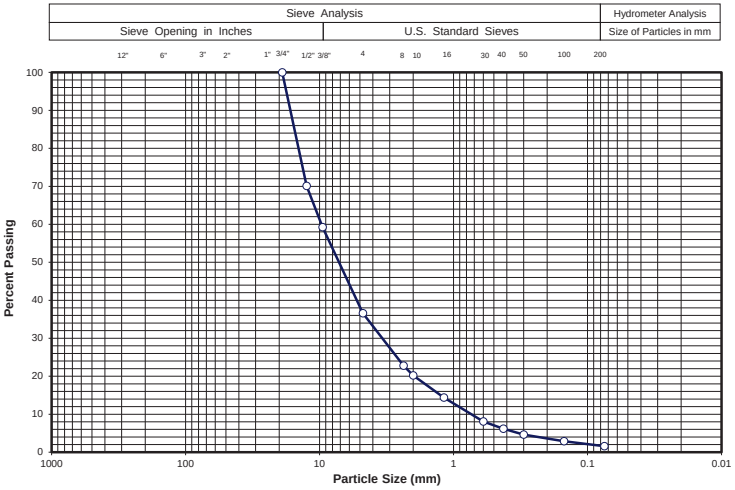

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	70
⅜"	59
#4	37
#10	20
#40	6
#200	2

Gravel (%)	63	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	35	PL	NP	Sample ID:	YA-PR-3 (sample 2)
Fines (%)	2	PI	NP	Sample Depth (ft.):	2

Sample Description: **A-1-a (0) / GW**

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SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

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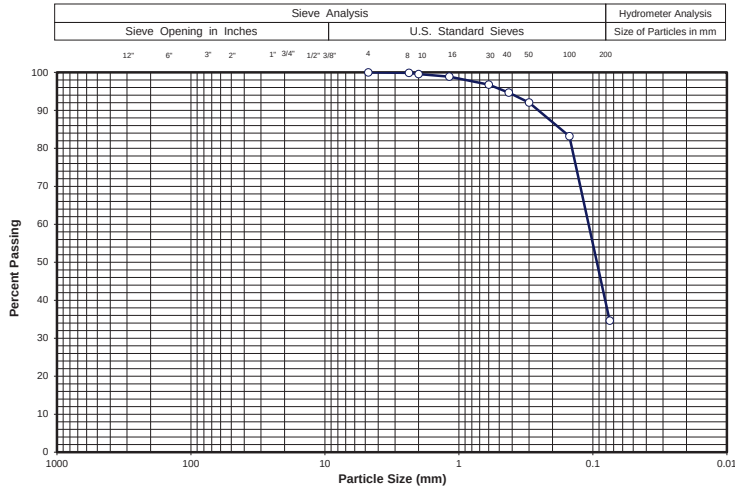

Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	95
#200	35

Gravel (%)	0	LL	33	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	65	PL	22	Sample ID:	YA-PR-3
Fines (%)	35	PI	11	Sample Depth (ft.):	5

Sample Description: **A-2-6 (0) / SC**

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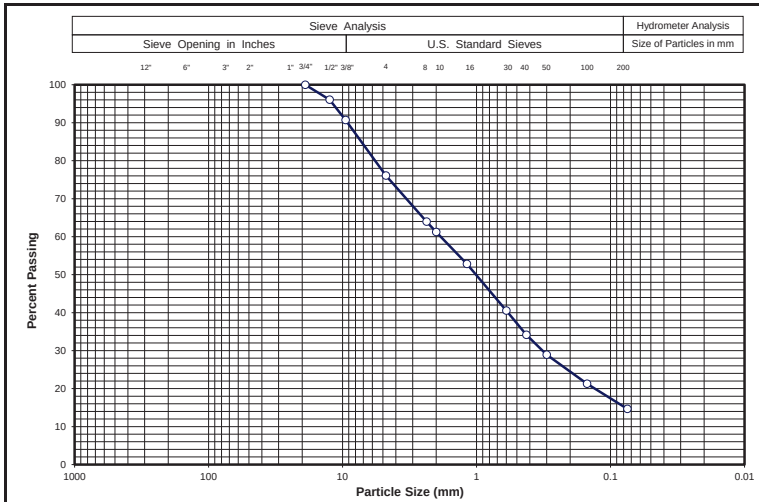
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	96
⅜"	91
#4	76
#10	61
#40	34
#200	15

Gravel (%)	24	LL	34	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	61	PL	16	Sample ID:	YA-PR-4
Fines (%)	15	PI	18	Sample Depth (ft.):	Sample Type: Bulk

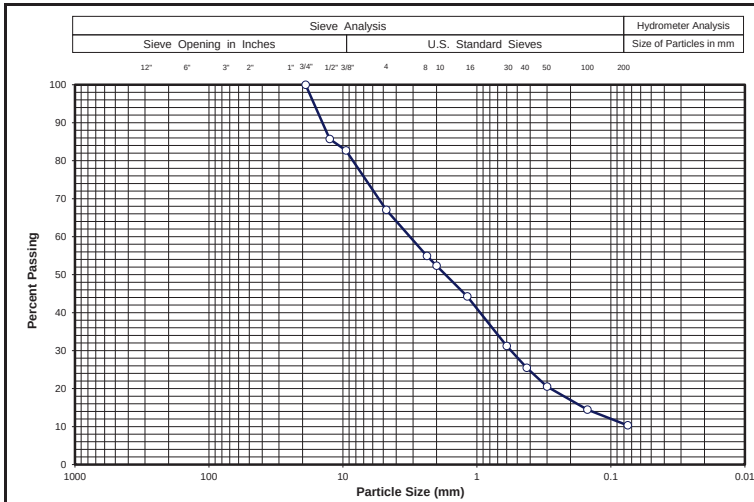
Sample Description: A-2-6 (0) / SC

Yeh & Associates, Inc.
Geotechnical Engineering Consultants

SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	06/09/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	100
½"	86
⅜"	83
#4	67
#10	52
#40	25
#200	10

Gravel (%)	33	LL	NV	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	57	PL	NP	Sample ID:	YA-PR-4
Fines (%)	10	PI	NP	Sample Depth (ft.):	2

Sample Description: **A-1-b (0) / SW-SM**

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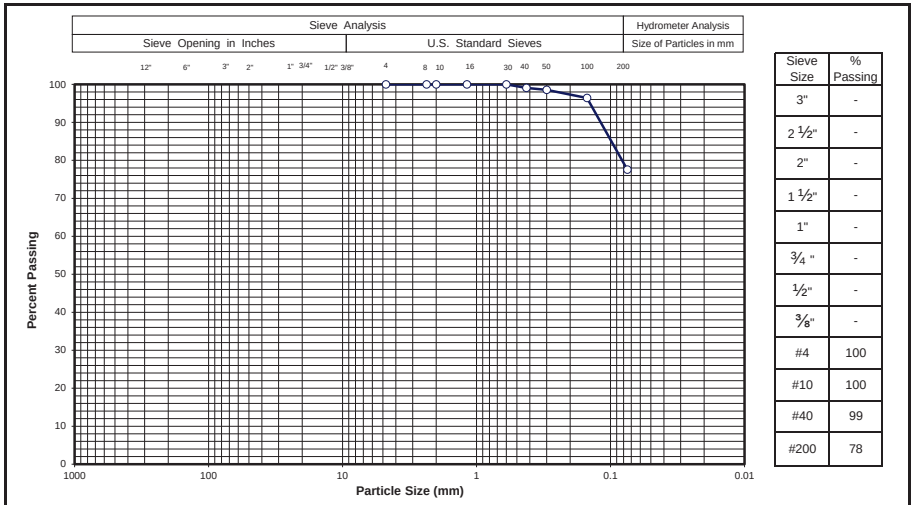
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

Revised 04/27/2004



Sieve Size	% Passing
3"	-
2 ½"	-
2"	-
1 ½"	-
1"	-
¾ "	-
½"	-
⅜"	-
#4	100
#10	100
#40	99
#200	78

Gravel (%)	0	LL	45	Project Name:	I-25 Crossroad Bridge Replacement
Sand (%)	22	PL	17	Sample ID:	YA-PR-4
Fines (%)	78	PI	28	Sample Depth (ft.):	5
Sample Description:	**A-7-6 (21) / CL**				

Yeh & Associates, Inc.
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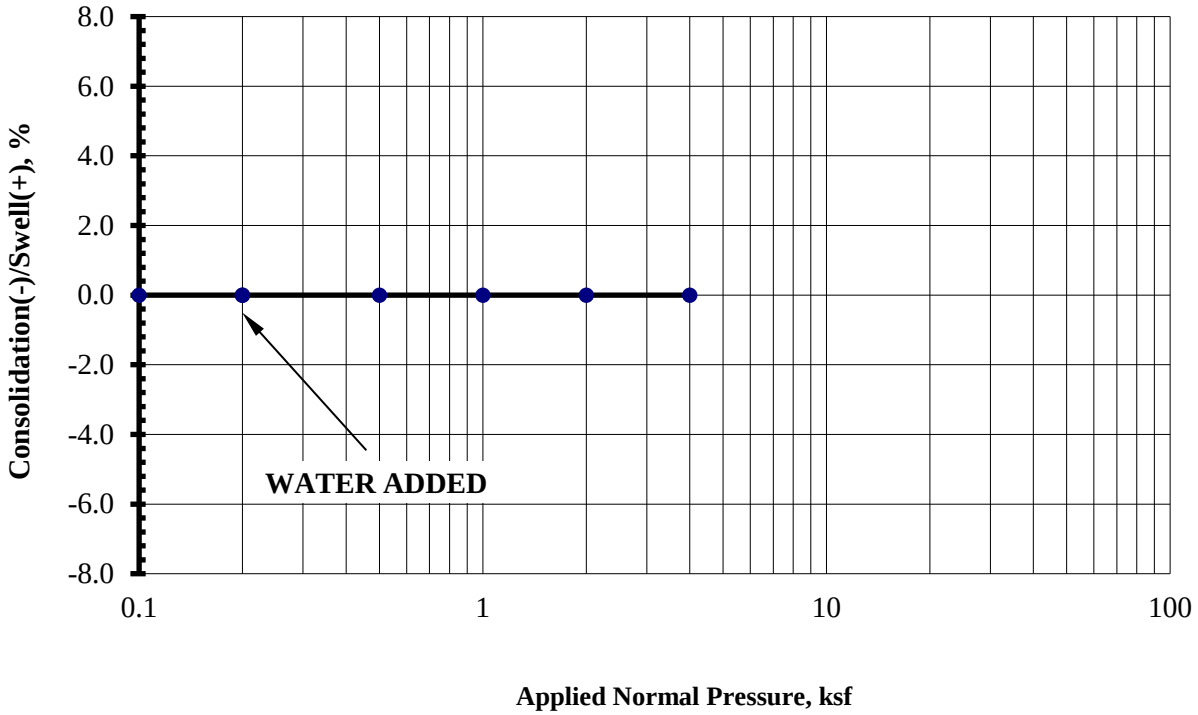
SIEVE ANALYSIS

Drawn By:	MA	Project No.:	215-043
Checked By:	Calvin		
Date:	05/25/15	Figure No.:	-

Revised 04/27/2004



Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-BC-4	2		4.8%	0.0		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

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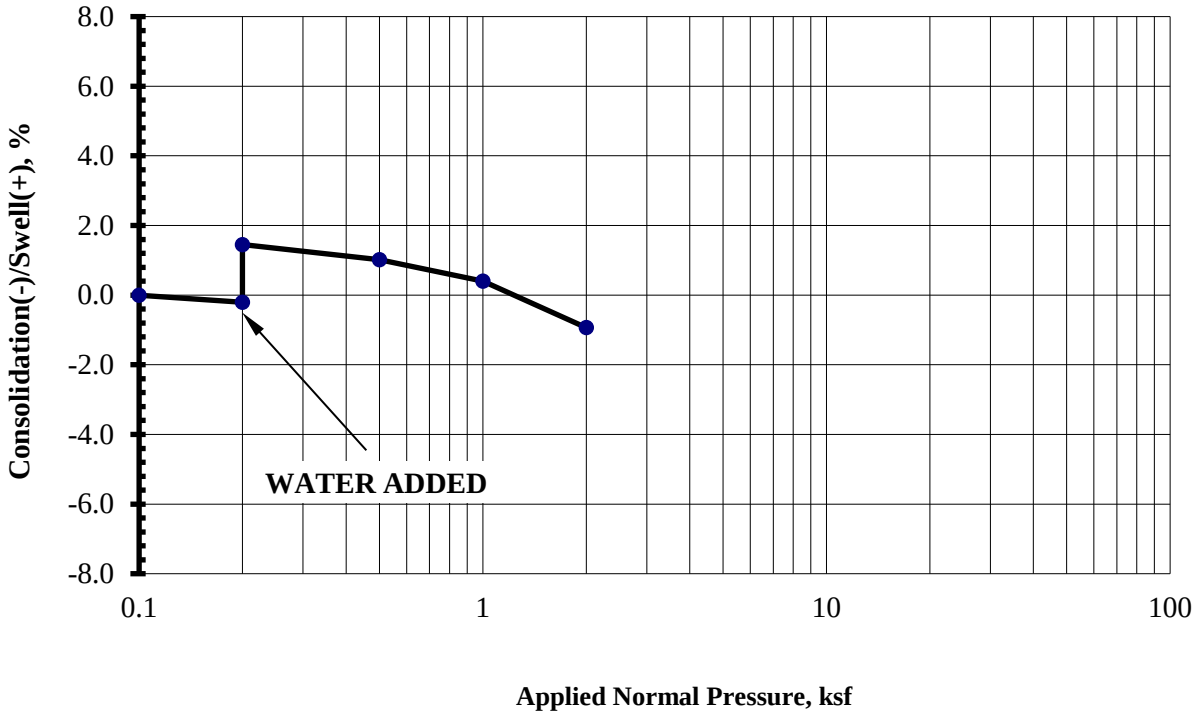
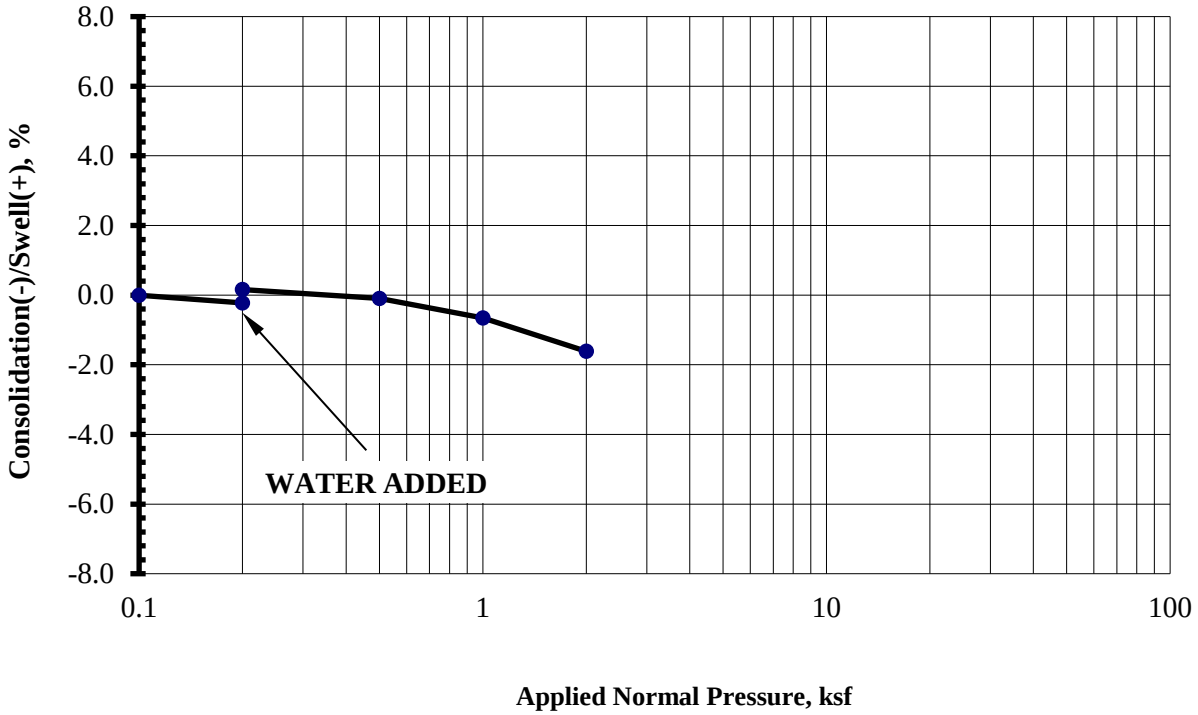


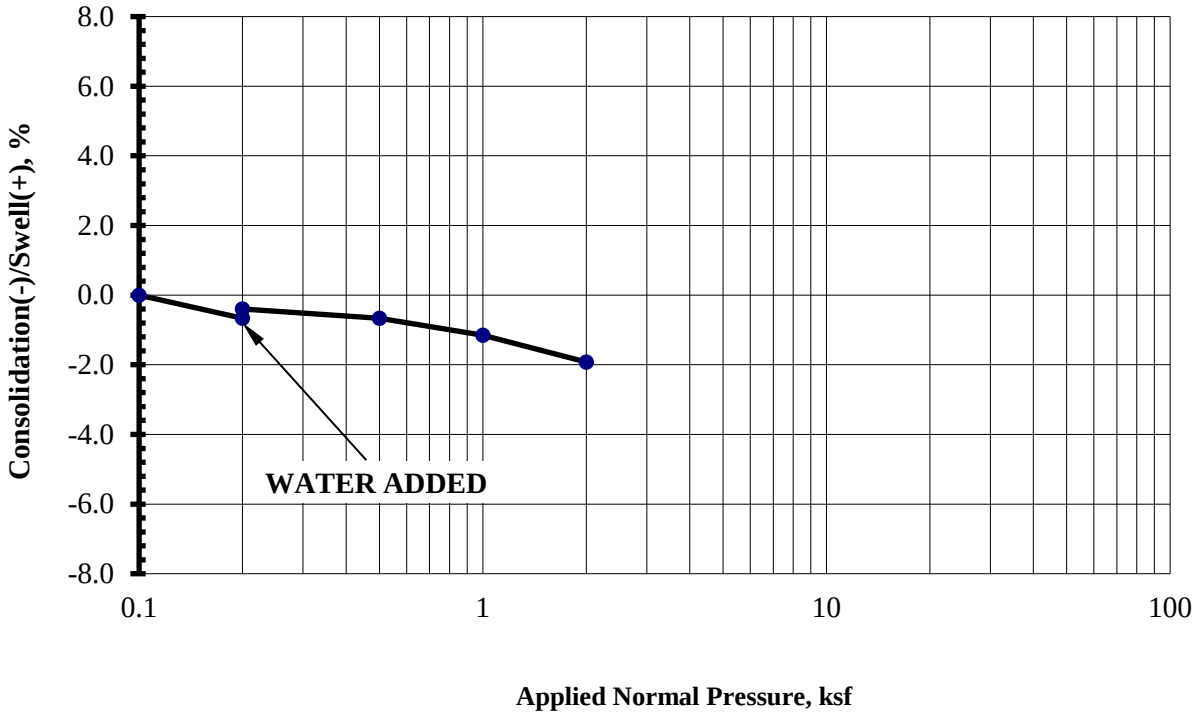
Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-RW-1	2	114.2	16.7%	1.7		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



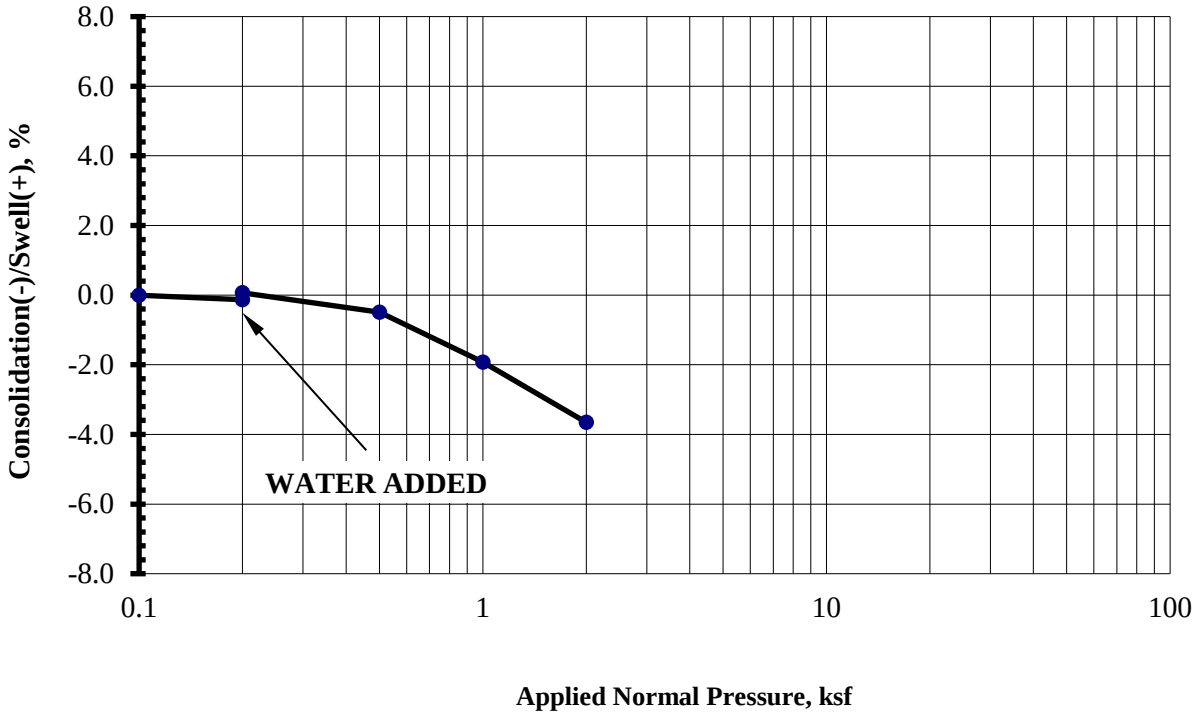
Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-RW-2	2	114.1	15.4%	0.4		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



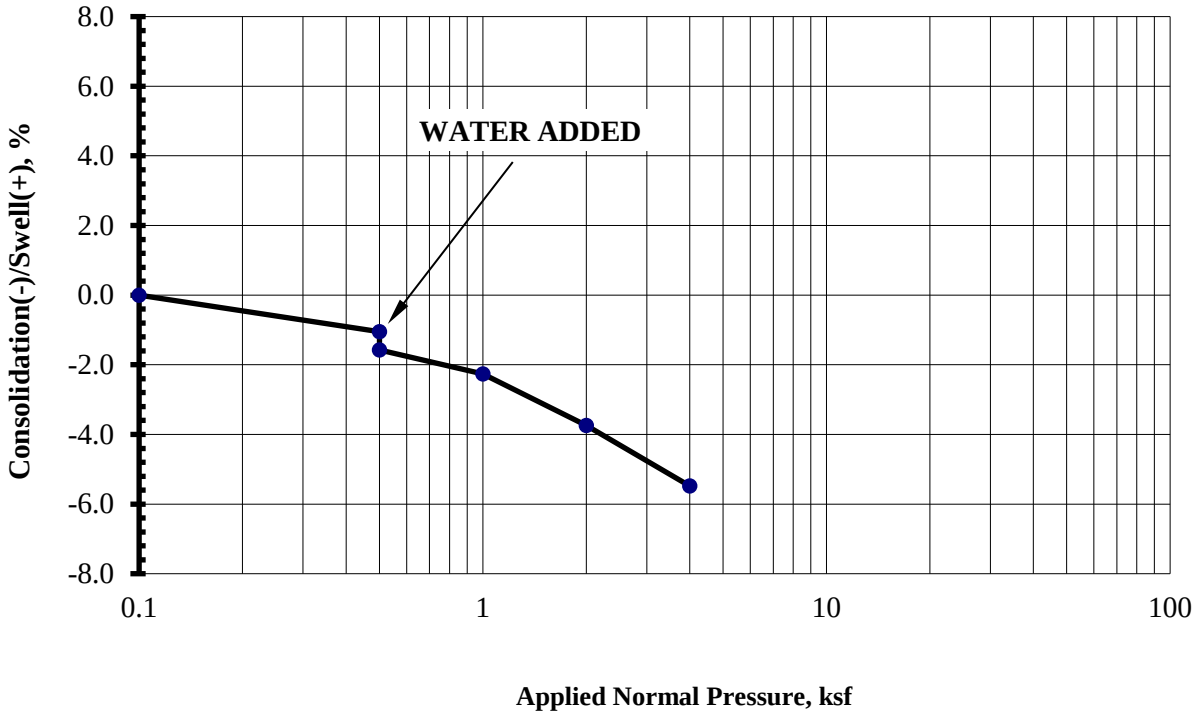
Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-RW-4	5	109.5	18.2%	0.3		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-RW-5	5	92.3	18.3%	0.2		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-RW-6	4	115.0	13.6%	-0.5		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

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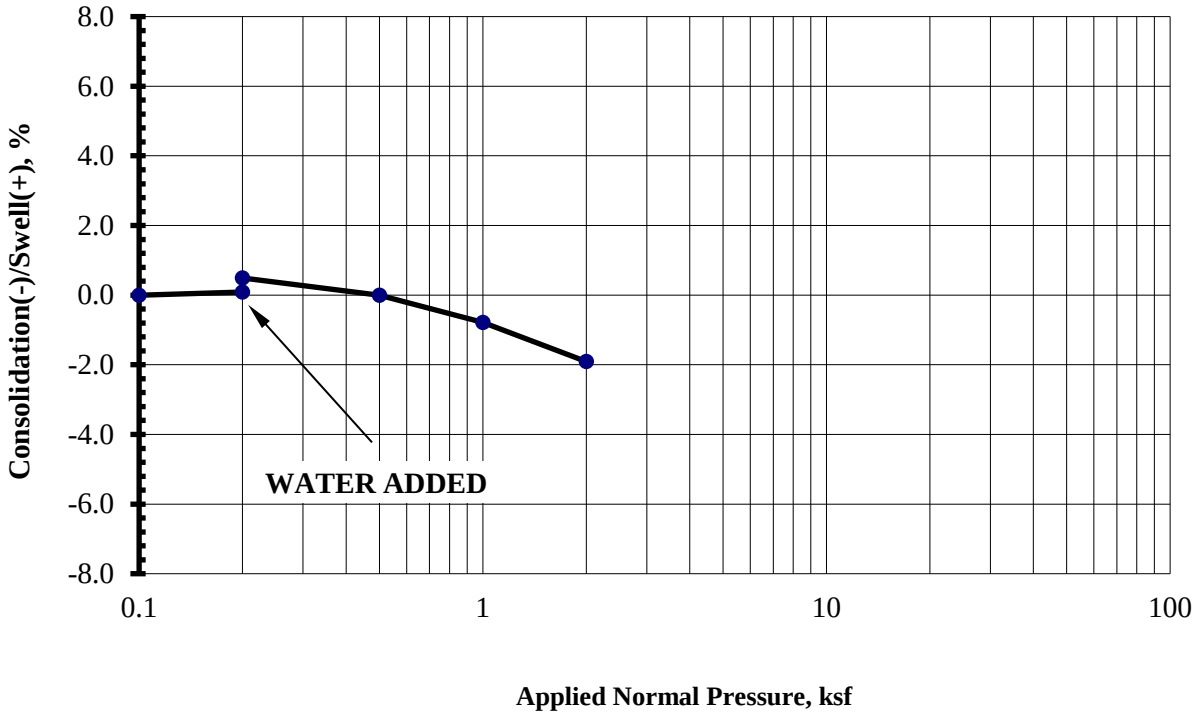

Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PC-1	2	115.9	13.9%	0.4		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

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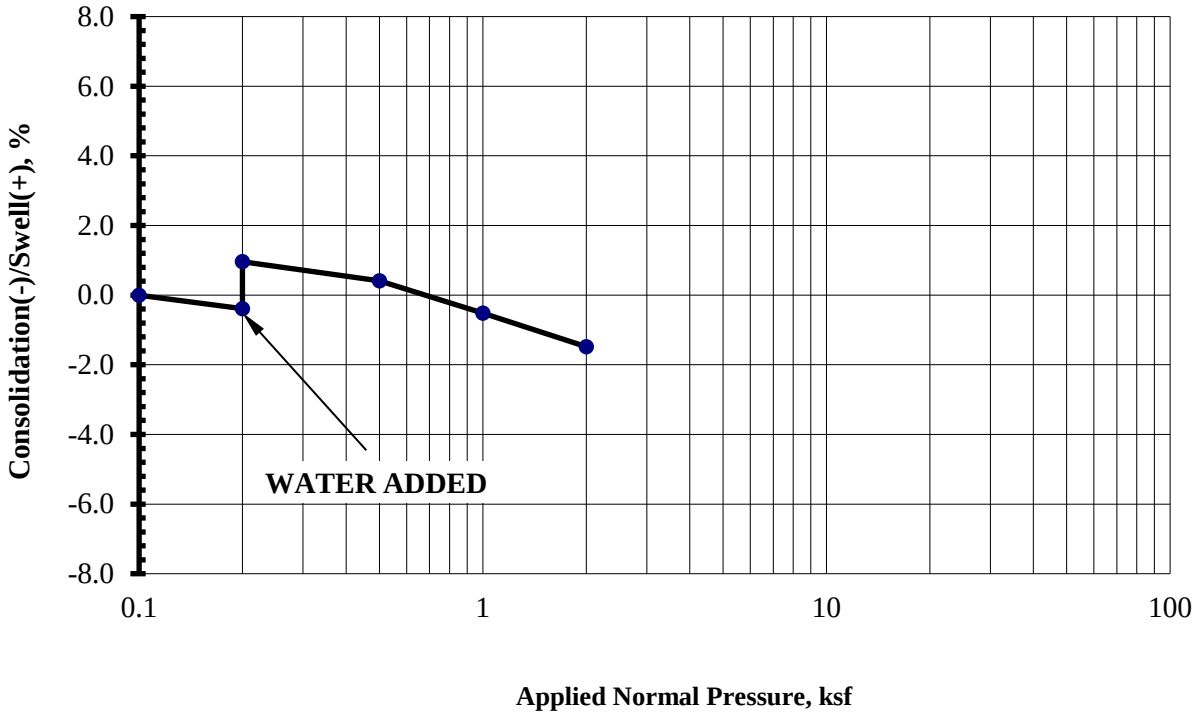

Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PC-2	2	117.8	13.7%	1.3		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

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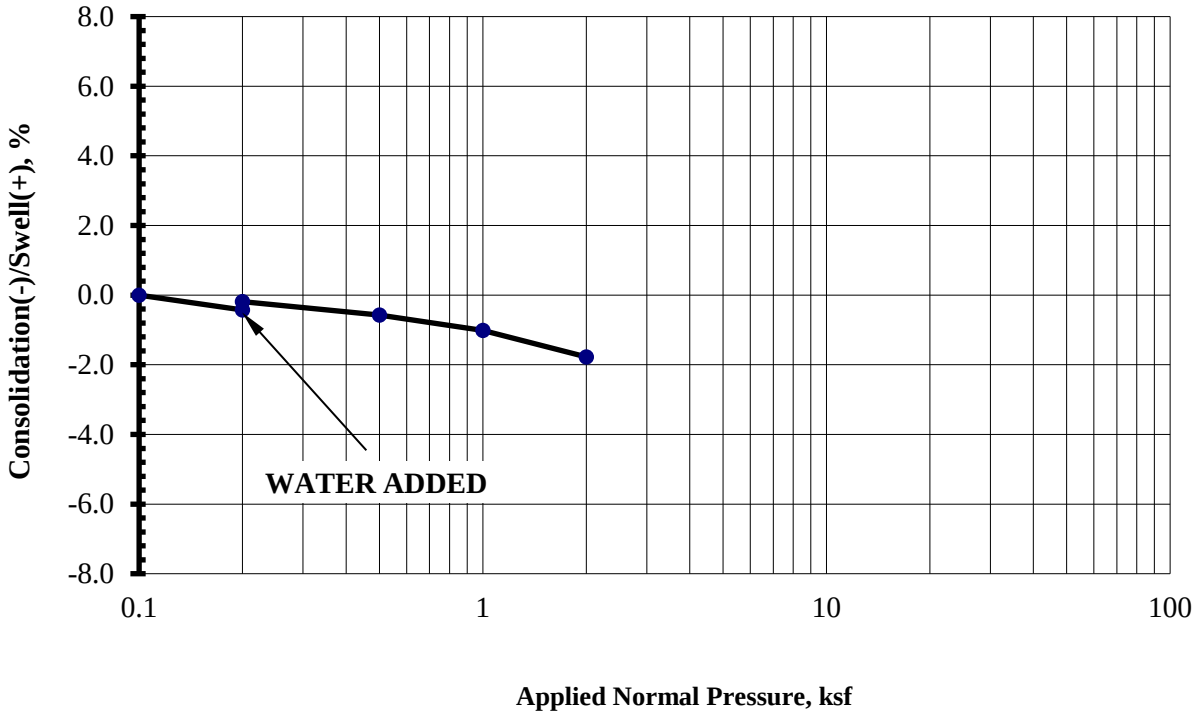

Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PNB-2	2	115.4	16.2%	0.2		Drawn By: M.A
Job No: 215-043	Project Name:	I-25 Crossroad Bridge Replacement				Checked By: Calvin

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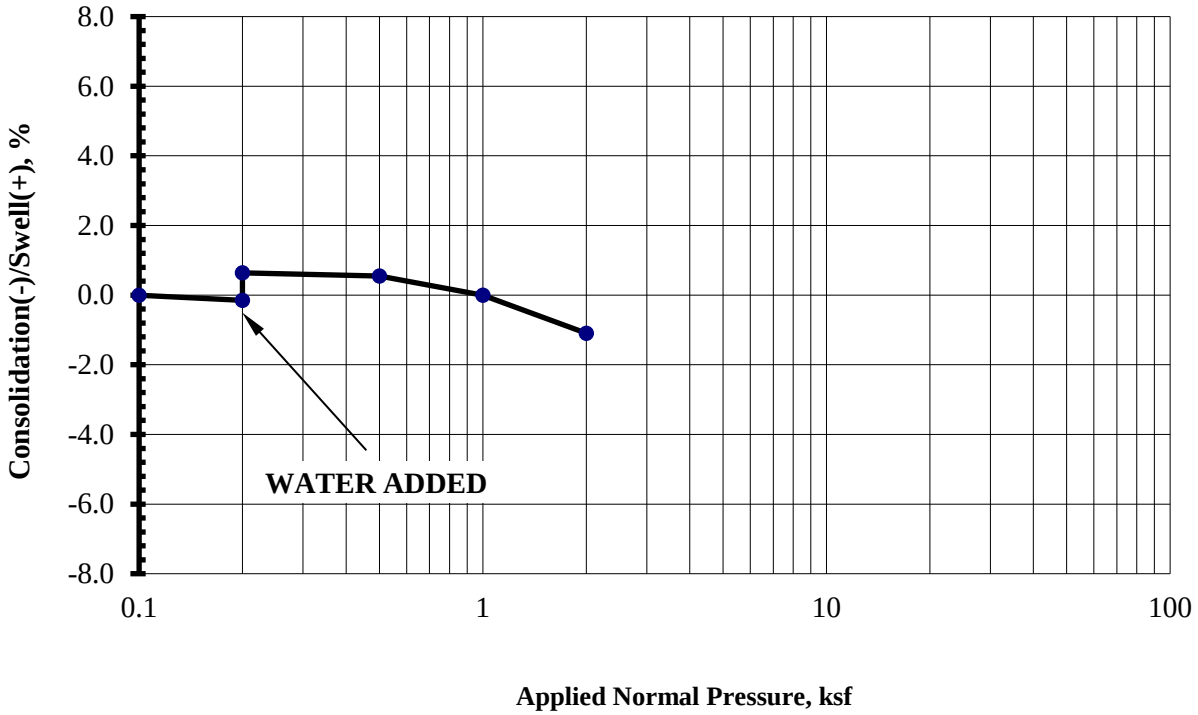

Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PNB-4	2	129.3	6.7%	0.8		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

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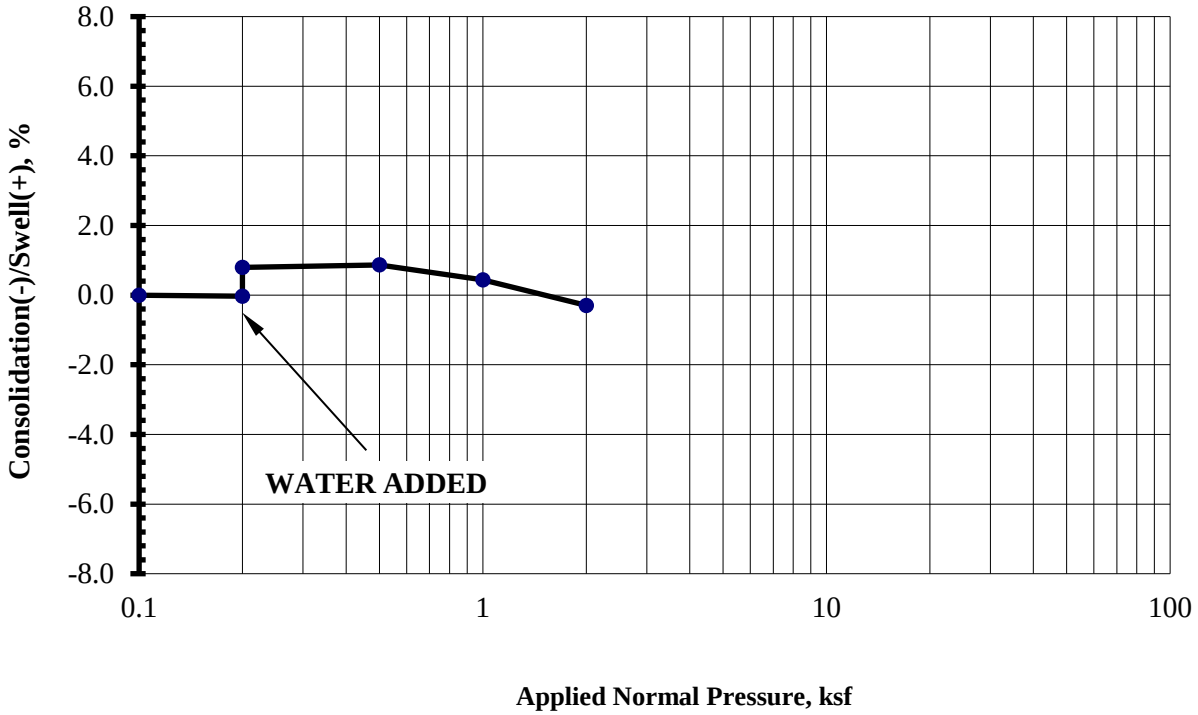

Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PNB-5	5	105.2	18.7%	0.8		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

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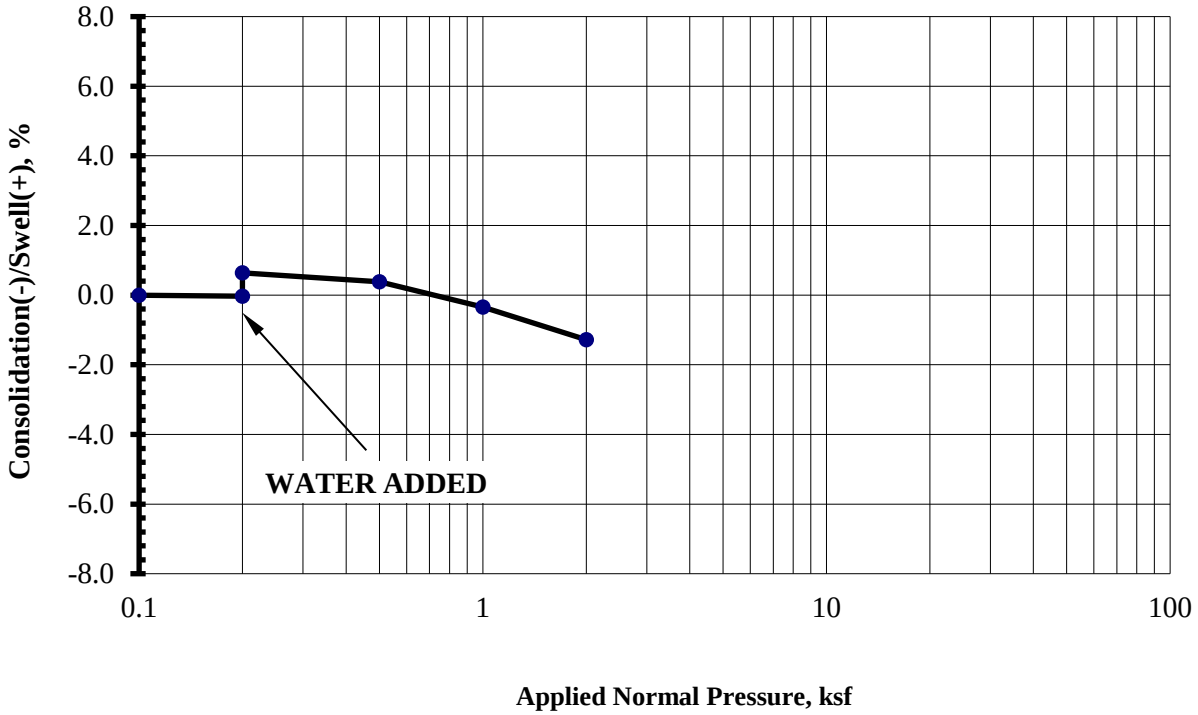
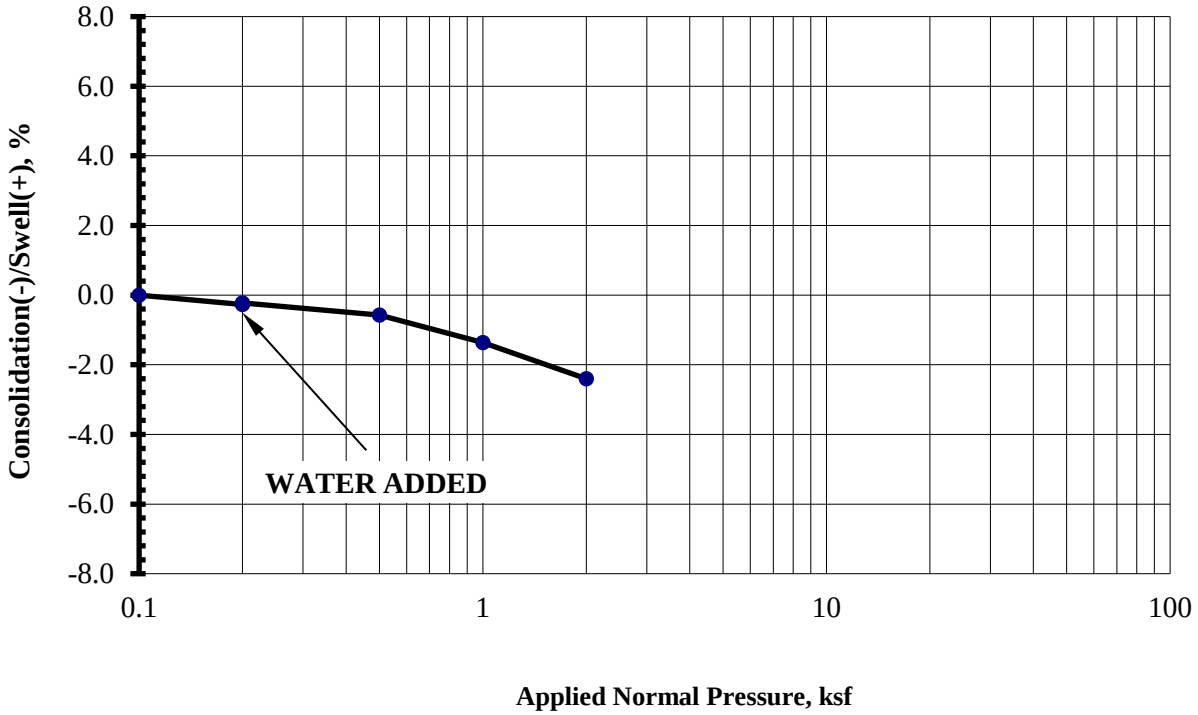


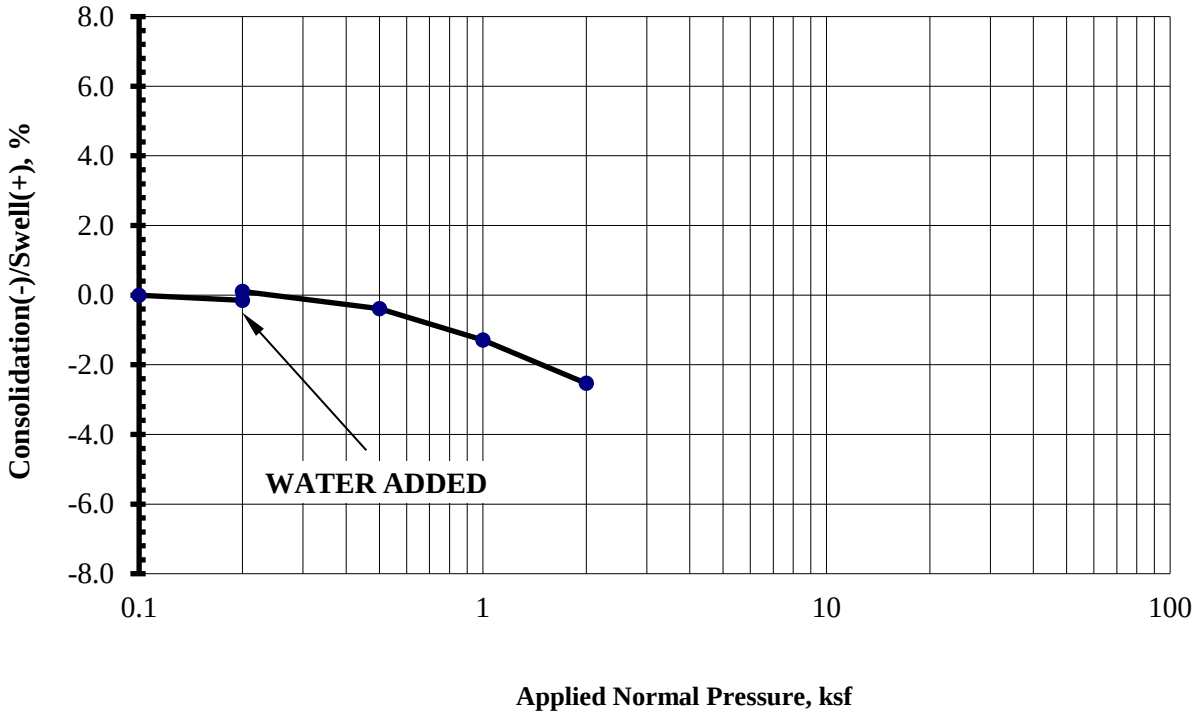
Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PNB-8	2	113.0	15.8%	0.7		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PNB-11	5	105.2	19.6%	0.0		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PNB-15	6	104.8	18.9%	0.3		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

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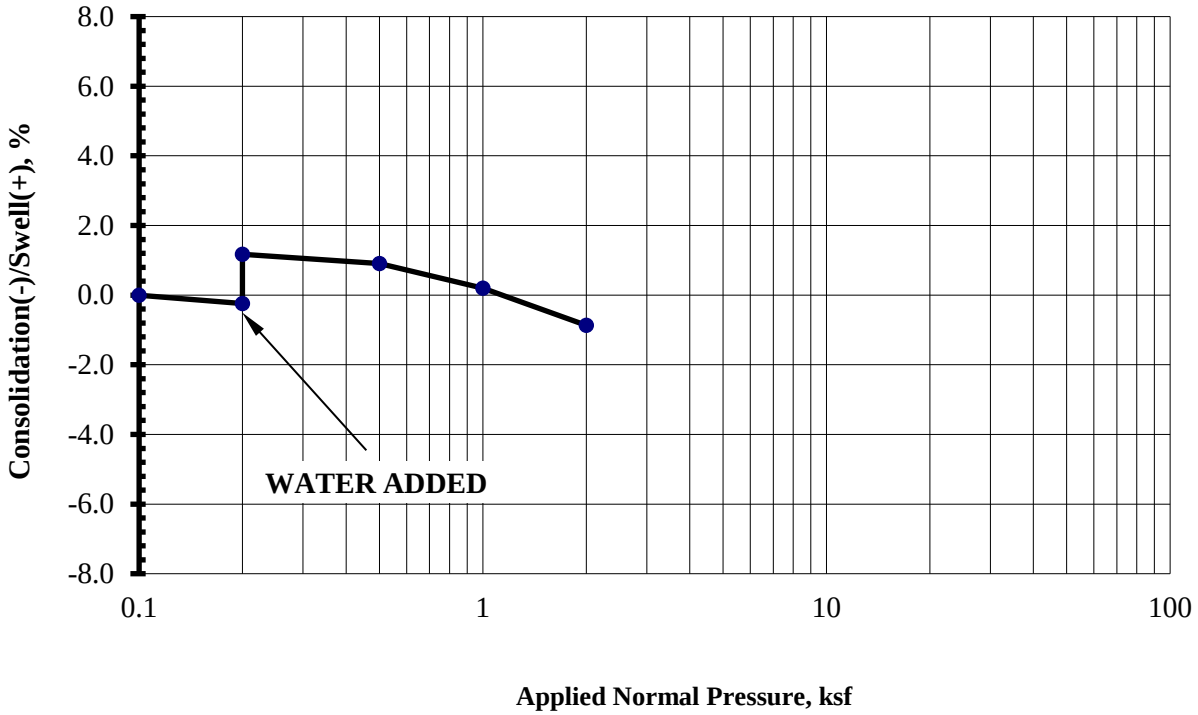

Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PSB-1	3	115.5	18.4%	1.4		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

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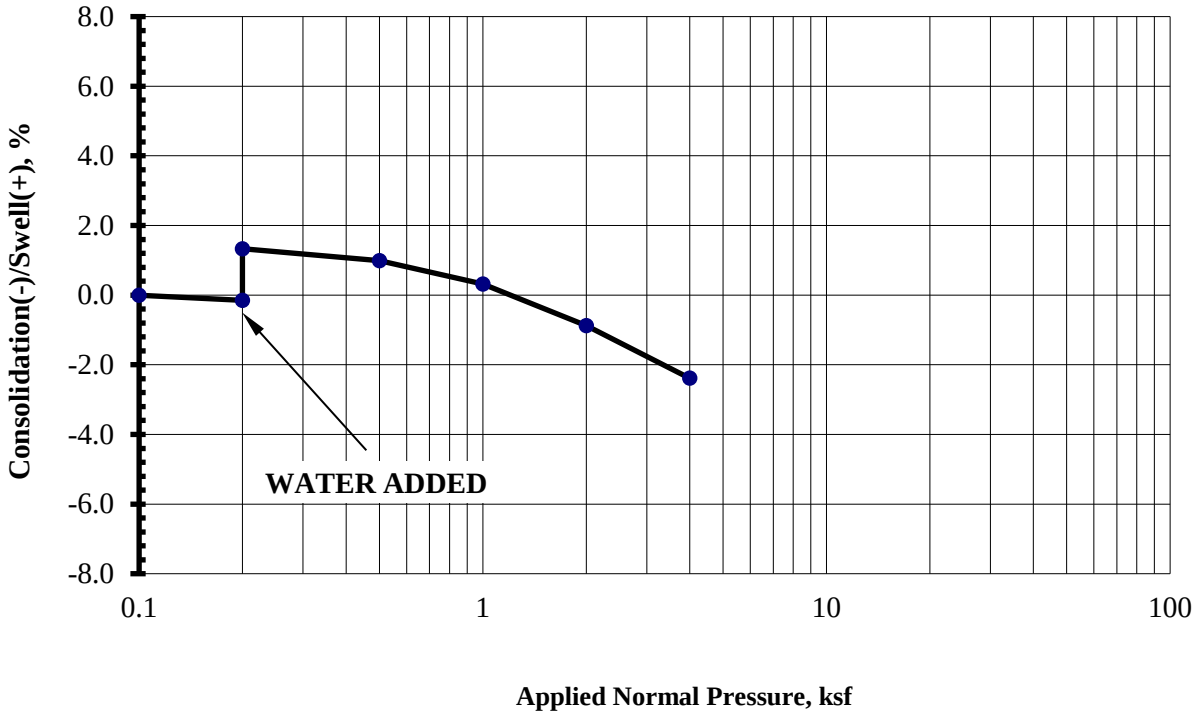
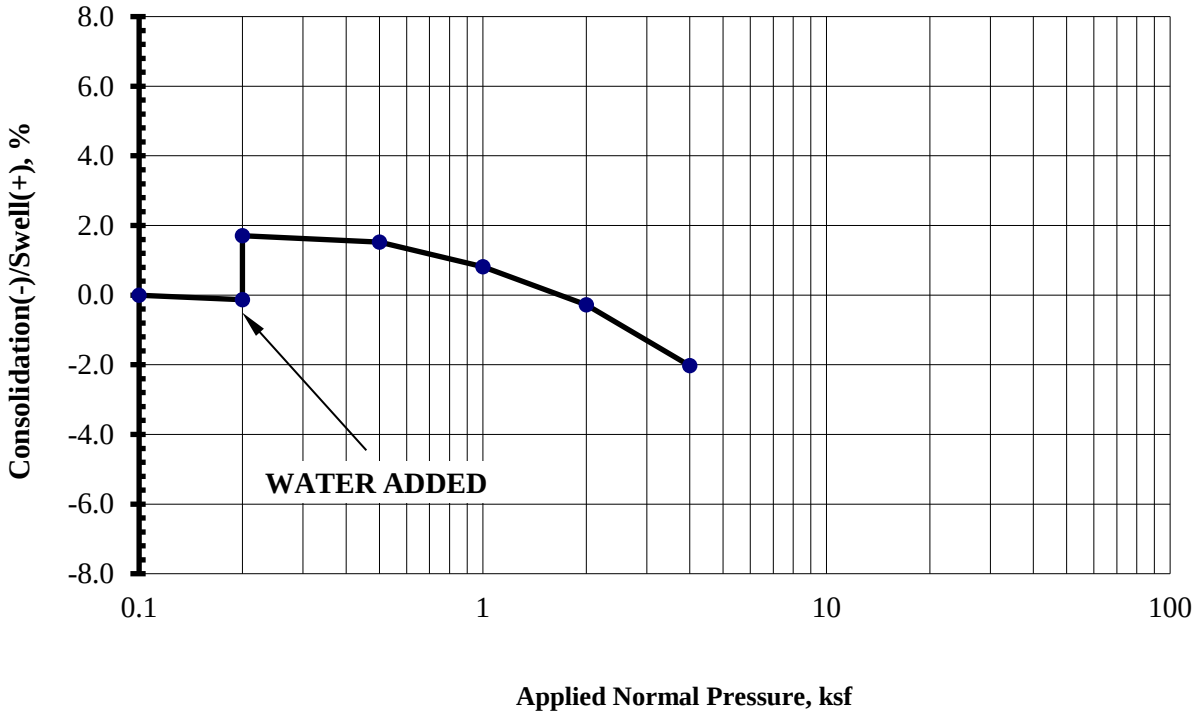


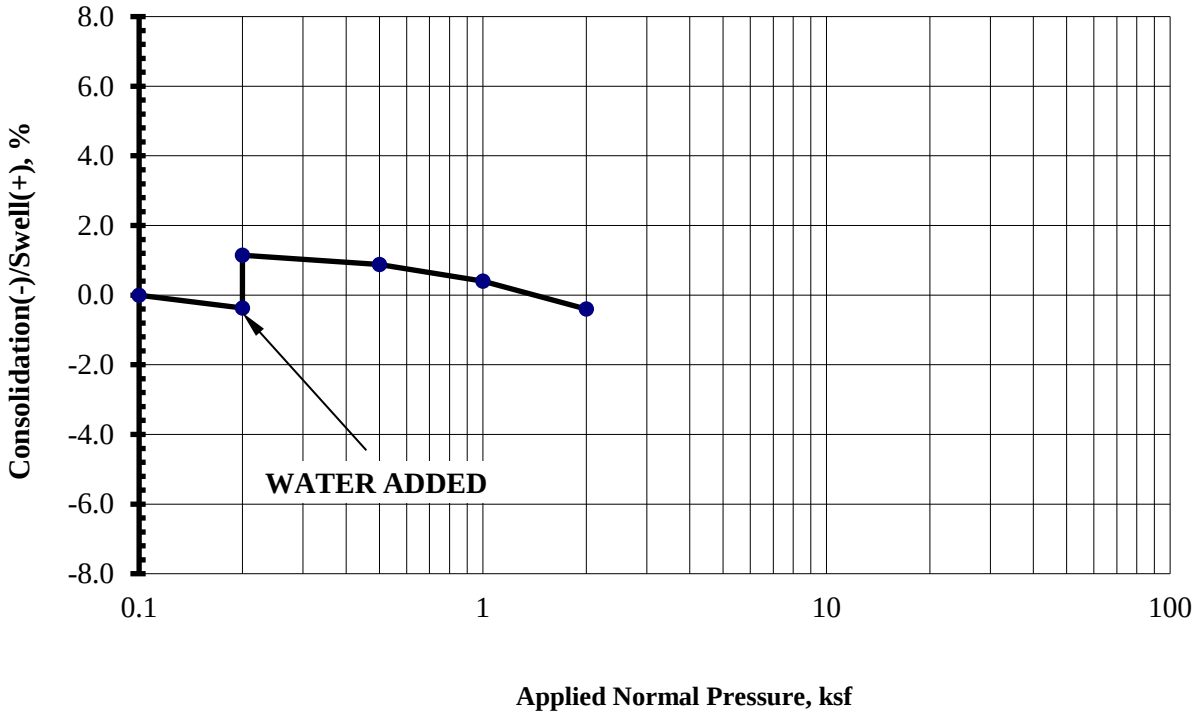
Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PSB-2	2	112.2	18.2%	1.5		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



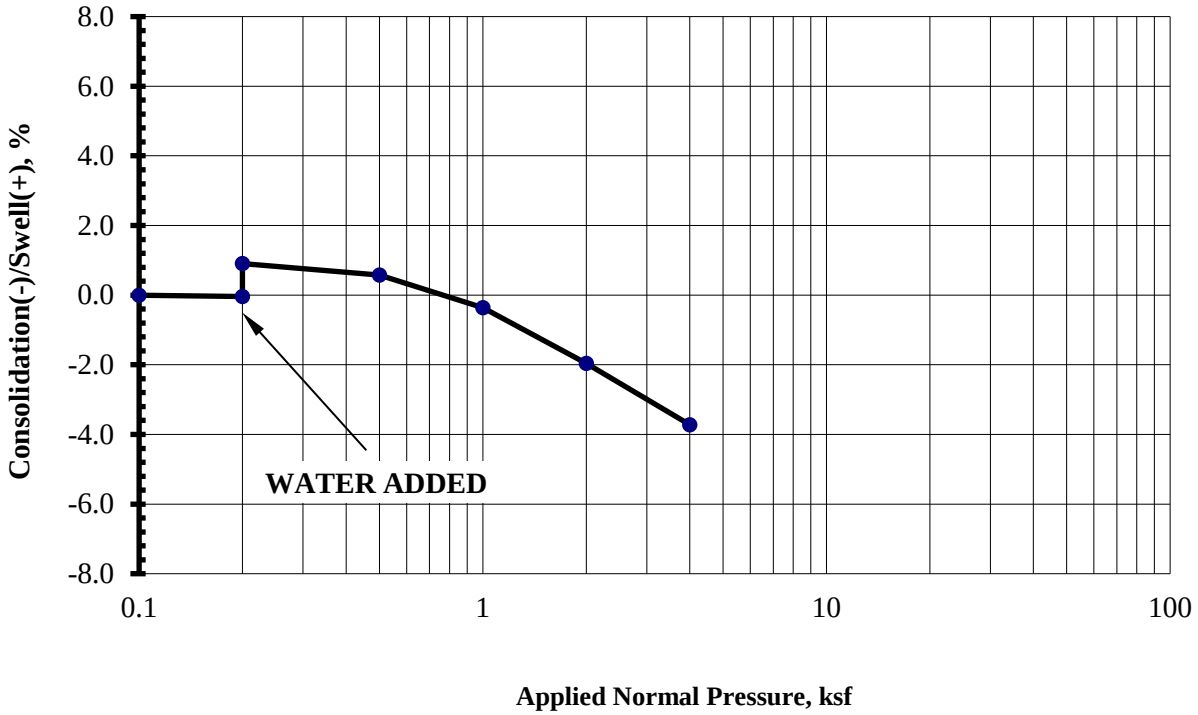
Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PSB-6	2	110.8	16.8%	1.8		Drawn By: M.A
Job No: 215-043	Project Name:	I-25 Crossroad Bridge Replacement				Checked By: Calvin

YEH & ASSOCIATES, INC



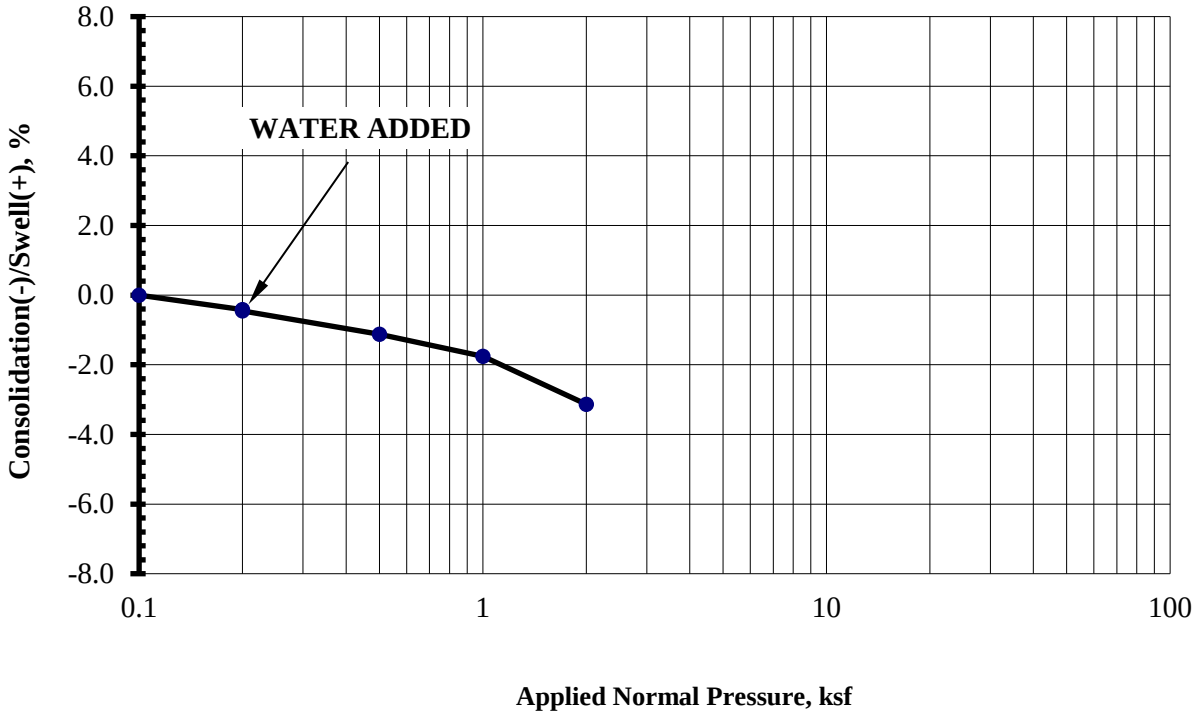
Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PSB-9	2	110.5	18.2%	1.5		Drawn By: M.A
Job No: 215-043	Project Name:	I-25 Crossroad Bridge Replacement				Checked By: Calvin

YEH & ASSOCIATES, INC



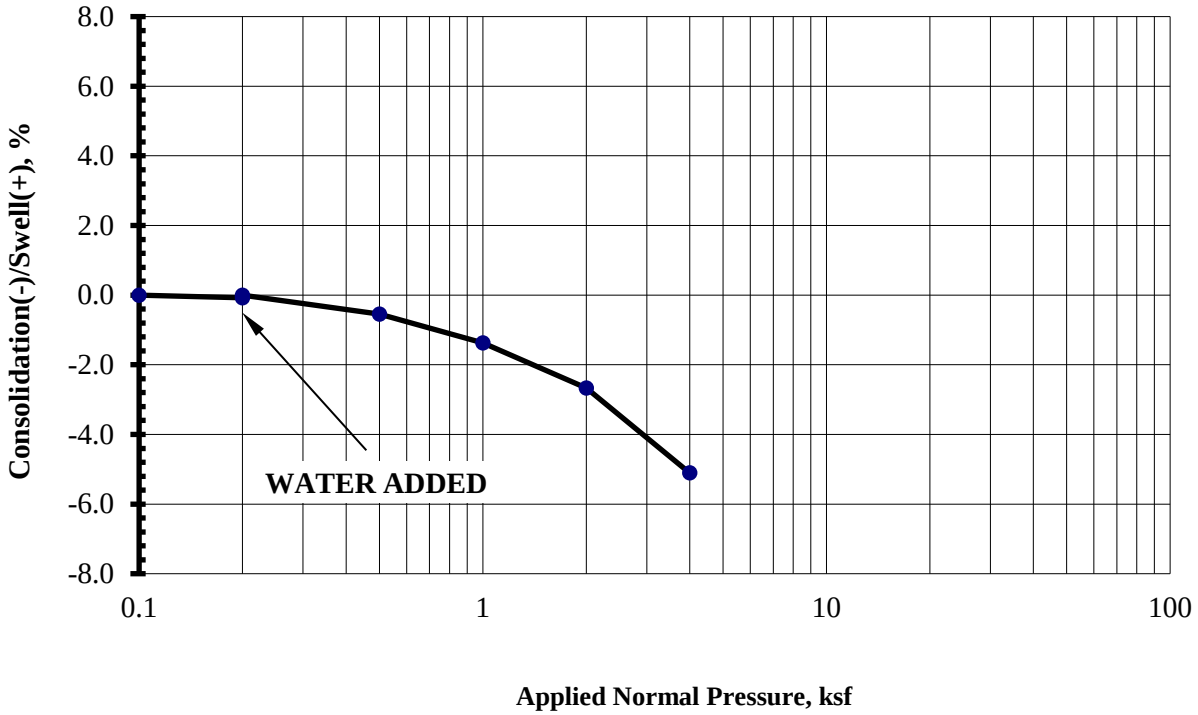
Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PSB-10	2	114.2	14.3%	0.9		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



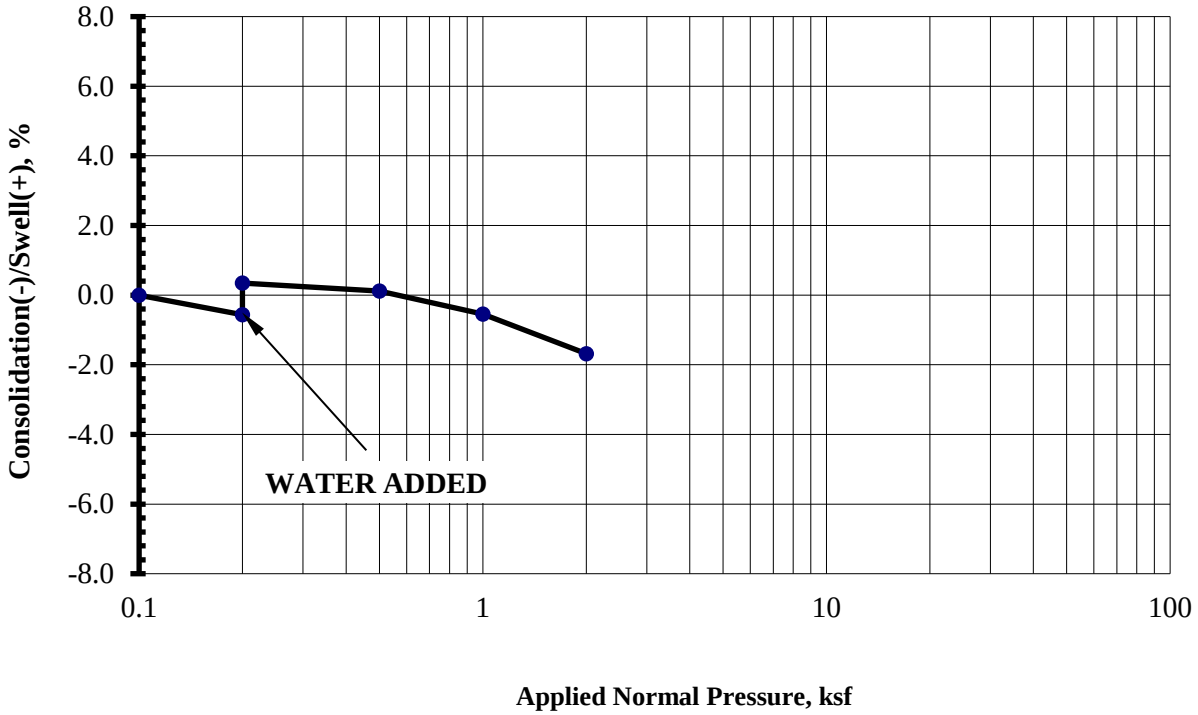
Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PSB-13	5	102.7	22.1%	0.0		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PSB-14	2	99.1	23.6%	0.1		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC



Boring Number	Depth, ft	Natural Dry Density, pcf	Moisture Content, %	Consolidation(-) /Swell(+), %	Soil Description	SWELL / CONSOLIDATION GRAPH
YA-PSB-16	2	115.2	17.1%	0.9		Drawn By: M.A
Job No: 215-043	Project Name:		I-25 Crossroad Bridge Replacement			Checked By: Calvin

YEH & ASSOCIATES, INC