Evaluation of Design Criteria and Field Performance of Rubblized Concrete Pavement Systems in Wisconsin: Final Phase I Report

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16. Abstract

The main purpose of this project is to develop guidance for pre-overlay concrete joint repair and consideration of the rubblized material in pavement design. In order to accomplish the project objectives, a field investigation utilizing falling weight deflectometer (FWD) testing as a means for properly characterizing the rubblized PCC material and subgrade as well as evaluating that the desired fracturing has been achieved was carried out. This testing was supplemented with surface distress surveys and permeability testing to further address the characterization of the rubblized PCC material. The analyses showed a difference in modulus at joint and mid-slab locations as well as sections in good and poor condition. Findings from the Year 1 field testing were used to make recommended changes for the Year 2 field testing to be carried out in 2014. *As allowed for in the project work plan, the sponsoring agency opted not to authorize Phase II of the Project.*

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

Rubblization is an excellent rehabilitation method and the preferred fracture technique approach for all PCC types (PCS, 1991). The Wisconsin Department of Transportation (WisDOT) utilizes rubblization as a rehabilitation technique for deteriorating PCC pavements and it has completed 10,354,000 square yards of rubblization on 145 projects throughout the state between 1988 and 2013. A study conducted by Von Quintus et al. (2007) indicated that the 22 year service life specified for HMA overlays over rubblized concrete used in Wisconsin was appropriate. However, at the time of the study, many of the rubblized pavements had only been in service a short amount of time. In more recent years there have been reports of tenting, winter pavement distress and construction problems on a number of rubblized projects statewide resulting in premature mill and inlay repairs or full HMA overlay replacement, but these have been relatively few compared to the amount of rubblization done to date in the State.

In light of the above problems and research conducted by other States, WisDOT decided to pursue research investigating potential causes of the premature failure of rubblized pavements. This includes consideration of the rubblized material (both at mid-slabs and joints) in pavement design with respect to the structural number and resilient modulus of the rubblized layer and whether the rubblized layer can be considered to perform similar to a drainable base. The objectives of this project were to develop guidance for eliminating tenting distress and to develop an accurate structural design methodology for rubblized pavements, including consideration of joint condition.

In order to accomplish the project objectives, a field investigation utilizing falling weight deflectometer (FWD) testing as a means for properly characterizing the rubblized PCC material and subgrade as well as evaluating that the desired fracturing has been achieved was carried out. This testing was supplemented with surface distress surveys and permeability testing to further address the characterization of the rubblized PCC material. This report presents findings from the literature research performed, field testing activities and data analysis that was performed as part of Year 1. The conclusions from this effort were used to update the recommendations for the Year 2 field evaluation work plan.

Literature Review

Findings from the literature review showed that rubblization of concrete pavements has been an effective method of rehabilitation. However, Wisconsin has experienced some premature failures with the primary distress observed being tenting of transverse cracks. Tenting of the transverse crack occurs as a result of water entering the crack, freezing and expanding during the winter. Adequate crack sealing has been shown to be effective in reducing this distress from forming and worsening. Inadequate subgrade support increases the difficulty of rubblization, often times reducing the amount of fracture of the concrete pavement resulting in large concrete pieces remaining, which can increase the likelihood of reflective cracking.

It also provided an overview of WisDOT practices and specifications for rubblization projects. Although there are two types of equipment used for rubblization, the resonant frequency breaker and the multi-head breaker (MHB), with the exception of a handful of projects which used the resonant frequency breaker, the majority of rubblization projects in Wisconsin have used the MHB.

Several studies suggested the elastic modulus value of the rubblized layer ranged between 65 – 78 ksi (Von Quintus et al., 2007; Ceylan et al., 2008) while the suggested rubblized layer coefficient ranged from 0.19 – 0.22 (Galal et al., 1998; Ceylan et al., 2008). The service life of 22 years for rubblized pavements in Wisconsin was considered appropriate (Von Quintus et al., 2007).

Work Plan

A work plan for the field evaluation was put together in order to accomplish the following objective:

- To aid in developing guidance for eliminating tenting distress in the rubblized pavement sections and in developing an accurate structural design methodology for these pavements in Wisconsin.

In order to accomplish this objective, a field investigation utilizing FWD testing as a means for properly characterizing the rubblized PCC material and subgrade as well as evaluating that the desired fracturing has been achieved was carried out. This testing was supplemented with surface distress surveys and permeability testing to further address the characterization of the rubblized PCC material.

WisDOT had four viable rubblization projects scheduled in 2013 for inclusion in this study. There were roughly 23.1 centerline and 52.9 lane-miles of rubblization within the four projects, providing potential for many test sections covering wide range of experimental factors. The work plan contained project information including soil properties and design parameters, typical pavement cross sections, proposed HMA overlay thickness and traffic data for the 2013 Wisconsin rubblization projects.

As a result of the literature review performed and the project team's experience with rubblization, the following five factors were proposed to be included in the experiment factorial:

1. PCC pavement type
2. Subgrade type
3. Edge drains
4. Joint condition
5. Degree of rubblization

An experiment factorial design for the Year 1 field evaluation was developed consisting of 24 possible cells. Initially, it was thought that 12 of the possible 24 cells could be covered, provided that there are joints in both good and poor condition on all projects. However, once construction began, several factors changed such as the pavement on I-43 actually being CRCP instead of

JRCP and the pavement on US14 being JRCP instead of JPCP. Also, as discussed later, the project engineers were reluctant to change normal practice as far as varying the rubblization energy for more than a limited number of locations.

A summary of the project information meeting the experiment factorial follows:

- STH 29: JPCP, fine subgrade (silty/sandy loam), edge drains, known spalled joints
- USH 14: JRCP, fine subgrade (silty loam), no edge drains
- I-43: CRCP, fine subgrade, edge drains
- STH 96: JPCP, fine subgrade, no edge drains, known spalled joints

To finalize project sectioning and hence to complete the experiment factorial for the possible 12 cells, additional information was needed, including subgrade condition and distress surveys. The distress surveys, which were carried out prior to FWD testing, focused on the joint conditions and allowed the projects to be sectioned based on where joints were in good/fair and poor condition.

The condition of the joints was assessed using the Long-Term Pavement Performance (LTPP) *Distress Identification Manual* (Miller and Bellinger, 2003). The condition of the joints was based on the presence of distresses such as corner breaks, faulting, and spalling and the severity of the distresses. Other factors such as the presence and degree of bituminous patching at the joints were also considered and the more significantly patched joints were recorded independent of the condition classification.

After the joint condition sectioning, it was anticipated that the projects would be further sectioned based on the degree of rubblization at the joints. However, there was hesitation from the field engineer on many projects to allow for this to be conducted on an entire 1000-foot section. For several of the projects, a small selection of joints was indicated to vary the degree of rubblization. This resulted in sections ranging from 5 – 10 feet where the degree of rubblization was varied, including the joint. The degree of rubblization was controlled by variation of speed of the rubblization equipment. By either decreasing or increasing the speed of the rubblization equipment from the typical speed near the joints, the degree of rubblization was increased or decreased, respectively. As a result, there are a limited number of testing points with varied degree of rubblization.

Therefore, for the final sectioning, two sections were indicated containing joints in good condition and two sections were indicated containing joints in poor condition. The typical length of the sections was roughly 1,000 feet.

The Year 1 field evaluation considered the following three types of testing: distress surveys, FWD testing, and permeability testing. FWD testing was conducted in order to determine the in-situ moduli of the pavement layers as well as the between and within project moduli variability for consideration in the structural design methodology as well as to show through the backcalculated layer moduli of the rubblized layer whether there is complete debonding of the steel from the concrete and complete fracture below the steel for pavements containing steel.

Currently, the rubblized material is considered to perform similar to a drainable base in Wisconsin, which results in an increase of 25% in service life equal to four years. The permeability of the rubblized material was tested in order to substantiate this assumption of acting as a drainable base and increase in service life.

Field Testing Activities

Field testing activities were carried out during the months of August and September 2013. The field testing activities consisted of distress surveys of the joints, FWD testing at both joint and mid-slab locations, and permeability testing.

The distress surveys were generally conducted the day prior to rubblization or in some cases the morning before rubblization began. The length of the section that was scheduled to be rubblized for the day was driven and sections of both good and poor condition areas were noted. Sections were then identified based on combining areas of similar joint conditions close in proximity in order to assemble sections roughly 1,000 feet in length.

FWD tests were conducted at both joint and mid-slab locations. While testing, any significant information was noted such as if the testing location was within a patched area, included an area with asphalt, was located close to a crack, or any other issues. Latitude and longitude measurements were taken using handheld GPS units in line with the testing plate.

As mentioned previously, it was desired to vary the rubblization energy. However, due to hesitation of the field engineer to change the rubblization energy on an entire 1,000-foot section, only a limited number of joints on the I-43, STH 96 and US14 projects had the rubblization energy reduced or increased.

Permeability testing was conducted. As was anticipated, the newly rubblized layer acted as a highly drainable base. This was so much so the case, that it was not possible to fill the infiltrometer with enough water fast enough to be able to make any type of measurements. In fact, no measureable depth of water accumulated at all. The water drained through the layer as quickly as it was being poured.

These permeability tests showed that the rubblized layer drains quickly. The issue is not the drainability of the fractured layer but possibly the other layers. Beyond the confirmation that the rubblized layer drains quickly, no further conclusions could be drawn. However, since the rubblized layer does drain quickly, the WisDOT assumption that the rubblized layer acts as a drainable base is a valid assumption. The resulting increase in design life as a result needs to be investigated further.

Data Analyses

The analyses consisted of first using the FWD measured deflections to backcalculate the layer moduli. Analyses of these computed layer moduli then included comparisons between measurements taken at joint or mid-slab locations, comparisons between sections in good or poor condition, comparison of varying rubblization energies and comparisons of between and within section and project variability.

The MODULUS software (version 5.1) was used to backcalculate the layer moduli values. This software was chosen as it is one of the most popular software for conducting this type of analysis. Two runs were performed for each section. For the first run, the depth of the subgrade (depth to bedrock) was calculated by MODULUS. For the second run, the depth of the subgrade was assumed to be semi-infinite. The former scenario yielded better results as demonstrated by less deflections of greater that 80 mils, which is beyond the range of the geophones and a smaller occurrence of the estimated modulus being the default minimum modulus as inputted into the software and therefore only those results are contained hereafter.

A summary of the backcalculated moduli including the mean, standard deviation and coefficient of variation (COV) for each section and project were provided. The summary was further divided to measurements taken at the joints and mid-slab locations. The average modulus values measured at joint and mid-slab locations were 82 ksi and 88 ksi, respectively, for all projects and sections.

Prior to conducting the comparison of joints and mid-slabs, the distributions of the measurements were compared. This was conducted using a statistical F test which compares whether the distributions have similar variances. The results of this comparison were used to determine whether to use a t-test assuming equal or unequal variances when comparing the means. All other t-tests described in this report were also preceded by an F test to determine whether the variances of the distributions were equal or not. There were a total of 57 F tests conducted. Of these tests, 37 showed unequal variances.

The overall results of the estimated moduli values were consistent with known conditions of the project areas, such as I-43 and STH96 having lower modulus values for the rubblized layer and subgrade while STH 29 had larger modulus values which was attributable to thicker, better condition PCC.

Poor subgrade conditions, which were present on STH96, required reduced rubblization energy. The subgrade AASHTO classification for STH96 contained A-7-6 in parts. Owusu-Ababio and Nelson (1999) reported that subgrades classified as A-6 or A-7 with high moisture content did not rubblize satisfactorily. However, despite the high-moisture A-7-6 soil at STH96, the reduced energy appears to have rubblized satisfactorily. This issue is discussed further within the main text of the report.

A significant finding from the analyses was the difference in moduli values at joint and mid-slab locations. This can have implications on the modulus value used for the design of rubblized pavements and needs to be considered.

Although limited in the number of locations, the comparison of varied rubblized energies showed that sections with less rubblization (increased speed) had higher modulus values than sections with more rubblization (decreased speed).

Composite modulus plots showed moderate to high nonlinear response in subgrade materials for STH96 and I-43. The composite modulus is also known as the surface modulus, which is the effective modulus of the pavement structure when treated as a one-layer Boussinesq solution. Close to the center of the FWD load plate center, the modulus value reflects the influence of all layers, and as one moves away from the FWD load plate center, the subgrade contribution increases until it is the only contributing layer. However, the characterization of this nonlinearity was not possible. Changes have been suggested for the Year 2 field testing in order to be able to characterize this and include in the analysis.

In addition, to augment the findings from this study and to further investigate the potential causes of tenting, a supplemental desktop study was conducted. This study identified those projects that have experienced tenting and were reported in poor condition in the Battaglia and Paye report (2011). The objective of this supplemental desktop study was to try and investigate any correlations or patterns that occurred on those projects that experienced tenting. The variables that were investigated included: Location in the State, Year of construction, Class of roadway, Type of concrete, Use of edge drains, Subgrade support, Degree of rubblization fracture, Asphalt thickness, Asphalt properties, and Location of joints in vertical profile (i.e., top of peak or bottom of valley).

During the course of the study, it was not possible to gather the desired level of detailed data for these projects. As a result of the lack of available detailed data regarding tenting found in the sources, no specific conclusions were able to be drawn. The desktop study revealed that there were no correlations or patterns to suggest a cause for the poor performance of these projects. Further detailed information regarding the initial onset of the tenting, further consideration of the project design assumptions and investigation of subgrade support may lead to a better understanding of the poor performance of these projects; however, this information was not available.

Recommendations

As a result of the Year 1 field testing and findings, the same field evaluation work plan for Year 2 is recommended, but with the following caveat and recommendations::

- The projects that will be included in Year 2 are limited to those projects available for 2014 as already planned by WisDOT. The project team will attempt to populate as many of the experimental cells as possible, but this will clearly depend on the projects that will be available for 2014.

- Although the Year 1 analysis of varied rubblization energy was based on limited data and locations, it showed promising results. In order to expand on this analysis in the future, it is recommended to expand the number of locations of varied rubblization energy in the Year 2 field testing. It is anticipated that experimentation with less rubblization energy will be viewed more favorably, as this does not raise the risk of expensive pavement failures during and after construction plus it results in a greater structural capacity for the rubblized layer. Reduced rubblization energy at joints only or throughout the length of test sections should be considered in an attempt to reduce mid-slab versus joint variability of rubblized layer moduli. However, higher rubblization energy would also contribute to the understanding and characterization of rubblized layers, and hence should be pursued where possible, perhaps with the support of FWD testing to demonstrate via layer moduli that joints and mid-slabs have been adequately fractured.

- FWD testing should be conducted prior to rubblization, after rubblization and after placement of HMA overlay on closed projects during Year 2 where traffic control would not be an issue. If testing can be done throughout the three construction events in question, then a more clear history of the rubblized PCC layer and hence its characterization can be obtained. FWD testing conducted prior to and after rubblization can be used to determine the reduction in PCC modulus as well as related issues such as degree of rubblization, remaining structural capacity, etc. As stated in the literature review chapter, for example, Buncher et al. (2008) suggested that there is a relationship between the ratio of the modulus of the rubblized layer and the modulus of the pre-fractured PCC (E_{rub}/E_{PCC}) with an average retained modulus of 6.0%, which should be explored further. Similarly, FWD testing after HMA overlay would be extremely beneficial as it helps characterize the rubblized PCC layer as fully constructed, which defines its actual (as compared to as–designed) performance.

- Consideration should be given to conducting FWD testing on older (prior to 2013) rubblized projects that are performing both well and poorly (perhaps with tenting), as this would provide extremely valuable data on projects with known performance. Again, this would require the availability of traffic control.

- As the Year 1 data analysis showed, two of the projects showed nonlinearity in the subgrade. In order to properly account for nonlinearity in the data analyses, it is recommended that a fourth drop height be included in the FWD testing to enable the use of an important non-linear characterization feature within the MODCOMP layer moduli backcalculation software. In addition, consideration will be given to FWD testing with the larger plate instead of the small one in order to improve data quality, including the reduction or elimination of deflections over 80 mils. By testing with the larger plate, the second sensor, located at 8 inches, will be removed from analysis, which was a source of high deflections. Also, the use of the larger plate (because of its larger contact area) will significantly reduce the number of deflections exceeding 80 mils, which is the upper range of the FWD geophones. However, if it is possible to maintain deflections under 80 mils with the 12-inch plate, the research team will do so, as it has important implications in terms of historical deflection data for rubblized projects.

After completion of the Year 2 field testing and data analysis, the Year 1 and Year 2 results will be used to address the validity of WisDOT design values and structural values used for the rubblized layer. A major consideration during this will be how to incorporate the difference between mid-slab and joint locations within the design. Other analysis considerations include:

- It is important to conduct MEPDG simulations as part of the Phase II effort to look at the effects of rubblized layer modulus and HMA layer thickness for the range of subgrade support conditions. These simulations could provide beneficial information regarding the effects of rubblized layer modulus and HMA layer thickness. Perhaps the most important element of these simulations will be the determination of the required HMA overlay thickness derived from the characterization of the rubblized PCC layer from deflection testing versus the as-designed and as-constructed HMA overlay thickness, as determined by WisDOT. As part of these simulations, another consideration will be incorporation of the variability of the modulus of the rubblized layer, especially since WisDOT is moving towards the MEPDG; i.e., and an important outcome of the project will be guidelines on how to consider the variability of the rubblized PCC layer in the design process. Still another consideration as part of the simulations, relative to the within and the between project variability of the modulus of the rubblized layer, is to obtain an estimate on how the rubblized layer moduli variations impact predicted distress, which again could provide some insight and be of value to the WisDOT design method.

- Further investigation into the higher modulus values determined for STH 29 during the Year 1 effort is needed so that the condition that resulted in the increased moduli can be incorporated into the material properties. It is believed the higher modulus values are a result of thicker concrete pavement that was in relatively good condition. Although the STH 29 rubblized moduli were higher relative to other three projects, the moduli were substantially lower than found in the NAPA study. WisDOT results are considered better than the NAPA study for various reasons, including improved testing equipment and backcalculation software. Similarly and for the same reasons, some of the backcalculated moduli for the granular base/subbase and subgrade appear to be too low and/or highly variable. On I-43, for example, the subgrade moduli are less than 1,000 psi for 3 of the 4 sections.

- In addition to the backcalculated layer moduli, consideration will be given to the use of deflection indices such as the Area Under the Pavement Profile (AUPP) index developed by professor Marshall Thompson. While premature at this time, it is suspected that such indices will be of value in characterizing the structural capacity variability within projects, but it is unlikely that they will serve as direct input into the rubblization design process.

- To the extent possible and if the data support it, a more detailed investigation between the amount of joint deterioration, that is the width of the failed joints, would be beneficial as part of the Year 2 effort.

- Finally, the work completed during Year 1 suggests WisDOT projects are potentially being over-rubblized, creating excessively-low structural capacity, which in-turn increases the thickness (cost) of the HMA overlay needed. Similarly, the project team feels that repairs prior to rubblization could potentially be a waste of effort and budget, as the rubblization process will destroy any repairs applied at the joints. Accordingly, it is important that this finding be seen through by the WisDOT. More specifically, the following important activities are strongly recommended:

  + Find an approach that balances between minimizing or eliminating reflection cracking and tenting, while not over-breaking the PCC layer. As stated above, it is possible that the PCC layer is being broken too much, such that little benefit is gained in terms of reflection cracking control and too much is lost in terms of structural capacity.

  + Find an approach that improves uniformity across rubblized projects, including consideration of mid-slabs and joints. There seems to be differences between the two, and a key to quality and good performance is uniformity; i.e., low within project variability. As part of this effort, use of proof-rolling on all projects to identify and correct weak areas should be seriously considered.

+ Adequately characterize the modulus of the rubblized PCC, both in terms of central tendencies and variability, as the primary input to WisDOT design of rubblized pavements, whether using the design methodology in AASHTO 1993 or MEPDG.

As allowed for in the project work plan, the sponsoring agency opted not to authorize Phase II of this project. Accordingly, the Phase II work contained in the original work plan and contemplated by this Phase I report was not subsequently performed.

1. INTRODUCTION

The selection of rehabilitation procedures and strategies for deteriorating highway pavements require knowledge of the type and cause of the distress, determination of candidate rehabilitation procedures, and selection of an optimal strategy based on economic and other considerations. For Portland cement concrete (PCC) pavements, there is a vast array of possible rehabilitation procedures, but hot-mix asphalt (HMA) overlays have been and continue to be, the most common strategy. However, the performance of HMA overlays on PCC pavements is often hampered by the occurrence of reflection cracks over existing joints and cracks. This type of distress constitutes the most frequent cause of loss of performance for HMA overlays.

Reflection cracks in HMA overlays are caused by a combination of thermal and traffic induced stresses. The expansion and contraction of the PCC pavement results in horizontal movements that produce strains in the HMA overlay exceeding its tensile strength. Traffic loads can cause vertical differential movements at the location of joints and working cracks in the PCC slab and induce critical shear stresses at the bottom of the HMA layer. The overlay immediately over the joints and working cracks in the PCC is not able to accommodate these localized movements resulting in the development of reflection cracks.

The engineering profession has attempted a wide variety of rehabilitation techniques aimed at eliminating the reflective crack problem associated with HMA overlays over PCC pavements. They include thick HMA overlays, crack relief layers and special interface materials; however, the results have been mixed. A technique that has been used increasingly with success over the past couple of decades has been the fracture techniques approach – break and seat, crack and seat, and rubblization. The major objective of this approach is to reduce the effective in-situ slab length before the overlay is placed. If this is effectively accomplished, the likelihood of having reflective cracks appear is significantly reduced or eliminated. The probability of reflective cracking is proportional to the horizontal movement at joints and cracks, which in turn is directly proportional to the spacing between joints and cracks.

The NAPA study *Guidelines and Methodologies for the Rehabilitation of Rigid Highway Pavements using Asphalt Concrete Overlays, Technical Report* concluded that rubblization is an excellent rehabilitation method and the preferred fracture technique approach for all PCC types (PCS, 1991). The Wisconsin Department of Transportation (WisDOT) utilizes rubblization as a rehabilitation technique for deteriorating PCC pavements and it has completed 10,354,000 square yards of rubblization on 145 projects throughout the state between 1988 and 2013. A study conducted by Von Quintus et al. (2007) indicated that the 22 year service life specified for HMA overlays over rubblized concrete used in Wisconsin was appropriate. However, at the time of the study, many of the rubblized pavements had only been in service a short amount of time. In more recent years there have been reports of tenting, winter pavement distress and construction problems on a number of rubblized projects statewide resulting in premature mill and inlay repairs or full HMA overlay replacement, but these have been relatively few compared to the amount of rubblization done to date in the State.

In light of the above problems and research conducted by other States, WisDOT decided to pursue research investigating potential causes of the premature failure of rubblized pavements.

This includes consideration of the rubblized material (both at mid-slabs and joints) in pavement design with respect to the structural number and resilient modulus of the rubblized layer and whether the rubblized layer can be considered to perform similar to a drainable base. The objectives of this project were to develop guidance for eliminating tenting distress and to develop an accurate structural design methodology for rubblized pavements, including consideration of joint condition. .

In order to accomplish the project objectives, a field investigation utilizing falling weight deflectometer (FWD) testing as a means for properly characterizing the rubblized PCC material and subgrade as well as evaluating that the desired fracturing has been achieved was carried out. This testing was supplemented with surface distress surveys and permeability testing to further address the characterization of the rubblized PCC material. This report presents findings from the literature research performed, field testing activities and data analysis that were performed as part of Year 1. The conclusions from this effort were used to update the recommendations for the Year 2 field evaluation work plan.

As allowed for in the project work plan, the sponsoring agency opted not to authorize Phase II of this project. Accordingly, the Phase II work contained in the original work plan and contemplated by this Phase I report was not subsequently performed.

2. LITERATURE RESEARCH

This chapter presents the literature research that was conducted as part of the project planning. The objectives of the literature research were to investigate and evaluate previous, on-going, and proposed research projects relating to rubblization equipment, current rubblization distresses observed by Wisconsin, pre-overlay joint repair, permeability of rubblized/recycled bases, resilient modulus and structural number of rubblized bases and joint repair materials and performance, design life and maintenance of HMA overlays over rubblized concrete. Publications by the National Cooperative Highway Research Program (NCHRP), State DOTs, Federal Highway Administration (FHWA) and overseas agency relating to rubblizing practices and associated topics were reviewed.

During the literature research process, the information presented in each reference was assessed for consideration under the remainder of the project tasks. Detailed records of each reference were kept including information on the location of the materials, relevance to the topic, and significant findings from the work. A sample form is contained in appendix A. Each record contained an index, date completed, author, title, source, source document, and abstract. The relevance of each document was used to prioritize the reports to undergo further detailed review.

2.1. SUMMARY OF REFERENCES REVIEWED

A total of 23 references were initially reviewed. Table 1 illustrates the distribution of references by source. The vast majority of references reviewed are reports. Table 2 illustrates the number of references relating to each subject. Note that the total number is greater than the total number of references reviewed because a number of references applied to multiple subject matters.

Table 1. Distribution by references source

Type of Source	No. of References
Report	16
Article	3
Manual	4
Total	23

Table 2. Distribution of references by subject

Type of Technology	No. of References
Rubblization (equipment types)	7
Rubblization distresses observed by Wisconsin	5
Pre-overlay joint repair	1
Permeability of rubblized/recycled bases	2
Resilient modulus/structural number	6
Performance, design life, and maintenance	10
LTPP SPS-6 studies/data	1
Historic WisDOT rubblization data	1

2.2. LITERATURE FINDINGS

There are two types of equipment used for rubblization, the resonant frequency breaker and the multi-head breaker (MHB). The resonant frequency breaker is a self-propelled unit capable of producing low-amplitude blows of 2,000 pound force at a rate of at least 44 cycles per second. The MHB is a self-propelled unit with twelve hammers mounted laterally in pairs capable of applying 1,000 to 8,000 foot pounds of energy, which operates at a travel speed up to 5 mph with a cycle rate of 30 to 35 impacts per minute. With the exception of a handful of projects that used the resonant frequency breaker, the majority of rubblization projects in Wisconsin have used the MHB.

The Wisconsin Department of Transportation Facilities Development Manual (2011) provides guidance on the rubblization of concrete pavements in Wisconsin and suggests the following project scoping (WisDOT, 2011):

1. Check the condition of the existing concrete pavement
2. Check for roadway features
3. Verify subgrade conditions

The manual suggests rubblization as a viable option when one or more of the following structural deficiencies exist(s) (WisDOT, 2011):

- PDI values are greater than 60
- Greater than 20% of the concrete pavement joints are in need of repair
- Greater than 20% of the concrete surface has been patched
- Greater than 20% of the concrete slabs exhibit the “slab breakup” pavement distress
- Greater than 20% of the project length exhibits “longitudinal joint distress” greater than 4 inches wide

The manual suggests the following subgrade condition and drainage (WisDOT, 2011):

- Supplementary subgrade investigation consisting of FWD or Dynamic Cone Penetrometer (DCP) testing can be performed but are not required.
- Use of edge drains is not a statewide standard; not typically needed for areas with coarse-grained soils with high permeability, but more so for areas with fine-gained soils with low permeability. If edge drains are used, they should be installed prior to rubblization to allow for sufficient draining and drying of subbase and subgrade. Figure 1 is used to determine subgrade adequacy prior to rubblization.

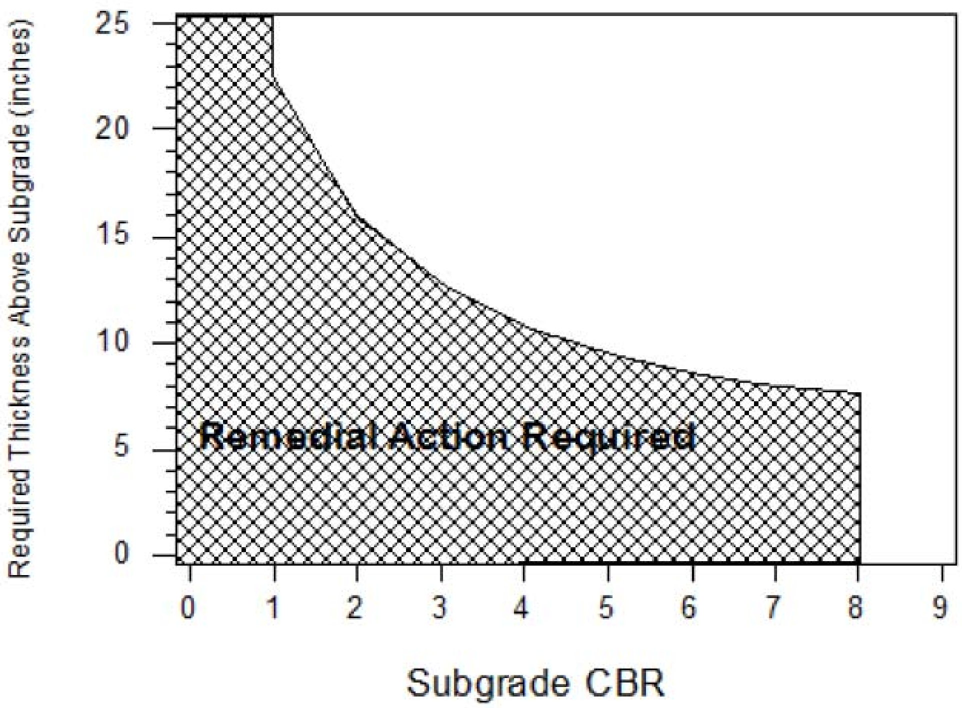

Figure 1. Subgrade/base layer adequacy

The design of the HMA overlay is based on (WisDOT, 2011):

- WisPAVE software used for pavement structural design
- Layer coefficient assigned to rubblized layer ranges between 0.20 to 0.24
- Minimum HMA overlay thickness is 4 inches

The State of Wisconsin Standard Specifications for Highway and Structure Construction Section 335 Rubblized Pavements (2013) specifies that pavements be rubblized using a self-contained, self-propelled breaker and that load transfer devices should be completely severed and full depth joints be sawed prior to rubblization in order to protect the concrete to remain in place. The rubblized pavement should contain particles with a maximum dimension less than or equal to 12 inches with 75 percent of the particles less than or equal to 2 inches at the surface of the slab, 3 inches in the top half of the slab and 9 inches in the bottom half of the slab (WisDOT, 2013). Two test holes, about 9 square feet during the first half day of rubblization are required to determine the particle size with at least one test hole per lane mile thereafter unless the engineer directs or allows otherwise (WisDOT, 2013).

Owusu-Ababio and Nelson (1999) examined performance of rubblization and crack and seat of PCC pavements in Wisconsin based on Pavement Distress Index (PDI), International Roughness Index (IRI) and Present Serviceability Index (PSI). A comparison between control sections and rubblized sections generally showed improved performance with respect to reflective cracking

(Owusu-Abadio and Nelson, 1999). Subgrades classified as A-6 or A-7 with high moisture content or good soils with saturated moisture condition did not rubblize satisfactorily (Owusu-Ababio and Nelson, 1999).

Von Quintus et al. (2007) developed guidelines and recommendations for the selection, design, testing, and construction of rubblized PCC slabs in Wisconsin. For the study, 224 rubblized segments that had been constructed through 2003 were selected for performance analysis considering PDI, average rut depth, and IRI. At the time of the study, the rubblized pavements showed good performance; however, since over half of the segments were less than five years of age, this good performance was expected. The extrapolated service life based on PDI, average rut depth and IRI were 21 years, much greater than 20 years, and greater than 20 years, respectively, indicating that the 22 year service life used in Wisconsin is appropriate (Von Quintus et al., 2007). Von Quintus et al. (2007) recommend using an elastic modulus value of the rubblized layer of 65 ksi for design purposes, an in-place modulus of foundation layers be at least 10,000 psi in order to ensure adequate fracturing of the PCC layer during rubblization and a minimum HMA overlay of 4 inches.

Battaglia and Paye (2010) investigated whether increasing the thickness of HMA overlay on rubblized pavements would extend the service life cost-effectively in Wisconsin. FWD testing showed a reduction of 3 $\mu\varepsilon$ for a 1-in increase in HMA thickness with the control section showing the highest strain of 56 $\mu\varepsilon$ (Battaglia and Paye, 2010). However, this value is still within the acceptable range of 70 to 100 $\mu\varepsilon$ for adequate fatigue protection (Battaglia and Paye, 2010). Life-cycle cost (LCC) analysis of the control section and two test sections with actual paved thicknesses of 7.3, 8.4, and 9.8 inches, respectively, showed that although the increased thicknesses delayed distress formation and reduced the measured strains, it does not provide the required increase in service life to be considered cost-effective (Battaglia and Paye, 2010).

Battaglia and Paye (2011) also investigated the premature distress formation observed in HMA overlays of rubblized concrete pavements in Wisconsin by analyzing 19 rubblized pavements, consisting of 11 “good” performing pavements and 8 “poor” performing pavements, which showed signs of early distress. The study found the primary distress to be tented transverse cracking, which was a result of non-uniform support of the rubblized layer occurring at locations of deteriorated joints and cracks of the previous concrete pavement, and which resulted in reflective cracking in the HMA overlay (Battaglia and Paye, 2011). Tenting of the transverse crack occurs as a result of water entering the crack, and freezing and expanding during the winter. Figure 2 depicts a tented crack on USH 41 in Brown County, Wisconsin (Note: it is the authors’ understanding that the USH 41 rubblization project was not intended as a long-term solution, as reconstruction was planned at the time and is occurring now). Adequate crack sealing was found to be critical in reducing tented transverse cracks as it helps prevent water from entering the crack.

Figure 2. Tented crack on USH 41, Brown County, Wisconsin (Battaglia and Paye, 2011)

Three of four good performing pavements with reflective cracks were adequately sealed and did not exhibit tented cracks while three of four poor performing pavements with reflective cracks were not adequately sealed and did exhibit tented transverse cracks (Battaglia and Paye, 2011). Battaglia and Paye (2011) recommended the use of base patching to repair deteriorated joints. In addition, weak areas should be located using test rolling and those areas should be excavated below subgrade and backfilled with aggregate material (Battaglia and Paye, 2011). Battaglia and Paye (2011) recommended the following for good performing rubblized pavements:

1. Correct deteriorated joints and cracks prior to rubblization.
2. Ensure all joints/cracks are indistinguishable after rubblization.
3. Test roll the rubblized layer and address weak areas as necessary.
4. Correct known areas of weak subgrade support prior to rubblization.
5. Carefully monitor the rubblization process.
6. Ensure that the foundation is dry prior to HMA paving.
7. Promptly seal all cracks that occur in the HMA pavement.
8. Review the initial service life used for rubblized pavement design.
9. Revise the current DGI guideline.

Johnson and Olson (2008) investigated the causes of tenting observed in Minnesota with a focus on deicing chemicals and crack sealing and found that concentration of deicing salts in base materials decreased with depth and distance from pavement cracks and that crack sealing could reduce roughness and height of tented cracks. Excavation of test pits revealed a ridge of fine, silty material found below the tented cracks as depicted in figure 3. Similar conditions were found on I-39 in Wisconsin in May 2012 as shown in figure 4. Kestler et al. (2000) investigated the causes and mechanics of tenting in New Hampshire and determined the underlying cause to be intrusion of road salt-sand mix in the base course. However, other necessary components to induce tenting include available water, cracked asphalt, salt-sand mix, freeze-thaw cycling of base course, and the phase diagram of NaCl (Kestler et al., 2000).

(a) (b)

Figure 3. Ridge of fine, silty material found below tented cracks at two test pits (Johnson and Olson, 2008).

(a) (b)

Figure 4. I-39 test trenches at tended distress areas

Yigong Ji (2009) developed a mechanistic approach and procedure to determine layer coefficients of rubblized pavement using FWD testing and the 1993 AASHTO Design Guide and recommends a layer coefficient of 0.42 for HMA and 0.22 for the rubblized layer for overlay design. Galal et al. (1998) also recommend a layer coefficient of 0.22 based on the AASHTO method. Ceylan et al. (2005) developed a mechanistic-empirical (M-E) design system for HMA overlay on crack/seat and rubblized PCC pavements in Iowa using multi-layer elastic theory. During Phase II of the research, Ceylan et al. (2008) evaluated the structural condition of existing rubblized concrete pavements using FWD, DCP and visual distress surveys. The research concluded that the HMA thickness can be estimated reasonably well by the (M-E) structural design methodology (Ceylan et al., 2008). The average rubblized PCC layer coefficient and average rubblized PCC modulus were found to be 0.19 and 78 ksi, respectively (Ceylan et al., 2008). Comparison of the predicted critical strain values were close to the recommended values of 70 $\mu\varepsilon$ and 200 $\mu\varepsilon$ for long lasting HMA pavements with values of 74 $\mu\varepsilon$ and 235 $\mu\varepsilon$ at the bottom of the HMA layer and on top of the subgrade, respectively (Ceylan et al. 2008). The 1993 AASHTO design guide recommends a layer coefficient for the rubblized layer for any PCC pavement type between 0.14-0.3 (AASHTO, 1993).

Buncher et al. (2008) investigated the appropriate design modulus of the rubblized layer (E_{rub}) and found that E_{rub} somewhat related to slab thickness and suggested the following ranges of E_{rub} for design purposes:

- For slabs 6 to 8 inches thick: E_{rub} from 100 to 135 ksi
- For slabs 8 to 14 inches thick: E_{rub} from 135 to 235 ksi
- For slabs > 14 inches thick: E_{rub} from 235 to 400 ksi

The investigation also suggested that there is a relationship between the ratio of the modulus of the rubblized layer and the modulus of the pre-fractured PCC (E_{rub}/E_{PCC}) with an average retained modulus of 6.0%, which should be explored further (Buncher et al., 2008).

Several studies have evaluated rubblization projects in different states and found the procedure to be successful at minimizing reflective cracking (Heckel, 2002; LaForce, 2006). Comparison of concrete pavement rehabilitative strategies in Pennsylvania after 10 years of service showed that rubblization and overlay using the AASHTO procedure performed best both structurally and functionally over other rehabilitative strategies such as using a HMA overlay with various surface preparations or HMA overlays with crack/break and seat (Morian et al., 2003).

Sebesta and Scullion (2010) evaluated and validated procedures and construction specifications for rubblization on very poor condition concrete pavement and they recommend the rubblization selection chart based on subgrade condition as depicted in figure 5.

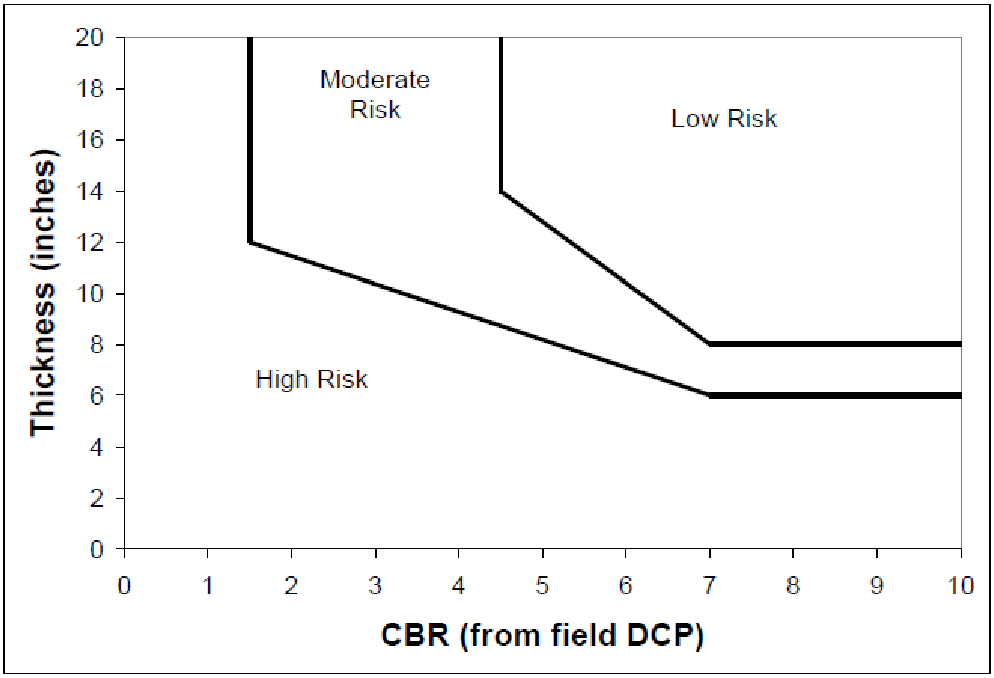

Figure 5. Rubblization selection chart based on subgrade conditions (Sebesta and Scullion, 2010)

2.3. SUMMARY

Rubblization of concrete pavements has been shown to be an effective method of rehabilitation. However, Wisconsin has experienced some premature failures with the primary distress observed being tenting of transverse cracks. Tenting of the transverse crack occurs as a result of water entering the crack, freezing and expanding during the winter. Adequate crack sealing has been shown to be effective in reducing this distress from forming and worsening. Inadequate subgrade support increases the difficulty of rubblization, often times reducing the amount of fracture of the concrete pavement resulting in large concrete pieces remaining, which can increase the likelihood of reflective cracking.

This chapter provided an overview of WisDOT practices and specifications for rubblization projects. Although there are two types of equipment used for rubblization, the resonant frequency breaker and the multi-head breaker (MHB), with the exception of a handful of projects which used the resonant frequency breaker, the majority of rubblization projects in Wisconsin have used the MHB.

Several studies suggested the elastic modulus value of the rubblized layer ranged between 65 – 78 ksi while the suggested rubblized layer coefficient ranged from 0.19 – 0.22. The service life of 22 years for rubblized pavements in Wisconsin was considered appropriate.

3. WORK PLAN

3.1. INTRODUCTION

This chapter summarizes the work plan for the Year 1 field evaluation that was carried out in order to investigate potential causes of the premature failure including consideration of the rubblized material in pavement design with respect to the structural number and resilient modulus of the rubblized layer. The work plan for the field evaluation was put together in order to accomplish the following objective:

- To aid in developing guidance for eliminating tenting distress in the rubblized pavement sections and in developing an accurate structural design methodology for these pavements in Wisconsin.

In order to accomplish this objective, a field investigation utilizing FWD testing as a means for properly characterizing the rubblized PCC material and subgrade as well as evaluating that the desired fracturing has been achieved was carried out. This testing was supplemented with surface distress surveys and permeability testing to further address the characterization of the rubblized PCC material. Field investigation sites were constrained to existing, planned construction projects, with project field activities to be performed within normal construction operations and traffic closures.

3.2. 2013 WISCONSIN DOT RUBBLIZE PROJECTS

WisDOT had four viable rubblization projects scheduled in 2013 for inclusion in this study. Table 3 contains information for these projects. Figure 6 depicts the 2013 Wisconsin rubblization project locations. There are roughly 23.1 centerline and 52.9 lane-miles of rubblization within the four projects, providing potential for many test sections covering wide range of experimental factors. The STH 96 project in Outagamie County covers a total estimated length of almost 10 miles; however, that stretch includes two urban sections in Dale and Medina where the concrete will not be rubblized. The information presented in this chapter regarding STH 96 only focused on the rural sections where the concrete was rubblized.

Table 3. 2013 Wisconsin rubblization project information

Project	Location	Estimated Centerline Length	Estimated Lane-Mile Length
STH 29	Marathon County	3.4 miles	13.5 miles
STH 96	Outagamie County	7.7 miles	15.4 miles
USH 14	Richland County	6.2 miles	12.4 miles
I-43 NB	Waukesha County	5.8 miles	11.6 miles

A fifth project, USH 51 from Quam Drive to B (ID#5845-01-75), was a late addition to the 2013 schedule and did not come up until testing had been completed on the above four projects in September 2013. However, based on the review of the project plans (JPCP; fine, silty sand subgrade) as well as additional subgrade information, it appeared that the USH 51 project replicated cells from the STH 96 project. Given this, and taking into consideration the FWD schedule and project cost impacts (especially labor), the project team decided it was not in the interest of the project to perform the USH 51 testing.

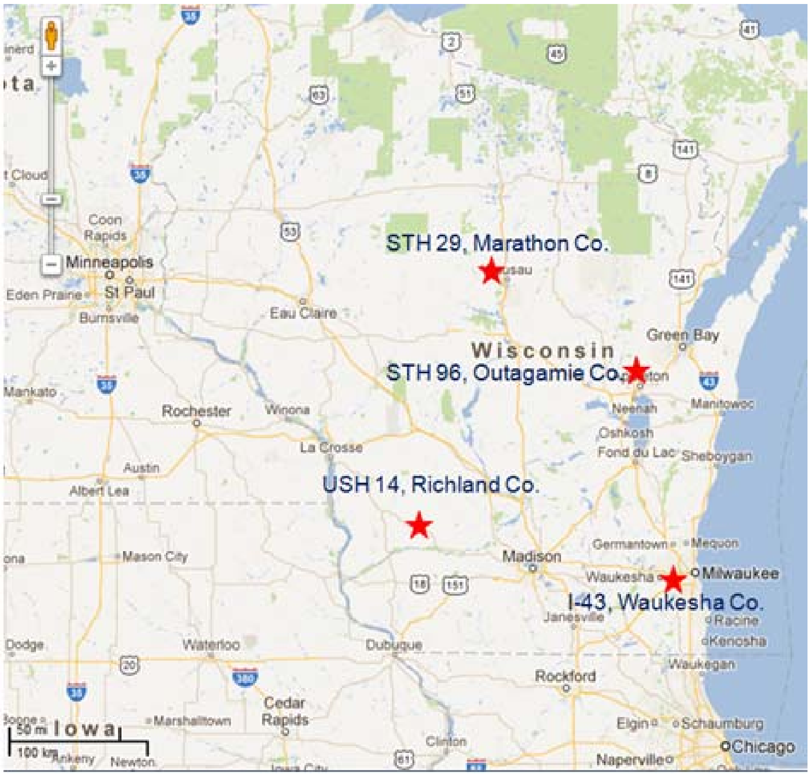

Figure 6. 2013 Wisconsin rubblization project locations

Figure 7 through figure 10 depict the soil property maps from the NCHRP 9-23B database (Zapata et al., 2011) for the four 2013 Wisconsin rubblization projects, while the soil properties for these four projects are detailed in table 4 through table 7 as obtained from the NCHRP 9-23B database.

Figure 7. STH 29 soil property map

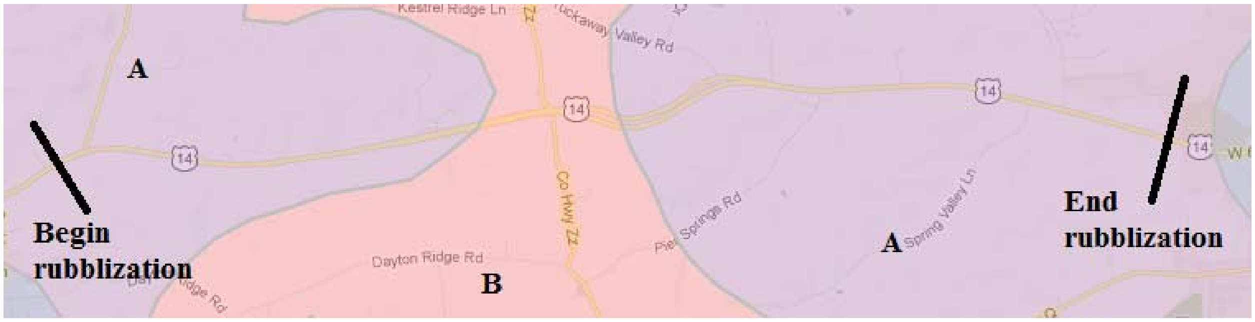

Figure 8. USH 14 soil property map

Figure 9. I-43 soil property map

Figure 10. STH 96 soil property map

Table 4. STH 29 soil properties

Project	AASHTO Classification	AASHTO Group Index	Thickness (in)	CBR from Index Properties	Passing #200 (%)
STH 29	A-4	4	7.9	15.7	80
	A-4	1	7.1	20.3	67.5
	A-6	4	14.2	11.4	42.5
	A-2-6	1	15.7	16.9	35

Table 5. USH 14 soil properties

Project	AASHTO Classification	AASHTO Group Index	Thickness (in)	CBR from Index Properties	Passing #200 (%)
US 14 (A)	A-4	5	7.9	12.4	92.5
	A-6	16	17.3	5.9	92.5
	A-6	5	5.9	10.7	55
US 14 (B)	A-6	7	7.9	10.8	77.5
	A-6	12	14.2	7.1	77.5
	A-7-6	30	37.8	3.3	70

Table 6. I-43 soil properties

Project	AASHTO Classification	AASHTO Group Index	Thickness (in)	CBR from Index Properties	Passing #200 (%)
I-43	A-4	6	14.2	11.7	92.5
	A-7-6	22	3.9	4.6	92.5
	A-6	8	15.7	9.3	65
	A-4	0	26	32.5	45

Table 7. STH 96 soil properties

Project	AASHTO Classification	AASHTO Group Index	Thickness (in)	CBR from Index Properties	Passing #200 (%)
STH 96 (A)	A-4	3	9.1	16.9	72.5
	A-7-6	18	18.9	5	70
	A-6	4	31.9	12.5	57.5
STH 96 (B)	A-7-6	29	9.1	3.7	95
	A-7-6	44	24	2.6	95
	A-2-5	0	26.8	18.1	27

Table 8 presents a summary of the soil design parameters used for the 2013 Wisconsin rubblization projects.

Table 8. Soil Design Parameters

Project	STH 29	USH 14	I-43	STH 96
Design Group Index (DGI)	12	14	12	12
Soil Support Value (SSV)	4.2	4.0	4.3	4.3
Modulus of Subgrade, k (pci)	150	125	150	150
Frost Index (FI)	F-4		F-3	F-3

Table 9 presents the typical pavement cross sections for the 2013 Wisconsin rubblization projects.

Table 9. 2013 Wisconsin rubblization project cross sections

Project	Existing HMA Overlay Thickness	Concrete Thickness	Base Thickness	Subbase Thickness
STH 29	N/A	11” doweled, non-reinforced	4” OGBC(1)	4” CABC(2)
STH 96	N/A	9” non-reinforced concrete	6” CABC	
USH 14	3.5”	9” doweled, reinforced	6” CABC	9” granular
I-43	3.5 – 4.5”	8-9” continuously reinforced concrete	9” CABC	

(1)OGBC=Open graded base course

(2)CABC=Crushed aggregate base course

Although the proposed HMA overlay thickness over the rubblized PCC layer was not a factor considered in the factorial design due to time and cost limitations, this factor needs to be considered for purposes of statistical analysis. It was desired that the HMA overlay thickness be relatively the same between projects so that comparison between projects can be made. However, no changes to the planned thicknesses of the HMA overlays were permitted as part of working with previously-planned construction projects. The following details the pavement design above the rubblized layer for the four projects as planned from the Wisconsin DOT Plan of Proposed Improvements for each project. For the two projects (USH 14 and I-43) that had an HMA overlay, the overlay was completely milled prior to beginning the rubblization process.

- STH 29: 6.25” HMA overlay
    - Typical tangent sections with paved median leading into super-elevated sections requiring base aggregate (1¼”) of 5” minimum to correct vertical curve issues with 7.5” HMA overlay are:

      267+38 to 276+76
      331+45 to 341+93
      388+20 to 396+73
      408+79 to 414+93

- USH 14: 4.5” HMA overlay
    - 3” of the milled asphalt material once pulverized was inlayed over the rubblized layer prior to the HMA overlay
- I-43: 7” HMA overlay at outside lane edge to 8.5” HMA overlay at centerline
- STH 96: 4.5” HMA overlay at outside lane edge to 5.25” HMA overlay at centerline

Table 10 presents the traffic data for the 2013 Wisconsin rubblization projects including the average daily traffic (ADT), the design ADT for a life of 20 years and the design equivalent single axle loads (ESALs). Table 11 presents the percent trucks by type for the 2013 Wisconsin rubblization projects.

Table 10. Traffic Data

Project	STH 29	USH 14	I-43	STH 96
ADT	18,300	5,200	57,900	6,600
Design ADT	23,700	7,250	70,500	7,900
Design ESALs	10,818,600	1,321,300	15,680,400	1,693,600

Table 11. Percent Trucks

Project	STH 29	USH 14	I-43	STH 96
2D	2.7	2.3	2.5	4.8
3-Su	1.2	1.3	1.5	3.8
2S-1, 2S-2	2.0	1.3	1.6	1.0
3S-2	13.7	3.6	5.0	1.6
Double bottom	0.3	0.1	0.3	0.0
Total	19.9	8.6	10.9	11.2

3.3. EXPERIMENTAL FACTORS

As a result of the literature review performed and the project team’s experience with rubblization, the following five factors were proposed to be included in the experiment factorial:

1. PCC pavement type
2. Subgrade type
3. Edge drains
4. Joint condition
5. Degree of rubblization

HMA overlay thickness should be a main factor, but as noted in the previous section it was not included in this study due to project limitations. However, it is possible that this might be a future consideration under the Year 2 field evaluation work plan. Also, only the MHB is being considered for the rubblization equipment type as this is the preferred equipment for use in Wisconsin.

The use of proof rolling for determining the stability of the rubblized layer is not a standard practice in Wisconsin. Instead, observation of the compaction process or the asphalt trucks is often times used to determine the stability of the rubblized layer. If there is an issue with subgrade stability, undercut and subgrade improvement is performed for the more severe cases based on the project engineer's discretion. For those cases that are not severe, the reduction of rubblization fracture energy is typically proposed by the contractor and implemented when the project engineer allows. The reduction can range from slight to significant depending on conditions, traffic staging constraints, and whether or not increased asphalt overlay thickness is implemented. Despite these options for addressing subgrade stability issues, it is recommended that routine proof rolling be considered in the future.

Table 12 contains the experiment factorial design for the Year 1 field evaluation. Initially, it was expected to contain 24 possible cells and it was thought that 12 of the possible 24 cells could be covered, provided that there were joints in both good and poor condition on all projects. However, once construction began, several factors changed such as the pavement on I-43 actually being CRCP instead of JRCP and the pavement on US14 being JRCP instead of JPCP. This added 12 more possible cells by considering all conditions for CRCP as well. As a result, it was possible to cover 16 of the 36 experimental cells (highlighted in green). Also, as discussed later, the project engineers were reluctant to change normal practice as far as varying the rubblization energy for more than a limited number of locations.

A summary of the project information meeting the experiment factorial follows:

- STH 29: JPCP, fine subgrade (silty/sandy loam), edge drains, known spalled joints
- USH 14: JRCP, fine subgrade (silty loam), no edge drains
- I-43: CRCP, fine subgrade, edge drains
- STH 96: JPCP, fine subgrade, no edge drains, known spalled joints

Within the STH 96 and USH 14 projects, there are subgrade sections that may prove to be weak based on the soil properties obtained from the NCHRP 9-23B database (Zapata et al., 2011).

To finalize project sectioning and hence to complete the experiment factorial for the possible 16 cells highlighted in table 12, additional information was needed, including subgrade condition and distress surveys. The distress surveys, which were carried out prior to FWD testing, focused on the joint conditions and allowed the projects to be sectioned based on where joints were in good/fair and poor condition. This is discussed in more detail in the next chapter. Two of the projects initially had an HMA overlay which covered the joints of the PCC pavement. Therefore, for the initial joint condition survey of these pavements, the condition was assessed based on the presence of reflection cracking. If there was no reflection crack above the joint, the joint was classified as good condition. If there was a reflection crack above the joint which was deteriorated, the joint was classified as poor condition.

Table 12. Experiment factorial

Pavement Type	Subgrade Type	Edge Drains	Joint Condition	Degree of rubblization at joints
JPCP	Coarse	No	Good/Fair	High
				Normal/Low
			Poor	High
				Normal/Low
	Fine	Yes	Good/Fair	High
				Normal/Low
			Poor	High
				Normal/Low
		No	Good/Fair	High
				Normal/Low
			Poor	High
				Normal/Low
JRCP	Coarse	No	Good/Fair	High
				Normal/Low
			Poor	High
				Normal/Low
	Fine	Yes	Good/Fair	High
				Normal/Low
			Poor	High
				Normal/Low
		No	Good/Fair	High
				Normal/Low
			Poor	High
				Normal/Low
CRCP	Coarse	No	Good/Fair	High
				Normal/Low
			Poor	High
				Normal/Low
	Fine	Yes	Good/Fair	High
				Normal/Low
			Poor	High
				Normal/Low
		No	Good/Fair	High
				Normal/Low
			Poor	High
				Normal/Low

Figure 11 shows an example of a reflection crack classified as poor condition on the HMA overlay on I-43. Once the HMA overlay was milled off, the joint condition was confirmed prior to rubblization.

For the projects without an HMA overlay where the joints were exposed, the condition of the joints was assessed using the Long-Term Pavement Performance (LTPP) *Distress Identification Manual* (Miller and Bellinger, 2003). The condition of the joints was based on the presence of distresses such as corner breaks, faulting, and spalling and the severity of the distresses. Other factors such as the presence and degree of bituminous patching at the joints were also considered and the more significantly patched joints were recorded independent of the condition classification.

Figure 11. Reflection crack in HMA overlay on I-43 in poor condition

After the joint condition sectioning, it was anticipated that the projects would be further sectioned based on the degree of rubblization at the joints. However, there was hesitation from the field engineer on many projects to allow for this to be conducted on an entire 1000-foot section. For several of the projects, a small selection of joints were indicated to vary the degree of rubblization. This resulted in sections ranging from 5 – 10 feet where the degree of rubblization was varied, including the joint. The degree of rubblization was controlled by variation of speed of the rubblization equipment. By either decreasing or increasing the speed of the rubblization equipment from the typical speed near the joints, the degree of rubblization was increased or decreased, respectively. As a result, there are a limited number of testing points with varied degree of rubblization.

Therefore, for the final sectioning, two sections were indicated containing joints in good condition and two sections were indicated containing joints in poor condition. The typical length of the sections was roughly 1,000 feet.

3.4. FIELD TESTING

The Year 1 field evaluation considered the following three types of testing: distress surveys, FWD testing, and permeability testing. This section describes the activities for each type of field testing. The existing condition information for each project sequence number was provided by the Wisconsin DOT. Therefore, the distress surveys performed as part of the field evaluation focused on the joint conditions. These data were required for population of the experiment factorial design.

FWD testing was conducted in order to determine the in-situ moduli of the pavement layers as well as the between and within project moduli variability for consideration in the structural design methodology as well as to show through the backcalculated layer moduli of the rubblized layer whether there is complete debonding of the steel from the concrete and complete fracture below the steel for pavements containing steel. The ideal scenario would include conducting FWD testing before rubblization, after rubblization and after overlay, but this was not feasible due to time and cost limitations as well as coordination with construction times. Therefore, FWD testing was only conducted after rubblization prior to placement of the overlay. In addition, another critical data element that was gathered during the FWD testing was the precise location and mapping of existing joints and slab cracks using handheld GPS units.

With an average section length of about 1,000 feet, the number of FWD test locations varied for each section depending on joint spacing. It was proposed to test every other joint as well as every other mid-slab resulting in roughly 40 points per section. Figure 12 depicts a possible schematic for FWD test spacing and locations. FWD testing conducted at joint locations consisted of placing the FWD plate on the joint resulting in the sensors being located on the approach slab.

The FWD testing measured surface deflections from impulse loads of approximately 9 kips, 12 kips and 16 kips measured using nine sensors spaced at 0, 8, 12, 18, 24, 36, 48, 60, and 72 inches from the center of the loading plate. The drop sequence that was used is as follows:

- 3 initial seating drops at 9 kips (drop height 1),
- 3 recorded drops at 9 kips (drop height 1),
- 1 seating drop at 12 kips (drop height 2),
- 3 recorded drops at 12 kips (drop height 2),
- 1 seating drop at 16 kips (drop height 3), and
- 3 recorded drops at 16 kips (drop height 3).

It was estimated that the above drop sequence would require a testing time of four minutes per location, which enabled testing of 40 locations within a project to be completed within half a day. Each project was tentatively scheduled to have two days of FWD testing, therefore covering four sections per project. Once again, coordination with the contractor was critical during this activity to enable completion of FWD testing once the rubblization has occurred but prior to the HMA overlay being placed.

Currently, the rubblized material is considered to perform similar to a drainable base in Wisconsin, which results in an increase of 25% in service life equal to four years. The permeability of the rubblized material was tested in order to substantiate this assumption of acting as a drainable base and increase in service life. There was also concern over the rubblized concrete becoming cementitious. However, permeability testing directly after rubblization would not give an indication of issues with cementition. Although these issues are not the main focus of the field evaluation, permeability testing of the rubblized concrete where conditions warrant testing was conducted on the first project.

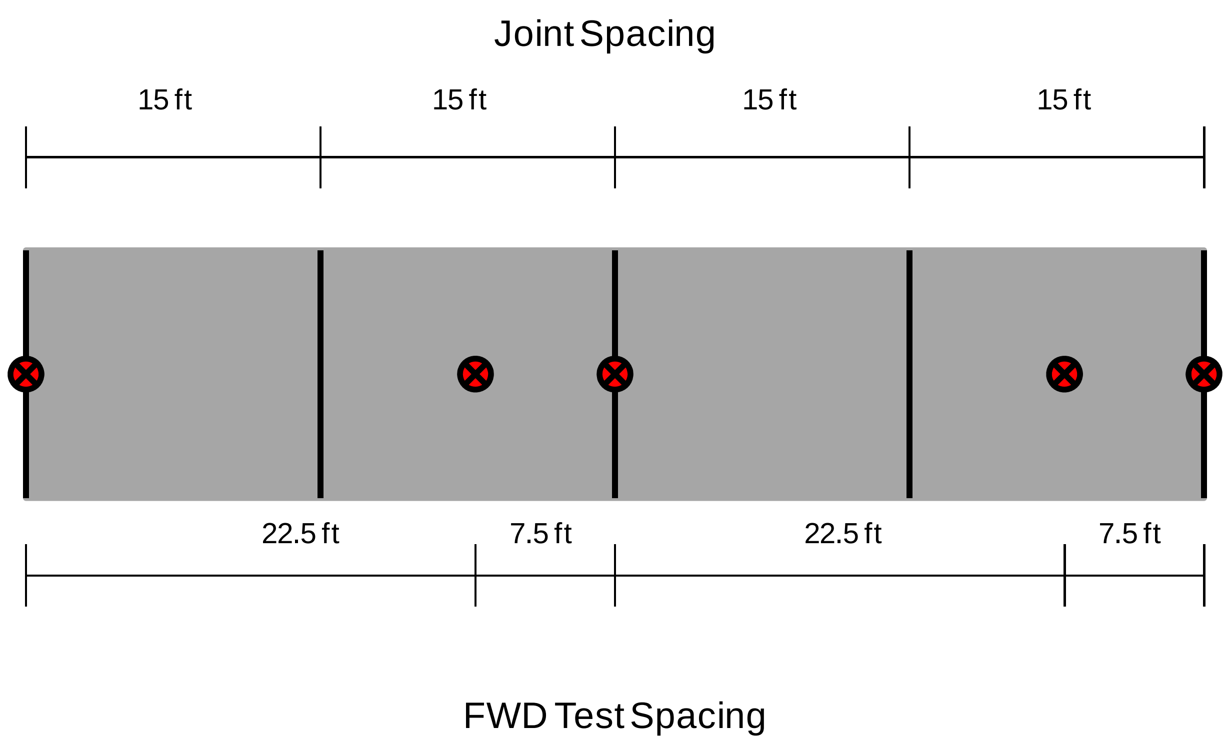

Figure 12. FWD test spacing and locations

Several procedures were available to conduct field permeability testing. However, some of these procedures used permeameters which require the use of boreholes. Since the objective was to test the permeability of the rubblized layer, these procedures would not provide a representative measurement of the entire rubblized layer since as much as 6 – 9 inches of the rubblized layer would be removed. Therefore, permeability testing was conducted using infiltrometers, which allow for the measuring of permeability of the surface layer and the capillary effect of the soil.

This approach requires that the device be inserted only two inches into the layer, giving a better representative measurement of the rubblized permeability. A double-ring infiltrometer was selected for the permeability testing in the field. Five permeability tests were planned per section.

The double-ring infiltrometer consists of a smaller ring inside a larger outer ring. The infiltrometer should be inserted to a depth of two inches. Once inserted, both rings are filled with water until they slightly overflow. A ruler should be inserted in the inner ring so that the height of the top of the water can be read. Using a stop watch, a timer should be started when the depth of the water is recorded. Record the height of the water after 15 minutes. The infiltration rate in one hour can be calculated by multiplying the change in height, in inches, by four.

In summary, distress surveys were conducted to determine the condition of pavement and in particular the joints prior to rubblization, FWD testing was carried out to determine the in-situ moduli of the rubblized layer as well as the between and within project moduli variability, and permeability tests were carried out to determine the permeability of the rubblized layer.

4. FIELD TESTING ACTIVITIES

This chapter presents the field testing activities that were introduced in the previous chapter and carried out during the months of August and September 2013. The field testing activities consisted of distress surveys of the joints, FWD testing at both joint and mid-slab locations, and permeability testing. Activities were performed with the confines of the live construction project.

4.1. DISTRESS SURVEY

In order to complete as many experimental cells as possible, it was desired to assess the condition of the joints throughout the project and to select two sections each where the joints were in good and poor condition. Classifying the condition of the joints as good or poor condition was conducted as was set out in the work plan and discussed in the previous chapter.

Coordination prior to conducting the distress surveys was important. Although the projects stretched for miles, the FWD testing discussed in the next section was limited to locations that were being rubblized during the same time as the field testing, but had not yet been rubblized so that the distress surveys could be conducted. Therefore, close communication between the rubblization contractor, field engineer and the project team was critical.

The distress surveys were generally conducted the day prior to rubblization or in some cases the morning before rubblization began. The length of the section that was scheduled to be rubblized for the day was driven and sections of both good and poor condition areas were noted. Sections were then identified based on combining areas of similar joint conditions close in proximity in order to assemble sections roughly 1,000 feet in length. Figure 13 shows an example of a joint in good condition, while figure 14 shows an example of a joint in poor condition. Figure 15 shows a joint after rubblization that was classified as being in poor condition due to the large presence of asphalt in the joint, corner break and spalling. It should be noted that this joint was located on STH96 where the rubblization energy was reduced due to weak subgrade. The beginning of each section was marked with a wooden stake on the side of the roadway as well as a line painted on the shoulder so that the start point could be located when FWD testing began.

At the beginning of a new project, it is required that the contractor dig a test hole in order to determine if the level of rubblization throughout the layer of PCC is sufficient. For the STH 96 project, two test holes were dug at the beginning. Figure 16 shows one of these test holes. As can been seen in the photograph, there were several large pieces remaining at the bottom of the layer. There was discussion regarding whether or not to increase the rubblization energy in order to decrease the size of the concrete at the bottom of the layer. However, the pieces found at the top of the layer were quite small and there was concern that increasing the energy further would result in pieces that were too small and there would be a risk that there would be a loss of interlock. Poor subgrade support is one theory for the poor gradation of rubblized pieces in the layer on this project. As a result of the smaller pieces near the top layer, the rubblization energy was reduced. Despite the reduction, however, the moduli data appear to show a well rubblized layer; i.e., the reduction in rubblization energy does not appear to have produced significantly greater mean moduli as discussed later the report. The sections delineated for FWD testing all occurred in areas where the modified rubblization was performed.

Figure 13. Crack in good condition

Figure 14. Crack in poor condition

Figure 15. Joint in poor condition after rubblization

Figure 16. Test hole located on STH 96

4.2. FWD TESTING

FWD testing was conducted as described in the previous chapter. Tests were conducted at both joint and mid-slab locations. While testing, significant information was noted such as if the testing location was within a patched area, included an area with asphalt, was located close to a crack, or other issues.

Latitude and longitude measurements were taken using handheld GPS units in line with the testing plate as depicted in figure 17.

Testing was either conducted with one or two engineers. In those cases where two engineers were present, one engineer would line up the FWD on the joint and mid-slab testing locations as they walked along the section. For testing where only one engineer was present, he would spray paint the testing locations prior to rubblization and line the wheels using the vehicles mirrors in order to line up. Figure 18 shows an FWD test being conducted at the joint.

As mentioned previously, it was desired to vary the rubblization energy. However, due to hesitation of the field engineer to change the rubblization energy on an entire 1,000-foot section, only a limited number of joints on the I-43, STH 96 and US14 projects had the rubblization energy reduced or increased. Table 13 summarizes the locations where the rubblization energy was varied.

Figure 17. Gathering GPS location of joint during FWD testing

Figure 18. FWD testing of a joint

Table 13. Varied rubblization joint locations

Project	Section	Station	Rubblization Energy
I-43	3	2653	More (slow)
		2717	Less (fast)
		2825	Less (fast)
US 14	1	635	More (slow)
		652	Less (fast)
STH 96	Between 2 and 3	802	More (slow)
		840	More (slow)

Figure 19 shows a joint where the rubblization energy was increased by reducing the speed of the rubblization equipment. Figure 20 shows a joint where the rubblization energy was reduced by increasing the speed of the rubblization equipment.

Figure 19. Higher rubbliztion energy

Figure 20. Lower rubblization energy

4.3. PERMEABILITY

Permeability testing was conducted as described in the previous chapter. However, it was not possible to insert the infiltrometer ring two inches into the rubblized layer, therefore, plumbers putty was used to secure the inside and outside of both the inner and outer rings to prevent water from leaking through the sides to ensure that the water penetrated the rubblized layer downwards. As was anticipated, the newly rubblized layer acted as a highly drainable base. This was so much so the case, that it was not possible to fill the infiltrometer with enough water fast enough to be able to make measurements. In fact, no measureable depth of water accumulated at all. The water drained through the layer as quickly as it was being poured. Figure 21 shows a close up of the infiltrometer just after attempting to conduct the permeability test. As the figure shows, the rubblized layer consists of a varied gradation of pieces, allowing for the water to drain easily. Figure 22 shows the infiltrometer just after a permeability test was conducted and shows that there is very little water leakage on the outside of the infiltrometer.

These permeability tests showed that the rubblized layer drains quickly. The issue is not the drainability of the fractured layer but possibly the other layers. As these tests focused on newly rubblized concrete, the noted phenomenon of becoming re-cemented was out of the scope and ability to investigate under this study. Beyond the confirmation that the rubblized layer drains quickly, no further conclusions could be drawn. However, since the rubblized layer does drain quickly, the WisDOT assumption that the rubblized layer acts as a drainable base is a valid assumption. The resulting increase in design life as a result needs to be investigated further.

Figure 21. Result of permeability test trial

Figure 22. Permeability test setup after test

5. DATA ANALYSES

This chapter presents the analyses conducted on the field data collected as detailed in the previous chapter. The analyses consisted of first using the FWD measured deflections to backcalculate the layer moduli. Analyses of these computed layer moduli then included comparisons between measurements taken at joint or mid-slab locations, comparisons between sections in good or poor condition, comparison or varying rubblization energies and comparisons of between and within section and project variability. Electronic copies of the data that supports the analyses presented in this chapter as well as the data that resulted from those analyses is provided in the CD ROM attached to this report. Those data include:

- FWD deflection data in MS Access format.
- MODULUS files in ASC file format.
- Analysis files in MS Excel format.
- ModTAG linearity analysis in JPEG format.
- Photographs and photo logs.

The project work plan originally contained two years of data collection. As allowed for in the project work plan, the sponsoring agency opted not to authorize Phase II of the project and only one year of data collection was performed. The data analysis presented in this report was predominately aimed at refining the second year of data collection, and accordingly was not intended to address the ultimate project objectives.

5.1. BACKCALCULATION

The MODULUS software (version 5.1) was used to backcalculate the layer moduli values. This software was chosen as it is perhaps the most commonly used software for conducting this type of analysis. Table 14 provides the moduli ranges and Poisson Ratio values that were assumed. Two runs were performed for each section. For the first run, the depth of the subgrade (depth to bedrock) was calculated by MODULUS. For the second run, the depth of the subgrade was assumed to be semi-infinite. The former scenario yielded better results as demonstrated by a smaller occurrence of the estimated modulus being the default minimum modulus as inputted into the software and therefore only those results are presented and discussed hereafter.

Table 14. Assumed moduli and Poisson Ratio values

	Moduli Range (psi)		Poisson Ratio
	Minimum	Maximum	
Pavement	25,000	1,000,000	0.35
Base	5,000	500,000	0.35
Subbase	0	0	0.35
Subgrade		5,000	0.40

The results from the MODULUS backcalculation effort are contained in appendix B, which includes sensor deflections and calculated layer moduli for each location and drop height. Table 15 below presents a summary of the backcalculated moduli, including the mean, standard deviation and coefficient of variation (COV) for each section and project. The summary is further divided into measurements taken at the joints and mid-slab locations. Prior to computing these summary statistics, the data were analyzed for outliers. A measurement was considered an outlier if it exceeded two standard deviations away from the mean. Measurements identified as outliers were removed from the dataset.

Prior to conducting the comparison of joints and mid-slabs, the distributions of the measurements were compared. This was conducted using a statistical F-test, which compares whether the distributions have similar variances. The results of this comparison were then used to determine whether to use a t-test assuming equal or unequal variances when comparing the means. All other t-tests described in this report were also preceded by an F test to determine whether the variances of the distributions were equal or not. There were a total of 57 F-tests conducted. Of these tests, 37 showed unequal variances. Summaries of the F-test results are contained in appendix C.

5.1.1. Comparison of Joints and Mid-Slab Measurements

Measurements were taken throughout each project and section at both joint and mid-slab locations. For the I-43 project, where the pavement was CRCP, testing conducted on cracks were considered joint locations and testing between cracks were considered mid-slab locations. The hypothesis that the mean estimated moduli at these two locations were similar within each section of a project was tested. A t-test was performed to compare the means of the estimated modulus for the rubblized PCC.

Table 16 shows the difference in means (mid-slab versus joint), the resulting test statistics from the t-tests, and whether the difference is significant or not. From this table, it can be seen that 12 of the 16 sections have a significant test statistic, at an alpha equal to 0.05, which indicates that there is a difference in mean modulus of the fractured PCC for measurements taken at joint and mid-slab locations. This comparison was taken further to test whether the mean modulus from mid-slab locations was greater than the mean modulus measured at joint locations. Of the 12 sections where the means between joint and mid-slab locations were different, the modulus was greater at the mid-slab location eight times. These sections are represented by the negative test statistics in Table 16. Based on these results, the measurements from joint and mid-slab locations were treated separately throughout the remaining analysis.

Comparisons of Good and Poor Joint Condition Sections

The next step of the analysis was to compare whether the average modulus of the rubblized PCC for the sections with joints in good condition was higher than those in poor condition. As each project had two sections classified as good and two sections classified as poor, it was first necessary to determine whether or not each pair of sections (good-good or poor-poor) had similar means. If the sections had similar means, then the data could be combined for further analysis. Otherwise, if the means of the two sections proved to be different, the data remained separate in later analyses.

Table 15. Summary statistics for fractured PCC modulus

Project	Section	Location	Mean (ksi)	St Dev (ksi)	COV (%)	Grand Mean (ksi)	Pooled Variance $(ksi)^2$
I-43	1	Joint	36.5	13.4	36.8	43.3	385
		Mid-slab	45.8	16.8	36.7		
	2	Joint	42.8	8.5	19.9		
		Mid-slab	55.1	16.6	30.2		
	3	Joint	31.6	5.2	16.4		
		Mid-slab	26.5	2.5	9.3		
	4	Joint	51.2	33.9	66.1		
		Mid-slab	35.6	14.9	41.7		
STH 29	1	Joint	104.7	55.4	53.0	130.5	5357
		Mid-slab	98.9	42.3	42.8		
	2	Joint	150.0	74.9	50.0		
		Mid-slab	194.1	74.4	38.3		
	3	Joint	104.8	60.4	57.7		
		Mid-slab	127.4	68.4	53.6		
	4	Joint	89.3	70.6	79.1		
		Mid-slab	93.0	58.4	62.8		
STH 96	1	Joint	62.9	23.9	37.9	69.6	1450
		Mid-slab	71.3	16.0	22.4		
	2	Joint	64.8	29.2	45.1		
		Mid-slab	88.3	56.6	64.0		
	3	Joint	48.2	19.2	39.9		
		Mid-slab	75.2	26.9	35.8		
	4	Joint	39.8	13.2	33.1		
		Mid-slab	61.2	17.5	28.6		
US 14	1	Joint	54.4	33.5	61.6	66.1	1711
		Mid-slab	57.7	40.7	70.5		
	2	Joint	101.9	45.8	44.9		
		Mid-slab	85.1	49.0	57.6		
	3	Joint	49.1	21.9	44.6		
		Mid-slab	44.7	16.2	36.2		
	4	Joint	63.0	35.6	56.5		
		Mid-slab	69.3	35.9	51.8		

Table 16. Joint and Mid-slab Measurement Comparison Test Statistics

		I-43	STH 96	STH 29	US 14
Section 1	Difference (ksi)	9.38	27.06	-5.80	3.29
	Test statistic	-1.816	-6.745	1.048	-0.869
	Significant? (Y/N)	Y	Y	N	N
Section 2	Difference (ksi)	-5.11	8.40	22.66	-4.43
	Test statistic	4.395	-1.758	-2.847	1.942
	Significant? (Y/N)	Y	Y	Y	Y
Section 3	Difference (ksi)	15.62	21.41	44.08	6.36
	Test statistic	2.504	-3.679	-5.475	-1.283
	Significant? (Y/N)	Y	Y	Y	N
Section 4	Difference (ksi)	12.29	23.58	3.68	-16.78
	Test statistic	-4.573	-4.271	-0.193	3.260
	Significant? (Y/N)	Y	Y	N	Y

To determine whether the means of the sections classified as poor and the sections classified as good for each project were similar, a t-test was used. Table 17 shows the difference in means, the resulting test statistics from the t-tests, and whether the difference is significant. From this table, it can be seen that there were mixed results on whether the means between the two good and two poor sections were similar. Several factors that may have contributed to this variability (12 of 16 did not have similar means) include long project lengths and varying subgrades. Depending on whether the two good and two poor sections had similar means within each project, the number of comparisons between good and poor ranged between two and four for both joints and mid-slab measurements.

Table 17. Good and Poor Section Measurement Comparison Test Statistics

Location	Condition	Measure	I-43	STH 96	STH 29	US 14
Joints	Good	Difference (ksi)	6.38	1.84	45.36	47.44
		Test statistic	-1.519	-0.353	-6.156	-11.379
		Significant? (Y/N)	N	N	Y	Y
	Poor	Difference (ksi)	19.66	-8.36	-15.52	13.86
		Test statistic	-3.235	1.328	1.237	-3.475
		Significant? (Y/N)	Y	N	N	Y
Mid-slab	Good	Difference (ksi)	9.294	17.02	95.23	27.37
		Test statistic	-2.829	-3.053	-14.851	-5.646
		Significant? (Y/N)	Y	Y	Y	Y
	Poor	Difference (ksi)	9.143	-14.01	-34.50	24.65
		Test statistic	-5.002	3.497	2.132	-6.616
		Significant? (Y/N)	Y	Y	Y	Y

Table 18 provides the difference in mean (good – poor), the resulting test statistics and whether the difference is significant for the comparison between the good and poor sections. For this comparison, the null hypothesis was that the means of the good and poor sections were equal (μ_g

= μ_p where μ_g equals the mean of the good sections and μ_p equals the mean of the poor sections) and the alternative hypothesis was that the mean of the good sections was greater than the mean of the poor sections ($\mu_g > \mu_p$). As this test represents a one-sided t-test, the t-critical was about 1.65, depending on the degrees of freedom for the test. As can be seen from the values of the test statistics in table 18, 18 of the 25 (6 of 9 for joint and 12 of 16 for mid-slab locations) comparisons show a larger test statistic than the t-critical which results in rejecting the null hypothesis that the means of the good and poor sections are equal.

There are three sections where the test statistic is not greater than the t-critical and therefore the null hypothesis that the means of the good and poor sections are equal is not rejected. There are four sections where the test statistic is negative; these four comparisons represent instances where the mean of the poor sections were actually greater than the mean of the good sections. Each of these four cases was investigated to look for data anomalies, but no trends could be identified as suspicious or needing further investigation. It is suspected that there may be other interacting factors in these cases beyond the condition of the joints such as voids under the joints or incomplete debonding of the steel.

Table 18. Comparison of good sections to poor sections

Project	G v. P	Joints			Mid-slab		
		Difference (ksi)	Test Statistic	Significant? (Y/N)	Difference (ksi)	Test Statistic	Significant? (Y/N)
I-43	G v. P (1)	-10.97	-1.742	Y	19.39	6.97	Y
	G v. P (2)	8.69	3.934	Y	10.24	3.28	Y
	G v. P (3)	--	--	--	28.68	14.92	Y
	G v. P (4)	--	--	--	19.54	7.622	Y
STH 29	G v. P (1)	2.64	0.405	N	-28.56	-4.058	Y
	G v. P (2)	48.00	6.282	Y	5.93	0.440	N
	G v. P (3)	--	--	--	66.67	7.970	Y
	G v. P (4)	--	--	--	101.16	5.887	Y
STH 96	G v. P (1)	17.20	5.543	Y	-3.90	-0.897	N
	G v. P (2)	--	--	--	13.12	2.266	Y
	G v. P (3)	--	--	--	10.11	2.667	Y
	G v. P (4)	--	--	--	27.13	5.106	Y
US 14	G v. P (1)	5.35	1.822	Y	13.06	3.958	Y
	G v. P (2)	-8.51	-2.049	Y	-11.56	-2.454	Y
	G v. P (3)	52.79	13.499	Y	40.44	9.954	Y
	G v. P (4)	38.93	7.837	Y	15.79	3.066	Y

5.1.2. Rubblization Energy

As noted in the previous chapter, the rubblization energy was varied on a limited number of joints. After the raw FWD data were backcalculated and prepared for comparison, only data points for the I-43 and US14 projects remained consisting of one slow and two fast sections on I-43 and one slow and one fast section on US14.

To determine whether the means of the slow and fast sections were similar, a t-test was used. For this comparison, the null hypothesis was that the means of the fast and slow sections were equal ($\mu_f = \mu_s$ where μ_f equals the mean of the fast sections and μ_s equals the mean of the slow sections) and the alternative hypothesis was that the mean of the fast sections was greater than the mean of the slow sections ($\mu_f > \mu_s$). As this test represents a one-sided t-test, the t-critical was about 1.79, depending on the degrees of freedom for the test. Table 19 shows the difference in means (fast – slow), the resulting test statistics from the t-tests, and whether the difference is significant. This table shows that the means of the fast section are significantly greater than the means of the slow section for two out of three sections. Although this analysis was based on limited data and locations, it shows promising results. In order to expand on this analysis in the future, it is recommended to expand the number of locations of varied rubblization energy in the Year 2 field testing.

Table 19. Comparison of fast and slow test locations

Project	Difference (ksi)	Test Statistic	Significant? (Y/N)
I-43 (1)	13.33	1.504	N
I-43 (2)	61.41	32.850	Y
US14	62.82	9.686	Y

5.1.3. Between and Within Project Variability

Consideration was also given to both the between and within section project variability. The between variability is attributable to the differences between various sections and/or projects such as differing subgrades or pavement thickness and condition. The within section and/or project variability is an indication of differences occurring within a section and/or project such as construction practices and site conditions. (Note: a more in-depth look at the within project variability will be conducted as part of the Phase II effort to determine, to the extent possible, the within project variability related to construction and that related to site conditions, such as the presence of unique sub-sections). As with the previous analysis, the data was separated for the joint and mid-slab locations.

There were a total of 16 sections which resulted from four sections at each project. As these sections were created based on differing conditions, each section can be treated as its own "project" during the comparison of between and within project variability.

The between project variability compares the average calculated modulus value for the rubblized layer. Figure 23 and figure 24 depict the percentage of projects that fall within a certain modulus range at the section level for joints and mid-slab locations, respectively. The shapes indicate a uniform distribution with an outlier. Figure 25 and figure 26 depict the percentage of projects that fall within a certain modulus range at the project level for joint and mid-slab locations, respectively. The shapes are uniform, and may be a result of a low number of projects.

The within project variability compares project average modulus value with the project standard deviation. The best fit line represents the COV. Figure 27 and figure 28 show the within project variability at the section level for joint and mid-slab locations, respectively. The COV for joint locations is 51.75%, while the COV for mid-slab locations is 45.34%. Figure 29 and figure 30 show the within variability at the project level for joint and mid-slab locations, respectively. The COV for joint locations is 56.27%, while the COV for mid-slab locations is 54.39%.

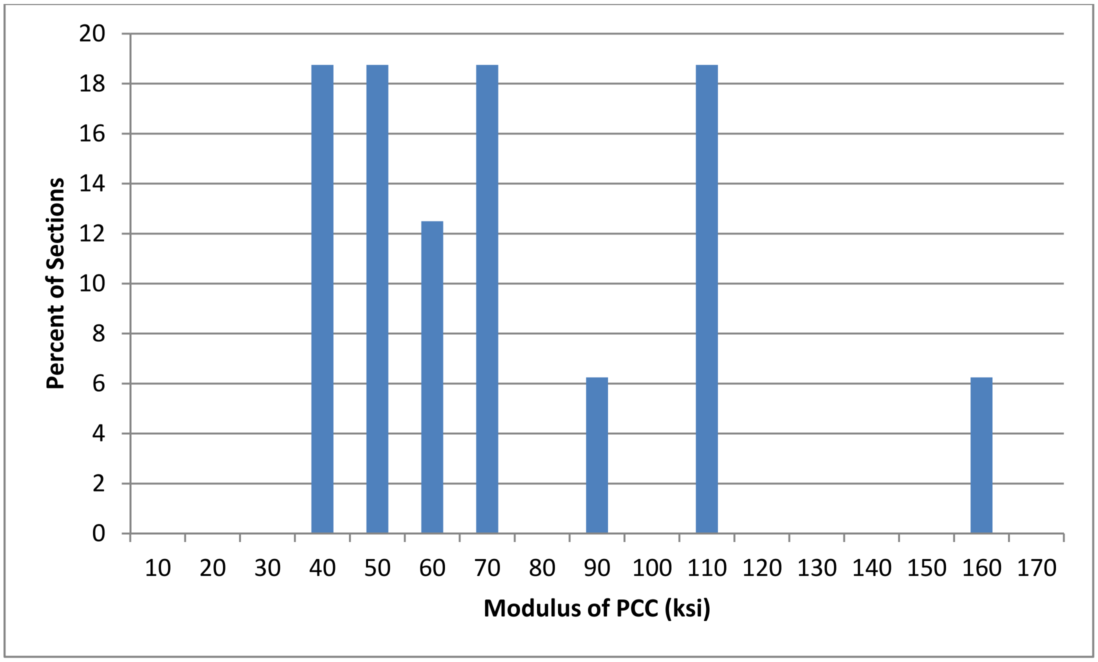

Figure 23. Frequency distribution of PCC modulus at section level at joint locations

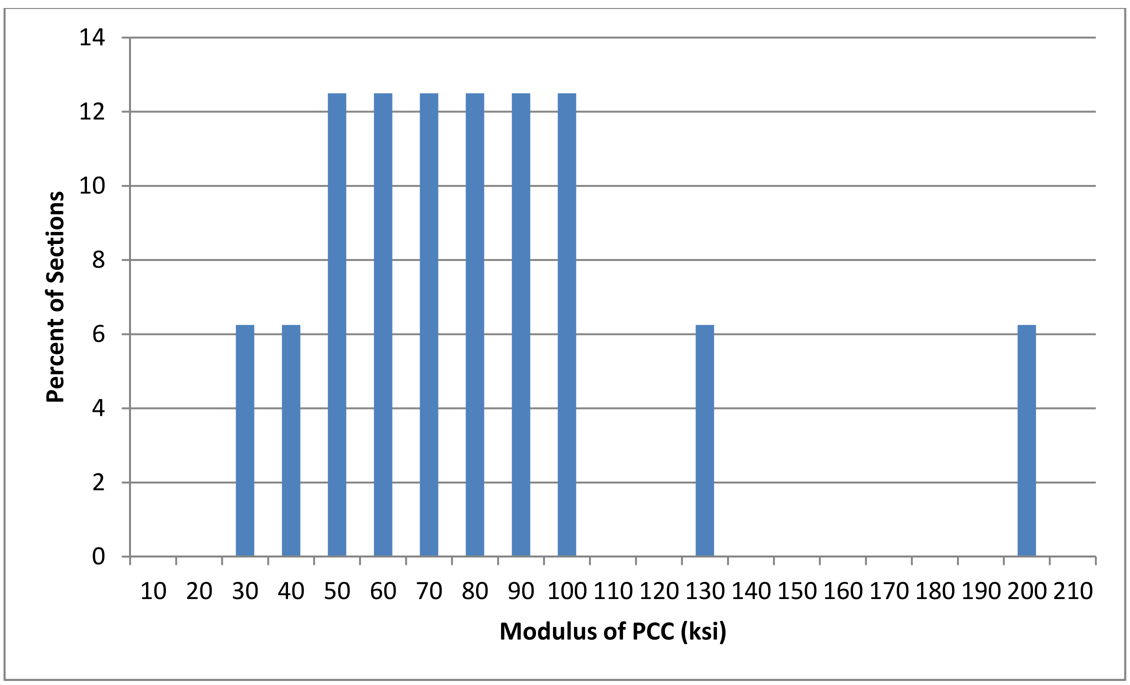

Figure 24. Frequency distribution of PCC modulus at section level at mid-slab locations

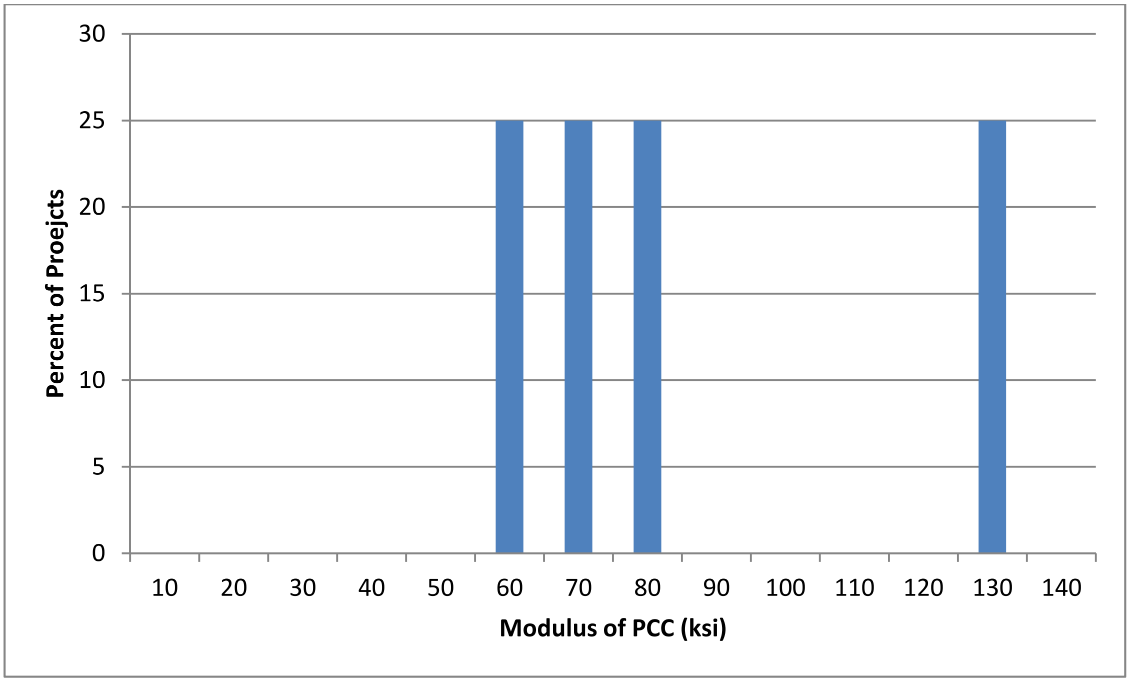

Figure 25. Frequency distribution of PCC modulus at project level at joint locations

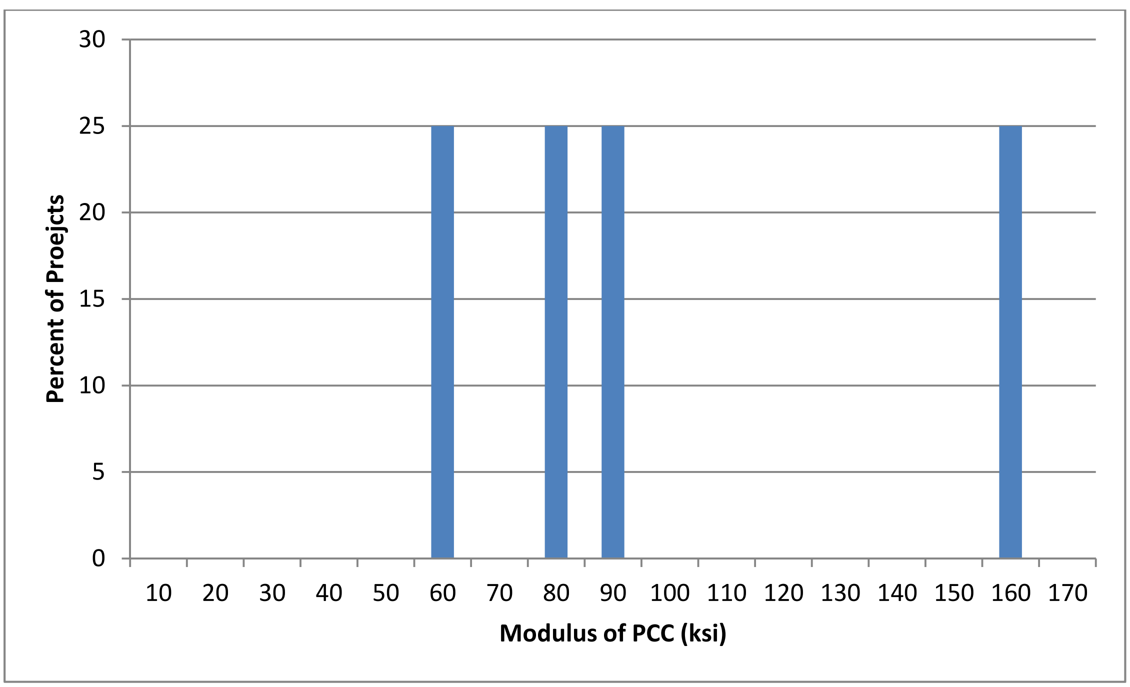

Figure 26. Frequency distribution of PCC modulus at project level at mid-slab locations

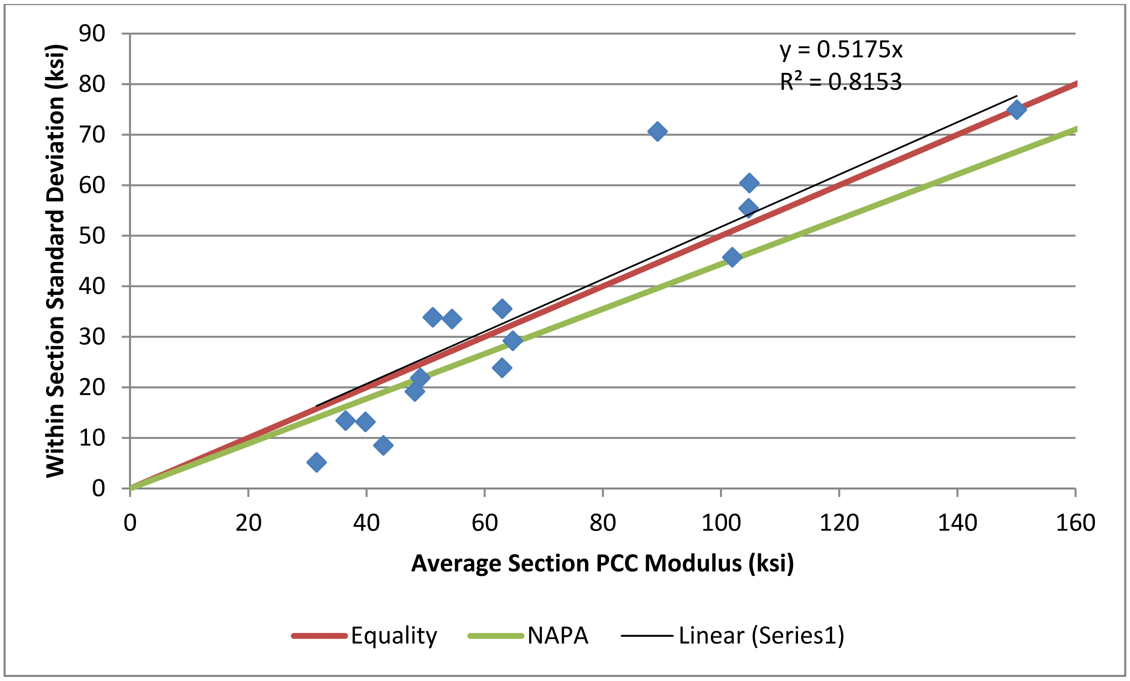

Figure 27. Within project variability of fractured PCC modulus at section level for joint locations

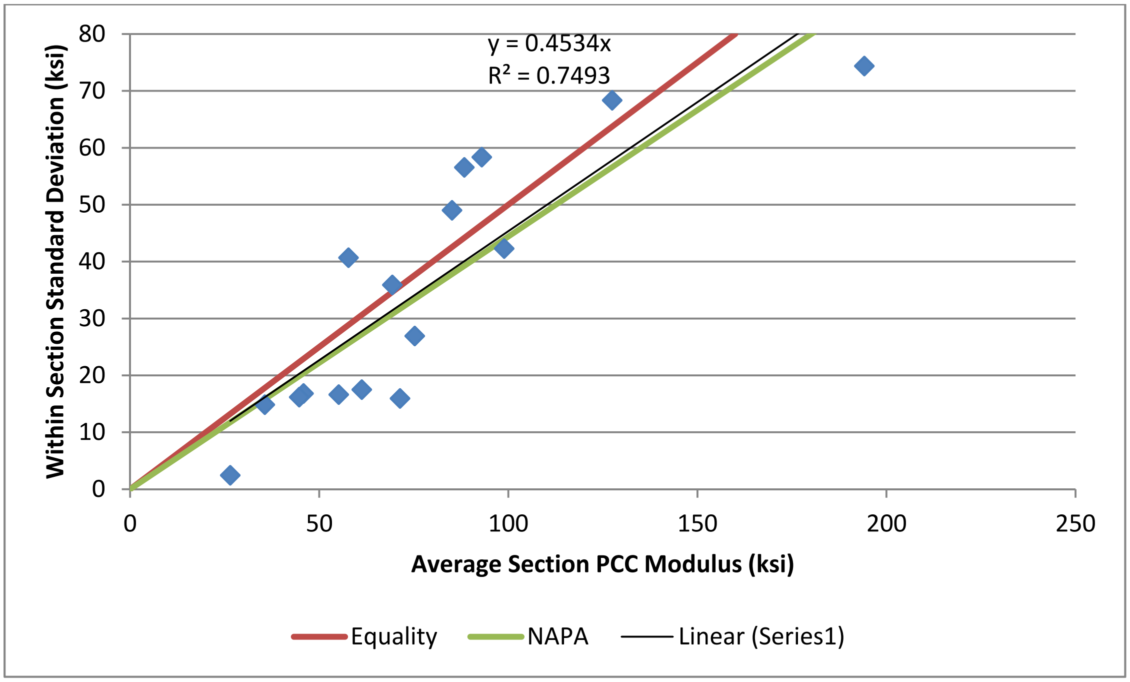

Figure 28. Within project variability of fractured PCC modulus at section level for mid-slab locations

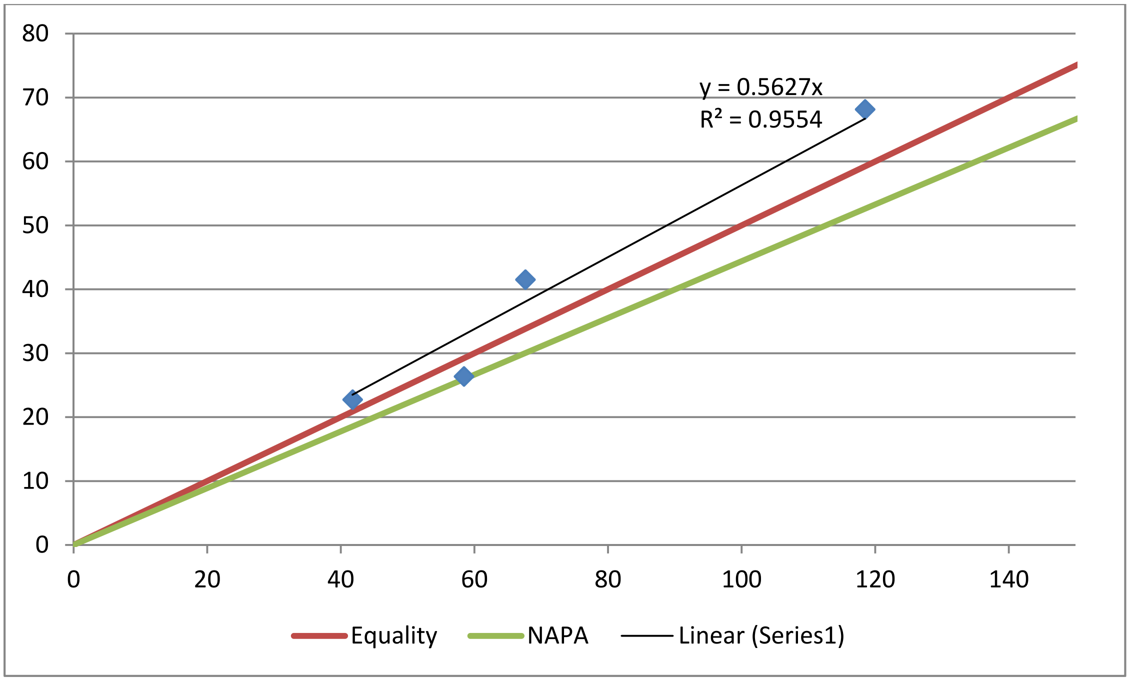

Figure 29. Within project variability of fractured PCC modulus at project level at joint locations

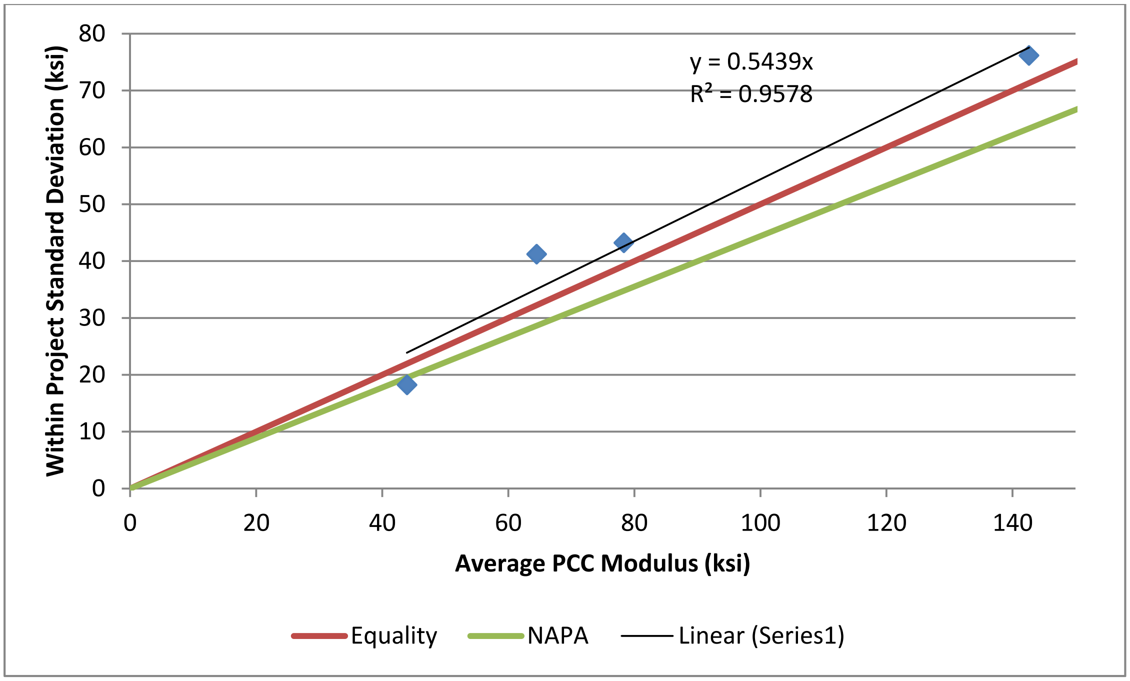

Figure 30. Within project variability of fractured PCC modulus at project level at mid-slab locations

5.1.4. Nonlinearity of Subgrade Materials

Nonlinearity of subgrade materials is a well documented phenomenon (Moossazadeh and Witczak, 1981) and it needs to be considered in the analysis. as it can affect the backcalculated layer moduli values. The observation of nonlinearity of the subgrade materials was investigated using composite modulus plots and normalized (to 9,000 lbs) deflections. The composite modulus is also known as the surface modulus, which is the effective modulus of the pavement structure when treated as a one-layer Boussinesq solution. Close to the center of the FWD load plate center, the modulus value reflects the influence of all layers, and as one moves away from the FWD load plate center, the subgrade contribution increases until it is the only contributing layer.

The referenced plots showed none to very little nonlinearity in the subgrade materials for projects US14 and SH29. Figure 31 and figure 32 show examples for each, respectively. On the other hand, there appears to be a moderate to high nonlinear response in the subgrade materials for STH96 and I-43. Figure 33 and figure 34 show examples of each, respectively. This characteristic is particularly observable in the composite modulus plots, which were created for a sample of locations for each project and the remaining plots can be found in appendix D. Several attempts to characterize this nonlinearity using MODCOMP were made, but they proved unsuccessful in part because of the sensor 2 data (8 inches) as well as some of the deflection basin variability encountered. The unsuccessful sensor data resulted from deflections of greater than 80 mils, which is beyond the range of the geophones. However, it is believed that by adding a fourth drop to the Year 2 FWD testing, that nonlinear characterization will more likely be achieved.

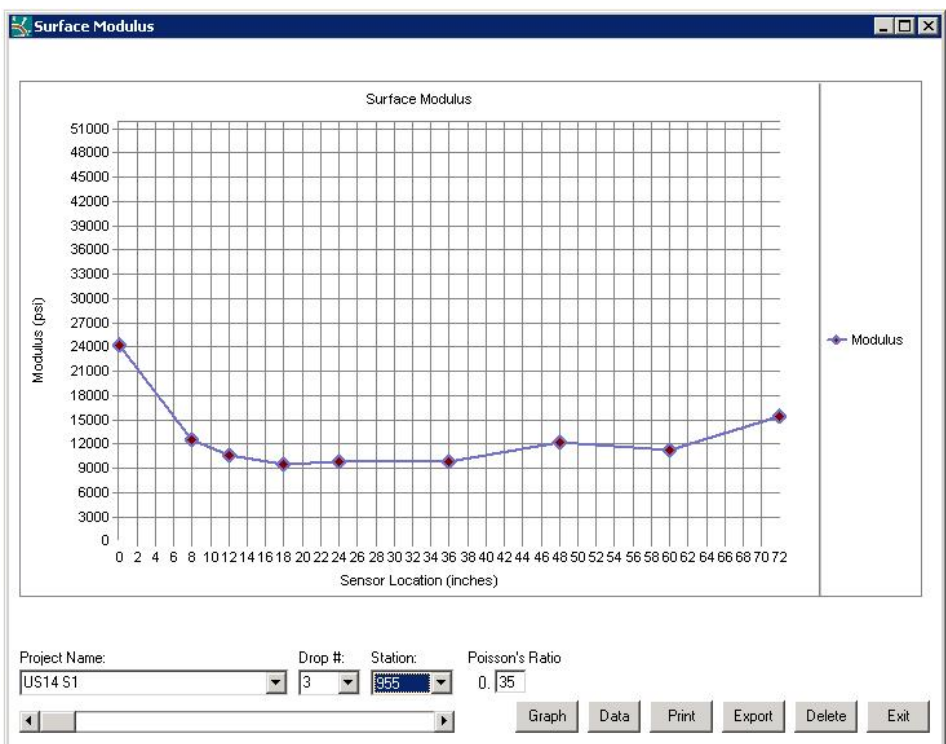

Figure 31. US 14 composite modulus plot

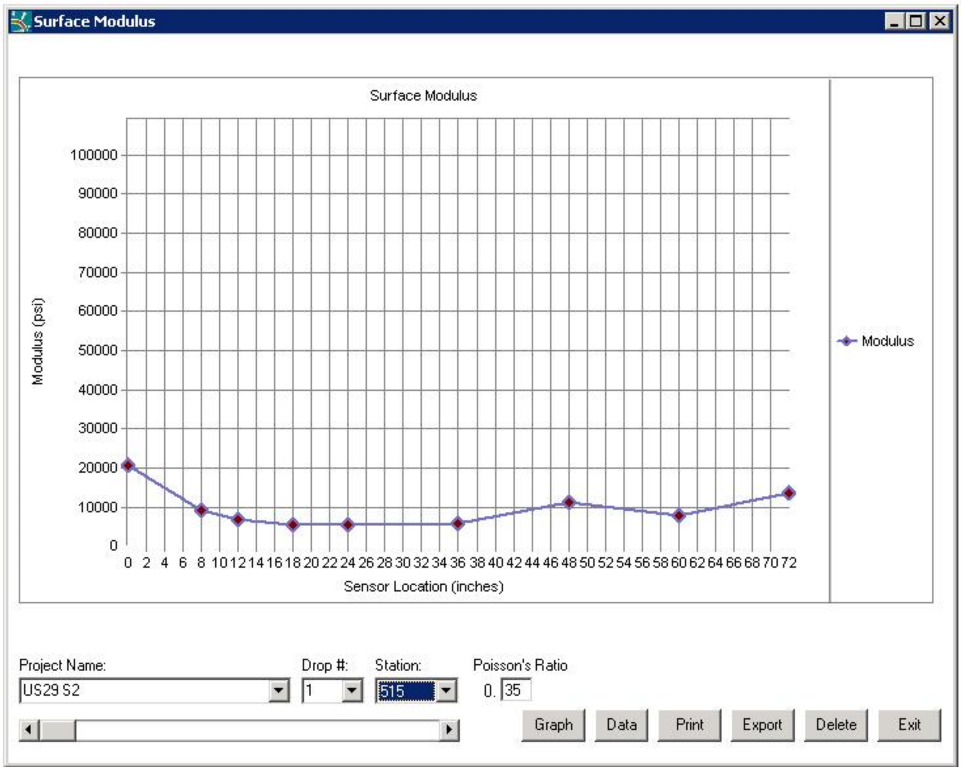

Figure 32. STH 29 composite modulus plot

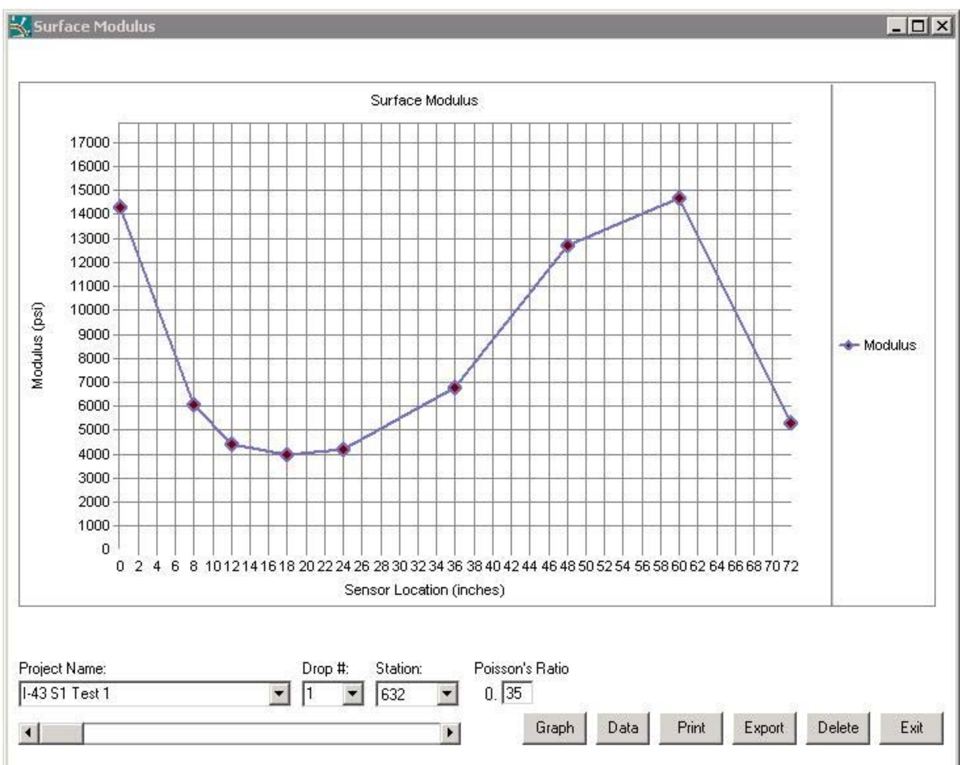

Figure 33. I-43 composite modulus plot

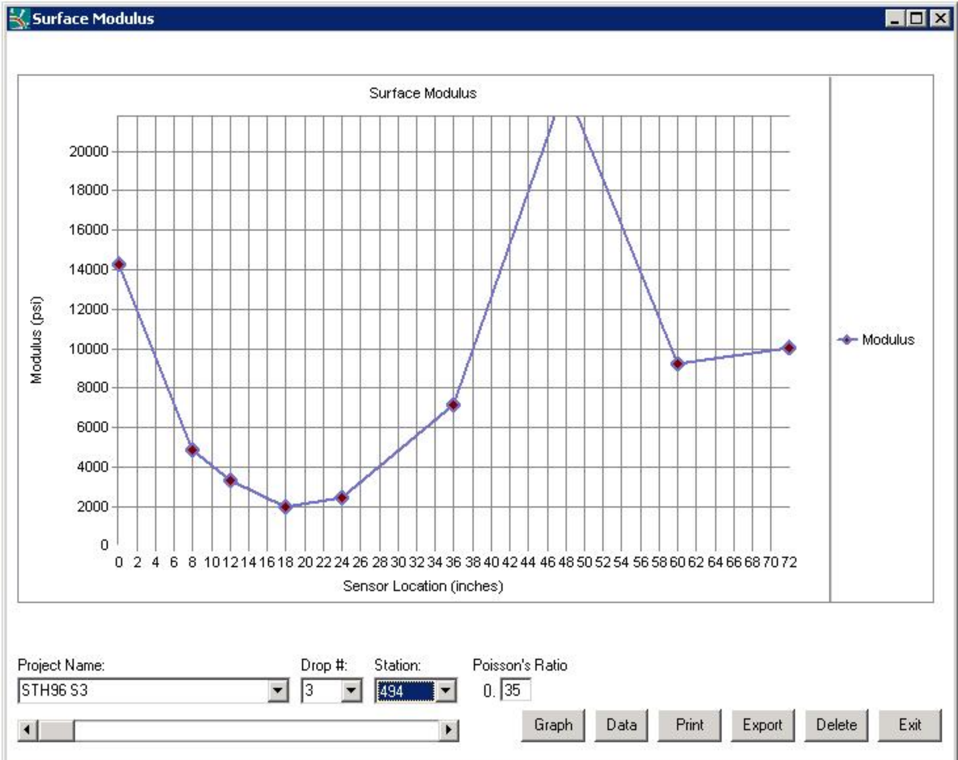

Figure 34. STH 96 composite modulus plot

5.2. DESKTOP STUDY

As the projects discussed previously were constructed in 2013, it is unlikely that tenting or distresses will occur on these projects within the timeframe of the remainder of this research project. The suggested methods for continued evaluation of these projects will be recommended in the final project report.

However, to augment the findings from this study and to further investigate the potential causes of tenting, a supplemental desktop study was conducted. This study identified those projects that have experienced tenting and were reported in poor condition in the Battaglia and Paye report (2011). The objective of this supplemental desktop study was to try and investigate correlations or patterns that occurred on those projects that experienced tenting. The variables that were investigated included:

- Location in the State
- Year of construction
- Class of roadway
- Type of concrete
- Use of edge drains

- Subgrade support
- Degree of rubblization fracture
- Asphalt thickness
- Asphalt properties
- Location of joints in vertical profile (i.e., top of peak or bottom of valley)

This was not meant to be an exhaustive study of all rubblized pavements in Wisconsin or even those that experience tenting, but an initial evaluation of the projects to recommend potential patterns of causes of the distress for further investigation. In addition, the success of this supplemental desk study was dependent to a large extent on the amount of information that WisDOT was able to provide.

During the course of the study, it was not possible to gather the desired level of detailed data for these projects. Therefore, the investigation included data gathered from the Battaglia and Paye report (2011), the WisDOT Yearly Pavement Condition database and Antigo rubbliztion database. The Battaglia and Paye report (2011) included eight projects that were considered to be in poor condition as a result of presence of tenting and other distresses. However, information was only available for seven of these projects. In addition to these references, discussion with the rubblization contractor indicated several key concepts for consideration during the supplemental study, which included:

- Although tenting has occurred on other projects besides those reported by Battaglia and Paye (2011), tenting is not specifically measured and the information is more anecdotal. Tenting exists generally speaking, but it is the severe cases (outliers) that are typically reported.
- It may be difficult to find indications of tenting in data through use of transverse cracking and IRI, as tenting tends to correct itself by the spring/summer when the referenced data are collected. It is possible that by looking at trends over time, a sudden change in either distress may be useful, but looking at a snapshot of data will not likely be helpful.
- Consideration should be given to the differences between water coming through cracks, ponding and freezing causing tenting or water coming from below.
- The permeability testing conducted on I-43 indicated high permeability of the rubblized layers; these layers tend to be very permeable unless bath-tub or other special conditions are present.
- From experience, placement of joint in vertical profile does not seem to be an issue in tenting; however, drainage issues could be potential contributors.

As a result of the lack of available detailed data regarding tenting found in the sources, no specific conclusions were able to be drawn. A summary of the general findings from the supplemental study include:

- The location in the State varied throughout, with one project being located in the southeast, northeast, north, north-northwest and west-northwest each as well as two in the south. The projects rated as being in good condition were also located throughout the State.

- Only one project contained the use of edge drains. However, the information only states if edge drains are present, and not when they were installed or the condition of the drains, such as whether they were clogged or still working as designed. Figure 35 shows the condition of the existing edge drain on I-43 showing pooled water and overgrown grass. A further investigation of the edge drain showed that it was clogged with mud, silt and debris.

Figure 35. Condition of existing edge drain on I-43

- Type of concrete varied with three projects containing JRCP and two projects containing CRCP and JPCP each.

- Asphalt thickness varied from 4.5 inches to 7.5 inches with an average of 6.2 inches.

- All overlays consisted of SuperPave mixes with two projects having warranties.

- The class of roadway varied from State highways to interstates with the majority being US highways.

- The year of rubblization ranged from 2002 to 2007 with four projects being constructed in 2002 and an average year of rubblization of 2003.

- The location of the joints in the vertical profile could not be determined. However, as reported by the rubblization contractor, this was not thought to play a significant role as a cause for tenting.

- Detailed information on the subgrade support was not available. Further consideration or investigation of this could be beneficial.

- As WisDOT collects distress data in two-year cycles on the entire network, a maximum of two years of distress data for each project was available in the Yearly Pavement Condition database that ranged from 2008-2011. As a result, no noticeable changes in either IRI or transverse cracking were observed between the years. Again, it may be difficult to find indications of tenting in data through use of transverse cracking and IRI, as tenting tends to correct itself by the spring/summer when the referenced data are collected.

Based on the above general conclusions, the desktop study revealed that there were no correlations or patterns to suggest a cause for the poor performance of these projects. Further detailed information regarding the initial onset of the tenting, further consideration of the project design assumptions and investigation of subgrade support may lead to a better understanding of the poor performance of these projects; however, this information was not available.

5.3. SUMMARY OF PHASE I DATA ANALYSES

This chapter presented the results of the analyses conducted on the field collected data. FWD deflections were used to backcalculate the layer moduli values. The average modulus values measured at joint and mid-slab locations were 82 ksi and 88 ksi, respectively, for all projects and sections. This compares well to the values referenced in the literature review of 65 ksi (Von Quintus et al., 2007) and 78 ksi (Ceylan et al., 2008). The average modulus of 412.5 ksi reported by the NAPA study (PCS, 1991) is much higher than found here. This could partly be due to the different methods used for backcalculation. The COV of the modulus values at joint and mid-slab locations was 51.8% and 45.3%, respectively. This is slightly higher than the 44.4% COV reported in the NAPA study. This represents the within project variability. which is attributable to differences within a section such as quality of construction and/or changes in site conditions (Note: as indicated earlier, a more in-depth investigation of the within project variability will be conducted under Phase II to determine, to the extent possible variability related to construction and that related to site conditions, such as the presence of unique sub-sections). The between project variability was positively skewed indicating differences between projects such as different subgrade support.

The overall results of the estimated moduli values were consistent with known conditions of the project areas, such as I-43 and STH96 having lower modulus values for the rubblized layer and subgrade, while STH 29 had larger modulus values, which was attributable to thicker, better condition PCC.

Poor subgrade conditions, which were present on STH96, required reduced rubblization energy. The subgrade AASHTO classification for STH96 contained A-7-6 in parts. Owusu-Ababio and Nelson (1999) reported that subgrades classified as A-6 or A-7 with high moisture content did not rubblize satisfactorily. However, the rubblization energy was reduced on the project after two test pits. This modified rubblization energy resulted in an acceptable rubblization (i.e., modulus of the rubblized layer).

A significant finding from the analyses was the difference in moduli values at joint and mid-slab locations. This can have implications on the modulus value used for the design of rubblized pavements and needs to be considered.

Although limited in the number of locations, the comparison of varied rubblized energies showed that most often sections with less rubblization (increased speed) had higher modulus values than sections with more rubblization (decreased speed).

Composite modulus plots showed moderate to high nonlinear response in subgrade materials for STH96 and I-43. However, the characterization of this nonlinearity was not possible. Changes have been suggested for the Year 2 field testing in order to be able to characterize this and include in the analysis.

6. CONCLUSIONS AND RECOMMENDATIONS

The objectives of this project were to develop guidance for eliminating tenting distress and to develop an accurate structural design methodology for rubblized pavements, including consideration of joint condition. To accomplish these objectives, a field investigation utilizing FWD testing as a means for properly characterizing the rubblized PCC material (both at mid-slab and joints) and subgrade as well as evaluating that the desired fracturing has been achieved was carried out. This testing was supplemented with surface distress surveys and permeability testing to further address the characterization of the rubblized PCC material.

This report presented the findings from the literature review performed, field testing activities and data analysis that were performed as part of Year 1. The conclusions from this effort were used to develop recommendations for updating the Year 2 field evaluation work plan.

The findings from the literature review found important elements related to the performance of rubblized pavement such as sufficient subgrade support and timely sealing of transverse cracking to reduce the occurrence and severity of tenting. The literature review also provided insight into the WisDOT specifications for rubblization.

Using the findings from the literature review and information gathered on the four Year 1 rubblization projects, a field evaluation work plan was developed for Year 1. The work plan contained background information on the four Year 1 rubblization projects including existing pavement cross sections and subgrade support, traffic data, planned HMA overlay thicknesses, suggested field testing activities, and schedule. An experimental matrix was developed for the field testing with the goal of filling as many experimental cells as possible with the given rubblization projects. The experimental matrix included the following five factors, resulting in a total of 36 experimental cells:

1. PCC pavement type
2. Subgrade type
3. Edge drains
4. Joint condition
5. Degree of rubblization

The field testing was conducted during the months of August and September 2013. Through coordination with the contractors, testing of all four projects was completed in two separate trips to Wisconsin. The field testing included distress surveys of the joints to classify them as either in good or poor condition, FWD testing at both joint and mid-slab locations and permeability testing on the I-43 project. Throughout the field testing, several changes were required to the proposed work plan in order to accommodate the actual field conditions, testing schedules and preference of the field engineers.

Analysis of the data collected during the field activities included backcalculation of the layer moduli using MODULUS. Analysis of the calculated moduli layers showed that there was a statistically significant difference between moduli values at mid-slab and joint locations (for 12 out of 16) as well as between joints in good and poor condition (for 16 out of 23). The between project variability showed a positive skew, while the within project variability showed a COV of 49.9%.

The observation of nonlinearity of the subgrade materials was investigated using composite modulus plots and normalized (to 9,000 lbs) deflections. These plots showed none to very little nonlinearity was observed in the subgrade materials for projects US14 and SH29, while there appeared to be a moderate to high nonlinear response in the subgrade materials for SH96 and I-43. Several attempts to characterize this nonlinearity using MODCOMP were made, but they proved unsuccessful in part because of the sensor 2 data (8 inches) as well as some of the deflection basin variability encountered. However, it is believed that by adding a fourth drop to the Year 2 FWD testing, that non-linear characterization will more likely be achieved.

As a result of the Year 1 field testing and findings, the same field evaluation work plan for Year 2 is recommended, but with the following caveats and recommendations:

- The projects that will be included in Year 2 are limited to those projects available for 2014 as already planned by WisDOT. The project team will attempt to populate as many of the experimental cells as possible, but this will clearly depend on the projects that will be available for 2014.

- Although the Year 1 analysis of varied rubblization energy was based on limited data and locations, it showed promising results. In order to expand on this analysis in the future, it is recommended to expand the number of locations of varied rubblization energy in the Year 2 field testing. It is anticipated that experimentation with less rubblization energy will be viewed more favorably, as this does not raise the risk of expensive pavement failures during and after construction plus it results in a greater structural capacity for the rubblized layer. Reduced rubblization energy at joints only or throughout length of test sections should be considered in an attempt to reduce mid-slab versus joint variability of rubblized layer moduli. However, higher rubblization energy would also contribute to the understanding and characterization of rubblized layers, and hence should be pursued where possible, perhaps with the support of FWD testing to demonstrate via layer moduli that joints and mid-slabs have been adequately fractured.

- FWD testing should be conducted prior to rubblization, after rubblization and after placement of HMA overlay on closed projects during Year 2 where traffic control would not be an issue. If testing can be done throughout the three construction events in question, then a more clear history of the rubblized PCC layer and hence its characterization can be obtained. FWD testing conducted prior to and after rubblization can be used to determine the reduction in PCC modulus as well as related issues such as degree of rubblization, remaining structural capacity, etc. As stated in the literature review chapter, for example, Buncher et al. (2008) suggested that there is a relationship between the ratio of the modulus of the rubblized layer and the modulus of the pre-fractured PCC (E_{rub}/E_{PCC}) with an average retained modulus of 6.0%, which should be explored further. Similarly, FWD testing after HMA overlay would be extremely beneficial as it helps characterize the rubblized PCC layer as fully constructed, which defines its actual (as compared to as –designed) performance.

- Consideration should be given to conducting FWD testing on older (prior to 2013) rubblized projects that are performing both well and poorly (perhaps with tenting), as this would provide extremely valuable data on projects with known performance. Again, this would require the availability of traffic control.

- As the Year 1 data analysis showed, two of the projects showed nonlinearity in the subgrade. In order to properly account for nonlinearity in the data analyses, it is recommended that a fourth drop height be included in the FWD testing to enable the use of an important non-linear characterization feature within the MODCOMP layer moduli backcalculation software. In addition, consideration will be given to FWD testing with the larger plate instead of the small one in order to improve data quality, including the reduction or elimination of deflections over 80 mils. By testing with the larger plate, the second sensor, located at 8 inches, will be removed from analysis, which was a source of high deflections. Also, the use of the larger plate (because of its larger contact area) will significantly reduce the number of deflections exceeding 80 mils, which is the upper range of the FWD geophones. However, if it is possible to maintain deflections under 80 mils with the 12-inch plate, the research team will do so, as it has important implications in terms of historical deflection data for rubblized projects.

After completion of the Year 2 field testing and data analysis, the Year 1 and Year 2 results will be used to address the validity of WisDOT design values and structural values used for the rubblized layer. A major consideration during this will be how to incorporate the difference between mid-slab and joint locations within the design. Other analysis considerations include:

- It is important to conduct MEPDG simulations as part of the Phase II effort to look at the effects of rubblized layer modulus and HMA layer thickness for the range of subgrade support conditions. These simulations will could provide beneficial information regarding the effects of rubblized layer modulus and HMA layer thickness. Perhaps the most important element of these simulations will be the determination of the required HMA overlay thickness derived from the characterization of the rubblized PCC layer from deflection testing versus the as-designed and as-constructed HMA overlay thickness, as determined by WisDOT. As part of these simulations, another consideration will be incorporation of the variability of the modulus of the rubblized layer, especially since WisDOT is moving towards the MEPDG; i.e., and an important outcome of the project will be guidelines on how to consider the variability of the rubblized PCC layer in the design process. Still another consideration as part of the simulations, relative to the within and the between project variability of the modulus of the rubblized layer, is to obtain an estimate on how the rubblized layer moduli variations impact predicted distress, which again could provide some insight and be of value to the WisDOT design method.

- Further investigation into the higher modulus values determined for STH 29 during the Year 1 effort is needed so that the condition that resulted in the increases moduli can be incorporated into the material properties. It is believed the higher modulus values are a result of thicker concrete pavement that was in relatively good condition. Although the STH 29 rubblized moduli were higher relative to other three projects, the moduli were substantially lower than found in NAPA study. WisDOT results are considered better than the NAPA study for various reasons, including improved testing equipment and backcalculation software. Similarly and for the same reasons, some of the backcalculated moduli for the granular base/subbase and subgrade appear to be too low and/or highly variable. On I-43, for example, the subgrade moduli are less than 1,000 psi for 3 of the 4 sections.

- In addition to the backcalculated layer moduli, consideration will be given to the use of deflection indices such as the Area Under the Pavement Profile (AUPP) index developed by professor Marshall Thompson. While premature at this time, it is suspected that such indices will be of value in characterizing the structural capacity variability within projects, but it is unlikely that they will serve as direct input into the rubblization design process.
- To the extent possible and if the data support it, a more detailed investigation between the amount of joint deterioration, that is the width of the failed joints, would be beneficial as part of the Year 2 effort.
- Finally, the work completed during Year 1 suggests WisDOT projects are potentially being over-rubblized, creating excessively-low structural capacity, which in-turn increases the thickness (cost) of the HMA overlay needed. Similarly, the project team feels that repairs prior to rubblization could potentially be a waste of effort and budget, as the rubblization process will destroy any repairs applied at the joints. Accordingly, it is important that this finding be seen through by the WisDOT. More specifically, the following important activities are strongly recommended:
    + Find an approach that balances between minimizing or eliminating reflection cracking and tenting, while not over-breaking the PCC layer. As stated above, it is possible that the PCC layer is being broken too much, such that little benefit is gained in terms of reflection cracking control and too much is lost in terms of structural capacity.
    + Find an approach that improves uniformity across rubblized projects, including consideration of mid-slabs and joints. There seems to be differences between the two, and a key to quality and good performance is uniformity; i.e., low within project variability. As part of this effort, use of proof-rolling on all projects to identify and correct weak areas should be seriously considered.
    + Adequately characterize the modulus of the rubblized PCC, both in terms of central tendencies and variability, as the primary input to WisDOT design of rubblized pavements, whether using the design methodology in AASHTO 1993 or MEPDG.

As allowed for in the project work plan, the sponsoring agency opted not to authorize Phase II of this project. Accordingly, the Phase II work contained in the original work plan and contemplated by this Phase I report was not subsequently performed.

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APPENDIX A. LITERATURE REVIEW FORM

LITERATURE RESEARCH FORM

Project: WisDOT Evaluation of Design Criteria and Field Performance of Rubblized Concrete
Task: 1. Literature Review

Completed by: _____

Date (dd/mm/yyyy): _____

Reference in FHWA Format (Authors, title, publication #, publisher, date):	_____
Reference Source:	Report ☐ Article ☐ Internet ☐ Interview ☐ Presentation ☐ Other ☐ Specify: _____
Reference Abstract (if contained) or Brief Summary:	_____

Relevant Subject **(check all that apply):**	Rubblization Equipment (resonant breaking system) ☐ Rubblization distresses in Wisconsin ☐ Pre-Overlay joint repair ☐ Permeability of rubblized/recycled bases ☐ Resilient modulus/structural number ☐ Performance, design life, maintenance ☐ LTPP SPS-6 studies/data ☐ Historic WisDOT rubblization data ☐ Other ☐ Specify: _____
Does information presented in reference merit further consideration under the remainder of the project tasks"?	Yes ☐ No ☐ If yes, please give reason(s): _____

APPENDIX B. MODULUS BACKCALCULATION

The sensors used for backcalculation purposes were spaced at 0, 12, 18, 24, 36, 48, and 60 inches.

I-43 Section 1

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                                             TTI  MODULUS  ANALYSIS  SYSTEM  (SUMMARY REPORT)                          (Version 5.1)
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  District:     11                                                                  MODULI RANGE(psi)
  County:       111                                  Thickness(in)          Minimum        Maximum    Poisson Ratio Values
  Highway/Road: 111111                 Pavement:            8.50              25,000      1,000,000       H1: õ = 0.35
                                       Base:                9.00               5,000        500,000       H2: õ = 0.35
                                       Subbase:             0.00                   0              0       H3: õ = 0.35
                                       Subgrade:           13.50                      5,000               H4: õ = 0.40
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Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock
202.000	7,917	57.77	60.34	42.76	28.68	10.83	5.41	3.35	56.	5.0	0.0	0.5	17.71	*** *
202.000	7,917	66.28	59.21	43.13	29.08	10.48	4.52	3.33	43.	5.0	0.0	0.5	15.88	32.20 *
202.000	7,884	61.07	59.54	42.60	28.19	10.15	4.35	3.36	48.	5.0	0.0	0.5	18.32	31.69 *
202.000	10,290	76.36	76.91	52.06	35.39	14.23	7.13	4.31	56.	5.0	0.0	0.5	14.08	*** *
202.000	10,333	68.35	76.28	54.21	36.25	15.79	7.70	4.18	71.	5.0	0.0	0.4	16.93	*** *
202.000	10,268	69.68	76.39	52.45	36.15	15.26	7.22	4.12	66.	5.0	0.0	0.4	16.72	*** *
202.000	10,301	63.44	78.96	53.96	37.06	14.86	9.77	3.94	84.	5.0	0.0	0.4	18.25	*** *
240.000	8,245	62.76	40.53	28.95	18.05	6.47	1.84	1.96	41.	5.0	0.0	0.9	6.37	33.56 *
240.000	8,332	66.32	40.92	29.57	18.56	6.06	1.78	2.11	37.	5.0	0.0	0.9	7.51	31.61 *
240.000	8,299	67.55	41.56	29.98	18.61	6.13	1.84	1.99	36.	5.0	0.0	0.8	8.01	31.60 *
262.000	8,288	76.38	40.11	30.25	17.62	6.49	2.17	2.30	25.	6.3	0.0	0.8	7.85	28.87
262.000	8,310	76.57	41.04	30.72	17.71	6.42	2.16	2.20	26.	6.0	0.0	0.8	8.85	27.88
262.000	8,267	77.27	41.81	30.97	17.72	6.38	2.18	2.25	26.	5.7	0.0	0.8	9.62	27.14
284.000	8,168	78.30	43.85	29.55	18.24	5.00	2.29	2.11	25.	5.0	0.0	0.8	15.34	27.98 *
284.000	8,234	78.34	44.30	28.98	16.30	4.60	2.08	2.16	25.	5.0	0.0	0.9	18.33	25.27 *
284.000	8,212	78.30	44.93	29.78	17.18	4.38	2.13	2.05	25.	5.0	0.0	0.9	19.37	26.65 *
300.000	8,015	75.54	52.76	32.93	20.05	6.21	2.07	4.09	27.	5.0	0.0	0.7	12.14	27.96 *
300.000	8,048	76.33	53.03	33.16	20.02	5.72	2.04	3.47	26.	5.0	0.0	0.7	14.24	26.88 *
300.000	8,070	77.44	53.86	33.52	19.86	5.99	2.18	3.14	26.	5.0	0.0	0.7	14.46	27.33 *
400.000	8,299	76.20	45.87	35.19	22.44	9.71	6.58	3.20	29.	8.6	0.0	0.5	11.63	40.87
400.000	8,277	76.09	45.35	35.32	22.67	10.05	5.04	3.32	31.	7.3	0.0	0.6	7.45	42.59
400.000	8,277	76.46	47.06	35.82	22.91	10.66	4.88	3.29	33.	6.6	0.0	0.6	6.48	40.95
437.000	8,004	74.35	45.01	28.79	17.96	7.36	3.16	2.13	26.	6.5	0.0	0.7	10.57	34.71
437.000	8,026	74.74	45.58	28.99	18.16	7.41	3.02	2.20	27.	6.2	0.0	0.7	10.29	35.23
437.000	7,982	75.58	43.46	28.82	18.30	7.31	3.02	2.23	25.	6.7	0.0	0.7	8.82	35.74 *
459.000	8,157	59.72	51.89	33.48	21.88	7.71	3.58	2.79	49.	5.0	0.0	0.6	12.68	31.23 *
459.000	8,179	59.90	53.26	33.78	22.30	7.87	3.64	3.00	49.	5.0	0.0	0.6	12.57	31.05 *
459.000	8,201	58.37	53.11	33.77	22.52	7.89	3.56	2.91	51.	5.0	0.0	0.6	12.14	31.04 *

459.000	10,683	77.41	70.66	45.30	30.76	10.57	4.82	3.60	50.	5.0	0.0	0.6	12.91	30.74 *
459.000	10,607	68.85	72.27	45.57	31.58	10.90	4.80	3.70	60.	5.0	0.0	0.6	17.79	*** *
522.000	7,818	70.48	65.78	37.37	22.46	6.50	5.37	3.24	33.	5.0	0.0	0.6	26.26	24.90 *
522.000	7,796	59.25	65.39	35.54	22.65	6.23	6.06	3.19	44.	5.0	0.0	0.6	28.64	*** *
522.000	8,048	59.35	65.91	36.09	22.72	6.04	8.17	3.15	47.	5.0	0.0	0.6	32.67	*** *
632.000	8,190	61.61	49.63	36.19	26.33	10.51	4.51	2.96	55.	5.0	0.0	0.5	9.19	37.82 *
632.000	8,245	62.15	49.55	36.68	25.98	10.90	4.20	2.97	54.	5.0	0.0	0.5	9.21	39.88 *
632.000	8,223	62.49	49.30	36.93	26.16	10.75	4.19	3.00	53.	5.0	0.0	0.5	9.41	39.12 *
648.000	8,288	63.84	42.07	30.13	20.36	6.98	1.99	2.87	42.	5.0	0.0	0.8	6.52	33.06 *
648.000	8,201	62.64	42.27	30.17	20.51	6.71	1.95	2.74	42.	5.0	0.0	0.8	8.28	32.00 *
648.000	8,256	63.75	42.90	30.63	20.83	6.76	2.27	2.93	42.	5.0	0.0	0.8	7.65	31.81 *
660.000	8,048	69.26	44.82	30.44	17.15	2.91	2.80	4.15	26.	5.0	0.0	1.0	33.98	23.94 *
660.000	8,059	70.04	44.90	30.74	17.12	3.14	2.93	4.05	26.	5.0	0.0	0.9	31.71	24.29 *
660.000	8,102	70.28	46.08	30.88	17.20	3.28	2.94	4.09	27.	5.0	0.0	0.9	30.81	24.32 *
824.000	8,256	46.17	50.60	35.79	24.13	10.33	3.29	2.59	77.	5.0	0.0	0.6	20.70	*** *
824.000	8,267	60.34	66.88	35.84	24.09	9.50	2.74	2.74	45.	5.0	0.0	0.6	19.01	*** *
824.000	8,245	58.77	51.30	35.82	24.10	9.53	2.55	2.50	50.	5.0	0.0	0.6	16.50	35.67 *
824.000	10,749	61.60	64.26	44.80	31.82	12.26	3.88	3.41	72.	5.0	0.0	0.6	20.96	*** *
824.000	10,672	96.09	64.72	46.46	31.55	12.18	3.63	3.63	35.	5.0	0.0	0.6	6.71	35.48 *
846.000	8,157	67.13	53.59	38.28	25.01	8.45	6.54	3.80	46.	5.0	0.0	0.5	17.77	31.08 *
846.000	8,124	42.07	54.73	38.83	25.37	8.96	4.23	3.74	87.	5.0	0.0	0.6	25.78	*** *
846.000	8,146	53.50	54.92	39.73	25.61	9.23	4.17	3.72	61.	5.0	0.0	0.5	18.85	*** *
846.000	10,607	63.12	75.25	50.27	32.77	12.15	5.57	5.08	71.	5.0	0.0	0.5	21.37	*** *
846.000	10,563	43.96	81.34	53.49	34.14	12.44	5.98	5.15	121.	5.0	0.0	0.5	34.09	*** *
846.000	10,574	69.52	79.17	56.81	34.59	12.73	5.05	5.07	59.	5.0	0.0	0.5	23.52	*** *
Mean:		67.34	54.82	37.21	24.05	8.63	4.00	3.20	46.	5.3	0.0	0.7	15.90	30.97
Std. Dev:		9.77	12.34	7.97	6.04	3.12	1.89	0.82	20.	0.7	0.0	0.1	7.77	4.79
Var Coeff(%):		14.50	22.51	21.41	25.11	36.14	47.15	25.59	44.	13.5	0.0	22.3	48.85	15.47

I-43 Section 2

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                                             TTI  MODULUS  ANALYSIS  SYSTEM  (SUMMARY REPORT)                            (Version 5.1)
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  District:     11                                                                  MODULI RANGE(psi)
  County:       111                                   Thickness(in)          Minimum        Maximum    Poisson Ratio Values
  Highway/Road: 111111                     Pavement:       8.50               25,000      1,000,000        H1: õ = 0.35
                                           Base:           9.00                5,000        500,000        H2: õ = 0.35
                                           Subbase:        0.00                    0              0        H3: õ = 0.35
                                           Subgrade:      14.10                       5,000                H4: õ = 0.40
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	Load	Measured Deflection (mils):							Calculated Moduli values (ksi):				Absolute	Dpth to
Station	(lbs)	R1	R2	R3	R4	R5	R6	R7	SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	ERR/Sens	Bedrock
1264.000	7,735	90.00	56.05	44.07	28.56	8.96	3.72	4.55	25.	5.0	0.0	0.5	10.44	30.02 *
1264.000	7,757	89.43	57.79	44.65	28.19	8.74	37.81	4.35	25.	6.6	0.0	0.4	29.60	42.08 *
1264.000	7,812	90.46	58.98	44.48	28.81	8.50	35.33	5.03	25.	6.1	0.0	0.4	29.32	42.50 *
1279.000	7,987	80.39	57.70	45.24	27.96	9.71	4.43	3.30	31.	5.0	0.0	0.5	10.56	31.44 *
1279.000	8,020	80.96	58.04	45.97	28.34	9.85	3.92	3.54	30.	5.0	0.0	0.5	11.93	31.53 *
1279.000	8,075	80.88	57.58	45.56	29.39	9.75	3.80	3.28	31.	5.0	0.0	0.5	12.92	31.14 *
1294.000	7,965	83.50	55.07	40.97	26.15	11.37	4.97	5.58	31.	5.0	0.0	0.5	7.33	38.66 *
1294.000	7,987	84.78	55.24	40.18	26.16	10.54	4.70	6.53	29.	5.0	0.0	0.5	8.07	35.62 *
1294.000	7,943	84.55	55.17	41.78	26.13	11.40	4.46	6.85	30.	5.0	0.0	0.5	6.16	35.24 *
1294.000	10,401	99.75	68.85	51.83	33.93	20.78	6.42	9.35	41.	5.0	0.0	0.5	7.13	43.57 *
1303.000	7,526	97.37	66.93	53.15	32.14	13.44	4.87	5.52	25.	5.0	0.0	0.4	13.67	29.53 *
1303.000	7,548	99.01	67.26	53.31	33.47	13.48	4.96	5.44	25.	5.0	0.0	0.4	13.72	34.02 *
1303.000	7,614	98.34	68.58	53.44	33.82	13.09	4.84	4.45	25.	5.0	0.0	0.4	14.46	32.59 *
1325.000	7,790	96.95	74.23	42.30	27.33	7.95	3.57	3.67	25.	5.0	0.0	0.5	19.41	29.44 *
1325.000	7,845	96.76	71.88	43.48	27.46	7.78	3.51	3.72	25.	5.0	0.0	0.5	19.49	24.80 *
1325.000	7,867	95.51	69.88	43.13	27.65	7.61	3.52	3.81	25.	5.0	0.0	0.5	18.67	24.98 *
1353.000	7,976	73.76	59.02	43.28	26.15	9.41	2.43	2.50	31.	5.0	0.0	0.6	18.83	30.18 *
1353.000	8,009	73.28	58.75	43.82	26.28	8.94	2.07	2.51	31.	5.0	0.0	0.6	22.32	29.67 *
1353.000	7,987	80.73	60.66	43.82	26.04	8.94	1.93	2.38	26.	5.0	0.0	0.6	21.01	28.25 *
1353.000	10,336	91.41	49.97	56.89	34.74	11.65	2.82	3.07	37.	5.0	0.0	0.6	18.32	*** *
1397.000	7,691	98.55	66.74	50.48	30.30	6.81	3.74	2.17	25.	5.0	0.0	0.5	25.96	24.48 *
1515.000	8,152	67.62	42.21	27.84	16.41	7.10	3.31	2.85	31.	7.0	0.0	0.8	12.15	28.65
1515.000	8,130	68.46	42.99	28.16	17.23	7.06	3.52	2.88	31.	6.8	0.0	0.8	12.41	32.62
1515.000	8,119	68.91	43.39	28.04	16.67	6.94	3.45	2.87	30.	6.8	0.0	0.8	13.27	29.24
1515.000	10,544	88.25	56.56	42.96	21.60	8.96	4.71	3.57	37.	5.2	0.0	0.8	17.18	20.40
1515.000	10,522	89.87	58.32	39.55	24.13	9.09	4.69	3.69	35.	5.4	0.0	0.8	13.75	32.41
1515.000	10,566	89.14	59.75	37.96	22.34	9.09	4.61	3.76	34.	5.6	0.0	0.8	14.78	27.96
1515.000	10,522	90.60	62.72	38.31	22.61	9.09	4.59	3.80	34.	5.1	0.0	0.8	15.65	27.72
1530.000	7,713	92.47	61.62	44.66	28.68	13.03	5.48	3.83	25.	5.0	0.0	0.4	6.45	37.79 *
1530.000	7,713	93.64	63.03	45.50	29.22	13.00	5.04	3.89	25.	5.0	0.0	0.4	6.59	37.53 *
1530.000	7,746	94.00	63.43	46.03	29.26	12.91	4.72	3.97	25.	5.0	0.0	0.4	7.85	35.77 *
1545.000	7,932	94.13	62.07	44.74	28.04	7.69	2.32	2.41	25.	5.0	0.0	0.5	23.50	26.70 *
1545.000	7,921	95.35	62.85	45.46	28.52	7.94	2.24	2.32	25.	5.0	0.0	0.5	25.28	26.82 *
1545.000	7,932	96.01	63.57	45.94	28.93	8.13	2.19	2.31	25.	5.0	0.0	0.5	26.40	26.89 *
1607.000	7,625	94.64	62.75	42.84	20.19	8.34	3.56	3.85	25.	5.0	0.0	0.5	17.84	17.15 *
1607.000	7,625	96.19	62.49	40.31	20.59	6.87	3.61	3.91	25.	5.0	0.0	0.6	22.06	19.16 *
1607.000	7,625	95.99	62.55	40.15	21.31	6.84	3.62	3.86	25.	5.0	0.0	0.5	21.40	20.47 *
1641.000	7,702	93.25	72.63	45.75	35.90	12.18	4.78	3.10	25.	5.0	0.0	0.4	14.50	70.34 *
1641.000	7,702	93.97	67.08	46.97	33.90	12.13	3.38	3.23	25.	5.0	0.0	0.4	18.17	31.24 *
1641.000	7,735	94.97	60.65	47.95	39.59	12.89	3.75	3.37	25.	5.0	0.0	0.4	16.67	33.57 *
1688.000	8,360	54.74	34.86	21.76	13.03	5.23	6.05	3.01	34.	11.9	0.0	0.9	21.31	30.88
1688.000	8,371	56.20	35.37	23.77	13.27	5.27	5.84	3.07	35.	10.6	0.0	0.9	22.14	25.40
1688.000	8,393	56.70	36.02	22.55	13.56	5.35	4.58	3.17	34.	10.2	0.0	1.0	18.80	31.28
1688.000	10,906	72.99	47.05	29.81	18.37	7.29	6.27	4.04	37.	10.3	0.0	0.9	18.17	34.44
1688.000	10,972	74.85	48.72	31.21	19.39	7.33	7.00	4.11	37.	9.7	0.0	0.9	19.30	34.61
1688.000	10,950	74.35	49.57	31.93	19.90	7.30	6.57	4.05	40.	8.7	0.0	0.9	19.14	33.72
1688.000	10,917	75.83	50.22	32.35	20.16	7.34	5.79	4.24	40.	8.0	0.0	0.9	18.03	33.44

1688.000	14,450	84.90	66.43	43.41	28.21	10.46	15.29	5.35	66.	7.9	0.0	0.8	23.17	50.56	
2129.000	7,515	99.81	80.37	54.96	39.25	16.69	4.87	3.44	25.	5.0	0.0	0.3	19.55	32.58	*
Mean:		86.00	58.65	41.69	26.11	9.60	5.79	3.87	30.	6.0	0.0	0.6	16.83	31.58	
Std. Dev:		12.04	10.01	8.37	6.42	3.00	6.72	1.31	7.	1.8	0.0	0.2	6.01	7.46	
Var Coeff(%):		14.00	17.07	20.09	24.59	31.25	99.99	33.93	24.	30.4	0.0	30.5	35.70	23.62	

I-43 Section 3

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	8.50	25,000	1,000,000	H1: õ = 0.35
Base:	9.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	15.60	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
2253.000	9,019	60.72	42.00	35.02	25.07	12.00	5.02	3.33	75.	5.0	0.0	0.7	2.66	50.35	*
2253.000	9,030	62.13	44.02	36.66	25.17	12.14	5.10	3.39	71.	5.0	0.0	0.7	3.37	49.21	*
2253.000	9,008	62.49	42.12	35.97	25.70	12.16	5.15	3.33	72.	5.0	0.0	0.7	3.00	51.40	*
2253.000	11,433	80.18	54.55	47.73	32.57	16.08	7.30	4.65	73.	5.0	0.0	0.6	3.55	53.57	*
2253.000	11,367	81.37	54.89	53.28	32.06	16.64	7.43	4.57	71.	5.0	0.0	0.6	5.66	33.92	*
2253.000	11,334	81.99	56.68	68.91	33.44	17.14	7.52	4.69	68.	5.0	0.0	0.6	11.88	***	*
2253.000	11,279	80.94	56.74	55.80	34.16	17.33	7.59	4.67	71.	5.0	0.0	0.6	6.73	36.59	*
2268.000	8,613	87.19	55.30	42.15	26.69	10.98	5.89	12.24	32.	5.2	0.0	0.6	10.28	37.27	
2268.000	8,569	84.94	56.58	42.80	27.04	10.78	5.47	11.83	34.	5.0	0.0	0.6	10.36	35.73	*
2268.000	8,602	89.26	57.22	43.48	27.41	10.82	5.39	13.31	31.	5.0	0.0	0.6	10.09	35.36	*
2297.000	8,437	79.14	52.87	37.30	23.42	10.17	4.46	4.38	35.	5.0	0.0	0.7	9.08	35.84	*
2297.000	8,448	79.92	53.65	37.49	23.88	10.48	4.54	3.95	35.	5.0	0.0	0.7	8.52	38.12	*
2297.000	8,437	80.61	54.09	37.66	24.22	10.47	4.56	4.00	34.	5.0	0.0	0.7	8.48	38.41	*
2319.000	8,613	76.72	46.35	38.33	36.26	8.11	5.48	3.68	41.	5.0	0.0	0.7	18.79	300.00	*
2319.000	8,679	77.08	47.31	35.75	31.62	8.28	5.18	3.73	40.	5.0	0.0	0.7	14.70	300.00	*
2319.000	8,668	77.14	47.64	35.67	26.88	8.67	6.20	3.60	35.	6.5	0.0	0.7	13.28	32.92	
2319.000	11,016	99.72	62.06	46.88	32.09	11.07	8.74	4.64	34.	6.7	0.0	0.7	14.13	33.39	
2341.000	8,075	85.87	43.08	27.05	15.60	5.13	3.00	3.36	25.	5.0	0.0	1.0	20.71	26.74	*
2341.000	8,097	86.53	44.45	27.76	15.81	4.64	4.11	3.91	25.	5.0	0.0	1.0	24.85	25.77	*

2341.000	8,152	86.98	43.65	28.24	16.23	4.43	6.06	4.16	25.	5.0	0.0	1.0	26.53	26.75	*
2449.000	8,251	80.26	49.50	21.95	9.43	3.04	1.94	2.07	25.	5.0	0.0	1.4	37.31	14.30	*
2449.000	8,174	80.32	49.86	22.16	9.26	2.91	1.93	1.99	25.	5.0	0.0	1.4	38.52	14.30	*
2449.000	8,218	80.76	50.61	22.61	9.36	2.85	1.97	2.04	25.	5.0	0.0	1.4	39.06	14.41	*
2536.000	7,669	95.73	57.99	36.96	21.56	4.74	5.46	3.56	25.	5.0	0.0	0.7	34.15	63.78	*
2536.000	7,702	98.10	59.28	51.59	22.43	4.60	4.22	3.56	25.	5.0	0.0	0.6	38.03	16.65	*
2536.000	7,735	99.09	60.19	40.31	22.44	4.75	5.63	3.39	25.	5.0	0.0	0.7	36.54	23.26	*
2558.000	8,262	76.28	38.30	18.30	10.82	5.10	3.74	3.17	25.	6.5	0.0	1.3	28.13	17.53	*
2558.000	8,251	76.93	39.00	18.59	11.01	5.18	3.81	3.20	25.	6.3	0.0	1.3	28.06	17.40	*
2558.000	8,207	77.40	39.48	18.87	11.15	5.26	3.85	3.21	25.	6.2	0.0	1.3	27.94	17.47	*
2558.000	10,785	97.91	51.41	25.11	15.11	6.69	4.78	3.83	25.	6.7	0.0	1.2	24.71	18.56	*
2562.000	8,185	76.46	40.70	19.59	11.15	5.30	3.46	2.84	25.	6.1	0.0	1.3	27.14	17.64	*
2562.000	8,152	77.35	41.63	20.10	11.43	5.40	3.52	2.93	25.	5.9	0.0	1.2	26.84	17.73	*
2562.000	8,196	77.96	42.32	20.41	11.61	5.37	3.56	2.91	25.	5.8	0.0	1.2	26.57	17.67	*
2562.000	10,753	98.61	55.00	27.46	15.33	6.77	4.40	3.67	25.	6.1	0.0	1.2	24.17	19.41	*
2584.000	7,976	80.07	47.22	36.11	22.70	7.36	3.56	3.44	28.	5.0	0.0	0.7	11.78	31.12	*
2584.000	7,987	83.83	48.08	37.06	23.19	8.24	3.56	3.37	26.	5.0	0.0	0.7	9.29	33.04	*
2584.000	7,976	86.12	48.68	37.61	23.50	8.03	3.55	3.43	25.	5.0	0.0	0.7	9.79	32.06	*
2653.000	12,936	99.94	91.27	72.55	51.60	7.72	3.18	3.25	35.	5.0	0.0	0.8	38.81	24.85	*
2653.000	12,804	99.82	84.18	73.63	49.91	8.06	2.95	3.16	36.	5.0	0.0	0.8	37.38	25.76	*
2677.000	7,965	80.17	62.39	45.52	32.34	14.05	5.59	3.40	36.	5.0	0.0	0.5	8.76	39.05	*
2677.000	7,911	79.22	62.33	46.59	32.99	14.01	5.71	3.39	36.	5.0	0.0	0.5	9.95	38.31	*
2677.000	7,932	81.38	62.78	47.23	33.66	13.71	5.84	3.49	35.	5.0	0.0	0.5	9.93	36.74	*
2677.000	10,325	98.62	79.99	60.98	45.13	18.65	7.80	5.05	41.	5.0	0.0	0.4	11.63	38.45	*
2700.000	7,965	92.45	56.98	35.60	29.18	9.98	5.26	4.81	25.	5.0	0.0	0.6	11.91	77.40	*
2700.000	7,943	93.15	58.91	37.19	29.83	9.94	5.12	5.20	25.	5.0	0.0	0.6	11.41	85.59	*
2700.000	7,932	94.24	62.32	37.36	30.95	9.95	5.67	3.05	25.	5.0	0.0	0.5	13.71	48.98	*
2717.000	8,031	74.31	53.63	39.70	30.30	11.49	5.13	3.78	41.	5.0	0.0	0.5	7.07	36.28	*
2717.000	8,009	75.61	55.02	40.82	31.12	11.73	5.13	3.81	39.	5.0	0.0	0.5	7.96	35.93	*
2717.000	8,009	76.93	56.62	41.85	31.82	11.89	5.33	3.74	38.	5.0	0.0	0.5	8.40	35.37	*
2717.000	10,588	97.58	71.55	54.54	41.29	15.90	7.33	4.82	42.	5.0	0.0	0.5	7.72	37.08	*
2717.000	10,478	99.93	74.07	57.64	43.48	16.43	7.44	4.88	40.	5.0	0.0	0.5	9.40	36.42	*
2717.000	14,022	79.18	96.50	81.10	59.53	22.77	9.75	6.64	93.	5.0	0.0	0.5	26.60	***	*
2738.000	7,889	85.45	56.09	44.07	28.18	10.55	2.67	3.07	25.	5.0	0.0	0.6	13.37	33.83	*
2738.000	7,889	88.12	58.59	44.78	28.97	10.04	2.69	3.12	25.	5.0	0.0	0.6	15.71	31.43	*
2738.000	7,889	89.31	58.02	45.82	29.82	9.05	2.59	3.09	25.	5.0	0.0	0.6	18.82	29.50	*
2825.000	8,657	49.09	35.12	27.67	21.97	12.10	6.34	3.61	89.	9.5	0.0	0.6	1.31	65.45	
2825.000	8,679	49.77	35.54	28.20	22.30	12.19	6.36	3.67	90.	8.9	0.0	0.6	1.23	65.16	
2825.000	8,668	50.19	36.02	28.52	22.59	12.41	6.40	3.72	90.	8.7	0.0	0.6	1.09	63.85	
2825.000	11,389	65.12	46.91	37.53	29.85	16.47	8.57	5.04	97.	8.2	0.0	0.6	1.00	65.26	
2825.000	11,334	66.58	48.15	38.61	30.81	17.73	8.92	5.22	95.	8.4	0.0	0.6	0.35	61.64	
2825.000	11,301	67.47	48.97	39.33	31.26	17.53	9.02	5.31	93.	8.0	0.0	0.6	0.63	63.79	
2825.000	11,323	68.33	49.61	39.96	31.76	17.79	9.10	5.41	98.	7.1	0.0	0.6	0.58	63.29	
2825.000	14,966	88.70	64.78	52.89	42.08	24.06	12.50	7.48	102.	7.5	0.0	0.6	0.44	65.15	
2825.000	14,955	90.71	66.81	54.54	43.44	25.15	12.92	7.75	104.	6.9	0.0	0.5	0.19	63.74	
2825.000	14,900	92.17	67.53	55.73	44.36	27.77	13.20	7.88	103.	7.2	0.0	0.5	1.92	56.99	
2825.000	14,867	93.30	68.85	56.55	45.06	26.66	13.35	7.97	105.	6.2	0.0	0.5	0.64	61.24	
2848.000	8,646	49.63	36.22	29.18	21.85	12.46	6.09	3.01	102.	6.7	0.0	0.6	1.18	57.77	
2848.000	8,679	50.39	36.77	29.65	22.21	12.65	6.20	3.08	102.	6.5	0.0	0.6	1.21	57.95	
2848.000	8,635	50.69	36.92	29.82	22.32	12.69	6.19	3.01	101.	6.4	0.0	0.6	1.15	57.61	
2848.000	11,246	65.82	48.30	39.17	29.63	17.02	8.47	4.13	105.	6.4	0.0	0.6	1.04	59.36	

2848.000	11,334	67.94	49.97	40.68	32.17	16.95	8.85	4.24	107.	5.5	0.0	0.6	1.75	66.24	
2848.000	11,224	69.06	50.82	41.50	32.67	16.84	9.26	4.24	104.	5.3	0.0	0.6	2.65	67.92	
2848.000	11,279	70.00	52.09	42.17	32.89	17.63	9.19	4.30	105.	5.1	0.0	0.6	1.67	64.77	
2848.000	14,769	91.79	68.46	56.46	42.97	24.43	12.88	6.11	106.	5.6	0.0	0.6	1.63	64.93	
2848.000	14,725	94.43	70.87	58.18	44.49	25.60	13.35	6.43	105.	5.3	0.0	0.5	1.37	63.39	
2848.000	14,714	96.41	72.15	59.51	45.49	26.46	13.64	6.52	104.	5.0	0.0	0.5	1.07	62.19	
2848.000	14,648	97.95	73.31	60.63	46.24	26.98	13.96	6.72	102.	5.0	0.0	0.5	1.13	62.34	*
2871.000	8,031	81.35	47.39	32.48	20.12	6.46	3.89	2.54	25.	5.1	0.0	0.8	15.62	29.92	*
2871.000	8,009	81.44	46.61	32.94	20.24	6.74	3.88	2.61	25.	5.3	0.0	0.8	14.53	30.84	*
2871.000	8,031	81.57	47.11	33.55	20.41	6.60	3.76	2.66	25.	5.1	0.0	0.8	15.10	30.24	*
2897.000	8,218	73.04	31.64	17.57	9.12	2.22	2.09	1.83	25.	5.0	0.0	1.9	28.97	21.70	*
2897.000	8,262	73.59	32.08	17.94	9.26	2.17	1.79	1.79	25.	5.0	0.0	1.9	30.07	21.50	*
2897.000	8,262	73.97	32.46	18.23	9.35	2.12	1.80	1.72	25.	5.0	0.0	1.8	30.84	21.26	*
2897.000	10,829	94.95	43.34	24.59	12.81	2.61	1.99	2.01	25.	5.0	0.0	1.8	31.82	21.87	*
2897.000	10,796	99.80	45.04	25.77	13.36	2.56	1.71	2.02	25.	5.0	0.0	1.7	35.01	21.63	*
2941.000	8,086	76.61	48.95	38.84	21.63	6.72	1.60	1.47	27.	5.0	0.0	0.8	15.51	25.12	*
2941.000	8,075	78.53	49.84	41.96	21.37	6.81	1.52	1.44	26.	5.0	0.0	0.8	18.44	21.00	*
2941.000	8,031	79.26	50.07	53.22	21.88	6.78	1.49	1.51	25.	5.0	0.0	0.7	25.27	***	*
2956.000	7,954	79.63	71.83	40.97	26.91	8.60	2.50	1.83	26.	5.0	0.0	0.6	20.47	30.22	*
2956.000	7,932	78.52	51.86	42.02	28.18	8.85	2.69	2.21	29.	5.0	0.0	0.6	14.63	31.26	*
2956.000	7,932	81.60	55.74	42.28	29.74	8.88	2.71	1.87	27.	5.0	0.0	0.6	16.38	29.87	*
2978.000	7,911	91.94	52.57	33.38	35.43	6.72	1.76	2.12	25.	5.0	0.0	0.7	26.25	27.80	*
2978.000	7,998	94.01	53.89	33.82	22.30	6.22	1.65	2.09	25.	5.0	0.0	0.7	18.91	27.08	*
2978.000	7,987	94.61	54.17	36.05	26.53	5.70	1.61	1.99	25.	5.0	0.0	0.7	26.78	25.88	*
3000.000	8,130	64.15	54.04	33.13	24.19	7.05	1.48	1.75	36.	5.0	0.0	0.8	23.11	60.08	*
3000.000	8,108	67.22	51.43	34.14	22.96	6.74	1.34	1.93	33.	5.0	0.0	0.8	21.95	28.57	*
3000.000	8,097	69.70	48.13	34.48	23.19	6.76	1.41	2.00	32.	5.0	0.0	0.8	18.92	29.37	*
3000.000	10,687	87.11	64.15	45.00	29.69	8.90	1.85	2.59	34.	5.0	0.0	0.9	19.95	29.41	*
3000.000	10,610	89.68	68.72	45.99	30.89	9.56	1.95	2.60	33.	5.0	0.0	0.8	20.88	29.28	*
3000.000	10,610	95.09	67.36	51.58	33.33	10.22	2.26	2.96	31.	5.0	0.0	0.7	20.49	30.06	*
3028.000	8,075	70.18	41.45	29.83	16.97	4.81	1.53	1.33	29.	5.0	0.0	1.0	13.29	26.69	*
3028.000	8,053	71.54	42.52	29.72	17.15	4.93	1.20	1.30	27.	5.0	0.0	1.0	10.03	27.51	*
3028.000	8,064	71.98	42.83	30.75	17.27	4.80	1.04	1.14	27.	5.0	0.0	1.0	9.71	25.68	*
3028.000	10,654	92.77	55.33	40.08	23.17	6.16	0.95	1.25	27.	5.0	0.0	1.1	13.97	36.00	*
3028.000	10,610	93.88	56.89	42.09	23.94	6.24	1.22	1.50	27.	5.0	0.0	1.0	13.74	26.73	*
3028.000	10,621	94.91	58.09	43.89	24.31	6.31	0.89	1.31	25.	5.0	0.0	1.0	19.34	36.00	*
3050.000	8,097	66.98	49.59	34.44	21.16	6.88	1.15	1.69	32.	5.0	0.0	0.9	21.77	29.98	*
3050.000	8,119	68.12	50.49	36.31	21.72	7.18	1.82	1.61	34.	5.0	0.0	0.8	15.62	30.12	*
3050.000	8,141	69.45	51.09	36.82	22.20	7.22	1.35	1.44	32.	5.0	0.0	0.8	21.04	30.00	*
3050.000	10,731	87.90	64.72	46.91	28.59	9.40	1.87	1.74	34.	5.0	0.0	0.8	19.17	30.55	*
3050.000	10,731	89.86	66.25	51.89	29.70	10.16	1.95	1.91	34.	5.0	0.0	0.8	21.24	26.79	*
3050.000	10,621	90.96	67.28	49.23	30.42	10.52	2.34	2.33	34.	5.0	0.0	0.8	17.43	31.48	*
3050.000	10,643	91.00	68.25	67.07	30.89	10.57	2.14	1.97	33.	5.0	0.0	0.7	26.48	18.46	*
3066.000	8,097	61.21	41.16	31.54	19.52	2.93	0.75	1.74	31.	5.0	0.0	1.2	25.94	36.00	*
3066.000	8,163	62.01	41.86	32.16	19.88	3.04	0.67	1.69	31.	5.0	0.0	1.2	27.70	36.00	*
3066.000	8,207	62.65	42.29	32.67	20.28	3.18	0.52	1.71	30.	5.0	0.0	1.2	31.24	36.00	*
3066.000	10,742	79.31	54.57	41.89	26.23	4.35	0.80	1.85	32.	5.0	0.0	1.2	29.40	36.00	*
3066.000	10,742	81.24	55.81	43.36	27.26	4.22	0.95	1.97	31.	5.0	0.0	1.2	29.09	36.00	*
3066.000	10,742	83.06	57.26	44.64	28.17	4.49	0.79	2.04	30.	5.0	0.0	1.1	32.68	36.00	*
3066.000	10,731	84.35	58.51	45.56	28.68	4.52	0.74	2.01	29.	5.0	0.0	1.1	34.58	36.00	*

	R1	R2	R3	R4	R5	R6	R7	SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	ERR/Sens	Bedrock
Mean:	80.63	53.62	39.69	26.55	10.19	4.67	3.55	46.	5.4	0.0	0.8	16.10	33.07
Std. Dev:	12.63	11.78	12.45	9.94	6.09	3.33	2.10	29.	0.9	0.0	0.3	11.24	14.57
Var Coeff(%):	15.66	21.96	31.37	37.43	59.83	71.29	59.07	63.	17.2	0.0	39.6	69.85	44.06

I-43 Section 4

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	8.50	25,000	1,000,000	H1: õ = 0.35
Base:	9.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	16.50	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
3233.000	8,196	74.80	49.45	36.91	22.97	8.13	3.46	1.70	34.	5.0	0.0	0.8	10.35	32.55	*
3233.000	8,185	75.19	49.60	37.08	23.11	8.07	2.81	1.59	32.	5.0	0.0	0.8	7.70	32.24	*
3233.000	8,042	74.99	50.34	37.16	23.22	8.03	2.87	1.62	32.	5.0	0.0	0.8	8.29	31.74	*
3292.000	7,724	78.24	51.42	43.39	30.04	10.11	3.93	4.26	32.	5.0	0.0	0.6	10.95	33.46	*
3311.000	11,115	74.85	39.87	27.88	18.91	5.55	1.65	1.55	38.	6.9	0.0	1.5	8.10	30.99	
3324.000	8,657	43.52	30.93	22.29	15.90	4.73	1.83	1.21	78.	5.0	0.0	1.4	11.15	31.75	*
3324.000	8,679	43.98	31.20	22.63	14.89	4.77	1.76	1.16	76.	5.0	0.0	1.5	10.17	32.60	*
3324.000	8,668	44.16	31.47	22.88	14.77	4.82	1.77	1.14	76.	5.0	0.0	1.5	10.14	32.84	*
3324.000	11,345	55.85	39.71	30.02	17.04	5.99	2.14	1.45	77.	5.0	0.0	1.6	12.48	27.62	*
3324.000	11,356	56.30	40.14	29.64	20.05	6.03	2.24	1.41	78.	5.0	0.0	1.5	11.14	31.76	*
3324.000	11,389	56.96	40.88	30.35	19.22	6.22	3.54	1.45	83.	5.0	0.0	1.4	15.40	32.71	*
3324.000	11,334	57.27	41.17	30.76	21.60	6.31	3.01	1.44	81.	5.0	0.0	1.4	13.75	31.56	*
3324.000	14,955	72.48	54.06	40.48	24.46	7.81	4.38	1.85	84.	5.0	0.0	1.4	16.97	32.16	*
3324.000	14,944	75.19	55.31	40.70	24.65	8.20	3.01	1.91	76.	5.0	0.0	1.5	11.76	32.85	*
3324.000	14,933	76.05	55.45	40.11	24.61	8.23	2.58	1.87	73.	5.0	0.0	1.5	9.63	32.92	*
3362.000	8,679	32.17	19.62	11.53	7.51	3.21	2.35	1.47	58.	21.5	0.0	2.1	16.83	46.55	
3362.000	8,668	32.59	20.63	11.72	7.62	3.22	2.07	1.39	61.	18.4	0.0	2.1	16.62	36.67	
3362.000	8,690	32.85	20.87	11.82	7.70	3.28	1.90	1.40	62.	17.4	0.0	2.1	15.66	35.96	
3362.000	11,433	42.33	25.89	14.65	9.72	4.22	2.19	1.89	59.	19.6	0.0	2.2	14.03	35.92	
3362.000	11,389	42.59	25.35	14.82	9.76	4.24	2.22	1.90	57.	20.5	0.0	2.2	13.32	44.78	
3362.000	11,477	43.63	24.92	15.14	9.95	4.31	2.64	1.94	52.	23.2	0.0	2.1	13.91	42.74	

3362.000	11,444	43.75	24.51	15.23	9.93	4.28	2.55	1.88	51.	23.6	0.0	2.1	13.20	42.59	
3362.000	15,251	60.14	30.95	19.65	12.83	5.79	3.52	2.57	42.	29.8	0.0	2.1	12.53	45.82	
3362.000	15,240	59.33	31.18	20.00	12.65	5.91	3.50	2.57	44.	28.7	0.0	2.1	12.35	40.77	
3362.000	15,208	60.10	31.22	20.28	12.64	5.93	3.37	2.56	43.	28.2	0.0	2.1	11.81	38.03	
3362.000	15,197	60.65	31.00	20.71	12.87	6.00	3.51	2.50	42.	29.1	0.0	2.1	11.46	37.72	
3395.000	8,207	54.09	29.93	21.73	14.46	3.65	1.51	1.50	44.	5.5	0.0	1.5	14.57	29.05	
3417.000	8,558	50.19	34.04	22.31	17.40	5.92	1.74	1.64	64.	5.0	0.0	1.3	5.92	251.97	*
3417.000	8,613	50.93	34.14	22.50	17.66	6.09	1.88	1.68	64.	5.0	0.0	1.3	6.20	300.00	*
3417.000	8,580	51.77	34.68	22.88	17.91	6.22	1.97	1.70	63.	5.0	0.0	1.2	6.32	300.00	*
3417.000	11,159	64.24	43.48	29.98	22.56	7.93	2.29	2.00	67.	5.0	0.0	1.3	4.64	35.27	*
3417.000	11,148	65.63	44.81	42.23	23.37	8.29	2.62	2.14	65.	5.0	0.0	1.1	10.74	26.61	*
3417.000	11,159	66.44	45.79	36.65	24.37	8.52	3.06	2.22	67.	5.0	0.0	1.1	7.04	35.22	*
3417.000	11,104	67.75	47.35	36.97	23.93	8.69	2.76	2.20	62.	5.0	0.0	1.1	7.49	35.68	*
3422.000	8,415	55.57	26.85	22.34	15.90	6.87	1.96	1.10	32.	13.0	0.0	1.1	6.43	43.17	
3422.000	8,459	55.69	27.46	22.58	16.26	6.50	1.94	1.07	35.	11.4	0.0	1.2	5.58	41.80	
3422.000	8,591	56.39	27.97	22.98	16.60	6.69	2.02	1.09	35.	11.5	0.0	1.1	5.43	42.22	
3422.000	11,191	69.39	36.55	29.16	21.08	8.67	2.48	1.38	43.	10.2	0.0	1.2	4.11	42.91	
3422.000	11,235	70.25	37.38	29.80	21.46	8.97	2.44	1.37	44.	9.4	0.0	1.2	4.49	42.21	
3422.000	11,268	70.84	37.82	30.48	22.27	9.39	2.52	1.37	46.	9.3	0.0	1.2	5.32	42.33	
3422.000	11,268	71.71	38.00	30.85	22.58	10.12	2.60	1.42	44.	9.7	0.0	1.1	6.73	41.75	
3444.000	8,393	44.67	28.21	19.01	12.85	4.42	1.63	1.20	61.	6.7	0.0	1.5	8.89	34.03	
3444.000	8,382	45.04	26.82	19.30	13.12	4.37	1.67	1.22	58.	7.6	0.0	1.5	8.16	33.87	
3444.000	8,426	45.06	27.18	19.60	13.30	4.19	1.64	1.19	61.	6.7	0.0	1.6	9.71	32.65	
3444.000	11,060	56.99	34.33	24.94	17.07	5.74	2.07	1.64	64.	7.2	0.0	1.6	7.40	34.26	
3444.000	11,093	58.90	61.95	25.61	17.76	9.04	2.14	1.71	68.	5.0	0.0	1.3	14.30	***	*
3466.000	7,921	70.07	46.53	34.18	25.17	7.36	1.12	0.90	30.	5.0	0.0	0.9	24.63	30.48	*
3466.000	7,900	71.30	47.38	34.97	25.57	7.72	1.05	0.86	29.	5.0	0.0	0.9	26.90	30.89	*
3466.000	7,889	72.40	48.70	35.87	26.36	7.95	1.11	0.85	28.	5.0	0.0	0.8	27.37	30.78	*
3538.000	8,525	37.08	17.95	11.08	7.14	2.90	1.64	1.38	35.	25.9	0.0	2.2	13.39	39.46	
3538.000	8,547	37.22	18.40	11.18	7.21	2.91	1.61	1.41	37.	24.3	0.0	2.2	13.65	39.06	
3538.000	8,481	37.28	18.58	11.28	7.25	2.87	1.58	1.37	37.	23.2	0.0	2.2	13.84	38.21	
3538.000	11,246	47.37	24.19	15.09	9.84	3.87	1.99	1.66	41.	22.6	0.0	2.2	12.19	38.24	
3538.000	11,301	47.95	24.53	15.46	10.05	3.93	2.21	1.71	41.	22.7	0.0	2.2	12.93	38.06	
3538.000	11,235	48.10	24.52	15.69	10.12	3.93	2.22	1.70	41.	22.4	0.0	2.1	12.75	37.84	
3538.000	11,279	48.35	37.51	16.17	10.28	3.96	2.07	1.71	70.	7.0	0.0	2.3	24.46	14.70	
3538.000	15,197	62.67	33.25	22.19	14.27	5.43	2.63	2.07	49.	19.1	0.0	2.1	10.33	37.34	
3538.000	15,208	63.81	33.19	22.38	14.72	5.52	2.58	2.08	47.	19.4	0.0	2.1	9.26	37.05	
3538.000	15,186	64.73	34.11	22.93	15.02	5.58	2.49	2.07	48.	17.8	0.0	2.1	9.09	36.67	
3538.000	15,219	65.34	36.15	23.42	15.15	5.59	2.54	2.08	51.	15.5	0.0	2.1	10.87	36.07	
3591.000	8,327	48.28	37.86	29.41	19.68	7.53	2.12	2.09	68.	5.0	0.0	1.0	12.92	37.46	*
3591.000	10,994	51.23	47.82	38.47	25.72	10.06	2.89	2.74	95.	5.0	0.0	1.0	19.35	38.88	*
3591.000	10,950	52.41	48.43	39.02	26.18	10.23	2.93	2.67	92.	5.0	0.0	1.0	19.17	38.84	*
3591.000	14,593	58.61	57.28	48.72	32.70	12.89	3.56	3.28	116.	5.0	0.0	1.1	22.16	40.29	*
3591.000	14,549	71.60	58.36	50.00	33.70	13.24	3.76	3.36	90.	5.0	0.0	1.1	15.64	40.23	*
3591.000	14,483	76.84	59.08	51.43	34.82	13.59	3.84	3.25	82.	5.0	0.0	1.0	14.18	40.17	*
3652.000	11,137	63.41	40.48	29.74	15.96	4.24	3.18	2.59	55.	5.0	0.0	1.7	24.22	24.08	*
3652.000	11,126	63.16	41.50	28.48	16.70	4.47	3.42	2.65	57.	5.0	0.0	1.6	22.72	28.70	*
3652.000	11,148	66.76	42.21	31.70	17.95	4.37	2.77	2.64	51.	5.0	0.0	1.6	22.64	27.53	*
3652.000	14,791	76.89	51.72	41.11	22.42	5.24	3.59	3.41	64.	5.0	0.0	1.7	25.07	25.39	*
3652.000	14,758	72.02	53.04	36.50	23.59	5.90	4.33	3.46	75.	5.0	0.0	1.6	22.48	28.53	*
3674.000	11,049	64.02	38.54	29.18	17.83	5.52	3.86	2.91	50.	7.9	0.0	1.4	17.18	31.80	

3674.000	11,071	66.11	40.17	34.63	18.60	5.79	4.49	3.07	56.	6.3	0.0	1.3	20.34	24.62	
3723.000	8,492	47.97	22.13	13.90	9.35	3.55	1.43	1.26	27.	18.8	0.0	1.8	9.04	36.93	
3723.000	8,481	47.98	23.24	14.61	9.37	3.57	1.41	1.26	30.	16.2	0.0	1.8	9.98	36.63	
3723.000	8,437	47.80	23.64	14.74	9.32	3.53	1.36	1.29	31.	15.1	0.0	1.8	10.43	36.23	
3723.000	11,246	61.13	29.50	18.31	12.16	5.59	1.82	1.68	29.	19.4	0.0	1.8	6.46	41.43	
3723.000	11,268	61.40	30.82	18.99	12.38	4.63	1.78	1.72	33.	15.3	0.0	1.9	10.22	36.00	
3723.000	11,290	61.89	31.93	19.63	12.72	4.86	1.77	1.74	34.	14.2	0.0	1.8	9.74	36.58	
3723.000	15,186	79.94	40.91	25.24	16.75	6.39	2.41	2.31	35.	15.6	0.0	1.8	9.35	36.82	
3846.000	8,262	47.59	32.10	21.77	14.58	5.08	2.19	1.87	66.	5.0	0.0	1.3	10.84	33.93	*
3846.000	8,262	48.69	31.98	22.23	14.45	4.94	2.21	1.87	62.	5.1	0.0	1.3	11.92	33.44	
3846.000	8,295	50.06	32.56	22.64	14.73	5.00	2.23	1.87	58.	5.3	0.0	1.3	11.84	33.23	
3846.000	10,983	68.38	39.82	27.08	18.06	6.28	2.84	2.43	41.	8.8	0.0	1.3	9.78	34.08	
3846.000	11,060	68.11	40.10	27.88	18.56	7.00	2.85	2.48	43.	8.9	0.0	1.3	7.58	36.62	
3846.000	11,005	67.32	41.19	28.39	18.50	6.85	2.83	2.58	47.	7.7	0.0	1.3	9.19	35.66	
3846.000	11,038	68.94	41.24	28.87	18.56	7.06	2.85	2.44	44.	8.1	0.0	1.3	8.60	36.56	
3846.000	14,966	77.73	49.56	34.36	22.56	8.68	3.77	3.42	61.	8.5	0.0	1.4	9.23	37.44	
3846.000	14,889	73.63	50.47	35.38	23.51	8.62	3.71	3.36	84.	5.0	0.0	1.5	10.04	35.95	*
3846.000	14,878	78.64	50.21	35.74	24.59	8.85	3.85	3.45	66.	7.2	0.0	1.4	8.41	35.81	
3846.000	14,856	65.58	51.13	36.65	22.89	8.46	3.72	3.31	98.	5.0	0.0	1.5	12.13	35.84	*
3877.000	8,393	35.43	24.97	20.34	10.73	5.00	1.75	1.45	106.	5.0	0.0	1.7	9.98	23.39	*
3877.000	8,426	35.80	24.73	20.41	10.94	4.67	1.55	1.47	102.	5.0	0.0	1.7	9.59	24.34	*
3877.000	15,361	61.15	50.89	31.58	18.68	7.41	2.92	2.78	104.	5.0	0.0	1.9	14.41	30.30	*
3893.000	8,382	47.99	27.43	17.76	10.51	3.11	1.83	1.74	42.	8.4	0.0	1.7	18.66	30.13	
3893.000	11,213	60.97	34.09	22.81	13.78	3.91	2.74	2.23	44.	9.4	0.0	1.8	19.28	29.92	
3893.000	11,268	61.79	34.47	23.39	14.29	3.97	3.39	2.19	43.	9.7	0.0	1.7	20.42	29.74	
3893.000	11,257	62.84	35.63	24.09	14.44	4.05	2.57	2.15	45.	8.2	0.0	1.8	18.94	29.70	
3893.000	15,153	79.58	43.49	29.51	18.79	5.07	4.10	3.04	44.	10.7	0.0	1.8	19.18	29.66	
3908.000	8,481	43.04	22.63	17.02	9.89	2.86	1.86	1.48	45.	11.1	0.0	1.9	17.84	30.23	
3908.000	8,481	43.33	23.24	21.34	10.06	2.94	1.82	1.54	56.	7.2	0.0	1.9	22.36	20.03	
3908.000	8,492	43.43	23.82	17.27	9.97	3.00	1.65	1.57	48.	9.6	0.0	1.9	16.88	29.35	
3908.000	11,257	55.62	29.44	21.05	12.27	3.62	2.16	2.00	45.	11.5	0.0	2.0	17.53	30.30	
3908.000	11,268	56.34	29.97	22.37	12.78	3.60	2.12	2.00	48.	10.1	0.0	2.0	18.15	28.69	
3908.000	11,279	56.98	30.88	22.19	13.11	3.64	2.07	1.75	49.	9.6	0.0	2.0	17.70	30.02	
3908.000	11,268	57.52	31.05	22.85	13.34	3.76	2.16	1.80	48.	9.6	0.0	1.9	17.55	30.28	
Mean:		58.22	36.44	26.04	16.90	6.00	2.50	1.96	56.	10.5	0.0	1.6	13.04	33.97	
Std. Dev:		12.43	10.63	9.15	6.16	2.32	0.80	0.69	20.	7.0	0.0	0.4	5.46	8.73	
Var Coeff(%):		21.35	29.17	35.15	36.44	38.70	31.94	35.36	35.	67.0	0.0	26.5	41.87	25.70	

STH29 Section 1

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TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

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District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	11.00	25,000	1,000,000	H1: õ = 0.35
Base:	4.00	10,000	100,000	H2: õ = 0.35
Subbase:	4.00	5,000	500,000	H3: õ = 0.35
Subgrade:	59.40	5,000		H4: õ = 0.40

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Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
0.000	12,102	45.94	23.84	21.15	15.07	10.43	6.48	5.24	46.	23.8	74.7	3.7	2.93	122.01	
0.000	12,179	44.45	23.37	20.44	14.06	9.67	6.07	4.69	45.	82.0	21.1	4.2	3.97	76.15	
26.000	9,436	39.65	25.57	23.11	17.24	13.49	11.40	7.88	56.	24.7	158.1	1.6	5.38	300.00	*
26.000	9,414	36.91	25.60	23.09	17.19	17.15	13.02	7.57	79.	40.4	122.3	1.3	6.52	70.58	*
26.000	11,751	47.61	34.22	31.30	22.93	19.43	15.20	10.23	81.	17.6	136.9	1.4	4.29	169.45	*
26.000	11,927	47.77	33.36	30.76	23.68	18.07	14.33	9.21	81.	14.8	147.5	1.5	3.52	300.00	*
26.000	11,949	46.25	33.56	30.56	25.89	19.70	16.70	8.55	88.	30.8	123.9	1.2	2.78	300.00	*
26.000	12,036	46.98	34.07	31.16	23.06	17.54	14.78	9.43	91.	12.3	149.4	1.5	5.45	278.09	*
26.000	15,054	56.83	45.85	45.26	30.34	23.02	17.21	14.79	159.	10.0	5.8	1.9	6.42	60.62	*
26.000	15,273	54.19	46.84	45.40	29.47	23.98	19.60	13.67	173.	10.0	24.4	1.6	8.67	46.21	*
26.000	15,361	75.43	71.59	50.48	29.25	23.14	20.95	12.49	76.	10.0	6.7	2.0	17.02	26.18	*
74.000	9,074	43.64	33.74	31.88	25.09	18.01	8.50	5.56	92.	10.0	5.0	1.8	7.97	58.57	*
74.000	9,107	40.35	34.27	31.18	25.46	19.33	8.29	6.73	109.	10.0	5.0	1.8	11.28	52.33	*
74.000	9,150	41.30	33.55	28.46	24.25	16.02	7.97	5.95	95.	10.0	5.0	2.0	7.24	63.23	*
74.000	11,466	58.53	44.17	38.30	28.63	20.87	11.53	10.23	80.	10.0	5.0	2.0	4.27	300.00	*
74.000	11,619	53.71	44.72	39.56	28.74	22.03	11.32	8.71	97.	10.0	5.0	1.9	7.80	158.03	*
74.000	11,696	45.41	50.79	40.61	28.75	22.37	11.37	7.57	129.	10.0	5.0	1.7	13.65	***	*
74.000	14,374	66.05	56.07	52.85	41.56	35.05	14.67	8.98	114.	10.0	5.0	1.6	11.19	300.00	*
74.000	14,428	72.42	59.65	55.06	45.99	30.44	14.64	9.66	89.	10.0	5.0	1.6	9.66	62.85	*
74.000	14,593	65.86	59.61	55.30	45.17	30.70	15.02	14.01	110.	10.0	5.0	1.6	11.31	63.02	*
87.000	8,668	44.93	38.59	30.90	26.36	13.64	8.54	5.59	69.	10.0	5.0	1.9	9.96	71.69	*
87.000	11,038	63.13	48.22	42.91	31.04	16.79	11.64	6.16	58.	10.0	5.0	1.9	6.72	80.10	*
87.000	11,235	60.89	40.56	39.23	26.93	16.17	11.54	5.74	64.	10.0	5.0	2.2	6.63	82.30	*
111.000	8,635	62.94	45.06	37.99	28.69	24.71	13.29	8.76	47.	10.0	14.2	1.2	5.36	300.00	*
111.000	8,690	61.71	45.78	37.98	30.08	26.35	15.54	7.70	48.	13.8	21.9	1.0	4.70	300.00	
111.000	8,920	61.52	45.44	38.09	30.74	25.01	10.65	8.01	54.	10.0	5.0	1.4	7.45	300.00	*
111.000	11,115	68.20	60.63	50.06	42.18	35.80	13.86	10.17	74.	10.0	5.0	1.2	12.83	300.00	*
111.000	11,169	73.62	63.47	50.59	43.26	34.67	12.69	10.41	58.	10.0	5.0	1.3	13.77	43.59	*
123.000	8,602	52.71	39.78	27.87	22.24	12.15	6.08	4.79	41.	10.0	5.0	2.4	7.70	300.00	*
123.000	8,613	52.23	36.57	27.17	23.38	12.03	5.93	4.49	43.	10.0	5.0	2.4	7.45	300.00	*
123.000	8,712	52.50	33.63	27.37	20.28	11.96	6.03	4.17	42.	10.0	5.0	2.6	3.34	60.11	*

123.000	10,928	69.64	37.15	36.48	23.57	16.55	7.54	5.58	33.	22.7	5.0	2.6	7.81	47.43 *
123.000	11,038	61.28	39.68	36.24	24.00	16.17	7.70	5.24	51.	10.0	5.0	2.6	6.03	55.16 *
123.000	11,060	66.33	36.37	35.69	23.35	16.27	7.69	5.70	37.	24.2	5.0	2.6	7.18	51.68 *
151.000	8,744	39.39	34.40	30.97	19.46	12.66	7.08	5.10	79.	10.0	5.0	2.2	11.17	39.74 *
151.000	8,931	39.71	30.14	25.99	19.52	12.82	7.22	5.09	86.	10.0	5.0	2.4	3.82	73.79 *
151.000	9,041	38.50	29.09	25.79	19.70	12.55	7.11	5.26	93.	10.0	5.0	2.5	3.75	77.62 *
151.000	11,422	54.69	39.78	36.03	29.04	16.19	9.23	6.64	75.	10.0	5.0	2.3	6.09	86.15 *
151.000	11,455	54.35	38.78	33.66	27.00	16.79	9.50	6.84	79.	10.0	5.0	2.4	2.41	79.31 *
151.000	11,630	54.08	40.48	30.76	26.20	16.95	9.78	7.23	81.	10.0	5.0	2.4	2.16	300.00 *
151.000	11,543	54.48	40.18	33.78	26.57	17.74	9.81	7.29	81.	10.0	5.0	2.3	2.75	71.42 *
151.000	14,769	69.26	54.39	40.81	39.26	23.70	12.63	8.33	85.	10.0	5.0	2.2	6.20	300.00 *
151.000	14,714	65.45	55.47	38.61	38.20	25.63	12.65	8.11	97.	10.0	5.0	2.1	9.07	300.00 *
151.000	14,736	67.89	55.66	39.90	36.68	24.68	12.53	8.17	87.	10.0	5.0	2.2	6.94	300.00 *
176.000	11,641	36.16	22.39	22.23	15.73	9.95	6.39	5.01	101.	11.3	37.6	3.6	4.38	123.24
176.000	11,784	35.60	23.00	21.93	15.90	11.44	6.39	5.03	103.	40.5	10.6	3.6	4.49	175.21
176.000	11,894	37.04	23.77	22.26	16.33	11.47	6.43	5.08	94.	47.2	8.7	3.6	3.88	240.33
176.000	12,003	38.89	24.40	22.39	16.43	11.56	6.42	5.22	88.	19.7	25.9	3.6	3.92	235.91
176.000	15,230	44.89	33.94	31.97	22.60	16.71	8.80	6.77	157.	10.0	5.0	3.4	5.66	107.93 *
176.000	15,383	43.54	33.54	32.16	23.90	17.71	8.87	6.87	176.	10.0	5.0	3.3	6.57	300.00 *
176.000	15,306	40.18	36.61	33.54	22.28	17.04	8.89	6.95	187.	10.0	5.0	3.2	10.19	54.64 *
204.000	9,436	20.88	14.70	13.58	10.59	6.75	4.21	3.70	202.	10.2	13.8	4.7	1.99	102.30
204.000	9,502	21.62	15.12	13.56	10.72	6.87	4.35	3.78	180.	15.7	16.2	4.6	1.78	107.89
204.000	11,938	24.54	19.52	16.83	14.53	9.08	6.03	4.79	273.	10.0	5.4	4.4	2.25	145.37 *
204.000	12,036	23.70	18.85	15.59	14.48	9.16	6.05	4.89	304.	10.0	5.3	4.4	2.29	300.00 *
204.000	12,157	22.57	18.80	15.10	14.13	9.06	7.65	5.09	306.	11.5	128.6	3.1	5.21	300.00
204.000	15,603	35.44	27.28	19.91	19.70	12.66	10.33	6.82	162.	15.0	276.5	2.8	6.05	300.00 *
204.000	15,646	36.74	26.06	22.00	21.12	13.17	10.43	7.15	136.	73.1	62.8	3.0	3.96	300.00
204.000	15,734	36.46	26.78	22.36	20.17	13.08	9.47	6.88	167.	36.2	39.5	3.4	2.47	300.00
231.000	9,205	22.55	13.72	11.55	8.81	5.83	3.83	2.88	102.	12.5	265.6	4.4	1.77	118.21
231.000	9,205	22.15	13.58	11.45	8.83	5.87	3.79	2.90	107.	11.3	386.0	4.3	1.25	109.10
231.000	9,260	21.86	13.52	11.43	9.00	5.87	3.80	2.96	113.	11.6	291.2	4.4	1.10	112.76
231.000	11,729	30.62	17.98	15.57	12.13	8.39	5.04	3.91	91.	14.2	250.3	4.1	2.40	84.21
231.000	11,828	31.07	18.15	15.55	11.81	8.00	5.01	3.91	89.	13.4	262.4	4.2	1.67	95.91
231.000	11,872	31.28	18.48	15.47	11.93	8.11	5.15	4.03	89.	12.1	399.9	4.0	1.21	100.76
231.000	15,438	39.74	26.09	21.26	16.58	10.95	7.18	5.63	109.	10.0	203.4	4.0	1.71	118.26 *
231.000	15,427	38.33	25.78	21.13	16.13	10.65	7.10	5.57	122.	10.0	116.0	4.3	2.62	127.92 *
231.000	15,471	36.14	24.64	21.13	16.26	10.66	7.10	5.62	143.	13.5	56.4	4.4	2.30	131.42
231.000	15,471	36.59	25.61	21.24	16.19	10.81	7.07	5.61	146.	10.6	55.1	4.5	2.64	115.43
263.000	9,282	16.62	13.68	12.56	10.89	5.42	4.08	3.26	291.	10.0	5.2	5.2	7.95	65.89 *
263.000	9,348	18.95	13.86	12.41	11.31	5.32	3.70	3.21	222.	10.0	5.6	5.6	6.72	58.02 *
263.000	11,707	24.70	26.11	16.17	13.94	7.08	5.33	4.04	194.	10.0	5.0	5.0	10.99	*** *
263.000	11,762	25.47	20.00	16.41	16.24	7.16	5.96	5.47	219.	10.0	5.0	4.8	9.30	300.00 *
263.000	11,982	26.71	22.69	16.72	15.55	7.36	5.25	5.10	184.	10.0	5.1	5.1	8.37	300.00 *
263.000	15,317	36.71	28.32	22.44	17.54	10.19	6.48	5.78	165.	10.0	5.2	5.2	3.87	107.78 *
263.000	15,482	37.33	29.24	22.43	16.92	10.09	6.52	6.50	159.	10.0	5.3	5.3	5.22	110.45 *
275.000	12,135	28.68	19.50	18.74	14.36	9.17	5.12	3.83	191.	10.0	5.0	5.0	3.44	75.27 *
275.000	15,515	37.87	26.90	25.69	20.12	12.85	7.56	5.61	198.	10.0	5.0	4.3	3.18	86.97 *
275.000	15,504	38.06	26.31	25.88	20.93	12.86	7.44	5.51	198.	10.0	5.0	4.3	4.61	86.48 *
275.000	15,515	32.96	26.38	25.25	19.22	13.05	7.37	5.47	252.	10.0	5.0	4.2	4.49	75.63 *
300.000	9,293	11.11	9.86	8.45	8.22	4.26	2.84	2.25	495.	10.0	6.8	6.8	8.88	300.00 *
300.000	9,469	10.30	10.13	8.26	6.78	4.06	2.84	2.49	541.	10.0	7.3	7.3	7.93	128.62 *

300.000	11,718	12.02	14.26	10.97	9.49	5.54	3.85	3.19	640.	10.0	6.0	6.0	13.00	*** *
300.000	11,872	13.24	13.28	11.13	9.55	5.63	3.81	3.18	556.	10.0	6.5	6.5	9.38	*** *
300.000	11,938	13.46	13.18	11.15	9.46	5.95	3.74	3.54	561.	10.0	6.4	6.4	8.38	100.44 *
300.000	15,405	19.25	17.47	15.48	13.56	8.34	5.11	5.05	509.	10.0	5.9	5.9	7.65	95.85 *
300.000	15,548	22.97	18.38	15.61	13.39	8.38	5.30	4.74	364.	15.4	6.4	6.4	2.79	105.06 *
300.000	15,668	26.61	18.82	15.76	13.43	8.35	5.30	4.64	218.	63.5	6.6	6.4	1.22	106.18
324.000	9,107	27.28	17.08	14.24	11.39	7.71	3.79	3.44	88.	41.0	8.9	4.5	3.06	58.69
324.000	9,216	25.22	17.27	14.54	11.62	8.34	3.88	3.32	146.	10.2	6.5	4.5	4.34	54.35
324.000	11,696	31.03	22.69	18.73	15.33	11.39	4.99	4.13	162.	10.0	5.0	4.4	5.36	50.99 *
324.000	11,707	30.11	23.63	18.98	14.89	10.56	5.20	4.30	165.	10.0	5.0	4.4	5.15	57.10 *
324.000	11,751	29.58	22.80	18.49	14.89	9.96	5.05	4.24	168.	10.0	5.0	4.6	3.87	61.00 *
324.000	11,773	30.62	24.47	18.30	15.70	11.23	5.17	4.23	165.	10.0	5.0	4.3	6.58	300.00 *
324.000	15,482	38.33	31.06	24.55	22.29	14.25	6.98	6.13	184.	10.0	5.0	4.2	6.73	300.00 *
324.000	15,449	36.53	30.11	24.07	22.23	14.13	7.20	7.13	206.	10.0	5.0	4.1	6.52	300.00 *
355.000	9,129	25.88	15.28	13.60	9.54	6.26	3.60	2.50	91.	10.0	75.3	4.8	2.97	98.17 *
355.000	9,183	25.75	15.39	13.61	9.64	6.13	3.77	3.36	92.	10.0	92.4	4.7	2.95	114.35 *
355.000	9,293	26.49	15.49	13.38	9.41	6.55	3.28	2.87	79.	50.7	9.3	5.4	4.17	97.31
355.000	11,433	36.28	20.87	18.29	13.59	6.82	4.69	4.09	74.	33.1	5.4	5.4	6.19	64.00 *
355.000	11,554	35.53	22.54	17.87	13.56	7.41	4.84	3.56	89.	10.0	18.2	5.1	3.96	81.93 *
355.000	11,685	34.98	20.70	17.84	13.50	6.83	4.81	3.76	81.	37.4	5.5	5.5	5.99	65.34 *
355.000	11,795	32.68	20.82	19.33	12.85	7.20	4.67	3.94	118.	10.0	6.2	5.7	6.56	59.66 *
355.000	15,175	47.73	28.13	26.91	17.58	9.07	6.76	5.19	85.	20.5	5.4	5.3	9.36	53.54
355.000	15,295	43.34	28.85	26.58	18.85	9.35	6.30	5.09	119.	10.0	5.3	5.3	6.41	62.27 *
355.000	15,240	43.19	29.38	26.20	21.44	9.60	6.81	5.26	124.	10.0	5.0	4.9	7.97	52.01 *
355.000	15,295	42.11	28.94	26.38	97.13	9.52	6.47	5.82	140.	10.0	5.0	4.0	28.66	43.67 *
382.000	9,238	20.54	14.12	12.05	8.35	5.20	3.18	2.54	156.	10.0	11.7	6.3	4.32	83.76 *
382.000	9,293	19.09	13.07	11.19	9.35	5.07	3.06	2.50	188.	14.4	6.4	6.4	2.91	83.18 *
382.000	11,795	24.26	24.82	20.10	12.16	7.34	4.26	3.67	186.	10.0	5.1	5.1	16.10	*** *
382.000	11,828	24.66	17.83	15.16	11.41	7.54	4.36	4.09	195.	15.8	5.8	5.8	1.68	75.91 *
382.000	11,850	25.85	18.89	14.43	11.23	8.40	4.47	3.52	160.	17.2	21.3	5.2	4.49	300.00
382.000	15,427	29.43	25.85	21.44	14.43	12.02	6.19	4.27	262.	10.0	5.1	5.1	9.19	55.59 *
382.000	15,405	30.96	24.13	21.94	14.02	10.73	5.95	4.26	227.	10.0	5.6	5.6	6.45	42.25 *
382.000	15,427	29.91	25.01	21.72	13.90	10.57	6.06	4.33	238.	10.0	5.5	5.5	7.14	42.34 *
414.000	9,118	20.29	15.63	13.42	11.62	5.78	3.54	2.59	186.	10.0	5.2	5.2	7.32	65.19 *
414.000	9,205	21.95	15.87	13.26	11.54	5.94	3.41	2.63	162.	10.0	5.4	5.4	4.86	71.35 *
414.000	9,271	17.53	16.07	13.26	11.30	6.08	3.43	2.68	248.	10.0	5.0	5.0	11.48	79.70 *
414.000	11,554	25.11	21.74	18.10	15.37	8.31	4.67	3.41	198.	10.0	5.0	4.7	9.36	79.66 *
414.000	11,630	36.12	21.91	18.26	15.29	8.32	4.64	3.79	92.	11.7	14.9	4.8	2.55	77.74
414.000	11,652	34.06	27.70	17.87	15.18	8.57	4.51	3.96	110.	10.0	5.0	5.0	6.00	169.54 *
414.000	11,729	33.06	23.30	18.17	15.06	8.72	4.57	3.99	124.	10.0	5.1	5.1	2.21	66.32 *
414.000	15,164	36.99	32.81	25.25	22.28	12.56	6.52	5.17	170.	10.0	5.0	4.3	8.95	300.00 *
414.000	15,208	41.10	30.30	25.12	21.48	13.37	6.16	6.05	146.	10.0	5.0	4.5	5.86	57.06 *
414.000	15,219	42.49	29.77	25.10	20.87	13.88	6.12	5.72	140.	10.0	5.0	4.5	5.57	53.61 *
414.000	15,273	41.27	30.02	25.32	22.78	14.47	6.09	6.06	151.	10.0	5.0	4.3	8.10	53.46 *
424.000	9,107	24.76	16.97	14.31	12.54	7.10	4.59	2.86	138.	12.9	15.0	4.1	2.73	106.53
424.000	11,411	39.43	22.54	20.06	18.87	9.80	5.68	3.97	67.	75.6	5.0	3.9	5.61	300.00 *
424.000	11,499	40.89	23.11	20.35	16.29	9.63	5.86	3.93	60.	40.3	18.9	3.9	2.45	97.87
424.000	11,619	41.13	23.43	20.96	16.45	9.79	5.65	4.11	64.	39.2	13.5	4.0	2.73	83.15
424.000	11,597	39.19	24.15	20.79	16.12	9.84	5.96	4.13	83.	10.0	36.7	3.8	1.59	92.71 *
424.000	15,098	50.49	33.65	28.61	22.02	13.87	8.20	5.89	100.	10.0	14.5	3.7	1.23	84.67 *
424.000	15,153	45.13	33.56	29.05	22.51	14.07	8.44	6.05	141.	10.0	5.0	3.8	2.28	89.72 *

424.000	15,142	46.40	33.79	29.00	22.85	14.07	8.70	5.97	136.	10.0	5.0	3.8	1.72	100.53	*
424.000	15,208	49.53	34.84	29.01	22.20	15.88	8.65	6.00	113.	10.0	14.0	3.5	2.83	300.00	*
449.000	8,712	28.15	14.97	13.16	6.51	4.33	3.79	2.33	55.	10.0	136.9	5.6	15.04	20.73	*
449.000	11,411	50.11	19.58	15.02	9.10	6.06	4.71	3.76	29.	11.7	500.0	5.5	9.28	33.34	*
449.000	11,532	35.46	20.18	16.23	9.31	6.91	4.76	3.52	62.	10.0	217.6	5.0	9.09	27.53	*
449.000	11,565	37.89	20.13	15.99	9.39	6.16	4.92	3.43	53.	10.0	202.3	5.3	10.76	30.09	*
449.000	11,652	39.20	20.29	15.04	9.66	6.13	5.03	3.83	49.	10.0	330.2	5.2	9.65	43.81	*
449.000	15,339	42.74	27.25	20.56	13.28	8.63	7.12	5.72	79.	10.0	218.5	4.8	10.41	45.21	*
449.000	15,383	42.31	27.20	24.02	13.13	8.84	7.01	5.26	88.	10.0	96.7	5.0	12.44	24.99	*
449.000	15,471	40.52	28.83	20.80	12.87	8.87	8.56	4.98	90.	10.0	419.3	4.2	14.29	35.76	*
474.000	8,920	28.85	18.35	13.05	9.24	5.15	2.96	2.34	77.	10.0	6.3	6.2	5.16	72.91	*
474.000	9,063	28.14	16.59	13.59	9.30	5.09	2.98	2.44	78.	15.9	6.2	6.2	4.32	75.13	
474.000	9,019	28.64	17.20	13.32	9.09	4.93	2.93	2.29	77.	10.0	7.5	6.4	5.20	71.79	*
474.000	11,455	35.98	21.15	17.48	12.14	6.76	3.91	3.02	78.	17.5	6.1	6.0	3.85	77.58	
474.000	11,510	35.03	21.13	17.38	12.11	6.54	3.92	3.14	86.	13.3	6.2	6.2	4.45	76.69	
474.000	11,488	35.13	21.35	17.56	12.07	6.81	3.96	3.16	86.	13.5	6.1	6.1	4.09	78.36	
474.000	11,565	35.17	21.80	17.86	12.09	6.50	3.94	3.05	89.	10.0	6.2	6.2	5.45	67.79	*
474.000	15,219	45.88	42.10	24.71	16.79	8.95	5.46	4.20	92.	10.0	5.3	5.3	12.60	44.95	*
474.000	15,230	47.17	32.85	23.77	16.62	8.70	5.26	5.04	86.	10.0	5.9	5.9	6.79	66.39	*
474.000	15,317	47.70	30.13	24.37	16.61	8.86	5.04	4.20	86.	10.0	6.0	6.0	4.68	72.28	*
474.000	15,262	48.57	29.76	23.85	16.51	8.83	4.88	4.07	82.	10.0	6.1	6.1	3.71	70.09	*
504.000	9,326	45.26	16.58	15.24	10.09	5.38	3.58	2.74	25.	83.1	18.4	5.5	7.64	58.09	*
504.000	9,370	34.31	16.15	15.19	10.28	5.36	3.55	2.62	49.	13.3	45.3	5.2	6.57	70.66	
504.000	9,381	39.05	16.20	14.11	9.61	5.08	3.31	2.52	36.	11.7	113.3	5.4	5.44	72.00	
504.000	11,630	39.52	22.47	19.48	13.13	7.24	4.91	4.07	63.	34.9	5.3	5.3	6.66	66.13	
504.000	11,806	40.44	29.43	18.78	12.99	7.09	4.79	3.57	72.	10.0	5.6	5.6	10.42	71.85	*
504.000	11,850	41.94	28.98	18.46	13.25	7.02	4.71	3.78	67.	10.0	5.7	5.7	9.79	118.40	*
504.000	11,839	42.35	23.01	18.11	13.41	7.13	4.64	3.71	57.	10.0	35.2	5.2	3.65	73.27	*
504.000	15,175	55.00	31.82	24.72	18.68	9.63	6.20	5.09	60.	24.0	5.5	5.2	4.19	66.86	
504.000	15,208	61.39	31.23	24.48	18.70	10.04	6.45	5.30	45.	11.6	40.9	4.7	3.08	76.72	
504.000	15,219	66.56	30.81	25.30	20.44	10.11	6.30	5.08	35.	38.8	16.9	4.8	4.52	62.37	
531.000	8,887	32.60	19.71	15.97	10.35	7.19	3.83	3.28	65.	10.0	20.8	4.5	4.87	46.17	*
531.000	8,931	31.84	21.48	15.54	10.23	7.16	3.85	3.24	73.	10.0	9.7	4.8	6.54	49.38	*
531.000	8,942	31.64	19.05	15.35	10.09	7.00	3.80	3.16	66.	10.0	27.2	4.6	4.67	50.50	*
531.000	11,334	38.28	23.77	20.20	13.05	9.34	4.60	4.08	78.	20.7	5.4	4.9	4.69	45.47	
531.000	11,400	39.16	25.24	20.50	12.43	9.43	4.93	4.24	75.	10.0	18.1	4.6	7.18	32.86	*
531.000	11,411	38.22	26.69	21.06	12.33	9.37	5.00	4.17	85.	10.0	7.7	4.8	8.85	28.97	*
531.000	11,510	36.84	24.29	20.53	12.24	9.41	5.27	4.13	85.	10.0	26.6	4.4	7.43	31.02	*
531.000	15,186	49.53	30.81	28.81	15.68	13.17	6.84	6.07	79.	10.0	40.5	4.3	8.41	23.90	*
531.000	15,251	47.79	31.46	28.18	15.85	12.59	7.23	6.17	89.	10.0	30.5	4.3	8.35	26.08	*
531.000	15,284	56.02	31.30	28.75	15.78	12.78	7.36	5.83	56.	10.0	102.9	4.0	8.01	24.54	*
561.000	8,854	30.97	18.80	16.63	11.67	7.82	4.71	3.92	75.	10.0	50.5	3.7	2.83	98.95	*
561.000	8,887	30.80	18.64	15.89	11.64	7.78	4.52	3.82	70.	21.8	23.4	3.9	2.12	218.32	
561.000	8,887	31.44	18.65	16.10	11.63	7.93	4.59	3.93	68.	12.4	52.3	3.7	2.62	156.32	
561.000	11,597	39.94	24.97	23.50	15.74	10.50	6.24	5.08	87.	10.0	22.9	3.7	3.98	61.69	*
561.000	11,707	39.30	25.10	24.88	15.95	10.68	6.52	5.23	99.	10.0	15.3	3.7	5.38	45.90	*
561.000	11,740	39.62	25.32	22.33	16.22	11.54	6.56	5.33	88.	10.0	42.7	3.4	3.37	173.16	*
561.000	11,729	39.18	25.06	23.38	16.24	11.17	6.67	5.30	94.	10.0	32.7	3.5	3.37	88.05	*
561.000	15,383	54.57	34.85	32.21	22.78	16.63	8.86	6.93	84.	24.3	12.4	3.3	4.85	108.43	
561.000	15,383	54.98	36.29	31.85	22.84	18.38	8.83	7.12	86.	23.4	11.6	3.2	6.04	119.02	
561.000	15,372	53.11	34.61	30.37	22.57	18.34	9.20	7.06	79.	47.7	14.2	3.1	5.50	246.80	

561.000	15,405	53.02	34.84	30.72	23.09	20.64	9.47	7.26	83.	39.3	21.5	2.9	7.36	300.00	
579.000	8,624	29.41	12.28	10.69	6.89	5.69	3.96	3.30	36.	41.7	459.9	4.6	6.80	42.44	*
579.000	8,810	28.54	12.64	11.12	6.93	5.80	4.06	3.56	41.	31.6	450.3	4.5	7.44	35.87	*
579.000	8,843	28.91	17.00	10.44	6.89	5.70	3.90	3.56	51.	10.4	435.0	4.8	12.09	45.66	
579.000	11,652	36.68	19.57	14.68	9.37	7.39	5.02	4.74	53.	13.1	463.8	4.6	7.74	40.17	*
579.000	11,652	36.67	19.56	15.67	9.52	7.03	5.29	4.77	55.	11.9	455.7	4.6	8.80	33.25	
579.000	11,663	36.87	20.79	16.18	9.78	6.92	5.20	4.67	59.	10.0	303.3	4.8	9.48	32.78	*
579.000	11,696	36.54	17.85	14.16	9.64	6.67	5.11	4.57	49.	15.9	476.9	4.8	6.58	65.76	*
579.000	15,603	47.39	23.03	17.98	13.02	9.17	7.23	5.97	48.	23.0	459.4	4.6	6.08	143.15	*
579.000	15,636	46.52	22.07	20.20	13.15	9.15	7.78	6.25	51.	26.1	438.3	4.4	8.62	48.29	*
579.000	15,646	42.71	22.37	21.75	13.39	9.31	7.52	6.30	69.	17.8	428.7	4.3	8.88	36.49	*
579.000	15,657	40.43	22.30	18.84	13.07	9.31	7.22	6.28	73.	19.2	443.9	4.4	5.91	79.72	*
616.000	9,150	24.88	10.96	10.00	9.98	5.64	3.43	2.74	50.	100.0	202.3	4.7	6.20	300.00	*
616.000	9,293	27.17	11.25	10.48	9.12	5.61	3.39	2.67	44.	100.0	190.0	5.0	4.66	94.29	*
616.000	9,293	23.73	11.58	10.18	8.99	5.58	3.35	2.63	60.	100.0	99.8	5.2	3.08	90.73	*
616.000	11,817	30.48	14.58	12.96	12.03	7.54	4.58	3.61	56.	100.0	193.0	4.6	4.00	96.38	*
616.000	11,817	27.63	14.78	12.68	11.58	7.55	4.70	3.61	75.	100.0	117.3	4.8	2.63	101.31	*
616.000	11,850	31.86	15.69	12.61	11.91	7.63	4.68	3.63	54.	100.0	144.8	4.8	2.77	300.00	*
616.000	11,872	44.39	16.08	12.60	11.85	7.60	4.60	3.65	28.	100.0	390.7	5.0	2.42	300.00	*
616.000	15,701	32.92	21.21	16.48	15.84	10.38	6.43	5.08	113.	73.3	68.8	4.7	3.28	300.00	
616.000	15,734	33.42	21.96	16.55	16.05	10.36	6.34	4.96	117.	61.1	58.1	4.8	3.67	300.00	
616.000	15,778	34.33	22.73	17.33	15.83	10.41	6.33	5.26	129.	17.0	148.1	4.5	3.06	300.00	
616.000	15,734	33.82	22.52	19.41	16.53	10.13	6.07	5.11	150.	64.8	6.3	5.4	1.71	90.19	
625.000	11,773	25.53	11.33	11.05	8.13	5.53	4.05	3.61	61.	90.1	446.3	5.7	4.85	225.21	
625.000	11,773	23.80	11.25	10.91	8.09	5.42	4.03	3.89	72.	97.8	317.2	5.9	4.99	285.90	
673.000	12,080	46.98	12.43	11.90	7.75	5.46	3.90	3.81	25.	76.3	500.0	6.9	8.87	47.77	*
673.000	12,003	23.52	12.31	11.65	7.74	5.41	3.99	3.67	96.	28.0	500.0	5.9	6.20	54.67	*
673.000	12,091	24.07	12.35	11.84	7.74	5.43	3.88	3.52	91.	29.0	432.1	6.1	6.13	48.97	
673.000	12,113	23.16	12.29	10.94	7.69	5.39	3.74	3.52	98.	27.7	500.0	6.2	4.07	92.27	*
673.000	15,690	28.13	16.30	15.94	10.52	7.12	4.82	4.70	137.	25.3	146.3	6.5	5.70	53.02	
673.000	15,767	48.15	16.55	16.14	10.48	7.14	4.84	4.73	36.	97.2	280.7	6.9	6.77	47.54	
681.000	9,150	23.41	12.06	8.75	5.30	3.65	2.62	2.23	65.	11.1	500.0	7.4	8.90	32.77	*
681.000	9,216	22.74	10.57	8.08	5.36	3.68	2.64	2.28	60.	19.5	500.0	7.3	6.34	52.38	*
681.000	9,172	22.01	9.94	7.84	5.36	3.70	2.65	2.28	60.	24.6	500.0	7.2	5.49	66.84	*
681.000	11,663	30.61	13.19	10.22	7.09	4.92	3.45	3.01	51.	26.2	500.0	7.1	5.09	76.95	*
681.000	11,652	31.49	13.32	9.74	7.41	4.86	3.51	3.00	48.	28.7	500.0	7.1	4.76	205.48	*
681.000	11,696	30.60	13.62	10.16	7.26	4.80	3.35	2.94	54.	21.4	500.0	7.2	4.61	113.28	*
681.000	11,729	30.33	13.37	10.18	7.09	4.85	3.39	2.98	54.	22.7	500.0	7.2	4.97	80.41	*
681.000	15,460	35.36	17.24	13.68	9.57	6.36	4.48	3.89	69.	20.3	500.0	6.8	4.73	86.61	*
681.000	15,493	32.73	16.87	13.77	9.60	6.33	4.61	4.09	83.	20.3	500.0	6.7	5.14	84.04	*
681.000	15,515	34.65	16.61	13.80	9.59	6.32	4.63	4.17	70.	22.9	500.0	6.7	5.18	81.35	*
681.000	15,548	33.91	16.20	14.78	9.72	6.29	4.55	4.11	76.	22.9	418.2	6.8	6.48	51.57	
691.000	9,107	27.37	11.65	9.74	5.74	4.39	3.84	3.25	44.	26.6	500.0	6.0	11.22	29.67	*
691.000	9,129	27.59	11.73	8.39	5.76	3.84	3.80	2.82	42.	25.5	500.0	6.6	11.12	69.35	*
691.000	9,150	26.53	11.13	8.34	5.83	4.22	3.94	2.97	42.	45.4	500.0	6.2	9.94	81.66	*
691.000	11,576	32.09	14.70	10.31	6.98	4.97	4.76	3.15	48.	25.3	500.0	6.6	11.33	59.61	*
691.000	11,916	30.44	13.08	10.46	7.09	5.69	4.18	3.39	49.	51.6	500.0	6.4	6.96	58.29	*
691.000	11,927	29.92	14.02	10.94	7.15	5.60	4.03	3.36	57.	26.3	500.0	6.4	7.28	45.76	*
691.000	12,003	30.61	14.84	10.82	7.23	6.25	4.07	3.85	56.	27.0	500.0	6.1	8.20	49.40	*
691.000	15,186	45.31	18.41	13.48	8.80	5.43	4.64	4.16	43.	18.1	500.0	7.9	9.57	47.97	*
691.000	15,240	36.28	18.65	13.35	9.00	5.59	5.20	4.40	67.	15.8	500.0	7.1	10.61	60.08	*

691.000	15,328	36.83	18.93	13.70	8.85	5.61	5.01	4.50	68.	14.5	497.7	7.3	10.82	44.74	
691.000	15,295	38.87	18.63	13.59	9.00	5.58	5.07	4.34	59.	16.8	500.0	7.3	10.41	52.70	*
700.000	8,668	20.76	11.30	7.44	4.26	3.52	2.72	2.40	66.	14.7	500.0	7.7	13.14	26.09	*
700.000	8,733	22.00	11.17	10.54	4.41	3.53	2.73	2.37	69.	10.0	493.7	7.4	15.61	16.73	
700.000	8,766	22.28	13.55	7.51	4.61	3.58	2.85	2.46	66.	10.4	500.0	7.6	15.61	29.72	*
700.000	11,345	32.13	19.02	6.10	5.22	4.41	3.61	3.03	44.	16.8	500.0	9.5	27.21	10.35	*
700.000	11,367	32.87	18.72	7.50	5.09	4.38	3.57	3.03	46.	12.4	500.0	9.3	24.41	12.79	*
700.000	11,367	33.90	18.77	10.66	5.02	4.57	3.67	3.15	49.	10.0	415.5	8.5	21.08	17.70	*
700.000	11,378	34.26	22.43	13.78	4.91	4.59	3.51	3.05	56.	10.0	18.5	9.7	28.72	13.99	*
700.000	15,317	38.93	20.50	15.16	7.28	5.85	4.57	4.05	65.	10.5	500.0	8.2	15.52	19.10	*
700.000	15,317	38.07	24.48	13.61	6.89	6.01	4.65	4.23	67.	10.0	364.8	8.4	18.96	19.78	*
700.000	15,361	38.31	18.85	14.46	7.39	6.11	4.80	4.33	61.	15.6	500.0	7.7	13.75	20.85	*
700.000	15,383	38.85	18.23	15.59	7.39	6.10	4.89	4.41	59.	16.3	500.0	7.6	14.13	18.85	*
819.000	9,129	21.19	13.54	10.23	8.61	5.03	2.85	2.50	117.	19.0	22.5	6.3	1.61	300.00	
819.000	9,150	21.95	13.40	10.56	7.92	5.01	2.82	2.40	96.	48.0	11.6	6.6	1.92	70.46	
819.000	9,161	22.50	13.31	11.81	7.80	5.10	2.93	2.45	95.	47.7	9.9	6.5	4.02	53.78	
819.000	11,696	28.46	17.69	15.30	10.81	6.89	3.93	3.29	118.	10.0	41.9	5.9	2.41	107.54	*
819.000	11,762	29.41	17.61	14.78	11.42	6.98	3.99	3.44	107.	10.2	74.1	5.6	1.10	76.08	
819.000	11,806	30.68	18.46	14.28	11.37	6.78	3.92	3.40	87.	45.7	11.2	6.1	1.51	77.50	
819.000	11,784	30.71	26.75	13.75	11.80	6.59	3.87	3.34	109.	10.0	6.5	6.5	10.53	23.37	*
819.000	15,427	34.93	26.50	18.89	17.65	9.04	5.37	4.75	165.	10.0	6.0	6.0	5.65	300.00	*
819.000	15,416	41.48	88.84	18.41	15.46	8.98	5.59	4.89	94.	10.0	5.7	5.7	25.01	***	*
819.000	15,427	37.63	24.75	17.43	15.32	8.96	5.75	4.73	109.	10.0	126.1	5.2	3.93	300.00	*
819.000	15,460	37.99	23.96	16.26	15.36	8.84	5.37	4.67	88.	57.2	19.6	5.9	4.83	300.00	
836.000	8,788	24.67	14.47	11.77	8.50	5.33	2.84	2.24	79.	45.1	6.2	6.2	1.97	153.74	*
836.000	8,810	24.09	16.43	11.74	8.74	5.22	2.81	2.23	107.	10.0	6.5	6.5	3.65	64.33	*
836.000	8,810	23.97	16.11	11.74	8.52	5.18	2.89	2.29	106.	10.0	7.9	6.4	4.01	68.18	*
836.000	11,554	25.76	20.05	16.27	11.35	6.85	3.59	2.86	156.	10.0	6.2	6.2	6.54	90.63	*
836.000	11,586	27.18	19.81	16.08	11.42	6.92	3.76	3.05	147.	10.0	6.2	6.2	4.24	116.37	*
836.000	11,641	24.40	19.39	16.06	11.44	6.96	3.77	3.04	179.	10.0	6.0	6.0	6.19	123.12	*
836.000	11,685	24.35	19.23	16.55	11.28	6.88	3.72	3.00	180.	10.4	6.0	6.0	7.63	71.16	*
836.000	15,383	30.42	25.39	21.34	15.38	9.31	5.08	4.06	200.	10.0	5.9	5.9	7.13	68.15	*
836.000	15,405	31.01	25.72	20.90	15.53	8.95	5.03	4.31	192.	10.0	6.0	6.0	7.10	73.10	*
836.000	15,449	31.33	25.43	21.91	15.41	8.81	5.19	4.59	189.	10.0	6.0	6.0	7.38	82.01	*
849.000	8,964	21.01	11.31	9.92	6.78	4.76	2.67	2.21	77.	100.0	22.1	6.7	3.78	69.01	*
849.000	9,008	21.20	11.37	9.37	6.80	4.76	2.54	2.22	74.	100.0	21.6	6.9	2.75	151.66	*
849.000	11,784	25.43	15.46	12.49	9.94	6.52	3.61	3.04	111.	33.1	43.3	6.3	1.22	68.66	
849.000	11,850	25.37	15.37	12.33	9.42	6.65	3.99	3.20	111.	15.0	318.4	5.3	1.96	300.00	
849.000	11,905	25.19	15.45	12.24	9.34	6.52	3.93	3.22	114.	14.2	291.3	5.5	1.83	300.00	
849.000	11,927	25.22	15.41	12.02	9.27	6.62	3.88	3.17	112.	15.4	279.3	5.5	2.41	300.00	
849.000	15,504	32.16	23.32	16.94	12.97	9.32	5.43	4.42	149.	10.0	105.9	5.5	4.37	300.00	*
849.000	15,570	34.74	26.09	18.12	12.94	9.59	5.17	4.54	140.	10.0	27.3	6.1	6.63	104.32	*
849.000	15,537	29.09	35.05	18.36	13.02	9.22	5.01	4.51	190.	10.0	6.3	6.3	12.31	***	*
854.000	8,766	21.46	13.31	10.85	7.68	5.22	3.19	2.41	104.	10.0	169.2	5.2	3.02	104.01	*
854.000	8,777	22.66	13.11	11.06	7.79	5.25	3.22	2.38	77.	83.1	15.7	5.7	3.48	98.93	
854.000	8,832	23.40	13.39	10.67	7.91	5.24	3.19	2.55	80.	15.2	117.6	5.3	1.99	270.80	
854.000	11,334	27.92	17.29	14.28	10.43	7.00	4.20	3.41	107.	10.7	129.0	5.1	2.07	186.80	
854.000	11,422	28.50	17.16	14.31	10.38	7.04	4.24	3.40	99.	10.9	198.4	5.0	2.08	160.02	
854.000	11,576	29.17	18.24	14.57	10.69	7.15	4.30	3.40	100.	10.0	176.1	5.0	2.21	203.76	*
854.000	11,630	29.65	18.31	14.50	10.66	7.20	4.35	3.48	97.	11.2	131.7	5.1	2.48	210.32	
854.000	15,284	36.17	24.61	20.59	14.76	10.24	6.27	4.96	131.	10.0	82.5	4.7	2.91	127.55	*

854.000	15,262	37.34	24.86	20.18	14.91	10.20	6.32	4.93	119.	10.0	113.4	4.6	2.45	244.67	*
854.000	15,361	37.33	23.96	20.65	15.04	10.35	6.20	4.96	121.	10.0	120.1	4.6	2.29	178.14	*
854.000	15,361	36.28	23.95	19.97	14.80	10.22	6.35	5.03	126.	10.0	145.3	4.6	2.14	270.46	
874.000	8,766	27.73	11.52	9.65	6.57	4.53	3.47	3.04	41.	27.6	500.0	5.5	6.41	66.34	*
874.000	8,733	27.76	11.54	9.57	6.79	4.52	3.24	2.89	41.	24.8	500.0	5.6	4.76	108.14	*
874.000	15,438	42.36	18.94	18.15	10.67	8.80	6.27	5.96	50.	34.8	497.9	5.0	7.96	29.27	*
892.000	8,832	17.27	10.72	9.59	6.41	4.71	3.33	2.54	130.	15.6	491.8	4.9	4.82	56.23	*
892.000	8,975	18.79	10.75	9.86	6.56	4.84	3.39	2.62	105.	19.2	496.6	5.0	5.00	54.50	*
892.000	8,931	17.89	10.58	9.63	6.58	4.85	3.57	2.78	113.	21.7	474.1	4.7	5.07	67.80	*
892.000	11,608	23.25	13.69	12.61	8.91	6.50	4.31	3.48	118.	20.3	390.0	4.9	3.36	99.89	
892.000	11,685	23.48	14.24	12.92	8.95	6.58	4.36	3.59	124.	17.2	382.9	4.9	3.64	78.05	
892.000	11,806	23.07	14.28	12.78	9.15	6.75	4.65	3.78	129.	19.5	398.9	4.6	3.18	119.19	
892.000	15,383	32.04	18.68	17.45	12.54	9.52	6.14	5.28	110.	23.1	403.4	4.4	3.82	126.42	
892.000	15,482	31.14	18.52	17.48	12.61	9.44	6.32	5.33	118.	27.0	295.0	4.4	3.34	137.42	
892.000	15,526	31.26	18.49	17.10	12.63	9.48	6.15	5.24	114.	28.0	303.3	4.5	3.27	223.98	
892.000	15,526	29.38	18.70	16.99	12.57	9.41	6.19	5.06	138.	37.8	127.8	4.8	2.77	231.89	
904.000	9,359	23.94	13.43	11.91	8.94	6.14	3.56	3.07	76.	99.9	29.5	5.2	2.52	300.00	*
904.000	9,425	25.56	13.19	11.25	9.40	5.96	3.50	2.89	60.	100.0	52.5	5.2	1.71	82.82	*
904.000	11,850	26.96	17.80	15.50	14.90	7.85	4.69	3.98	155.	45.3	5.1	5.1	5.16	300.00	*
904.000	11,883	27.09	21.21	17.83	12.64	8.22	4.90	4.11	181.	10.0	5.2	5.2	4.52	112.01	*
904.000	11,850	28.58	19.26	15.12	12.96	8.42	4.87	4.12	131.	14.0	47.5	4.7	1.88	78.38	
904.000	11,872	28.01	19.06	15.05	12.87	8.44	4.76	4.04	138.	13.4	43.9	4.7	2.20	73.74	
904.000	15,131	38.38	28.54	20.59	17.90	13.81	6.61	5.74	144.	13.4	23.5	4.2	6.79	300.00	
925.000	8,733	25.78	16.22	9.63	6.90	5.02	3.04	2.50	63.	10.0	173.1	5.7	9.64	47.62	*
925.000	8,766	25.96	17.64	9.63	6.86	5.03	2.96	2.35	65.	10.0	74.9	6.1	12.01	28.40	*
925.000	8,799	25.00	17.28	9.63	6.85	4.96	2.87	2.21	71.	10.0	58.9	6.3	11.53	31.53	*
925.000	11,554	31.63	47.83	12.56	9.18	6.50	3.90	3.07	87.	10.0	6.6	6.6	24.47	***	*
925.000	11,641	30.46	19.20	12.96	9.26	6.75	4.06	3.28	81.	10.0	289.6	5.5	6.66	104.88	*
925.000	11,696	29.45	18.33	13.06	9.22	6.66	3.99	3.33	87.	10.0	315.2	5.5	5.37	91.79	*
925.000	11,641	28.26	18.69	13.02	9.15	6.54	3.92	3.24	97.	10.0	189.3	5.7	5.82	86.65	*
925.000	15,383	37.51	24.24	17.63	12.51	8.97	5.43	4.78	98.	10.0	235.1	5.4	4.87	99.41	*
925.000	15,460	38.57	32.43	17.64	12.65	9.07	5.20	5.01	112.	10.0	10.6	6.7	12.71	28.04	*
947.000	8,766	15.43	9.75	8.79	7.21	4.44	2.44	2.00	172.	60.3	14.0	6.9	3.37	70.76	
947.000	8,799	14.87	9.84	9.17	7.20	4.57	2.58	2.12	214.	51.9	6.9	6.9	2.97	73.93	*
947.000	8,832	15.76	9.93	8.99	7.24	4.58	2.60	2.11	161.	90.2	10.1	6.8	2.68	74.88	
947.000	11,630	23.50	13.68	12.17	10.35	6.39	3.46	2.82	113.	100.0	22.7	6.3	4.01	69.71	*
947.000	11,696	24.94	13.92	12.20	10.27	6.45	3.58	2.93	94.	100.0	37.3	6.1	3.25	72.30	*
947.000	11,674	24.67	13.97	12.67	9.78	6.31	3.40	2.76	101.	98.0	21.1	6.5	3.30	66.77	
947.000	11,729	25.02	14.30	12.37	9.83	6.50	3.63	3.04	96.	100.0	32.4	6.2	2.05	70.61	*
947.000	15,350	31.15	20.71	16.82	13.17	9.04	4.96	4.15	151.	19.6	38.0	6.0	2.03	66.42	
947.000	15,405	31.24	19.08	18.48	12.97	9.03	5.01	4.16	141.	35.9	31.7	5.9	4.78	96.45	
947.000	15,383	31.49	19.18	17.02	15.49	9.26	5.13	4.31	127.	100.0	16.4	5.6	4.38	75.81	*
947.000	15,416	31.90	18.87	17.21	13.97	9.14	4.97	4.14	115.	100.0	21.6	5.9	3.91	68.92	*
971.000	9,030	21.80	11.39	10.56	7.43	5.35	2.80	2.50	79.	100.0	19.7	6.2	5.12	96.26	*
971.000	9,139	21.65	11.33	10.88	7.54	5.58	2.81	2.52	80.	100.0	26.9	6.1	6.40	79.82	*
971.000	9,161	22.45	11.43	10.67	7.60	5.33	2.87	2.56	77.	100.0	17.1	6.4	4.92	117.03	*
971.000	11,455	27.27	14.83	13.85	10.08	7.36	3.77	3.41	86.	100.0	21.7	5.8	5.45	169.42	*
971.000	11,554	29.22	14.96	13.68	10.14	7.46	3.91	3.58	66.	100.0	57.1	5.5	4.97	259.80	*
971.000	11,565	29.15	14.90	13.63	10.06	7.32	3.85	3.55	66.	100.0	54.7	5.5	4.86	234.17	*
971.000	11,597	33.23	14.72	13.51	10.03	7.32	3.83	3.41	48.	100.0	95.7	5.5	5.12	275.58	*
971.000	15,295	34.01	19.78	17.33	13.29	10.12	5.45	5.03	94.	100.0	45.3	5.4	4.05	300.00	*

	R1	R2	R3	R4	R5	R6	R7	SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	ERR/Sens	Dpth to Bedrock
Mean:	35.14	23.21	18.99	14.43	9.48	5.73	4.51	111.	25.0	128.8	4.9	6.27	78.39
Std. Dev:	12.05	11.02	8.96	8.53	5.38	2.93	1.94	80.	26.7	178.6	1.6	4.37	64.59
Var Coeff(%):	34.29	47.49	47.16	59.08	56.76	51.13	42.97	72.	100.0	100.0	32.2	69.65	82.40

STH 29 Section 2

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	11.00	25,000	1,000,000	H1: õ = 0.35
Base:	4.00	10,000	100,000	H2: õ = 0.35
Subbase:	4.00	5,000	500,000	H3: õ = 0.35
Subgrade:	56.40	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
0.000	8,964	13.67	8.17	7.81	5.77	3.77	2.06	1.83	170.	96.6	24.0	7.9	3.87	253.90	
0.000	8,986	13.57	8.34	7.89	5.82	3.66	1.99	1.71	224.	10.3	117.2	8.0	3.77	66.41	
0.000	11,806	15.34	11.52	11.09	7.84	5.08	2.89	2.44	366.	10.0	8.4	8.4	4.47	106.22	*
0.000	11,927	15.68	11.85	10.48	7.85	5.07	2.87	2.42	344.	15.4	8.4	8.4	3.16	70.77	*
0.000	11,938	16.00	11.44	11.01	7.62	5.07	2.85	2.43	336.	12.8	8.6	8.6	3.96	80.10	*
0.000	15,690	25.50	16.14	14.61	10.84	6.99	3.98	3.35	191.	25.8	39.7	7.3	2.49	72.26	
0.000	15,712	24.98	15.50	14.01	10.91	7.02	4.00	3.35	168.	95.5	22.0	7.3	2.18	73.08	
0.000	15,734	25.16	16.15	14.20	13.67	7.07	4.04	3.42	206.	70.7	7.3	7.3	5.46	300.00	*
0.000	15,734	25.76	19.62	13.80	11.33	7.13	4.11	3.51	223.	10.1	23.4	7.6	3.72	300.00	
22.000	8,975	13.86	9.21	7.38	7.24	4.49	2.56	1.87	189.	100.0	31.7	6.3	4.39	300.00	*
22.000	9,019	13.50	8.88	7.45	6.43	3.86	2.46	1.81	193.	92.9	24.1	7.2	1.81	106.49	
22.000	8,964	13.04	8.74	7.26	6.04	3.76	1.84	1.78	249.	28.2	9.0	9.0	3.15	57.28	
22.000	11,839	20.63	12.64	10.07	7.93	5.97	3.22	2.30	131.	36.1	132.4	6.5	3.59	300.00	
22.000	11,872	20.58	12.11	9.91	8.04	5.43	3.14	2.31	130.	28.0	199.6	6.5	1.42	73.31	
22.000	11,916	17.96	12.00	10.25	8.14	5.35	3.18	2.40	203.	72.3	22.5	7.2	0.82	79.67	
22.000	15,734	24.71	16.82	13.80	10.83	7.03	4.37	3.46	205.	20.5	68.8	6.9	1.40	90.72	
22.000	15,756	25.55	16.39	13.40	10.89	7.01	4.41	3.50	174.	18.4	196.6	6.3	0.23	95.77	
22.000	15,789	23.31	17.68	13.29	11.01	6.91	4.39	3.52	275.	24.9	8.9	7.8	3.69	98.94	
22.000	15,767	25.76	18.67	13.26	11.10	7.32	4.45	3.62	196.	10.3	253.4	6.3	3.41	300.00	
70.000	8,821	19.71	11.06	9.00	6.41	3.80	2.33	1.91	87.	82.7	9.0	7.7	4.05	87.73	
70.000	8,788	19.80	10.85	8.79	6.20	3.67	2.07	1.62	85.	70.3	8.2	8.2	2.95	102.64	

70.000	11,532	22.43	13.90	12.85	8.27	5.10	2.58	2.43	160.	10.0	14.3	8.3	4.11	45.93	*
70.000	11,586	24.30	14.11	11.89	9.21	7.74	2.79	2.48	105.	96.5	16.2	6.5	8.79	300.00	
70.000	11,608	25.67	14.39	11.98	8.60	5.46	2.62	2.40	94.	65.9	7.9	7.9	3.19	133.01	*
70.000	11,608	25.95	14.41	11.75	8.06	5.54	2.57	2.51	88.	72.8	8.1	8.0	4.25	70.45	
70.000	15,383	28.14	18.58	15.93	10.80	6.74	3.66	3.35	177.	10.0	19.8	8.1	2.95	65.84	*
70.000	15,383	30.45	20.86	16.30	9.74	6.68	3.69	3.26	151.	10.0	10.3	8.8	8.11	31.53	*
70.000	15,361	29.14	20.36	16.32	9.19	6.64	3.93	3.47	150.	10.0	34.3	8.1	9.47	26.24	*
82.000	8,986	12.30	7.54	6.65	4.88	3.31	1.98	1.70	196.	26.7	161.8	8.2	2.43	186.43	
82.000	8,953	12.17	7.60	6.61	4.84	3.24	1.88	1.63	199.	41.5	64.3	9.0	2.21	178.65	
82.000	8,986	11.50	7.77	6.44	4.68	3.09	1.76	1.47	253.	23.6	38.5	9.8	2.42	151.04	
82.000	11,751	17.08	9.93	8.79	6.35	4.22	2.77	2.06	152.	46.8	145.0	8.2	3.39	138.80	
82.000	11,839	16.13	9.92	8.80	6.43	4.33	2.80	2.20	190.	34.6	153.9	8.0	2.88	171.42	
82.000	11,883	17.09	10.30	8.96	6.45	4.30	2.74	2.17	175.	24.8	203.1	8.0	2.88	129.82	
82.000	11,905	17.56	9.83	9.01	6.48	4.38	2.85	2.25	134.	99.8	104.7	8.2	3.67	128.56	*
82.000	15,833	21.56	12.71	12.43	8.74	5.87	3.74	3.22	190.	34.2	180.4	7.7	3.81	94.39	
82.000	15,723	22.04	12.90	12.43	8.50	6.06	3.81	3.31	173.	40.3	179.6	7.6	4.01	67.72	
107.000	15,636	29.52	20.40	17.52	15.31	10.28	4.53	4.37	214.	26.8	6.0	6.0	6.55	52.94	*
107.000	15,679	29.55	20.51	17.30	15.27	9.75	4.55	4.44	229.	13.1	6.3	6.3	5.47	56.53	*
130.000	8,712	16.69	11.06	8.44	6.27	3.78	2.12	1.62	153.	10.0	36.9	7.8	2.41	69.28	*
130.000	8,788	15.09	10.98	9.86	6.29	3.82	2.04	1.54	210.	10.0	8.1	8.1	6.68	43.63	*
130.000	11,543	19.21	16.75	11.89	8.45	5.05	2.80	2.09	216.	10.0	7.8	7.8	8.02	109.21	*
130.000	11,641	18.45	15.11	11.69	8.30	5.27	2.91	2.17	225.	22.1	7.5	7.5	6.62	108.09	*
130.000	11,608	18.82	14.84	11.61	8.21	5.23	2.83	2.10	235.	10.0	8.0	8.0	5.06	102.21	*
130.000	11,674	18.62	18.30	11.72	8.31	5.24	2.95	2.20	230.	10.0	7.7	7.7	9.34	99.34	*
130.000	15,427	26.87	23.89	15.36	11.97	7.36	3.98	3.09	209.	10.0	7.5	7.5	7.07	139.71	*
130.000	15,416	26.45	22.07	16.11	11.84	7.73	3.96	3.06	219.	10.0	7.4	7.4	5.56	197.32	*
130.000	15,427	25.07	22.96	17.94	11.99	8.40	3.89	3.13	241.	10.0	6.9	6.9	10.89	55.92	*
164.000	8,810	14.58	8.02	7.89	5.17	3.79	2.02	1.63	126.	100.0	45.1	8.0	6.16	48.89	*
164.000	8,898	15.03	8.12	7.80	5.23	3.97	2.05	1.66	136.	100.0	20.1	8.4	6.98	56.47	*
164.000	8,887	15.37	7.91	7.74	5.18	4.23	2.01	1.69	104.	100.0	94.0	7.5	8.48	53.79	*
164.000	11,707	19.41	10.96	12.56	7.29	5.50	2.79	2.26	151.	100.0	20.3	7.5	9.55	***	*
164.000	11,850	18.69	11.88	11.80	7.32	5.14	2.77	2.34	217.	10.0	68.6	7.9	5.97	37.16	*
164.000	15,690	27.16	16.04	15.45	10.20	7.35	4.17	3.32	143.	42.0	66.1	7.0	5.04	51.94	
164.000	15,701	27.28	16.05	14.06	10.15	7.41	4.20	3.35	133.	30.1	149.2	6.6	3.73	132.32	
164.000	15,734	26.23	15.87	14.15	10.12	7.28	4.15	3.35	149.	34.6	97.7	6.9	3.66	115.65	
187.000	9,085	10.97	7.01	5.90	3.74	2.84	1.87	1.56	211.	22.3	500.0	9.0	6.28	38.80	*
187.000	9,129	11.26	6.29	5.92	3.81	3.12	2.45	1.63	149.	97.8	500.0	7.5	7.24	41.07	*
187.000	11,696	16.90	10.43	7.91	5.28	4.69	2.97	2.22	141.	35.5	500.0	7.4	7.66	47.47	*
187.000	11,828	17.37	9.84	7.69	5.31	3.96	2.96	2.39	126.	38.2	500.0	8.1	6.37	69.18	*
187.000	11,817	17.11	12.35	7.59	5.17	3.80	2.78	2.14	159.	16.0	500.0	8.8	11.19	59.56	*
187.000	15,548	21.15	12.59	10.40	7.18	5.21	4.02	2.99	155.	36.4	500.0	7.7	6.40	70.71	*
187.000	15,603	21.36	12.85	10.26	7.31	5.43	4.26	3.59	148.	43.9	500.0	7.4	6.33	99.12	*
221.000	9,249	12.33	8.44	7.81	4.56	4.03	2.45	1.71	231.	17.4	500.0	6.5	8.14	27.48	*
221.000	9,282	12.96	8.29	8.04	4.44	3.81	2.21	1.46	206.	15.0	500.0	7.2	8.23	24.22	*
221.000	9,249	13.45	8.31	7.63	4.54	3.71	2.36	1.61	173.	20.7	500.0	6.9	6.99	30.02	*
221.000	11,619	13.36	11.26	10.07	6.28	5.50	2.87	2.01	453.	15.0	8.2	8.2	9.48	34.70	*
221.000	11,674	13.19	11.28	10.04	6.65	5.44	3.01	2.03	488.	10.0	8.1	8.1	7.74	49.41	*
221.000	11,707	13.23	11.47	10.54	6.41	5.60	2.85	1.77	466.	10.0	8.3	8.3	10.68	31.62	*
221.000	11,806	14.34	12.13	10.44	6.54	5.90	2.91	1.82	410.	15.6	8.1	8.1	10.31	34.58	*
221.000	15,482	19.56	15.28	13.39	8.80	7.09	3.70	2.35	353.	25.5	8.3	8.3	7.14	47.29	*
221.000	15,559	19.54	15.51	14.26	9.01	6.92	3.90	3.01	387.	10.2	8.5	8.5	6.52	39.10	*

221.000	15,636	20.06	15.71	13.43	8.89	6.46	3.65	2.54	339.	13.4	9.0	9.0	5.21	51.44	*
221.000	15,646	20.89	15.56	12.95	9.01	6.45	3.86	2.70	305.	25.4	9.5	8.7	4.60	78.99	
240.000	8,854	23.22	13.90	12.81	10.14	7.80	4.88	3.79	79.	96.8	94.7	3.2	3.02	300.00	
240.000	8,953	23.19	14.11	12.87	10.20	7.78	4.89	3.81	84.	71.6	95.2	3.3	2.80	300.00	
240.000	11,554	29.51	19.12	17.65	13.91	10.73	6.65	5.07	106.	53.0	70.5	3.1	3.23	300.00	
240.000	11,619	26.76	20.20	17.57	14.02	10.88	6.76	5.20	203.	10.0	93.6	3.0	2.54	300.00	*
240.000	11,641	28.50	20.00	18.05	14.26	10.96	7.02	5.50	140.	38.1	58.1	3.0	2.38	300.00	
240.000	11,696	31.72	19.85	18.04	14.39	10.93	6.97	5.52	87.	52.0	92.1	3.0	2.55	300.00	
240.000	15,438	40.27	29.07	27.57	20.13	15.18	9.40	7.59	171.	17.1	24.0	3.2	3.47	192.62	
260.000	8,744	26.93	18.24	15.09	12.56	8.57	5.15	4.44	98.	26.9	26.9	3.2	0.90	87.96	
260.000	8,865	25.89	16.96	15.15	12.69	8.56	5.24	4.42	96.	85.6	12.4	3.2	1.75	97.51	
260.000	8,865	25.41	17.24	15.15	12.42	8.49	5.23	4.36	118.	23.9	31.8	3.2	1.20	97.12	
260.000	11,400	39.77	21.62	19.95	16.92	11.40	7.14	5.83	53.	88.3	63.0	2.9	2.69	109.40	*
260.000	11,455	40.32	21.94	20.51	16.14	11.61	7.34	5.98	51.	87.8	67.3	2.9	2.51	105.34	*
260.000	11,499	42.15	22.48	20.69	16.11	11.74	7.25	5.94	46.	87.8	75.1	2.9	2.75	300.00	*
260.000	11,510	37.91	23.53	20.91	16.41	12.02	7.58	6.12	74.	25.8	80.7	2.7	2.22	300.00	
260.000	15,043	43.57	29.91	27.52	23.24	16.20	10.00	7.94	117.	78.3	12.9	2.8	2.41	101.57	
260.000	15,043	49.19	32.39	28.20	21.73	16.68	9.77	7.96	83.	35.7	35.7	2.8	3.03	300.00	
260.000	15,120	40.35	33.37	29.34	21.78	19.74	10.14	8.12	230.	10.0	5.9	2.7	7.22	171.09	*
279.000	11,685	26.43	22.13	21.96	17.35	13.77	10.01	8.01	407.	10.0	9.5	2.1	2.44	300.00	*
279.000	11,674	25.00	22.35	20.51	17.13	13.62	9.96	7.88	462.	10.0	5.1	2.1	1.90	299.86	*
279.000	11,696	25.28	23.53	20.72	17.37	13.89	10.03	8.30	436.	10.0	9.0	2.0	2.73	239.03	*
279.000	15,493	29.26	80.60	30.31	23.37	18.35	13.37	10.58	366.	10.0	5.0	2.0	20.89	***	*
279.000	15,548	29.87	33.46	31.40	23.76	18.66	13.47	10.86	513.	10.0	5.0	1.9	8.65	***	*
279.000	15,526	27.26	34.22	65.84	24.98	18.79	13.44	10.77	458.	22.0	19.8	1.5	22.70	***	*
279.000	15,603	22.70	35.19	28.79	23.77	19.06	13.84	11.27	517.	36.8	28.9	1.7	14.01	***	*
311.000	8,426	36.26	28.94	22.43	20.45	12.11	6.66	4.98	94.	10.0	5.0	2.3	5.32	300.00	*
311.000	8,503	35.67	29.25	22.96	19.10	11.83	6.34	4.69	92.	10.0	5.0	2.4	5.27	68.44	*
311.000	8,558	36.49	27.39	23.38	21.21	12.00	6.52	4.70	95.	10.0	5.0	2.3	5.44	79.69	*
311.000	11,235	44.21	38.61	35.72	25.37	15.04	7.87	5.67	98.	10.0	5.0	2.3	11.29	131.24	*
311.000	11,279	44.20	54.09	38.75	25.18	15.43	8.41	6.14	91.	10.0	5.0	2.1	18.18	***	*
311.000	11,257	44.02	39.98	36.82	25.40	15.42	8.30	5.96	101.	10.0	5.0	2.2	11.50	84.19	*
311.000	11,312	44.93	34.05	34.00	25.59	15.55	8.33	6.03	106.	10.0	5.0	2.3	7.54	74.37	*
311.000	14,966	59.24	42.58	33.59	30.36	19.45	10.17	7.44	102.	10.0	5.1	2.8	3.77	300.00	*
311.000	14,977	59.44	42.16	33.78	31.39	19.71	10.44	7.46	105.	10.1	5.1	2.7	4.13	300.00	
311.000	15,065	61.73	42.57	33.86	31.50	19.91	10.77	7.70	85.	21.9	6.4	2.6	3.87	300.00	
334.000	8,514	33.74	26.16	23.88	20.41	14.17	7.91	6.20	137.	10.0	5.0	1.9	4.41	79.30	*
334.000	8,514	33.96	26.12	23.92	21.39	14.14	7.83	6.14	135.	10.0	5.0	1.9	5.30	82.06	*
334.000	8,569	35.08	26.35	24.24	21.10	14.23	8.06	6.20	130.	10.0	5.0	1.9	4.31	84.62	*
334.000	11,148	45.77	33.29	30.80	30.24	18.37	10.14	7.94	130.	10.0	5.0	1.9	6.34	300.00	*
334.000	11,202	45.73	34.55	31.91	26.87	18.52	10.38	8.17	128.	10.0	5.0	2.0	4.23	80.13	*
334.000	11,257	45.66	35.08	31.54	36.09	19.02	10.69	8.24	138.	10.0	5.0	1.8	8.84	106.96	*
334.000	11,268	45.75	35.15	31.58	27.31	18.83	10.50	8.03	131.	10.0	5.0	2.0	4.06	79.19	*
334.000	14,845	53.13	47.89	41.39	36.15	25.14	13.46	10.30	160.	10.0	5.0	1.8	7.76	71.45	*
334.000	14,834	53.89	47.43	43.31	42.85	26.20	13.93	10.61	166.	10.0	5.0	1.7	9.61	300.00	*
368.000	7,570	77.96	55.27	50.55	38.43	22.79	5.09	2.42	25.	10.0	5.0	1.2	31.93	39.51	*
368.000	7,801	77.54	56.93	53.70	37.56	24.48	5.46	2.63	25.	10.0	5.0	1.2	30.94	87.79	*
368.000	7,878	75.52	60.19	54.39	37.47	24.24	6.03	3.11	25.	10.0	5.0	1.2	28.74	69.46	*
375.000	7,943	70.41	57.51	44.93	35.65	19.26	9.05	4.93	29.	10.0	5.0	1.2	13.89	52.07	*
375.000	7,965	71.44	58.00	44.91	35.84	19.81	9.27	4.52	28.	10.0	5.0	1.2	13.03	51.51	*
375.000	8,009	72.30	58.22	45.12	38.07	19.83	9.33	3.91	28.	10.0	5.0	1.2	13.97	54.45	*

375.000	10,500	74.60	70.76	60.04	51.22	24.99	9.22	6.05	39.	10.0	5.0	1.3	24.21	49.65	*
375.000	10,577	75.32	71.53	57.17	56.06	25.00	10.26	5.26	41.	10.0	5.0	1.3	22.92	300.00	*
375.000	10,621	75.89	71.55	58.38	54.41	25.33	9.50	4.97	39.	10.0	5.0	1.3	23.86	300.00	*
375.000	10,610	76.61	71.87	58.55	51.62	25.56	10.27	4.94	40.	10.0	5.0	1.3	21.32	51.99	*
404.000	8,119	56.38	38.84	36.25	26.17	15.35	6.40	4.92	39.	10.0	5.0	1.8	10.35	51.71	*
404.000	8,152	58.28	39.61	36.62	26.75	17.19	6.89	6.28	39.	10.0	5.0	1.7	9.95	224.59	*
404.000	8,108	56.51	38.80	36.52	26.76	19.26	6.66	5.26	42.	10.0	5.0	1.6	12.85	225.82	*
404.000	10,774	73.76	46.79	45.89	32.17	25.65	7.57	7.09	41.	10.0	5.0	1.8	15.21	92.65	*
404.000	10,720	73.36	51.44	45.96	32.49	23.70	7.69	6.65	39.	10.0	5.0	1.8	13.87	100.49	*
404.000	10,742	73.49	49.65	46.88	33.14	21.86	7.98	7.15	40.	10.0	5.0	1.8	11.88	113.70	*
404.000	10,763	71.39	48.80	48.68	33.15	20.52	7.80	7.04	41.	10.0	5.0	1.9	12.43	75.06	*
429.000	7,932	56.53	46.37	41.24	32.93	19.83	9.07	5.85	46.	10.0	5.0	1.3	11.72	56.64	*
429.000	7,987	59.94	47.69	41.80	33.41	20.04	9.48	6.34	42.	10.0	5.0	1.3	10.39	58.05	*
429.000	8,009	60.50	43.17	42.10	32.32	20.61	9.61	6.05	44.	10.0	5.0	1.3	9.01	59.63	*
429.000	10,577	73.83	70.19	51.44	40.69	24.50	11.55	7.68	43.	10.0	5.0	1.3	13.07	50.13	*
429.000	10,621	74.24	56.98	51.75	40.91	23.60	11.52	7.48	46.	10.0	5.0	1.4	10.11	62.51	*
429.000	10,632	71.50	57.04	52.48	41.07	23.37	11.80	7.85	50.	10.0	5.0	1.4	11.16	65.82	*
429.000	10,665	74.19	58.06	52.69	41.28	23.27	11.96	7.82	46.	10.0	5.0	1.4	10.56	66.99	*
459.000	8,262	47.78	44.86	32.17	25.09	14.85	6.54	4.67	51.	10.0	5.0	1.8	13.42	48.32	*
459.000	8,273	49.04	45.70	32.46	25.12	14.71	6.18	5.48	47.	10.0	5.0	1.8	14.36	46.24	*
459.000	10,785	72.08	65.63	40.18	31.34	17.98	7.45	5.63	36.	10.0	5.0	2.0	13.31	59.02	*
459.000	10,720	60.07	64.75	40.03	31.28	17.75	7.57	4.99	49.	10.0	5.0	1.9	17.02	***	*
459.000	10,895	52.10	78.67	42.41	34.32	19.46	7.45	5.28	62.	10.0	5.0	1.8	25.28	***	*
482.000	8,053	56.56	36.52	32.63	24.10	14.93	5.74	5.07	36.	10.0	5.0	2.0	9.71	48.16	*
482.000	8,097	56.69	37.17	33.31	24.42	14.59	5.81	5.06	36.	10.0	5.0	2.0	9.65	49.42	*
482.000	8,119	57.13	36.67	34.31	24.33	14.33	5.71	5.00	35.	10.0	5.0	2.0	9.83	49.85	*
482.000	10,654	60.20	46.81	44.35	30.09	20.06	7.44	6.50	54.	10.0	5.0	1.9	14.30	68.37	*
482.000	10,676	61.17	48.96	43.19	31.39	20.01	7.66	6.80	52.	10.0	5.0	1.9	13.98	183.06	*
482.000	10,698	65.55	50.31	42.48	31.30	19.85	7.77	6.79	46.	10.0	5.0	1.9	12.03	47.04	*
482.000	10,687	63.23	61.41	44.28	31.13	19.05	7.85	6.73	47.	10.0	5.0	1.8	15.68	79.93	*
482.000	14,308	77.46	76.51	67.27	39.58	24.46	9.73	8.30	52.	10.0	5.0	1.9	20.06	29.53	*
482.000	14,319	78.40	72.34	48.30	40.33	24.12	9.92	8.65	53.	10.0	5.0	2.0	12.65	300.00	*
515.000	11,038	60.58	57.59	32.57	27.81	13.83	5.87	5.62	44.	10.0	5.0	2.5	16.07	34.80	*
515.000	14,736	72.96	55.06	39.20	37.45	17.19	7.65	7.27	55.	10.0	5.0	2.8	12.02	300.00	*
515.000	14,780	73.11	54.00	39.99	38.64	17.34	7.44	7.17	55.	10.0	5.0	2.8	12.66	300.00	*
515.000	14,769	73.07	71.69	40.23	41.79	17.44	7.39	6.97	52.	10.0	5.0	2.6	20.65	42.62	*
515.000	14,824	76.79	56.54	40.78	35.51	17.78	7.84	7.51	51.	10.0	5.0	2.8	9.90	300.00	*
526.000	8,437	32.28	30.61	20.06	14.41	9.20	5.31	3.54	87.	10.0	5.0	2.9	8.91	112.19	*
526.000	8,525	32.35	29.33	20.52	14.71	9.39	5.63	3.75	90.	10.0	5.0	2.9	7.65	115.57	*
526.000	8,558	33.70	37.03	20.67	14.46	9.54	5.22	3.57	78.	10.0	5.0	2.9	12.19	***	*
526.000	11,235	43.23	38.41	24.61	17.73	12.26	7.08	4.73	86.	10.0	5.0	3.1	7.43	110.33	*
526.000	11,268	42.62	37.96	24.85	18.11	12.07	7.07	4.92	89.	10.0	5.0	3.1	6.98	141.52	*
526.000	11,290	42.13	42.86	24.80	18.74	12.44	6.87	4.66	89.	10.0	5.0	3.0	9.91	***	*
526.000	11,334	41.85	40.40	25.13	18.94	12.00	6.97	4.81	91.	10.0	5.0	3.1	8.60	76.92	*
526.000	15,076	57.50	50.97	31.03	23.76	15.26	8.90	6.39	84.	10.0	5.0	3.3	7.94	61.02	*
526.000	15,120	59.62	99.30	31.51	24.10	15.07	8.97	6.24	69.	10.0	5.0	3.1	20.29	***	*
526.000	15,120	55.63	39.50	32.17	24.19	15.46	8.66	6.30	96.	10.0	5.0	3.4	1.76	71.90	*
526.000	15,120	59.12	37.18	32.74	23.99	15.18	8.39	5.92	77.	10.1	12.1	3.4	2.23	71.82	
550.000	8,327	48.72	20.76	15.88	10.39	6.47	2.71	2.07	25.	10.0	22.4	4.6	4.84	49.39	*
550.000	8,327	50.05	20.89	16.46	10.81	5.74	2.64	2.05	25.	11.1	11.4	4.9	2.51	52.46	*
550.000	8,306	49.95	22.86	16.93	10.81	6.02	2.82	2.32	26.	10.0	8.8	4.7	3.26	42.89	*

550.000	10,895	54.15	27.32	21.79	13.32	7.63	3.41	2.59	38.	10.0	6.1	5.1	3.65	35.37	*
550.000	10,983	55.34	27.26	21.93	13.56	8.04	3.70	2.87	36.	10.0	9.4	4.8	3.83	37.08	*
550.000	10,928	54.54	28.91	22.48	14.19	9.04	3.65	3.15	40.	10.0	5.9	4.6	5.38	40.10	*
550.000	10,950	54.77	28.02	21.86	13.68	9.52	3.72	3.09	37.	10.0	11.5	4.5	6.84	37.89	*
550.000	14,648	68.61	39.90	28.39	17.54	12.27	4.84	4.24	44.	10.0	5.0	4.8	7.19	35.03	*
550.000	14,659	66.56	38.05	28.72	17.75	10.62	4.48	4.35	45.	10.0	5.0	5.0	5.73	36.45	*
575.000	8,832	24.47	17.26	14.07	8.84	4.32	2.55	2.15	96.	10.0	6.3	6.3	8.66	41.09	*
575.000	8,887	25.04	17.53	13.74	9.01	4.44	2.66	2.30	95.	10.0	6.3	6.3	8.10	52.50	*
575.000	8,887	26.53	17.32	13.69	9.24	4.52	2.58	2.28	86.	10.0	6.3	6.3	6.12	56.66	*
575.000	11,323	36.11	23.32	20.35	12.83	6.03	3.63	3.05	82.	10.0	5.6	5.6	7.73	42.60	*
575.000	11,367	38.80	24.13	20.00	12.67	5.99	3.69	3.10	70.	10.0	5.8	5.8	8.19	43.20	*
575.000	11,411	36.89	23.51	20.97	12.79	6.03	3.67	3.14	81.	10.0	5.6	5.6	8.34	36.53	*
575.000	15,010	45.74	31.10	30.06	17.18	8.70	4.69	3.98	90.	10.0	5.4	5.4	10.24	29.20	*
575.000	15,120	44.33	31.69	29.20	17.77	11.06	4.92	4.24	105.	10.0	5.0	5.0	8.55	35.37	*
575.000	15,087	45.42	33.28	27.08	17.07	10.20	5.03	4.15	97.	10.0	5.2	5.2	7.90	40.78	*
588.000	8,558	39.50	19.29	13.69	8.07	4.44	2.48	2.37	36.	10.0	11.1	6.2	7.70	30.52	*
588.000	8,602	36.91	18.86	13.49	7.98	4.35	2.52	2.32	41.	10.0	10.3	6.4	8.29	30.96	*
588.000	8,657	39.32	18.54	13.11	7.96	4.31	2.46	2.24	35.	10.0	16.4	6.4	7.13	34.03	*
588.000	11,213	41.46	25.11	18.05	10.64	5.55	3.20	2.82	57.	10.0	6.2	6.2	9.42	30.72	*
588.000	11,268	43.94	25.08	19.00	10.89	5.85	3.44	2.98	52.	10.0	6.2	6.2	9.44	28.30	*
588.000	11,301	40.14	24.50	17.80	10.85	5.75	3.41	2.91	61.	10.0	6.2	6.2	8.83	34.78	*
588.000	11,268	40.31	24.46	17.28	10.88	5.78	3.47	3.10	60.	10.0	6.3	6.3	8.43	40.01	*
588.000	14,988	49.98	32.53	25.28	14.91	7.43	4.76	3.81	69.	10.0	6.0	6.0	11.13	31.26	*
588.000	14,966	50.39	32.87	24.30	14.93	7.52	4.71	3.86	67.	10.0	6.1	6.1	10.19	36.21	*
588.000	14,988	54.54	32.50	23.94	15.05	7.50	4.77	3.89	59.	10.0	6.2	6.2	9.14	40.29	*
588.000	14,999	52.88	32.89	25.11	15.04	7.62	4.70	4.01	62.	10.0	6.0	6.0	9.86	32.88	*
612.000	8,338	23.57	31.04	22.71	15.79	8.46	3.98	3.17	124.	10.0	5.0	3.0	23.36	***	*
612.000	8,393	30.15	30.59	22.30	15.94	8.41	3.77	3.22	83.	10.0	5.0	3.1	17.69	***	*
612.000	11,093	25.30	41.06	29.25	20.87	11.10	5.31	4.33	177.	10.0	5.0	2.9	28.16	***	*
612.000	11,093	36.59	46.57	30.59	22.94	11.11	5.24	4.52	92.	10.0	5.0	2.9	23.40	***	*
612.000	11,159	40.04	33.84	32.69	27.88	11.30	4.94	4.09	88.	10.0	5.0	2.9	21.80	47.66	*
612.000	15,076	50.83	43.25	39.91	37.83	14.38	6.91	5.35	99.	10.0	5.0	3.1	20.63	44.90	*
612.000	15,065	44.47	43.04	39.23	34.37	14.26	7.48	6.17	127.	10.0	5.0	3.0	21.19	48.50	*
645.000	8,459	38.83	24.80	22.57	15.26	7.95	3.75	2.63	56.	10.0	5.0	3.5	7.60	57.93	*
645.000	8,492	40.52	25.15	21.06	14.65	8.02	3.80	2.69	52.	10.0	5.0	3.6	4.77	56.54	*
645.000	8,481	40.15	25.63	20.78	14.56	8.73	3.87	2.86	54.	10.0	5.0	3.5	5.07	95.90	*
645.000	11,246	42.19	31.78	27.14	19.67	11.00	5.24	3.59	83.	10.0	5.0	3.4	8.46	58.06	*
645.000	11,301	41.13	32.16	28.24	18.89	17.74	5.53	3.53	102.	10.0	5.0	3.0	15.60	47.87	*
645.000	11,312	41.42	32.29	28.19	18.50	11.20	5.93	3.58	90.	10.0	5.0	3.3	8.49	52.53	*
645.000	15,284	51.05	43.61	37.55	26.10	13.81	6.89	4.92	97.	10.0	5.0	3.5	12.99	61.21	*
645.000	15,273	51.41	44.15	37.71	27.11	13.94	6.76	4.84	95.	10.0	5.0	3.4	14.06	59.90	*
645.000	15,339	54.02	49.57	44.58	24.28	13.95	6.72	4.81	83.	10.0	5.0	3.4	17.98	25.00	*
674.000	11,817	24.40	12.90	12.57	10.11	7.29	3.95	3.17	92.	100.0	105.3	5.1	5.85	66.41	*
698.000	8,701	19.63	8.55	6.41	5.72	3.80	2.31	2.23	54.	99.9	317.4	6.9	2.01	300.00	*
698.000	8,712	20.04	8.23	6.76	5.83	3.86	2.46	2.35	52.	100.0	433.6	6.5	0.77	100.44	*
698.000	8,701	19.80	8.21	6.89	5.88	3.87	2.64	2.37	53.	100.0	495.8	6.2	1.63	144.29	*
698.000	11,554	24.17	11.15	9.28	7.85	5.19	3.30	3.26	65.	81.8	302.9	6.3	0.81	99.70	
698.000	11,565	24.43	11.79	9.50	8.06	5.24	3.31	3.24	71.	44.3	368.4	6.1	0.81	97.65	
698.000	11,586	24.32	12.34	9.52	8.02	5.11	3.24	3.07	76.	40.7	227.3	6.5	1.23	98.57	
698.000	15,295	29.49	15.15	12.48	10.85	7.15	4.54	4.21	83.	66.1	274.5	6.0	1.15	100.46	
698.000	15,350	29.45	15.48	12.50	10.86	7.11	4.48	4.15	87.	60.8	234.5	6.2	1.03	97.26	

698.000	15,394	29.26	19.50	12.72	10.98	7.18	4.51	4.20	126.	13.2	493.7	5.9	4.73	191.74	
698.000	15,383	29.49	18.96	12.93	10.95	8.03	4.47	4.20	120.	16.9	406.5	5.7	5.35	300.00	
726.000	11,279	36.29	25.72	25.60	21.07	14.09	7.94	6.30	167.	10.0	5.0	2.7	5.18	82.63	*
726.000	11,301	35.65	26.52	25.93	21.44	14.20	7.97	6.32	172.	10.0	5.0	2.6	5.43	81.79	*
726.000	15,054	42.99	32.52	29.83	27.65	18.47	10.21	8.15	210.	10.0	5.0	2.7	5.33	80.19	*
726.000	15,208	43.44	35.89	33.22	28.74	18.79	10.40	8.30	199.	10.0	5.0	2.6	6.08	79.21	*
755.000	8,646	27.66	27.78	23.93	20.33	13.65	8.56	6.57	204.	10.0	5.0	1.7	8.21	***	*
755.000	8,755	30.59	27.70	24.03	20.65	13.78	8.47	6.43	172.	10.0	5.0	1.8	5.79	103.71	*
755.000	8,788	29.71	27.97	24.05	20.69	13.81	8.54	6.47	182.	10.0	5.0	1.8	6.65	105.48	*
755.000	11,060	36.87	35.80	30.89	26.52	17.47	11.02	7.92	189.	10.0	5.0	1.7	7.64	115.69	*
755.000	11,301	36.86	37.02	31.94	27.17	18.20	11.76	8.06	204.	10.0	5.0	1.6	7.97	***	*
755.000	14,560	49.09	46.63	40.30	34.98	23.05	15.19	9.75	194.	10.0	5.0	1.7	6.53	113.29	*
755.000	14,604	51.50	47.82	40.90	35.48	23.54	14.35	9.98	170.	10.0	5.0	1.8	6.49	100.61	*
755.000	14,659	53.83	46.93	41.28	37.64	23.81	13.92	10.13	157.	10.0	5.0	1.8	6.48	95.24	*
778.000	8,492	31.09	28.52	24.62	23.95	16.83	9.39	7.18	194.	10.0	5.0	1.4	7.67	300.00	*
778.000	8,602	29.33	28.43	24.78	23.80	16.94	9.47	7.18	220.	10.0	5.0	1.4	9.07	300.00	*
810.000	8,624	27.05	25.34	23.58	17.71	11.48	7.51	5.00	181.	10.0	5.0	2.1	7.96	119.96	*
810.000	11,060	43.43	32.07	31.41	23.09	17.72	8.72	6.12	123.	10.0	5.0	2.2	7.11	252.44	*
810.000	11,126	45.40	32.41	30.00	23.97	18.72	8.62	6.30	116.	10.0	5.0	2.3	6.51	300.00	*
810.000	11,060	46.61	31.76	29.46	22.87	14.83	8.26	6.11	96.	10.0	5.0	2.6	2.84	76.88	*
810.000	11,180	41.79	32.46	29.43	24.15	14.92	8.20	6.37	119.	10.0	5.0	2.4	5.27	77.36	*
810.000	14,769	55.50	41.79	37.64	29.70	19.21	10.77	9.50	117.	10.0	5.0	2.6	3.10	77.45	*
810.000	14,736	52.79	44.06	37.36	30.29	19.25	12.43	8.36	137.	10.0	5.0	2.3	3.87	122.73	*
810.000	14,725	50.87	54.67	38.98	29.71	19.33	10.82	8.02	123.	10.0	5.0	2.4	10.87	***	*
810.000	14,780	50.94	43.55	39.80	29.08	19.43	11.66	7.82	141.	10.0	5.0	2.4	6.34	228.70	*
866.000	15,438	24.55	23.45	21.24	15.99	9.60	5.21	3.54	308.	10.0	5.3	5.3	11.45	69.96	*
876.000	8,909	16.83	10.09	7.78	6.70	3.82	2.13	1.94	120.	70.1	17.4	7.8	1.73	300.00	
876.000	8,920	17.42	9.65	7.87	7.28	3.82	2.12	1.94	106.	100.0	16.9	7.6	4.19	300.00	*
876.000	8,964	17.65	9.69	7.78	6.19	3.77	2.06	1.93	96.	100.0	20.6	8.0	0.35	67.06	*
876.000	11,554	39.15	12.38	10.30	8.54	5.10	2.84	2.72	30.	100.0	237.9	7.2	2.73	71.38	*
876.000	11,586	20.37	12.47	10.51	8.85	5.24	2.87	2.77	146.	75.3	16.6	7.4	2.05	69.86	
876.000	11,554	18.67	13.02	10.27	8.98	5.15	2.92	2.76	232.	23.6	7.8	7.8	1.83	300.00	
876.000	15,350	22.12	18.22	13.94	11.91	7.11	4.06	3.89	316.	10.1	7.6	7.6	4.31	300.00	*
876.000	15,383	19.19	18.37	14.68	12.34	7.08	4.02	3.94	390.	10.0	7.3	7.3	9.78	75.43	*
876.000	15,416	16.99	18.18	16.11	12.46	7.11	3.97	3.87	476.	10.0	6.8	6.8	15.20	***	*
876.000	15,427	15.89	19.06	14.63	13.21	7.11	4.04	3.92	529.	10.0	6.6	6.6	16.82	***	*
904.000	8,657	28.22	23.85	21.40	16.43	10.83	6.10	4.75	147.	10.0	5.0	2.6	5.84	76.36	*
904.000	8,744	27.78	24.09	22.96	17.81	10.92	6.28	4.89	156.	10.0	5.0	2.4	8.78	85.79	*
904.000	8,712	27.67	24.24	22.45	16.78	10.71	6.14	4.70	152.	10.0	5.0	2.5	7.91	80.74	*
904.000	11,466	33.86	31.63	30.15	20.64	13.88	7.59	6.08	164.	10.0	5.0	2.6	10.23	76.54	*
904.000	11,532	38.00	31.93	27.08	20.89	14.83	7.72	6.18	141.	10.0	5.0	2.7	6.25	300.00	*
927.000	8,547	43.19	36.44	27.22	22.05	15.90	7.45	5.59	74.	10.0	5.0	1.9	7.42	52.12	*
927.000	8,558	40.56	33.38	27.74	24.48	14.96	7.11	6.00	84.	10.0	5.0	1.9	9.04	61.36	*
927.000	8,569	42.71	33.54	26.61	22.22	14.17	7.03	6.50	73.	10.0	5.0	2.1	5.78	60.56	*
927.000	11,301	52.32	44.77	42.24	31.59	16.79	9.39	7.10	80.	10.0	5.0	2.0	12.92	80.92	*
960.000	8,514	28.00	24.35	23.37	12.51	7.10	3.77	3.13	94.	10.0	5.0	3.7	16.16	24.40	*
960.000	8,580	28.19	24.87	23.13	16.30	8.09	3.82	3.11	98.	10.0	5.0	3.3	17.06	59.94	*
960.000	11,246	36.69	30.23	30.15	17.26	10.39	4.81	4.11	99.	10.0	5.0	3.6	13.90	29.03	*
960.000	11,268	36.23	31.11	27.05	17.44	9.34	4.96	4.15	99.	10.0	5.0	3.7	12.77	47.60	*
960.000	14,966	40.47	38.68	33.64	20.86	12.97	6.60	5.51	134.	10.0	5.0	3.8	13.75	37.90	*
960.000	14,933	42.48	41.58	27.89	22.83	12.11	6.72	5.62	121.	10.0	5.0	3.9	10.62	300.00	*

960.000	14,900	42.83	42.98	28.68	25.68	12.16	6.86	5.74	120.	10.0	5.0	3.7	13.54	***	*
960.000	14,922	46.61	44.05	32.15	23.70	12.33	6.91	5.78	105.	10.0	5.0	3.7	12.06	65.97	*
986.000	8,569	41.19	31.14	27.12	25.62	23.02	10.51	8.48	126.	19.4	5.0	1.3	8.82	300.00	*
986.000	11,159	48.13	38.31	33.33	30.90	28.09	12.39	12.69	157.	10.0	5.0	1.4	8.71	300.00	*
986.000	11,301	49.31	41.00	33.88	33.25	28.59	13.15	73.95	157.	10.0	5.0	1.4	9.03	300.00	*
Mean:		37.91	29.51	24.22	18.57	11.60	6.00	4.88	137.	23.4	50.6	4.4	8.26	75.37	
Std. Dev:		17.86	16.98	13.21	10.88	6.43	3.11	4.73	102.	26.5	115.1	2.5	5.82	46.71	
Var Coeff(%):		47.11	57.55	54.54	58.59	55.41	51.87	96.82	75.	100.0	100.0	56.5	70.55	61.97	

STH29 Section 3

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	11.00	25,000	1,000,000	H1: õ = 0.35
Base:	4.00	10,000	100,000	H2: õ = 0.35
Subbase:	4.00	5,000	500,000	H3: õ = 0.35
Subgrade:	72.10	10,500		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
0.000	13,825	79.80	12.69	12.06	8.00	4.69	3.76	2.12	25.	21.0	500.0	10.7	15.76	55.90	*
0.000	17,073	79.92	16.54	15.11	9.94	5.85	4.27	2.59	25.	21.3	500.0	10.5	11.18	52.41	*
27.000	9,381	11.15	6.46	5.50	3.56	2.70	1.69	1.16	182.	28.5	380.6	12.9	5.31	42.99	
27.000	9,436	11.15	6.51	5.48	3.56	2.63	1.69	1.17	186.	24.7	500.0	13.0	5.26	44.17	*
27.000	9,469	11.08	6.57	5.54	3.62	2.56	1.70	1.19	205.	100.0	12.4	16.2	6.83	46.32	*
27.000	12,168	13.03	8.24	7.02	4.59	3.18	2.11	1.42	249.	18.9	378.8	14.0	5.24	46.73	
27.000	12,179	13.11	8.31	7.19	4.63	3.23	2.12	1.43	252.	18.8	296.5	14.0	5.31	42.84	
27.000	12,212	13.20	8.33	7.18	4.87	3.26	2.15	1.44	243.	100.0	15.7	15.4	4.98	61.52	*
27.000	12,245	13.58	8.37	7.15	4.90	3.26	2.14	1.44	233.	100.0	12.8	15.8	4.86	67.39	*
27.000	16,085	17.37	10.86	9.52	6.49	4.12	2.65	1.71	256.	50.0	26.5	15.6	4.58	65.43	
27.000	16,195	17.46	10.80	10.35	6.67	4.16	2.69	1.73	261.	88.1	9.3	16.4	6.15	44.61	
83.000	8,931	13.70	9.94	7.23	5.01	3.49	2.12	1.95	203.	11.5	29.2	11.0	5.88	74.44	
83.000	8,953	13.93	9.66	7.19	5.04	3.49	2.18	2.00	184.	10.0	229.4	9.8	4.89	85.02	*
83.000	9,008	14.62	9.70	7.18	5.04	3.51	2.19	2.11	161.	10.1	457.9	9.6	4.79	86.02	
83.000	11,828	18.52	12.69	9.60	6.63	4.69	2.83	2.64	181.	10.0	231.0	9.8	5.00	72.07	*
83.000	11,839	17.87	12.66	9.60	6.63	4.66	2.78	2.76	203.	10.0	94.7	10.4	5.03	72.29	*

83.000	11,872	18.69	12.72	9.58	6.67	4.69	2.85	2.49	176.	10.0	344.2	9.6	4.74	78.48	*
83.000	11,872	18.87	12.74	9.66	6.66	4.70	2.86	2.45	175.	10.2	216.5	9.9	5.04	70.98	
83.000	15,811	25.71	16.09	13.06	8.67	6.26	3.80	3.31	156.	11.3	499.3	9.4	4.89	52.10	*
83.000	15,789	25.83	16.44	12.84	8.72	6.24	3.80	3.49	154.	12.8	226.4	9.7	4.89	61.85	
83.000	15,789	25.66	16.52	12.65	8.78	6.26	3.76	3.63	157.	13.0	184.1	9.9	4.62	75.65	
83.000	15,866	26.58	16.74	12.76	8.80	6.26	3.88	3.33	143.	13.0	296.0	9.5	4.81	70.96	
108.000	10,577	18.98	11.12	9.16	6.39	3.90	2.50	2.46	135.	10.0	298.1	9.8	3.48	86.95	
108.000	10,577	19.40	11.17	8.44	6.34	3.84	2.41	2.06	119.	11.6	303.9	9.9	2.13	91.79	
108.000	10,698	19.95	11.40	8.46	6.44	3.91	2.38	2.04	116.	10.4	500.0	9.8	1.74	83.02	*
108.000	13,627	38.23	13.52	10.59	7.90	4.76	3.03	2.31	41.	35.6	221.1	10.5	2.35	97.16	
135.000	9,129	19.39	10.71	9.74	7.55	5.01	2.77	1.86	102.	75.1	23.2	7.5	3.49	69.40	*
135.000	9,139	19.62	10.57	9.26	6.79	5.38	2.79	1.89	84.	71.8	70.9	7.2	5.38	165.53	*
135.000	9,150	20.48	10.16	9.34	6.89	5.11	2.85	1.83	74.	71.7	83.1	7.2	4.72	214.83	*
135.000	11,828	21.68	13.39	13.29	8.91	6.35	3.70	2.41	162.	29.4	35.7	7.5	5.11	59.39	
135.000	11,894	21.61	13.39	13.25	8.65	6.17	3.76	2.46	158.	28.3	44.5	7.5	4.64	48.96	
164.000	8,986	13.10	10.57	7.59	5.67	3.77	2.24	1.56	266.	10.0	8.2	10.8	4.56	279.89	*
164.000	8,986	12.93	11.23	7.46	5.56	3.75	2.21	1.55	275.	10.0	5.2	11.6	6.24	242.01	*
164.000	9,063	12.75	12.61	7.30	5.56	3.70	2.23	1.55	280.	10.0	5.0	11.7	8.78	40.68	*
164.000	11,872	20.81	13.26	9.49	7.15	4.93	3.04	2.07	135.	12.0	499.8	8.8	4.08	300.00	*
164.000	11,894	20.77	13.39	9.46	7.21	5.03	3.12	2.07	136.	14.2	257.2	8.9	4.60	300.00	
164.000	11,894	20.68	12.91	9.33	7.16	5.30	3.02	2.07	131.	16.1	318.1	8.6	4.32	300.00	
164.000	11,905	20.54	12.27	9.30	7.09	4.94	3.03	2.06	129.	16.0	442.4	8.7	2.54	300.00	
164.000	15,844	24.51	15.96	12.43	9.64	6.70	4.06	2.70	179.	15.0	230.8	8.8	2.09	79.17	
164.000	15,844	24.10	15.35	12.50	10.06	6.59	4.12	2.67	175.	37.6	60.3	9.2	0.54	91.52	
164.000	15,855	24.82	16.11	12.43	9.81	6.43	4.11	2.65	175.	16.1	159.9	9.1	1.96	91.19	
164.000	15,888	25.23	17.91	12.43	9.96	6.45	4.27	2.69	182.	11.1	216.8	9.1	4.87	300.00	
177.000	8,942	10.93	6.58	6.07	4.84	3.31	1.78	1.28	212.	100.0	46.1	11.1	4.64	62.67	*
177.000	9,030	11.19	6.63	6.46	4.85	3.32	1.82	1.34	212.	100.0	39.8	11.1	4.86	300.00	*
177.000	11,872	14.67	8.34	7.92	7.42	4.19	2.27	1.57	205.	100.0	47.9	11.3	7.54	69.64	*
177.000	15,833	18.56	11.55	11.35	8.04	5.37	3.00	2.08	293.	15.7	91.8	12.0	4.81	102.95	
177.000	15,899	18.63	11.36	11.29	7.95	5.40	3.03	2.15	274.	18.6	139.2	11.6	5.23	94.29	
177.000	15,910	18.82	11.51	10.85	7.95	5.41	3.08	2.18	241.	45.7	64.5	11.7	4.00	179.11	
177.000	15,932	19.22	11.54	11.43	8.02	5.42	3.08	2.15	242.	32.2	80.5	11.6	4.91	90.47	
202.000	8,843	17.00	12.90	12.06	7.90	6.87	2.87	2.13	228.	10.0	5.0	6.9	10.34	45.88	*
202.000	8,865	17.98	12.74	11.53	7.85	6.79	2.82	2.18	205.	10.0	5.0	7.3	8.76	60.09	*
202.000	8,876	18.40	12.80	11.14	7.81	6.38	2.87	2.22	195.	10.1	5.0	7.4	6.66	83.14	
202.000	11,367	21.99	16.33	13.75	9.50	7.64	3.49	2.72	210.	10.0	5.0	7.8	7.41	71.22	*
202.000	11,411	20.83	16.12	13.74	9.58	8.38	3.38	2.75	234.	10.0	5.0	7.6	10.05	72.38	*
202.000	11,433	23.69	16.15	13.98	9.62	7.56	3.36	2.75	182.	10.0	5.0	8.2	6.50	70.04	*
202.000	11,466	25.00	16.19	13.73	10.06	6.88	3.21	2.75	153.	13.6	5.5	8.3	4.41	199.38	
202.000	15,306	37.80	20.42	17.05	13.24	9.80	4.09	3.31	79.	77.3	8.0	7.7	6.24	300.00	*
202.000	15,372	31.36	20.39	17.84	11.14	10.87	4.05	3.29	151.	15.8	13.7	8.2	10.60	30.94	
202.000	15,350	43.68	20.35	16.68	11.01	8.94	4.09	3.37	53.	33.2	58.2	8.0	6.92	48.62	
227.000	8,975	10.84	8.13	6.79	4.72	2.83	1.54	1.31	314.	10.0	5.0	16.1	4.57	82.80	*
227.000	8,986	11.57	7.48	6.49	4.15	2.79	1.52	1.28	240.	15.4	17.9	14.5	4.36	42.16	
227.000	11,839	14.31	9.86	8.20	5.33	3.56	2.18	1.50	273.	11.7	28.4	14.4	5.54	46.01	
227.000	11,861	14.09	10.05	7.99	5.09	3.65	2.04	1.66	272.	12.6	27.0	14.7	6.42	40.28	
227.000	11,850	14.62	9.89	7.89	5.45	3.72	2.03	1.67	257.	14.7	24.0	14.3	3.90	72.49	
227.000	11,872	14.61	9.98	8.16	5.69	3.76	2.03	1.70	282.	10.0	16.7	14.8	3.15	81.71	
227.000	15,844	19.92	13.32	10.64	6.85	5.10	2.81	2.27	229.	10.9	247.8	13.1	5.97	42.14	
227.000	15,866	20.14	13.41	10.48	7.18	5.15	2.83	2.33	228.	19.9	38.0	13.6	4.74	65.56	

227.000	15,921	20.37	13.18	10.48	7.34	5.12	2.80	2.24	225.	13.1	106.5	13.2	3.49	83.11	
227.000	15,899	20.33	13.19	10.44	7.37	5.09	2.86	2.30	216.	24.0	44.1	13.2	3.52	91.65	
254.000	9,611	18.41	8.14	8.02	5.52	3.44	2.76	2.03	74.	76.6	215.2	9.3	7.61	76.45	
254.000	9,732	33.31	8.16	7.91	5.46	3.44	2.74	2.00	27.	100.0	500.0	10.1	9.02	78.09	*
254.000	11,729	20.10	10.16	9.81	6.82	4.28	3.43	2.44	99.	72.6	132.6	9.1	7.27	85.00	
254.000	12,003	20.38	10.20	9.93	6.76	4.33	3.63	2.50	103.	35.5	498.5	8.4	7.79	67.83	
254.000	12,058	19.87	10.39	10.27	6.81	4.28	3.59	2.50	119.	26.8	500.0	8.5	8.33	55.09	*
254.000	12,168	19.99	10.17	9.91	7.26	4.34	3.62	2.50	106.	93.5	110.0	9.3	7.45	124.64	*
254.000	15,636	32.95	12.85	12.22	8.92	5.84	4.75	3.55	59.	94.0	340.0	9.4	7.15	178.72	*
254.000	15,778	22.85	12.93	11.88	9.71	6.00	4.75	3.41	144.	54.9	304.5	8.1	4.89	162.96	
254.000	15,822	22.78	13.02	11.87	9.37	5.96	5.33	3.37	146.	47.0	500.0	7.6	5.82	208.13	*
254.000	15,833	46.97	13.00	11.87	9.15	6.02	4.70	3.30	33.	100.0	428.6	10.0	6.90	300.00	*
281.000	9,118	14.11	7.42	6.49	5.06	3.78	2.27	1.66	108.	89.6	225.5	9.0	3.02	300.00	*
281.000	9,139	13.48	7.41	6.44	4.94	3.76	2.25	1.69	125.	72.3	233.1	9.0	3.27	300.00	
281.000	9,161	15.25	7.39	6.39	5.00	3.76	2.26	1.67	88.	83.0	347.3	8.8	3.01	300.00	
281.000	11,883	17.57	9.21	8.31	6.54	5.04	2.85	2.13	120.	91.9	209.8	9.2	4.35	300.00	*
281.000	11,916	17.04	9.21	8.19	6.38	4.96	2.85	2.05	125.	91.1	249.1	9.1	4.12	300.00	*
281.000	11,883	16.04	9.19	8.13	6.36	5.01	2.86	1.99	147.	90.6	214.4	9.1	4.17	300.00	*
281.000	11,927	16.13	9.20	8.12	6.17	5.39	2.86	2.02	144.	89.2	252.2	8.9	5.88	300.00	*
281.000	15,954	22.55	11.71	10.68	7.84	7.40	3.71	2.50	125.	94.9	248.3	9.5	7.51	103.79	*
281.000	15,987	22.60	11.61	10.52	8.13	7.37	3.78	2.62	128.	94.8	235.8	9.5	6.57	300.00	*
281.000	16,020	22.27	11.63	10.44	7.71	7.21	3.90	2.76	127.	93.9	294.3	9.4	6.33	115.51	*
281.000	16,031	22.19	11.68	10.35	8.23	7.10	4.06	2.70	135.	93.4	246.7	9.3	4.83	300.00	*
311.000	9,030	7.19	6.63	5.75	3.96	2.60	1.27	1.24	592.	12.6	5.1	17.2	10.19	71.80	*
311.000	11,971	10.80	8.09	6.96	4.94	3.20	1.72	1.59	475.	10.0	6.0	20.1	3.62	100.88	*
311.000	11,927	14.85	8.12	7.17	4.86	3.19	1.64	1.54	170.	75.4	21.7	16.0	4.39	61.83	
311.000	11,949	14.15	8.09	7.10	5.09	3.13	1.68	1.55	197.	93.8	11.4	16.7	2.73	120.63	
311.000	11,938	13.15	8.02	7.13	4.92	2.94	1.71	1.57	250.	70.7	7.6	18.3	3.64	74.93	
311.000	15,965	16.74	10.78	10.00	6.98	3.73	2.23	1.93	320.	29.0	5.9	19.7	4.53	69.88	*
311.000	16,042	14.51	10.70	9.43	6.81	3.74	2.34	1.89	452.	10.0	6.3	21.0	4.59	76.28	*
335.000	9,118	9.08	7.53	7.22	4.58	3.35	1.56	1.22	461.	10.0	5.0	14.5	10.14	40.23	*
335.000	11,828	16.75	9.89	9.58	6.04	4.72	2.66	1.73	172.	43.8	80.6	10.3	6.32	38.38	
335.000	15,811	21.56	12.37	12.10	7.48	5.27	3.19	2.37	173.	40.2	69.8	11.8	5.41	35.99	
335.000	15,789	19.18	12.66	11.38	7.52	5.24	3.16	2.37	271.	12.7	113.4	12.1	4.06	51.10	
335.000	15,800	21.30	12.83	11.20	8.02	5.13	3.15	2.36	191.	32.8	52.8	12.1	2.80	120.38	
367.000	9,271	24.66	12.79	8.98	5.69	3.39	2.41	1.96	64.	10.0	164.1	9.7	8.12	40.64	*
367.000	9,315	24.30	12.64	8.69	5.51	3.50	2.41	1.97	64.	10.0	272.0	9.6	7.61	40.23	*
367.000	9,403	23.57	12.31	8.69	5.54	3.57	2.48	1.96	68.	10.0	437.3	9.4	7.37	41.39	*
367.000	11,784	16.98	16.15	11.30	7.65	4.76	3.26	2.63	277.	10.0	5.0	10.6	10.46	62.18	*
367.000	11,894	18.71	15.74	11.17	7.57	4.82	3.19	2.70	234.	10.0	5.0	11.3	8.90	62.50	*
367.000	15,328	21.20	14.51	13.50	10.54	6.31	4.27	3.56	298.	28.6	9.3	9.4	3.88	130.65	
389.000	8,744	13.91	9.67	7.93	6.21	3.72	2.47	1.81	228.	12.1	20.3	9.3	2.79	125.50	
389.000	8,821	13.93	9.72	7.82	6.28	3.73	2.73	1.76	215.	19.8	29.5	8.7	3.85	120.46	
389.000	8,865	14.03	10.08	7.77	6.26	3.76	2.97	1.76	209.	10.0	259.5	7.7	5.24	127.57	*
389.000	11,652	15.81	13.09	9.96	8.09	4.97	3.89	2.34	334.	10.0	24.9	8.4	6.18	149.30	*
389.000	11,663	15.87	12.46	9.95	8.20	4.98	4.19	2.36	337.	21.2	12.7	8.4	6.05	140.60	
389.000	11,696	14.87	12.43	9.91	8.24	5.02	4.02	2.36	426.	10.0	5.5	9.0	5.50	144.37	*
389.000	11,685	13.04	12.35	9.90	8.20	5.02	4.10	2.34	549.	10.0	11.6	7.7	7.08	149.83	*
389.000	15,690	17.22	15.49	13.23	10.15	6.64	5.26	3.22	568.	10.0	5.0	8.8	6.90	286.78	*
389.000	15,679	18.89	15.62	13.09	10.33	6.70	5.18	3.23	450.	10.0	15.1	8.4	5.30	260.16	*
389.000	15,734	19.44	15.74	13.16	10.07	6.59	5.05	3.15	407.	16.2	10.2	8.9	5.77	282.08	

389.000	15,767	19.20	15.69	13.13	10.13	6.87	4.90	3.28	431.	14.5	9.4	8.8	4.41	101.13	
402.000	8,843	10.61	10.54	9.89	6.62	4.57	2.35	1.65	445.	10.0	5.0	8.2	11.60	58.69	*
402.000	8,843	11.07	10.46	9.44	6.63	4.68	2.13	1.63	390.	10.0	5.0	8.8	12.29	93.28	*
402.000	8,898	11.46	10.70	9.45	6.65	4.66	2.25	1.63	380.	10.0	5.0	8.7	10.64	95.42	*
402.000	11,718	19.15	13.48	11.81	8.40	5.97	2.87	2.00	245.	10.0	5.0	10.2	5.03	108.73	*
402.000	11,729	19.28	13.57	12.06	8.49	5.99	2.98	2.05	247.	10.0	5.0	9.9	4.80	95.33	*
402.000	11,729	19.09	13.70	12.05	8.53	6.04	3.01	2.08	252.	10.0	5.0	9.8	4.80	102.20	*
402.000	11,762	18.65	14.09	11.32	8.59	6.08	2.96	2.07	261.	10.0	5.0	9.9	4.92	300.00	*
402.000	15,822	22.67	18.08	15.25	11.20	7.93	3.85	2.79	306.	10.0	5.0	9.9	6.66	192.14	*
426.000	8,898	12.98	6.95	6.95	4.44	2.89	1.81	1.27	137.	100.0	34.8	11.8	5.54	42.96	*
426.000	8,920	12.05	7.02	6.70	4.44	2.93	1.71	1.33	190.	34.8	48.2	12.2	4.01	53.39	
426.000	8,953	12.81	7.01	6.71	4.43	2.89	1.75	1.31	153.	42.5	64.9	12.0	4.28	52.15	
426.000	11,795	15.95	8.52	8.18	5.56	3.81	2.00	1.56	150.	100.0	35.4	12.9	5.68	64.06	*
426.000	11,817	15.98	8.53	8.18	5.61	3.76	2.00	1.53	151.	100.0	33.3	13.0	5.28	70.05	*
426.000	11,850	15.68	8.63	8.21	5.64	3.74	2.02	1.46	166.	100.0	22.7	13.3	4.77	71.39	*
426.000	11,828	15.64	8.63	8.31	5.63	3.78	2.03	1.51	167.	100.0	23.9	13.1	5.18	62.80	*
426.000	15,767	22.09	10.98	10.94	7.52	5.04	2.82	2.26	127.	100.0	75.4	12.3	5.35	71.99	*
426.000	15,800	17.93	10.99	10.89	7.46	5.16	2.76	2.30	287.	18.2	95.2	12.7	5.92	68.74	
426.000	15,822	20.87	11.11	11.06	7.43	5.16	2.69	2.35	155.	100.0	45.2	12.7	6.46	58.13	*
439.000	9,008	13.68	8.79	7.49	5.39	3.20	1.87	1.76	211.	10.0	20.8	12.0	2.60	76.04	*
439.000	9,030	12.46	8.85	7.52	5.35	3.24	1.89	1.81	280.	10.0	5.0	13.6	3.33	114.07	*
439.000	9,030	12.57	8.79	7.51	5.24	3.24	1.96	1.75	272.	10.0	7.0	13.0	3.97	87.04	*
439.000	11,850	15.51	11.09	9.44	6.47	3.93	2.38	1.90	288.	10.0	6.4	14.2	4.79	71.66	*
439.000	11,861	16.70	11.14	9.44	6.35	3.93	2.49	1.86	228.	12.1	20.9	12.5	5.14	60.24	
439.000	11,861	16.86	11.03	9.58	6.28	3.94	2.46	1.85	222.	12.4	21.3	12.6	5.11	49.91	
439.000	11,850	16.71	11.06	9.70	6.28	3.95	2.47	1.76	230.	11.5	19.0	12.7	5.42	46.24	
439.000	15,833	21.44	14.60	12.39	8.35	5.16	3.02	2.11	252.	10.0	12.0	13.8	4.19	61.12	*
439.000	15,866	20.88	14.75	12.16	8.69	5.18	2.90	2.23	282.	10.0	5.0	15.6	3.03	68.06	*
439.000	15,899	19.70	14.89	12.07	8.50	5.18	2.83	2.26	306.	10.0	5.0	15.6	4.22	96.00	*
439.000	15,866	20.72	15.33	11.82	8.47	5.15	2.83	2.28	278.	10.0	5.0	15.9	3.59	121.90	*
466.000	8,986	12.90	8.63	7.17	5.59	3.62	2.17	1.41	229.	21.4	34.2	10.0	0.77	80.27	
466.000	9,063	12.65	9.06	7.11	5.60	3.50	2.03	1.42	268.	10.0	15.7	11.3	1.33	73.99	*
466.000	9,096	13.20	9.31	7.29	5.61	3.63	2.00	1.43	249.	10.0	15.2	11.3	1.86	65.60	*
466.000	11,652	18.91	12.01	9.39	7.09	4.44	2.59	1.65	166.	21.2	29.2	10.8	1.58	74.20	
466.000	11,696	19.13	12.48	9.39	7.09	4.78	2.59	1.70	166.	21.0	29.2	10.5	2.92	62.26	
466.000	11,674	18.97	12.37	9.44	6.92	4.76	2.48	1.70	173.	17.5	26.0	10.9	3.29	173.38	
466.000	11,817	20.38	13.06	9.69	6.74	4.54	2.47	1.74	151.	10.1	58.3	11.2	4.10	78.93	
466.000	15,657	24.34	16.98	12.54	8.07	5.86	3.01	1.98	186.	10.0	23.1	12.6	6.74	42.41	*
466.000	15,679	22.76	16.99	12.33	8.27	5.66	3.06	1.98	227.	10.0	9.0	13.5	6.01	56.04	*
466.000	15,734	23.33	17.00	12.62	8.59	5.65	2.97	2.09	222.	10.0	7.1	13.9	4.88	64.27	*
466.000	15,734	24.67	23.87	12.85	8.65	5.64	3.04	2.28	196.	10.0	5.0	14.1	9.93	27.03	*
494.000	9,019	11.64	8.27	6.38	4.61	3.16	1.83	1.46	262.	15.0	24.0	12.4	3.77	129.66	
494.000	9,008	11.43	8.14	6.44	4.58	3.39	2.00	1.63	261.	22.0	42.0	11.2	4.48	98.00	
494.000	9,041	12.12	7.87	6.32	4.55	3.39	3.02	1.52	178.	33.6	500.0	8.2	7.65	115.97	*
494.000	11,674	17.46	10.50	8.55	6.04	3.73	2.41	1.71	167.	11.2	500.0	11.2	3.53	99.18	*
494.000	11,652	16.83	11.30	8.54	6.09	3.59	2.36	1.68	196.	10.0	60.0	12.8	5.47	104.45	*
494.000	11,674	16.27	10.46	8.50	6.01	3.63	2.42	1.73	205.	10.4	168.9	12.1	4.64	101.10	
494.000	11,685	15.56	10.49	8.52	5.98	3.61	2.43	1.71	237.	12.7	30.3	13.0	5.52	91.81	
494.000	15,603	22.43	14.34	11.56	8.17	4.84	3.11	2.20	198.	15.1	27.8	13.0	4.50	101.27	
494.000	15,668	23.34	14.16	11.50	8.17	4.88	3.13	2.32	168.	22.4	36.9	12.5	3.95	108.75	
494.000	15,668	24.94	14.00	11.64	8.21	5.07	3.20	2.39	139.	17.9	122.1	11.6	3.15	97.76	

494.000	15,701	23.59	13.96	11.54	8.19	4.95	3.22	2.36	164.	14.3	145.9	11.8	3.55	107.11	
518.000	9,205	10.00	7.81	5.62	3.93	2.42	1.39	1.11	331.	10.0	6.0	19.9	5.80	83.45	*
518.000	9,205	10.04	7.64	5.52	3.89	2.72	1.43	1.10	312.	10.0	31.6	15.9	5.10	86.71	*
518.000	9,216	10.04	7.28	5.51	3.85	2.45	1.46	1.10	321.	10.4	12.9	17.8	4.97	82.27	
518.000	12,102	13.64	9.59	6.97	5.22	3.48	1.74	1.34	291.	18.6	10.0	17.4	4.06	262.90	
518.000	12,091	13.44	9.67	7.02	5.31	3.99	1.77	1.37	299.	44.0	5.2	17.4	6.65	300.00	*
518.000	12,124	13.43	10.21	7.03	5.22	3.89	1.80	1.40	307.	34.0	5.3	17.6	7.15	183.55	*
518.000	12,113	13.41	9.92	6.97	5.16	3.44	1.78	1.45	314.	10.1	11.8	18.0	4.91	195.91	
518.000	16,195	16.93	12.57	9.78	7.36	4.83	2.52	1.96	389.	10.0	5.6	18.5	2.82	57.99	*
518.000	16,228	16.82	12.81	9.40	7.43	4.86	2.56	2.01	369.	10.0	16.8	15.9	3.82	58.82	*
518.000	16,228	17.32	12.19	9.31	7.31	5.43	2.57	1.97	333.	17.6	27.6	14.5	5.23	300.00	
518.000	16,239	17.55	12.24	9.42	7.26	5.68	2.59	2.10	320.	20.7	31.0	14.1	6.01	300.00	
548.000	8,898	16.03	7.80	6.30	4.65	3.30	1.59	1.30	87.	100.0	40.5	12.0	4.28	192.96	*
548.000	8,953	16.44	7.79	6.31	4.61	3.28	1.59	1.34	83.	100.0	43.8	12.2	4.33	155.69	*
548.000	8,953	16.94	7.80	6.29	4.59	3.30	1.58	1.31	78.	100.0	44.4	12.3	4.49	150.48	*
548.000	11,762	18.65	9.83	8.13	5.98	4.09	1.96	1.57	115.	100.0	20.5	12.8	4.28	186.16	*
548.000	11,795	17.72	9.80	8.04	5.90	4.27	1.95	1.66	134.	82.7	20.5	12.8	5.13	166.30	
548.000	11,795	17.76	9.77	7.90	5.87	4.22	1.93	1.61	128.	100.0	17.7	12.9	4.76	217.69	*
548.000	11,828	18.20	9.85	8.03	5.85	4.38	1.93	1.60	122.	100.0	19.7	12.8	5.72	139.81	*
548.000	15,778	25.07	13.46	11.01	7.49	5.42	2.43	1.97	127.	35.3	33.8	13.4	5.88	62.10	
548.000	15,811	24.94	13.56	10.58	7.58	5.78	2.44	2.04	125.	42.8	34.7	13.2	6.04	104.60	
548.000	15,877	26.19	13.62	10.40	7.62	5.67	2.48	2.38	112.	27.2	87.3	12.9	5.46	151.65	
548.000	15,844	24.88	14.11	10.37	7.51	5.82	2.52	2.44	126.	38.2	39.2	13.0	6.61	118.45	
560.000	8,832	17.78	8.80	7.24	4.91	3.64	2.16	1.78	83.	23.0	313.0	9.1	3.70	60.79	
560.000	8,821	16.85	8.81	7.21	4.84	3.50	2.09	1.72	95.	20.8	203.8	9.5	3.94	56.52	
560.000	8,898	17.80	8.81	7.25	4.81	3.52	2.13	1.65	84.	22.6	267.5	9.5	4.21	51.69	
560.000	11,718	21.20	10.81	9.15	6.37	4.50	2.89	2.17	96.	27.5	287.1	9.3	3.26	79.73	
560.000	11,740	21.69	11.03	9.20	6.26	4.50	2.95	1.88	93.	22.3	500.0	9.1	3.81	63.20	*
560.000	11,773	21.90	10.89	9.19	6.25	4.49	3.24	1.82	88.	27.6	490.3	8.8	4.82	63.02	
560.000	15,778	28.26	13.40	11.50	8.29	5.83	4.43	2.41	83.	45.0	500.0	8.9	4.81	126.84	*
560.000	15,811	28.74	13.70	11.55	8.17	5.89	3.66	2.52	84.	46.7	219.3	10.0	3.08	94.42	
560.000	15,778	28.47	13.70	11.56	8.15	5.82	3.59	2.57	87.	44.4	198.3	10.2	3.06	91.09	
586.000	8,931	22.78	11.31	11.04	7.70	5.51	3.53	2.34	63.	57.9	124.6	5.8	4.01	88.31	*
586.000	8,942	22.28	11.58	11.04	7.78	5.59	3.47	2.33	71.	60.0	78.9	6.0	3.85	100.02	*
586.000	11,433	31.17	14.34	13.94	10.17	7.01	4.32	2.96	53.	58.6	151.2	5.9	3.98	195.21	*
610.000	8,898	10.66	7.30	6.28	5.21	2.95	2.07	1.69	317.	10.8	110.1	10.9	3.76	92.36	
610.000	8,920	11.09	7.36	6.37	6.00	2.96	1.98	1.67	311.	13.3	29.5	11.4	5.34	300.00	
610.000	8,975	11.37	7.35	6.24	4.98	2.96	2.03	1.69	241.	28.9	54.3	11.2	2.87	116.87	
610.000	11,729	12.64	9.39	8.05	7.09	4.02	2.47	2.06	457.	10.0	5.0	13.5	2.83	92.50	*
610.000	11,718	13.93	9.34	8.14	6.87	4.03	2.43	2.06	333.	11.9	35.3	11.8	2.42	85.45	
610.000	11,751	14.78	9.34	8.08	7.29	4.05	2.42	2.09	256.	27.5	47.5	11.2	3.85	86.09	
610.000	15,668	19.98	12.35	10.46	9.19	5.58	3.25	2.67	204.	100.0	31.3	11.1	2.46	77.18	*
610.000	15,712	19.66	12.29	10.61	9.02	5.63	3.24	2.68	227.	48.9	56.2	10.9	2.91	74.03	
610.000	15,690	19.42	12.22	10.45	8.81	5.62	3.28	2.70	228.	54.6	54.9	10.9	2.28	75.58	
610.000	15,745	19.34	12.35	10.50	9.19	5.64	3.32	2.73	232.	100.0	24.8	11.1	2.21	78.96	*
642.000	8,953	12.57	6.44	5.87	4.28	2.74	1.72	1.43	127.	100.0	68.4	12.3	3.14	165.77	*
642.000	8,942	13.11	6.47	5.84	4.27	2.77	1.69	1.41	115.	100.0	75.0	12.4	2.68	173.31	*
642.000	8,909	13.55	6.52	5.78	4.24	2.80	1.70	1.41	106.	100.0	87.7	12.4	2.67	181.93	*
642.000	11,740	16.74	8.62	7.80	5.76	3.73	2.24	1.93	124.	100.0	70.5	12.0	2.54	220.11	*
642.000	11,762	16.99	8.69	7.80	5.75	3.75	2.27	1.93	121.	100.0	72.6	12.0	2.34	208.58	*
642.000	11,795	16.84	8.66	7.81	5.77	3.77	2.25	1.93	125.	100.0	68.5	12.1	2.54	220.11	*

642.000	11,817	16.80	8.72	7.88	5.89	3.79	2.29	1.90	128.	100.0	67.8	11.9	2.35	80.34	*
642.000	15,855	21.19	11.43	10.68	8.07	5.09	3.07	2.93	149.	100.0	68.6	11.8	3.25	81.25	*
642.000	15,855	23.54	11.70	10.70	7.87	5.09	3.09	2.83	113.	100.0	86.6	11.8	2.77	201.70	*
642.000	15,877	22.11	11.57	10.65	7.83	5.13	3.12	2.64	130.	100.0	86.2	11.7	2.87	197.47	*
668.000	8,821	15.24	7.90	6.26	5.88	3.00	1.82	1.49	102.	100.0	29.8	11.1	4.07	300.00	*
668.000	8,843	14.44	7.92	6.31	6.10	2.99	1.88	1.49	121.	100.0	21.5	11.1	4.68	300.00	*
668.000	8,843	13.08	7.91	6.31	5.89	3.00	1.80	1.46	178.	43.0	21.2	11.5	3.89	300.00	
668.000	11,641	20.67	10.50	8.39	8.28	4.10	2.33	2.02	99.	100.0	27.1	11.0	5.34	300.00	*
668.000	11,674	19.66	10.58	8.39	8.11	4.22	2.41	2.05	112.	100.0	27.6	10.7	4.73	300.00	*
668.000	11,729	20.23	10.75	8.41	8.04	4.20	2.42	2.06	105.	100.0	27.9	10.8	4.29	300.00	*
668.000	11,674	18.97	11.30	8.44	8.27	4.15	2.44	2.05	149.	31.5	34.2	10.9	4.38	300.00	
668.000	15,668	25.46	14.81	11.47	11.22	5.83	3.44	2.83	132.	98.9	18.6	10.5	4.34	300.00	
668.000	15,657	25.05	15.22	11.46	10.96	5.81	3.50	2.81	155.	32.7	39.9	10.4	3.65	300.00	
668.000	15,701	24.43	15.03	11.52	11.05	5.86	3.47	2.84	166.	41.7	28.7	10.5	3.76	300.00	
668.000	15,712	22.97	14.53	11.48	11.41	5.85	3.44	2.83	206.	27.4	30.5	10.5	4.78	300.00	
698.000	8,865	13.81	8.33	7.68	5.52	3.86	2.13	1.69	164.	67.3	28.4	9.5	4.25	128.18	
698.000	8,865	14.44	8.28	7.72	5.53	3.95	2.15	1.70	137.	93.4	32.9	9.3	4.81	119.92	*
698.000	8,887	14.89	8.28	7.99	5.54	3.94	2.18	1.72	124.	91.8	43.3	9.2	5.25	79.23	*
698.000	11,817	19.31	11.05	10.59	7.46	5.18	3.07	2.37	136.	90.2	42.0	9.0	3.99	96.83	*
698.000	11,784	19.17	11.05	10.55	7.48	5.11	3.06	2.39	139.	90.9	36.6	9.1	3.62	106.72	*
698.000	11,773	19.20	11.02	10.50	7.51	5.11	3.06	2.38	138.	88.6	40.0	9.0	3.54	122.22	
717.000	8,810	16.04	9.39	8.47	6.08	3.70	2.17	1.83	144.	21.8	30.0	9.5	2.69	138.36	
717.000	8,876	16.04	9.44	8.21	6.01	3.71	2.16	1.90	141.	22.9	33.7	9.6	1.97	76.12	
717.000	8,887	16.06	9.43	8.12	6.02	3.68	2.21	1.76	137.	24.9	37.0	9.5	2.08	82.88	
717.000	11,674	19.80	12.68	11.35	8.13	4.96	2.96	2.41	194.	13.6	17.2	9.7	2.99	132.91	
717.000	11,729	19.59	12.57	11.06	8.13	4.92	3.01	2.43	192.	18.3	17.2	9.7	2.80	88.46	
717.000	11,740	19.60	12.70	11.07	8.06	4.92	3.02	2.65	192.	17.6	17.1	9.7	2.90	88.65	
717.000	11,729	19.36	12.83	10.90	8.02	4.89	3.00	2.75	202.	10.5	25.5	9.8	2.55	88.17	
717.000	15,778	27.91	17.64	14.70	10.69	6.48	4.19	3.33	159.	18.2	28.4	9.5	3.46	106.73	
717.000	15,767	27.13	18.04	14.47	10.68	6.34	4.27	3.37	175.	20.5	14.0	9.9	4.54	115.79	
717.000	15,789	26.92	18.20	13.99	10.84	6.28	4.31	3.40	179.	14.5	22.7	9.8	4.27	101.47	
717.000	15,822	27.11	18.15	14.05	10.72	6.20	4.27	3.39	176.	12.9	26.5	9.9	4.45	100.18	
739.000	8,953	13.09	7.24	5.86	4.37	2.75	1.46	1.12	144.	41.1	37.8	13.4	2.11	60.76	
739.000	8,964	14.35	7.28	5.90	4.47	2.77	1.47	1.09	107.	99.4	25.7	13.5	1.88	61.21	
739.000	8,986	14.82	7.33	5.95	4.51	2.80	1.47	1.09	101.	87.7	32.1	13.4	2.14	60.25	
739.000	11,773	22.39	9.81	8.03	5.91	3.59	1.92	1.32	75.	100.0	36.0	13.6	2.09	62.14	*
739.000	11,784	22.35	9.84	7.83	5.90	3.61	1.92	1.32	75.	100.0	39.4	13.6	1.70	61.45	*
739.000	11,850	22.33	9.92	7.87	5.89	3.61	1.92	1.34	76.	92.8	39.9	13.6	1.73	61.30	
739.000	11,828	22.44	9.94	7.91	6.00	3.65	1.91	1.35	75.	100.0	35.8	13.6	1.82	60.16	*
739.000	15,811	28.95	13.65	10.79	7.87	4.81	2.58	1.71	91.	24.8	109.5	13.1	2.12	61.94	
739.000	15,800	28.72	13.69	10.88	7.86	4.85	2.67	1.76	93.	23.9	122.7	12.9	2.00	138.13	
739.000	15,822	28.19	13.83	10.96	7.88	4.88	2.71	1.78	98.	23.6	109.3	12.8	1.83	126.99	
739.000	15,855	27.96	13.83	11.05	7.86	4.90	2.70	1.80	101.	23.0	105.9	12.8	2.13	107.51	
763.000	8,777	12.78	7.42	6.34	3.74	2.41	1.30	0.82	164.	12.7	39.3	15.5	5.32	30.31	
763.000	8,766	13.04	7.36	6.13	3.74	2.35	1.24	0.82	155.	12.5	44.2	15.7	4.31	34.21	
763.000	8,810	13.83	7.34	6.06	3.76	2.41	1.29	0.82	132.	12.7	137.2	14.8	4.09	36.53	
763.000	11,565	18.12	9.86	8.05	4.92	3.19	1.66	1.00	137.	12.3	80.6	15.2	4.46	34.24	
763.000	11,652	18.00	9.90	8.03	4.95	3.05	1.63	1.03	141.	14.2	38.2	15.9	4.23	35.69	
763.000	11,674	18.35	9.90	7.99	5.02	3.04	1.51	1.05	137.	15.7	25.4	16.5	3.54	38.93	
763.000	11,685	18.13	9.94	8.01	5.00	3.43	1.52	1.06	141.	18.1	24.7	15.9	5.73	37.00	
763.000	15,723	25.63	13.78	11.09	6.85	4.64	1.98	1.35	133.	13.0	32.5	16.0	6.17	35.48	

763.000	15,723	23.14	13.65	11.13	6.72	4.31	2.24	1.36	162.	15.5	19.7	15.9	5.28	32.75	
763.000	15,767	23.00	13.63	10.80	6.78	4.18	2.18	1.37	165.	13.7	19.7	16.4	4.44	38.62	
763.000	15,756	23.14	13.65	10.78	6.70	4.33	2.22	1.38	158.	15.7	24.2	15.8	4.91	36.62	
783.000	8,755	20.77	8.85	7.41	4.29	2.06	0.94	0.56	68.	29.1	5.5	18.2	4.46	36.00	*
783.000	8,799	19.68	8.81	7.55	4.39	2.07	0.93	0.56	79.	23.1	5.5	18.4	4.54	36.00	*
783.000	8,766	19.42	8.68	7.40	4.37	2.07	0.94	0.55	79.	26.0	5.5	18.4	4.37	36.00	*
783.000	11,597	26.53	11.27	9.23	5.64	2.50	1.25	0.62	70.	31.1	5.7	18.9	5.02	36.00	*
783.000	11,597	25.83	11.79	9.44	5.63	2.54	1.30	0.68	81.	10.0	13.2	17.9	5.26	32.52	*
783.000	11,597	25.49	11.87	10.28	5.63	2.56	1.30	0.70	86.	13.0	7.4	18.5	7.24	25.61	
783.000	11,619	25.30	12.18	11.22	5.62	2.56	1.42	0.72	89.	10.0	8.6	18.1	9.93	21.63	*
783.000	15,570	38.95	21.96	16.11	7.41	3.22	1.52	0.78	67.	10.0	5.5	18.4	12.05	36.00	*
783.000	15,636	38.96	17.06	14.57	7.45	3.33	1.66	0.89	69.	10.0	8.2	18.5	7.80	36.00	*
783.000	15,646	39.48	16.31	13.24	7.64	3.31	1.68	0.91	62.	19.5	6.3	18.4	5.91	36.00	
783.000	15,668	35.72	16.76	14.22	7.65	3.31	1.66	0.91	83.	10.0	6.8	19.4	7.70	36.00	*
804.000	8,646	25.16	19.74	16.91	12.66	9.35	5.39	3.87	160.	10.0	5.0	3.8	4.16	300.00	*
804.000	8,744	25.57	19.83	17.00	12.67	9.39	5.49	3.91	158.	10.0	5.1	3.9	3.79	300.00	*
804.000	8,744	26.13	19.92	17.09	12.78	9.36	5.59	3.90	153.	10.0	5.0	3.9	3.07	300.00	*
804.000	11,455	38.29	26.00	22.16	16.65	11.97	7.12	4.87	98.	10.0	27.2	3.8	2.39	300.00	*
804.000	11,543	38.22	26.23	22.48	16.81	12.11	7.30	4.96	103.	10.0	24.4	3.8	2.30	300.00	*
804.000	11,576	39.29	26.41	22.66	17.17	12.43	7.39	5.03	94.	10.0	36.9	3.6	2.53	300.00	*
804.000	11,565	39.27	26.62	22.83	17.26	12.42	7.59	5.03	96.	10.0	33.6	3.6	2.08	300.00	*
804.000	15,295	51.77	34.91	29.76	22.57	15.85	9.59	6.32	96.	10.0	27.3	3.8	1.87	300.00	*
804.000	15,339	50.83	35.48	30.23	22.81	15.69	9.74	6.36	106.	10.0	17.8	3.8	1.79	300.00	*
804.000	15,383	51.32	35.79	30.36	22.90	15.90	9.56	6.50	106.	10.0	14.0	3.9	1.91	300.00	*
804.000	15,361	51.50	36.06	30.74	23.06	16.07	9.60	6.42	108.	10.0	11.9	3.9	2.04	300.00	*
845.000	8,657	22.15	20.19	18.03	15.55	10.16	5.85	4.16	238.	10.0	5.0	3.1	8.19	85.17	*
845.000	8,690	23.33	20.39	18.09	15.04	10.39	5.74	4.14	211.	10.0	5.0	3.2	7.07	73.99	*
845.000	8,701	23.46	20.38	18.13	14.96	10.35	5.74	4.15	208.	10.0	5.0	3.2	6.83	74.36	*
845.000	11,411	27.83	26.22	23.87	19.85	13.10	7.61	5.37	260.	10.0	5.0	3.1	9.24	85.90	*
845.000	11,422	25.65	26.43	24.09	20.42	13.19	7.72	5.45	286.	10.3	14.2	2.9	12.15	***	*
845.000	11,510	25.53	26.74	23.78	19.65	13.45	7.69	5.49	269.	21.4	24.9	2.7	12.44	***	*
845.000	11,499	24.26	26.88	23.55	19.70	13.47	7.99	5.81	278.	21.7	20.4	2.8	12.60	***	*
845.000	15,295	33.79	34.85	31.00	25.39	17.26	10.36	7.50	276.	25.9	19.0	2.8	11.57	***	*
845.000	15,361	31.77	35.24	31.21	25.20	17.40	10.63	7.53	284.	20.5	23.8	2.8	12.09	***	*
845.000	15,361	38.88	35.46	32.45	27.59	17.61	10.78	7.52	249.	10.0	5.0	3.0	8.43	104.93	*
845.000	15,328	43.78	35.59	31.49	26.33	17.63	10.69	7.52	189.	10.0	5.0	3.3	3.62	95.97	*
869.000	8,613	26.59	23.04	20.60	15.46	10.32	5.41	3.74	147.	10.0	5.0	3.3	8.30	65.50	*
869.000	8,646	26.20	24.28	20.27	15.26	10.37	5.42	3.74	150.	10.0	5.0	3.3	8.94	300.00	*
869.000	8,668	26.54	23.00	20.14	15.22	10.44	5.45	3.74	149.	10.0	5.0	3.3	7.84	300.00	*
869.000	11,290	39.23	28.65	25.66	19.05	13.89	6.71	4.61	114.	10.0	5.0	3.6	6.00	300.00	*
869.000	11,378	37.99	29.24	25.27	19.19	13.58	6.84	4.86	122.	10.0	5.0	3.6	5.88	300.00	*
869.000	11,367	37.06	28.88	25.68	19.17	12.93	6.89	4.61	127.	10.0	5.0	3.6	5.42	300.00	*
869.000	11,323	34.98	28.98	26.17	19.22	14.57	6.89	4.65	147.	10.0	5.0	3.4	8.97	217.66	*
869.000	15,175	48.30	37.82	33.96	24.55	17.03	8.45	5.78	126.	10.0	5.0	3.8	7.18	164.23	*
869.000	15,230	49.03	38.10	33.33	25.43	17.27	8.50	5.88	124.	10.0	5.0	3.8	6.57	59.39	*
869.000	15,208	49.42	38.93	33.27	25.28	16.42	8.56	5.82	119.	10.0	5.0	3.8	5.73	64.51	*
869.000	15,240	49.41	38.23	32.33	24.93	16.92	8.51	5.79	121.	10.0	5.0	3.9	5.65	60.54	*
901.000	8,624	16.70	11.43	9.01	6.52	4.71	2.93	2.13	156.	10.4	128.1	7.0	3.85	137.28	
901.000	8,624	16.74	11.48	9.02	6.54	4.70	2.90	2.14	154.	10.0	162.9	6.9	3.67	142.65	*
901.000	8,690	17.76	11.52	9.02	6.57	4.71	2.88	2.15	131.	10.5	245.0	6.8	3.33	155.46	
901.000	11,477	24.68	15.50	11.77	8.58	6.13	3.69	2.83	113.	12.1	165.4	7.2	3.55	155.72	

901.000	11,488	24.12	15.88	11.88	8.65	6.19	3.76	2.89	124.	11.3	126.2	7.2	4.12	151.02	
901.000	11,444	23.49	15.65	11.90	8.65	6.19	3.79	2.89	133.	11.1	121.9	7.2	3.93	147.60	
901.000	11,466	22.92	15.61	11.94	8.69	6.21	3.78	2.91	144.	10.0	133.9	7.1	3.83	151.83	*
901.000	15,548	30.77	20.86	15.56	11.50	8.21	5.00	3.97	141.	10.9	134.4	7.3	4.06	206.64	
901.000	15,537	31.37	20.54	15.74	11.65	8.18	5.01	4.08	133.	10.3	219.3	7.1	3.12	223.40	
901.000	15,526	31.59	20.98	15.80	11.69	8.27	4.96	4.16	133.	10.0	195.9	7.2	3.47	216.70	*
901.000	15,559	30.01	21.32	15.78	11.73	8.34	4.99	4.06	161.	10.7	54.7	7.7	4.43	239.17	
922.000	8,723	14.65	10.68	9.76	7.08	4.91	3.13	2.39	264.	14.0	14.1	7.0	2.81	161.56	
922.000	8,679	14.41	10.60	9.70	7.09	4.92	3.14	2.38	283.	11.4	11.6	7.0	2.73	191.02	
922.000	8,712	12.86	10.59	9.59	7.11	4.94	3.13	2.40	376.	10.0	5.0	7.1	4.04	277.01	*
922.000	11,565	16.03	14.24	12.91	9.43	6.52	4.07	3.11	418.	10.0	5.0	6.9	6.36	187.71	*
922.000	11,521	18.46	14.37	13.03	9.48	6.63	4.12	3.16	317.	10.0	6.0	7.2	3.09	170.39	*
922.000	11,576	19.00	14.24	13.35	9.57	6.66	4.16	3.19	300.	10.0	7.8	7.1	2.96	130.84	*
922.000	11,597	18.48	14.20	13.11	9.59	6.66	4.18	3.21	327.	10.0	5.0	7.3	2.69	196.11	*
922.000	15,559	24.06	19.88	18.17	13.21	9.05	5.54	4.27	342.	10.0	5.0	7.0	4.91	172.96	*
922.000	15,581	24.63	20.21	18.04	13.13	9.29	5.68	4.36	334.	10.0	5.0	7.0	4.27	169.35	*
922.000	15,592	25.74	20.11	17.85	13.19	10.56	5.72	4.41	325.	10.0	5.3	6.7	5.09	199.21	*
922.000	15,570	26.19	20.09	18.00	13.28	9.60	5.70	4.44	294.	10.0	8.8	6.7	3.32	228.95	*
965.000	8,777	20.40	7.89	6.09	4.02	2.40	1.50	1.33	57.	100.0	7.1	16.5	7.27	51.55	*
965.000	8,810	21.06	7.95	6.08	3.96	2.39	1.50	1.33	54.	17.0	496.3	13.2	4.06	47.10	
965.000	8,887	21.21	7.85	6.09	4.01	2.39	1.52	1.34	53.	21.0	282.8	13.5	4.29	50.68	
965.000	11,597	24.31	9.98	8.03	5.28	3.22	2.07	1.80	65.	100.0	16.7	14.9	5.94	50.23	*
965.000	11,652	23.60	10.07	7.94	5.22	3.24	2.09	1.83	72.	18.8	484.7	12.9	4.19	49.85	
965.000	11,718	23.80	10.16	7.94	5.19	3.22	2.06	1.84	72.	17.9	500.0	13.1	4.15	47.98	*
965.000	11,729	23.89	10.22	7.92	5.17	3.19	2.11	1.84	72.	18.0	491.8	13.2	4.69	47.57	
965.000	15,636	46.27	13.17	10.69	7.09	4.35	2.90	2.55	34.	35.6	339.2	13.0	5.52	53.24	
965.000	15,745	25.15	13.19	10.66	7.11	4.37	2.97	2.57	120.	16.5	284.9	12.7	4.85	55.38	
965.000	15,701	26.17	13.17	10.64	7.10	4.41	3.01	2.57	108.	17.8	359.8	12.5	4.75	55.45	
965.000	15,778	26.27	13.09	10.62	7.05	4.40	2.98	2.58	107.	16.9	500.0	12.5	4.70	53.33	*
977.000	8,953	12.72	8.18	7.64	5.30	3.56	1.76	1.46	267.	10.1	8.0	12.7	5.20	80.63	
977.000	8,942	12.69	8.12	7.61	5.23	3.46	1.72	1.45	263.	10.1	7.8	13.0	5.08	73.43	
977.000	11,773	16.53	11.57	9.96	6.87	4.80	2.37	1.98	279.	10.2	5.0	13.2	4.46	73.53	*
977.000	11,839	16.40	10.85	9.70	6.67	4.70	2.46	2.00	258.	10.5	26.2	11.5	4.47	71.25	
977.000	11,828	16.37	10.94	9.37	6.57	4.92	2.71	2.00	229.	24.6	41.8	10.3	4.07	84.13	
977.000	11,817	16.45	10.95	9.37	6.51	4.81	2.54	2.02	233.	19.8	32.8	10.8	4.31	76.60	
977.000	15,778	21.31	14.63	12.68	8.68	6.23	3.37	2.80	270.	10.7	26.9	11.4	3.93	67.28	
977.000	15,855	21.72	14.80	12.19	8.79	6.21	3.31	2.83	250.	15.2	23.9	11.4	3.37	126.93	
977.000	15,866	21.93	14.25	11.94	9.04	6.19	3.29	2.82	227.	22.4	34.6	11.0	2.83	300.00	
977.000	15,866	22.59	14.25	11.83	8.69	6.06	3.28	2.80	195.	27.4	43.3	11.1	2.88	181.61	
Mean:		21.37	13.33	11.21	8.20	5.49	3.19	2.37	186.	33.9	94.9	10.8	4.91	91.13	
Std. Dev:		9.17	6.18	5.39	4.31	3.07	1.76	1.21	96.	33.0	135.9	3.8	2.24	56.61	
Var Coeff(%):		42.91	46.36	48.09	52.64	55.96	55.10	51.19	52.	97.5	100.0	35.0	45.58	62.12	

STH29 Section 4

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	11.00	25,000	1,000,000	H1: õ = 0.35
Base:	4.00	10,000	100,000	H2: õ = 0.35
Subbase:	4.00	5,000	500,000	H3: õ = 0.35
Subgrade:	43.70	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
58.000	9,205	27.80	13.10	10.85	8.61	6.04	3.75	3.35	46.	55.5	239.4	3.4	1.14	91.07	
58.000	9,282	41.28	13.30	11.04	8.66	6.06	3.93	3.41	25.	53.5	367.9	3.7	4.74	107.82	*
103.000	8,690	20.35	16.72	15.69	12.97	6.76	4.37	3.23	213.	10.0	5.0	3.0	8.11	77.20	*
103.000	8,712	20.40	16.71	15.41	12.50	6.82	4.37	3.33	214.	10.0	5.0	3.1	6.89	90.26	*
150.000	9,139	8.67	7.59	6.37	4.92	3.63	2.62	2.02	674.	60.9	6.4	5.9	4.86	300.00	
150.000	9,161	7.43	7.60	6.41	4.94	3.65	2.63	2.03	959.	10.0	15.5	5.3	6.40	***	*
174.000	8,975	15.85	10.82	9.08	7.43	5.57	3.83	2.88	166.	31.1	302.5	3.0	1.33	141.12	*
174.000	8,964	15.07	10.70	9.11	7.48	5.56	3.80	2.90	206.	23.8	299.7	3.0	1.08	137.98	*
203.000	8,799	19.89	11.81	9.31	7.33	5.26	2.82	2.63	100.	15.6	320.0	3.8	3.08	62.36	
203.000	8,821	21.76	12.72	9.26	7.40	5.22	2.88	2.59	83.	16.9	265.6	4.0	3.62	65.02	
231.000	8,810	25.65	10.13	9.39	7.47	5.26	3.35	2.98	41.	100.0	372.5	3.7	3.06	102.06	*
282.000	8,920	18.36	7.64	6.70	5.91	3.17	2.44	1.90	61.	100.0	438.7	5.4	6.31	76.74	*
282.000	8,986	17.51	7.78	6.86	6.20	3.19	2.33	1.86	71.	100.0	254.4	5.7	6.41	67.79	*
302.000	8,931	17.10	7.61	6.24	4.61	3.16	1.95	1.80	71.	49.8	500.0	6.3	2.25	205.27	*
302.000	8,953	17.17	7.71	6.37	4.66	3.11	2.00	1.67	73.	45.7	500.0	6.3	2.90	170.60	*
327.000	8,810	22.14	11.40	9.10	7.15	4.33	2.71	2.32	69.	24.4	197.5	4.5	1.38	96.76	
327.000	8,788	18.68	11.07	9.27	7.17	4.37	2.69	2.33	117.	13.1	280.1	4.3	1.40	91.96	
355.000	9,227	11.48	11.41	10.70	5.56	3.69	2.09	1.88	338.	10.0	6.9	6.9	15.27	22.58	*
383.000	8,744	21.22	11.28	9.75	5.88	3.76	2.06	1.76	85.	10.0	269.4	5.5	4.98	33.35	*
383.000	8,766	20.25	11.69	9.85	5.96	3.79	2.08	1.80	100.	10.0	116.3	5.8	5.24	33.71	*
412.000	9,545	19.02	6.63	5.13	4.24	2.57	1.35	0.90	56.	100.0	315.2	9.7	1.67	60.12	*
412.000	9,699	73.79	6.74	5.25	4.29	2.62	1.37	0.92	27.	10.0	500.0	9.0	33.24	59.57	*
439.000	8,920	48.78	15.74	7.11	4.94	2.91	1.72	0.85	25.	10.0	19.0	8.3	21.83	16.19	*
439.000	8,997	53.59	7.86	7.07	4.97	2.89	1.81	0.84	25.	10.0	500.0	7.9	21.68	97.92	*
450.000	8,920	72.56	9.14	7.35	4.93	2.85	1.54	0.98	25.	10.0	37.6	8.3	28.42	59.44	*
476.000	8,964	19.95	11.25	10.14	8.00	4.37	2.70	1.60	115.	10.9	262.6	4.3	4.16	84.24	
476.000	8,953	21.85	11.44	10.61	8.68	4.41	2.64	1.63	79.	100.0	21.3	4.9	5.34	67.58	*
506.000	8,854	29.65	12.86	10.37	7.90	5.39	3.95	2.49	37.	45.8	340.4	3.4	4.48	88.93	*
506.000	8,832	37.20	12.95	10.44	7.91	5.40	4.56	2.51	25.	61.7	366.2	3.7	7.07	300.00	*
521.000	8,942	14.92	12.48	10.24	8.24	4.69	2.29	1.30	258.	10.0	5.5	5.5	7.72	59.33	*
521.000	8,953	14.83	12.49	10.33	8.48	4.75	2.29	1.37	263.	10.0	5.4	5.4	8.59	59.06	*

563.000	8,997	18.46	9.47	7.76	5.45	3.69	1.96	1.51	88.	100.0	23.0	6.9	5.14	90.55	*
563.000	8,986	14.99	9.33	7.86	5.49	3.76	2.01	1.51	164.	14.8	154.1	6.0	3.17	84.98	
617.000	8,766	20.52	10.26	8.00	5.29	3.07	1.43	0.80	77.	17.6	51.2	7.6	2.59	53.42	
617.000	8,854	22.21	10.18	7.95	5.33	3.08	1.44	0.81	62.	29.7	46.4	7.7	2.44	59.31	
639.000	9,019	16.95	8.88	7.13	5.81	3.43	1.28	0.69	101.	99.2	10.1	8.3	6.06	46.07	
639.000	9,041	17.24	7.93	7.12	5.68	3.20	1.27	0.69	88.	100.0	26.4	8.1	7.80	48.48	*
654.000	9,074	17.43	7.69	7.17	4.91	3.05	1.58	1.19	75.	100.0	78.4	7.6	3.95	71.57	*
654.000	9,150	17.87	7.64	6.94	4.76	3.01	1.54	1.14	70.	100.0	99.4	7.8	3.97	71.69	*
680.000	9,227	16.50	8.75	5.64	5.14	2.65	1.46	1.15	98.	23.7	171.0	8.2	4.74	163.04	
680.000	9,282	17.80	8.73	5.49	4.89	2.67	1.46	1.15	80.	24.3	256.2	8.1	4.17	100.12	
692.000	8,613	24.78	9.32	6.34	4.19	2.06	0.89	0.67	47.	10.5	407.7	9.6	1.11	36.00	
692.000	8,646	26.17	9.35	6.23	4.02	2.04	0.91	0.64	41.	15.0	112.8	10.3	2.90	36.00	
751.000	8,251	14.88	11.50	9.10	5.74	3.67	1.27	1.00	171.	10.0	7.4	7.4	11.73	40.06	*
751.000	8,635	16.72	11.78	9.59	6.04	3.65	1.38	1.00	157.	10.0	7.4	7.4	8.47	40.29	*
775.000	8,690	63.69	14.82	13.93	8.17	4.36	1.69	0.88	25.	10.0	9.3	5.7	16.57	31.37	*
805.000	8,481	27.50	13.11	9.73	4.92	2.26	0.88	0.65	52.	10.0	9.3	9.3	8.55	36.00	*
805.000	8,503	33.22	12.80	9.53	4.93	2.25	0.88	0.47	36.	10.0	14.8	9.2	6.79	36.00	*
869.000	8,810	27.52	13.35	12.85	7.19	4.01	2.07	1.98	56.	49.1	5.9	5.9	7.77	27.20	*
900.000	8,569	30.65	22.86	18.85	12.72	8.07	4.35	3.65	96.	10.0	5.0	2.9	4.64	63.58	*
900.000	8,690	42.62	23.04	18.74	12.77	8.09	4.38	3.66	40.	10.0	40.6	2.7	2.87	69.24	*
956.000	8,723	23.86	14.15	13.51	8.42	6.34	3.85	3.09	89.	15.9	118.4	3.2	5.75	37.87	
956.000	8,777	22.89	13.30	11.58	8.39	6.48	3.87	3.20	80.	27.0	179.7	3.0	3.51	142.43	
983.000	8,810	12.85	9.29	7.66	5.98	2.91	1.65	1.10	251.	10.0	8.3	8.3	4.54	56.88	*

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Mean:	24.84	11.22	9.25	6.70	4.13	2.38	1.79	124.	35.8	166.3	6.0	6.74	62.69
Std. Dev:	14.31	3.42	3.08	2.22	1.49	1.08	0.93	157.	34.2	165.0	2.2	6.54	38.47
Var Coeff(%):	57.58	30.50	33.26	33.15	36.06	45.35	51.94	100.	95.3	99.2	36.4	97.05	61.37

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STH96 Section 1

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	9.00	25,000	1,000,000	H1: õ = 0.35
Base:	6.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	20.30	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
313.000	7,987	79.67	56.91	34.04	16.38	1.42	0.90	0.73	25.	5.0	0.0	1.5	65.53	18.09	*
313.000	7,987	79.81	65.30	34.26	16.22	1.33	0.83	0.61	25.	5.0	0.0	1.5	70.47	36.00	*
313.000	7,987	79.81	65.30	34.26	16.22	1.33	0.83	0.61	25.	5.0	0.0	1.5	70.47	36.00	*
438.000	8,053	62.49	13.24	28.53	5.93	3.05	4.70	12.73	25.	19.0	0.0	2.5	45.58	***	*
438.000	8,119	59.64	12.98	28.51	5.97	4.48	2.97	18.78	25.	36.4	0.0	2.2	44.46	***	*
438.000	8,075	64.43	13.49	28.93	6.56	3.22	6.88	17.53	25.	24.0	0.0	2.2	45.48	***	*
438.000	8,075	64.43	13.49	28.93	6.56	3.22	6.88	17.53	25.	24.0	0.0	2.2	45.48	***	*
450.000	8,591	69.85	42.40	30.01	16.70	4.32	1.39	0.31	32.	5.0	0.0	1.4	19.40	25.30	*
450.000	8,613	70.59	42.88	30.62	16.69	4.27	1.47	0.38	32.	5.0	0.0	1.4	20.72	24.10	*
450.000	8,668	71.19	43.32	30.76	16.83	3.94	1.43	0.44	31.	5.0	0.0	1.4	22.97	24.31	*
450.000	8,668	71.19	43.32	30.76	16.83	3.94	1.43	0.44	31.	5.0	0.0	1.4	22.97	24.31	*
608.000	8,295	74.94	45.17	30.70	19.31	4.82	0.27	0.94	25.	5.0	0.0	1.4	17.78	36.00	*
608.000	8,284	75.75	45.12	30.57	19.15	4.17	0.03	0.63	25.	5.0	0.0	1.5	64.01	36.00	*
608.000	8,317	76.38	45.60	30.85	19.36	4.16	0.26	0.73	25.	5.0	0.0	1.4	19.78	36.00	*
608.000	8,317	76.38	45.60	30.85	19.36	4.16	0.26	0.73	25.	5.0	0.0	1.4	19.78	36.00	*
640.000	8,755	50.98	32.81	22.54	14.70	5.48	1.78	1.84	58.	5.7	0.0	1.6	8.24	35.85	
640.000	8,777	51.34	32.86	23.56	14.97	5.61	1.84	1.63	60.	5.0	0.0	1.6	8.43	36.16	
640.000	8,733	51.35	33.62	21.15	14.43	5.88	2.14	1.50	47.	10.5	0.0	1.5	9.08	38.64	
640.000	8,733	51.35	33.62	21.15	14.43	5.88	2.14	1.50	47.	10.5	0.0	1.5	9.08	38.64	
640.000	11,554	64.95	41.99	29.15	18.81	8.12	3.00	2.16	53.	10.8	0.0	1.5	7.42	42.19	
658.000	8,909	41.30	28.90	22.52	13.42	5.26	1.65	0.76	83.	5.0	0.0	1.8	7.90	32.46	*
658.000	8,898	42.50	27.60	22.11	13.61	5.35	1.78	0.78	83.	5.0	0.0	1.8	6.97	37.31	*
658.000	8,953	46.35	27.61	23.35	13.77	5.44	1.63	0.82	69.	6.3	0.0	1.8	7.14	31.84	
658.000	8,953	46.35	27.61	23.35	13.77	5.44	1.63	0.82	69.	6.3	0.0	1.8	7.14	31.84	
658.000	11,740	69.33	36.28	29.85	18.04	7.17	2.31	1.07	38.	16.5	0.0	1.6	6.18	34.70	
658.000	11,729	68.76	36.61	30.68	18.58	7.39	2.30	1.14	41.	14.6	0.0	1.6	5.77	35.12	
658.000	11,707	50.28	36.65	30.08	18.86	7.52	2.55	1.58	99.	5.0	0.0	1.7	6.76	40.16	*
658.000	11,696	72.29	36.54	30.43	19.04	7.59	2.62	1.35	33.	19.5	0.0	1.5	5.70	40.29	
658.000	15,943	63.11	48.71	41.07	25.76	10.37	3.55	1.76	112.	5.0	0.0	1.7	8.93	40.93	*
658.000	15,877	62.80	50.85	42.56	26.70	10.69	3.57	1.85	111.	5.0	0.0	1.6	11.09	40.51	*
658.000	15,822	73.93	51.85	43.49	27.13	10.90	3.56	1.69	90.	5.0	0.0	1.6	6.06	40.01	*

658.000	15,767	76.52	52.58	43.87	27.37	11.00	3.58	1.82	85.	5.0	0.0	1.6	5.28	39.93	*
686.000	8,964	35.09	24.49	18.05	12.85	5.12	2.41	1.10	117.	5.6	0.0	1.9	7.50	40.55	
686.000	8,898	35.37	24.69	18.18	12.87	5.12	2.39	1.12	114.	5.7	0.0	1.9	7.63	40.40	
686.000	8,909	35.43	24.73	18.21	12.91	5.15	2.39	1.12	117.	5.0	0.0	1.9	7.48	40.54	*
686.000	8,909	35.43	24.73	18.21	12.91	5.15	2.39	1.12	117.	5.0	0.0	1.9	7.48	40.54	*
686.000	11,740	46.46	32.41	24.16	16.63	6.65	3.17	1.41	117.	5.0	0.0	1.9	8.48	40.49	
686.000	11,773	47.98	33.91	25.00	17.03	6.98	3.30	1.46	113.	5.0	0.0	1.9	8.64	41.38	*
686.000	11,762	48.54	34.34	25.38	17.50	7.13	3.33	1.49	112.	5.0	0.0	1.8	8.17	41.21	
686.000	11,740	49.03	34.77	25.53	17.85	7.30	3.37	1.55	110.	5.1	0.0	1.8	7.67	41.44	
686.000	15,932	66.51	47.11	35.28	23.94	9.80	4.53	1.96	110.	5.1	0.0	1.8	8.31	41.39	
686.000	15,899	68.80	48.93	36.10	25.08	10.31	4.69	2.12	106.	5.0	0.0	1.7	7.58	41.61	*
686.000	15,888	70.11	49.26	36.96	25.26	10.25	4.72	2.15	103.	5.0	0.0	1.7	8.09	40.96	*
686.000	15,833	70.63	49.65	36.90	25.98	10.48	4.74	2.26	102.	5.0	0.0	1.7	7.17	40.87	*
701.000	8,887	36.58	22.71	15.72	8.65	5.24	1.87	1.10	57.	25.1	0.0	2.0	10.74	24.82	
701.000	8,964	36.68	23.78	15.90	8.48	5.28	1.87	1.12	62.	20.7	0.0	2.1	13.21	23.02	
701.000	8,931	36.93	24.02	16.11	8.80	5.35	1.90	1.12	60.	22.0	0.0	2.0	11.73	24.26	
701.000	8,931	36.93	24.02	16.11	8.80	5.35	1.90	1.12	60.	22.0	0.0	2.0	11.73	24.26	
701.000	11,685	47.98	33.23	21.62	12.40	7.28	2.61	1.41	68.	18.9	0.0	1.9	10.73	27.32	
701.000	11,674	48.69	33.11	22.15	12.58	7.43	2.65	1.48	66.	19.3	0.0	1.9	10.51	26.69	
701.000	11,696	49.18	32.92	22.39	12.97	7.50	2.66	1.52	66.	19.3	0.0	1.9	9.50	28.35	
701.000	11,729	49.72	33.18	22.62	13.19	7.57	2.69	1.53	66.	19.1	0.0	1.8	9.25	28.95	
701.000	15,866	66.19	45.14	31.46	20.04	10.50	3.77	2.04	80.	14.7	0.0	1.8	5.98	41.97	
701.000	15,800	67.63	45.69	32.85	20.93	10.72	3.90	2.13	81.	13.6	0.0	1.7	5.46	42.39	
701.000	15,745	67.82	46.19	33.25	21.22	10.83	3.93	2.19	83.	12.5	0.0	1.7	5.45	42.77	
701.000	15,811	68.57	45.85	33.85	21.34	10.93	3.94	2.19	81.	13.1	0.0	1.7	5.24	40.35	
723.000	8,964	37.21	22.63	15.93	11.28	5.29	1.89	1.06	62.	23.1	0.0	1.9	3.08	45.00	
723.000	8,942	37.28	22.58	16.05	11.36	5.15	1.87	1.08	63.	22.2	0.0	1.9	3.28	45.62	
723.000	8,964	36.86	22.50	16.29	11.48	5.04	1.88	1.11	67.	20.7	0.0	1.9	3.55	45.79	
723.000	8,964	36.86	22.50	16.29	11.48	5.04	1.88	1.11	67.	20.7	0.0	1.9	3.55	45.79	
723.000	11,729	48.65	30.56	21.76	15.24	6.86	2.47	1.37	71.	18.3	0.0	1.9	3.74	45.31	
723.000	11,674	49.68	31.71	22.42	15.68	7.21	2.52	1.43	72.	16.7	0.0	1.8	3.56	44.41	
723.000	11,619	51.07	32.50	22.83	15.94	7.27	2.55	1.44	69.	16.3	0.0	1.8	3.89	44.37	
723.000	11,597	50.34	32.52	23.00	16.04	7.14	2.57	1.48	74.	14.4	0.0	1.8	4.38	45.08	
723.000	15,712	68.43	45.12	31.54	21.79	10.45	3.56	1.96	76.	14.1	0.0	1.7	3.73	43.37	
723.000	15,646	74.99	46.63	32.80	22.46	11.02	3.57	1.97	58.	17.3	0.0	1.6	3.40	42.28	
723.000	15,592	75.25	46.75	33.44	22.78	11.14	3.61	2.00	59.	16.6	0.0	1.6	3.00	42.41	
723.000	15,548	75.82	47.35	33.89	23.16	10.61	3.68	2.10	60.	15.4	0.0	1.6	3.56	43.89	
734.000	8,810	46.59	29.65	20.94	12.87	5.71	1.97	1.18	55.	11.3	0.0	1.6	7.62	35.58	
734.000	8,832	47.22	29.74	21.51	12.84	5.70	2.00	1.20	54.	11.3	0.0	1.6	8.31	31.89	
734.000	8,832	47.57	30.06	21.90	13.12	5.68	2.05	1.26	55.	10.7	0.0	1.6	8.72	32.38	
734.000	8,832	47.57	30.06	21.90	13.12	5.68	2.05	1.26	55.	10.7	0.0	1.6	8.72	32.38	
734.000	11,652	61.37	42.54	29.26	17.82	7.65	2.60	1.54	71.	5.0	0.0	1.7	9.34	33.91	*
734.000	11,652	62.92	43.46	32.88	18.11	9.12	2.67	1.58	72.	5.0	0.0	1.6	7.74	25.02	*
734.000	11,619	64.22	43.80	31.54	18.62	8.79	2.71	1.62	69.	5.0	0.0	1.6	7.39	30.27	*
734.000	11,597	65.01	44.74	30.66	18.63	8.55	2.73	1.64	67.	5.0	0.0	1.6	8.05	33.25	*
759.000	8,832	39.27	24.47	17.57	11.10	3.96	3.70	1.26	55.	21.9	0.0	1.8	18.50	35.36	
759.000	8,898	40.22	25.07	18.01	11.48	4.03	3.10	1.19	55.	19.3	0.0	1.8	16.70	34.95	
759.000	8,865	41.00	25.58	18.39	11.63	4.06	1.45	1.32	68.	8.3	0.0	2.1	10.13	34.71	
759.000	8,865	41.00	25.58	18.39	11.63	4.06	1.45	1.32	68.	8.3	0.0	2.1	10.13	34.71	
759.000	11,773	53.74	33.16	23.85	15.12	5.28	3.59	1.94	56.	17.8	0.0	1.9	15.67	34.78	
759.000	11,718	55.86	34.48	24.71	15.67	5.54	1.35	2.06	70.	5.8	0.0	2.2	6.34	35.02	

759.000	11,685	56.98	35.20	25.13	15.96	5.56	1.22	2.09	69.	5.0	0.0	2.2	5.64	36.00 *
759.000	11,729	58.62	35.97	25.58	16.25	5.73	3.09	3.14	53.	13.7	0.0	1.8	13.38	34.82
759.000	15,932	77.63	46.85	33.51	21.59	7.79	5.04	3.62	52.	17.8	0.0	1.8	14.25	35.70
759.000	15,855	78.42	48.72	34.74	22.39	8.06	4.88	3.59	51.	17.0	0.0	1.7	13.87	35.52
767.000	8,613	61.69	40.62	26.17	15.75	3.45	1.06	0.69	36.	5.0	0.0	1.6	21.57	25.99 *
767.000	8,602	62.87	41.64	26.60	16.10	3.42	1.20	0.90	35.	5.0	0.0	1.6	23.11	25.68 *
767.000	8,613	63.50	42.50	26.76	15.70	3.40	1.19	0.83	35.	5.0	0.0	1.6	24.23	25.54 *
767.000	8,613	63.50	42.50	26.76	15.70	3.40	1.19	0.83	35.	5.0	0.0	1.6	24.23	25.54 *
767.000	11,367	79.60	52.06	33.23	19.15	3.85	1.46	1.13	36.	5.0	0.0	1.7	27.27	25.28 *
791.000	9,030	27.82	17.52	11.62	7.14	2.57	0.49	0.35	105.	8.0	0.0	3.6	6.76	36.00
791.000	8,975	27.96	17.38	11.69	7.17	2.58	0.48	0.43	104.	8.0	0.0	3.6	6.35	36.00
791.000	9,041	28.41	17.50	11.83	7.28	2.61	0.46	0.40	104.	7.5	0.0	3.6	5.85	36.00
791.000	9,041	28.41	17.50	11.83	7.28	2.61	0.46	0.40	104.	7.5	0.0	3.6	5.85	36.00
791.000	11,927	38.07	25.04	16.15	9.84	3.45	0.67	0.76	109.	5.0	0.0	3.7	8.72	36.00 *
791.000	11,916	39.46	25.33	16.56	10.09	3.58	0.73	0.68	100.	6.7	0.0	3.4	8.34	36.00
791.000	11,927	40.05	26.82	16.96	10.35	3.65	0.69	0.69	102.	5.0	0.0	3.5	8.80	36.00 *
791.000	11,938	40.34	26.29	17.17	10.48	3.70	0.74	0.65	103.	5.0	0.0	3.5	8.35	36.00 *
791.000	16,162	54.45	47.89	25.69	15.37	5.26	1.13	1.09	97.	5.0	0.0	3.0	12.80	36.00 *
791.000	16,151	60.37	46.17	26.04	15.54	5.31	1.35	1.02	88.	5.0	0.0	2.9	14.93	36.00 *
811.000	8,679	57.83	39.96	29.59	19.11	4.64	1.04	0.33	43.	5.0	0.0	1.4	14.68	28.05 *
811.000	8,591	58.17	51.22	29.81	18.60	4.75	1.02	0.37	39.	5.0	0.0	1.4	18.60	26.02 *
811.000	8,679	58.35	40.87	30.08	18.59	4.85	1.24	0.29	43.	5.0	0.0	1.4	12.28	28.43 *
811.000	8,679	58.35	40.87	30.08	18.59	4.85	1.24	0.29	43.	5.0	0.0	1.4	12.28	28.43 *
811.000	11,400	73.33	49.88	39.74	24.59	6.10	0.96	0.33	43.	5.0	0.0	1.5	19.09	36.00 *
811.000	11,301	73.93	51.66	39.95	26.41	6.27	1.03	0.43	43.	5.0	0.0	1.5	20.90	36.00 *
811.000	11,301	73.44	51.58	40.64	25.57	8.86	1.02	0.46	46.	5.0	0.0	1.4	20.75	36.00 *
811.000	11,301	72.91	51.61	41.59	26.37	6.35	1.03	0.43	44.	5.0	0.0	1.4	23.40	36.00 *
834.000	8,997	31.18	17.16	11.52	6.85	2.31	0.62	0.33	64.	19.7	0.0	3.4	11.35	36.00
834.000	9,052	31.19	17.38	11.68	6.95	2.21	0.61	0.41	67.	17.4	0.0	3.4	12.80	36.00
834.000	9,041	31.12	17.57	11.81	7.05	2.20	0.64	0.38	70.	16.3	0.0	3.4	13.48	36.00
834.000	9,041	31.12	17.57	11.81	7.05	2.20	0.64	0.38	70.	16.3	0.0	3.4	13.48	36.00
834.000	12,025	40.77	23.57	15.88	9.52	2.91	0.69	0.63	79.	12.3	0.0	3.5	12.52	36.00
834.000	12,003	41.19	24.11	16.30	9.80	2.99	0.76	0.83	81.	11.1	0.0	3.4	12.90	36.00
834.000	12,025	41.79	24.52	16.61	9.99	3.06	0.78	0.67	81.	10.8	0.0	3.3	12.74	36.00
834.000	12,025	42.39	24.78	16.82	10.11	3.31	0.79	0.62	78.	11.6	0.0	3.2	10.82	36.00
834.000	16,327	56.81	34.00	23.33	14.16	4.17	0.84	1.25	89.	7.1	0.0	3.5	11.52	36.00
834.000	16,316	58.75	34.92	24.10	14.69	4.26	0.90	0.69	84.	7.6	0.0	3.3	11.71	36.00
834.000	16,261	59.84	35.60	24.61	15.00	4.30	0.93	0.90	83.	7.3	0.0	3.2	12.13	36.00
834.000	16,261	60.88	35.95	24.86	15.13	4.49	0.95	0.60	80.	8.0	0.0	3.1	11.14	36.00
848.000	8,876	43.81	21.72	26.81	7.54	2.20	6.70	0.46	50.	8.9	0.0	2.6	37.90	***
848.000	8,854	43.81	22.02	13.83	7.83	2.37	4.37	0.38	31.	27.9	0.0	2.6	25.98	27.34
848.000	8,909	43.84	22.20	13.75	8.01	2.47	4.25	0.38	31.	29.4	0.0	2.5	25.18	29.64
848.000	8,909	43.84	22.20	13.75	8.01	2.47	4.25	0.38	31.	29.4	0.0	2.5	25.18	29.64
848.000	11,619	56.39	29.53	19.22	10.19	2.78	5.34	0.48	36.	18.4	0.0	2.7	27.70	23.57
848.000	11,586	58.09	30.38	19.65	10.69	3.01	0.47	0.57	40.	12.4	0.0	2.8	17.77	36.00
848.000	11,554	58.64	31.07	42.87	11.02	3.13	0.54	0.63	56.	5.0	0.0	2.6	32.03	*** *
848.000	11,586	59.63	31.38	20.58	11.21	3.16	0.64	0.65	39.	12.2	0.0	2.7	18.32	36.00
848.000	15,778	77.74	42.29	27.69	14.66	3.65	0.56	0.48	44.	9.9	0.0	2.9	23.58	36.00
848.000	15,734	79.89	43.44	29.01	15.33	3.86	0.72	0.65	44.	9.5	0.0	2.7	23.11	36.00
912.000	8,788	55.69	27.64	15.84	7.84	2.35	0.82	0.58	28.	8.3	0.0	2.8	25.73	36.00
912.000	8,777	56.51	28.06	16.05	7.93	2.85	0.85	0.60	25.	12.7	0.0	2.5	21.13	36.00 *

912.000	8,777	56.09	28.04	16.17	7.92	2.40	0.89	0.63	26.	9.9	0.0	2.6	25.23	36.00	
912.000	8,777	56.09	28.04	16.17	7.92	2.40	0.89	0.63	26.	9.9	0.0	2.6	25.23	36.00	
912.000	11,586	72.59	36.44	21.46	11.04	3.71	1.01	0.76	25.	13.9	0.0	2.4	19.67	36.00	
912.000	11,586	74.00	38.70	22.16	11.67	3.96	1.11	0.78	26.	13.2	0.0	2.3	19.60	36.00	
912.000	11,521	74.37	38.73	22.35	11.72	4.03	1.14	0.82	26.	13.3	0.0	2.3	19.32	36.00	
912.000	11,565	75.54	38.52	22.74	12.00	4.40	1.18	0.86	25.	14.3	0.0	2.2	17.00	36.00	*

Mean:	55.87	34.78	25.02	14.88	5.44	2.11	1.57	63.	11.0	0.0	2.1	15.00	35.27	
Std. Dev:	14.58	11.18	7.97	5.42	2.54	1.45	2.71	27.	6.8	0.0	0.7	12.73	6.88	
Var Coeff(%):	26.10	32.15	31.84	36.41	46.71	68.59	99.99	44.	62.1	0.0	31.8	84.92	19.51	

STH96 Section 2

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	9.00	25,000	1,000,000	H1: õ = 0.35
Base:	6.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	26.40	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
377.000	8,251	79.49	54.79	43.08	28.95	11.76	2.56	0.16	31.	5.0	0.0	1.0	12.69	36.19	*
377.000	8,295	79.87	55.15	42.89	29.17	12.10	2.50	0.27	31.	5.0	0.0	1.0	12.82	35.84	*
398.000	8,284	69.96	48.73	38.45	25.79	11.26	3.04	1.58	41.	5.0	0.0	1.1	8.03	38.55	*
398.000	8,338	70.63	49.26	38.96	26.13	11.41	3.09	1.57	41.	5.0	0.0	1.1	8.09	38.58	*
398.000	8,306	70.76	49.46	39.21	26.33	11.50	3.13	1.63	41.	5.0	0.0	1.1	8.23	38.63	*
425.000	8,415	63.22	46.90	37.44	27.94	15.15	5.35	2.15	65.	5.0	0.0	0.9	4.68	43.91	*
425.000	8,393	63.55	47.16	37.66	27.71	15.24	5.36	2.20	64.	5.0	0.0	0.9	4.71	43.42	*
425.000	8,426	63.98	47.47	37.94	27.96	15.32	5.35	2.17	64.	5.0	0.0	0.9	4.78	43.34	*
447.000	8,514	48.41	37.94	31.49	23.52	12.85	5.77	2.46	105.	5.0	0.0	1.1	3.27	53.65	*
447.000	8,547	48.69	38.21	31.76	23.71	12.91	5.82	2.54	105.	5.0	0.0	1.1	3.37	53.89	*
447.000	8,536	48.88	38.35	32.20	23.80	12.95	5.85	2.54	104.	5.0	0.0	1.1	3.53	53.97	*
447.000	11,356	63.78	50.47	41.15	31.51	17.30	7.86	3.42	109.	5.0	0.0	1.1	3.09	54.41	*
447.000	11,323	65.07	51.69	42.11	32.46	17.78	8.08	3.54	107.	5.0	0.0	1.0	3.32	54.47	*
447.000	11,312	65.83	52.43	42.66	32.98	18.10	8.20	3.61	105.	5.0	0.0	1.0	3.41	54.26	*
447.000	11,312	66.32	52.92	42.73	33.21	18.23	8.28	3.68	104.	5.0	0.0	1.0	3.30	54.27	*

474.000	8,690	42.69	30.98	23.86	14.91	6.91	2.07	1.10	81.	5.0	0.0	2.0	6.26	38.83 *
474.000	8,668	42.87	31.08	23.96	14.95	6.94	2.10	1.11	81.	5.0	0.0	2.0	6.16	38.54 *
474.000	8,679	43.39	31.39	24.35	15.07	7.04	2.14	1.12	80.	5.0	0.0	2.0	6.20	37.12 *
474.000	11,554	56.74	41.61	32.72	20.49	9.55	2.79	1.22	82.	5.0	0.0	1.9	7.12	39.40 *
474.000	11,532	58.21	42.68	33.41	21.13	9.86	2.93	1.26	80.	5.0	0.0	1.9	6.82	41.28 *
474.000	11,499	58.87	43.65	36.17	21.63	10.01	2.96	1.21	78.	5.0	0.0	1.8	8.87	32.65 *
474.000	11,455	59.55	44.28	35.70	21.59	10.13	3.00	1.13	77.	5.0	0.0	1.8	8.34	33.79 *
474.000	15,734	79.08	59.90	48.79	29.83	14.18	4.15	1.37	82.	5.0	0.0	1.8	8.88	35.42 *
497.000	8,558	60.20	37.38	28.85	17.77	9.41	2.39	0.81	49.	5.8	0.0	1.5	4.97	35.26
497.000	8,569	60.70	37.66	29.13	17.91	9.19	2.38	0.87	49.	5.3	0.0	1.6	4.30	35.09
497.000	8,580	61.06	38.07	29.46	18.18	9.08	2.41	0.86	49.	5.0	0.0	1.6	3.73	35.70 *
497.000	11,345	78.53	49.83	38.94	24.43	12.02	3.12	0.98	52.	5.0	0.0	1.6	4.47	38.73 *
497.000	11,334	79.93	76.71	39.89	25.22	11.62	3.46	1.09	45.	5.0	0.0	1.4	11.64	21.44 *
574.000	8,569	47.17	37.92	29.92	21.50	9.82	3.44	1.37	83.	5.0	0.0	1.4	8.70	44.84 *
574.000	8,525	47.63	38.15	30.11	21.65	9.87	3.43	1.37	82.	5.0	0.0	1.4	8.72	44.65 *
574.000	8,536	48.15	38.32	30.30	21.78	9.92	3.40	1.38	80.	5.0	0.0	1.4	8.69	44.39 *
574.000	11,400	64.12	50.40	40.45	29.31	13.64	4.66	2.00	82.	5.0	0.0	1.3	8.23	44.70 *
574.000	11,345	66.18	51.99	41.77	30.28	14.12	4.77	2.24	79.	5.0	0.0	1.3	8.40	44.34 *
574.000	11,345	67.33	53.27	42.62	30.96	14.50	4.88	2.17	77.	5.0	0.0	1.3	8.58	44.10 *
574.000	11,334	68.00	53.18	43.25	31.33	14.49	4.84	2.00	76.	5.0	0.0	1.2	8.84	44.26 *
602.000	8,547	56.02	36.89	26.80	17.61	7.45	1.76	0.90	51.	5.0	0.0	1.7	4.58	37.84 *
602.000	8,503	56.57	37.26	27.13	17.84	7.53	1.80	0.89	50.	5.0	0.0	1.7	4.66	37.90 *
602.000	8,481	56.95	37.61	27.38	18.00	7.57	1.78	0.87	49.	5.0	0.0	1.7	4.99	37.72 *
602.000	11,345	74.81	49.17	36.37	24.26	10.31	2.37	1.09	51.	5.0	0.0	1.7	5.19	37.96 *
602.000	11,345	76.98	51.03	37.77	25.19	10.67	2.50	1.15	49.	5.0	0.0	1.6	5.44	37.96 *
602.000	11,312	76.96	52.33	38.62	25.87	11.01	2.60	1.18	50.	5.0	0.0	1.6	6.27	37.89 *
602.000	11,312	78.28	53.52	39.19	26.24	11.14	2.58	1.16	48.	5.0	0.0	1.6	6.69	37.55 *
625.000	8,613	46.13	33.75	25.93	17.85	8.91	3.47	1.57	88.	5.0	0.0	1.6	3.27	46.37 *
625.000	8,602	46.61	34.07	26.04	18.02	8.96	3.49	1.58	86.	5.0	0.0	1.6	3.23	46.35 *
625.000	11,455	61.12	44.84	34.05	23.95	11.94	4.38	2.05	87.	5.0	0.0	1.6	3.00	45.04 *
625.000	11,455	62.97	45.85	35.04	24.72	12.44	4.55	2.19	85.	5.0	0.0	1.5	2.76	44.97 *
625.000	11,411	63.96	46.59	35.54	24.91	12.69	4.59	2.27	83.	5.0	0.0	1.5	2.82	44.45 *
625.000	11,411	64.82	46.95	35.85	25.15	12.39	4.62	2.32	80.	5.0	0.0	1.5	2.75	45.30 *
665.000	8,602	51.76	29.83	21.91	13.81	6.61	1.23	0.38	48.	7.3	0.0	2.2	5.14	40.02
665.000	8,602	52.06	30.18	21.97	13.91	6.70	1.24	0.40	49.	7.0	0.0	2.1	5.09	40.79
665.000	8,580	52.03	30.43	22.11	14.07	6.85	1.33	0.40	48.	7.4	0.0	2.1	5.13	41.79
665.000	11,499	66.91	39.96	29.17	18.66	8.93	1.57	0.26	56.	5.2	0.0	2.2	5.50	43.21
665.000	11,411	67.06	40.67	29.79	19.17	9.19	1.68	0.33	57.	5.0	0.0	2.2	5.61	44.63 *
665.000	11,433	66.71	41.15	30.17	19.41	9.27	1.69	0.36	58.	5.0	0.0	2.1	6.33	44.55 *
665.000	11,378	66.74	41.28	30.28	19.54	9.33	1.70	0.39	57.	5.0	0.0	2.1	6.47	45.33 *
678.000	8,525	52.85	34.96	24.14	15.05	5.56	0.64	0.45	45.	5.0	0.0	2.2	12.77	36.00 *
678.000	8,503	53.26	35.37	24.40	15.24	5.66	0.62	0.43	44.	5.0	0.0	2.2	14.08	36.00 *
678.000	8,591	53.94	35.67	24.67	15.42	5.71	0.70	0.51	44.	5.0	0.0	2.2	11.97	36.00 *
678.000	11,323	68.69	45.99	31.57	19.96	7.37	0.71	0.31	45.	5.0	0.0	2.3	16.94	36.00 *
678.000	11,224	70.22	47.66	32.50	20.60	7.51	0.81	0.39	44.	5.0	0.0	2.2	15.51	36.00 *
678.000	11,257	71.01	47.78	32.85	20.81	7.55	0.87	0.52	44.	5.0	0.0	2.1	14.28	36.00 *
678.000	11,246	71.83	48.75	33.24	21.11	7.60	0.87	0.55	43.	5.0	0.0	2.1	14.89	36.00 *
708.000	8,382	70.13	44.20	33.05	19.93	5.82	1.05	0.81	30.	5.0	0.0	1.6	13.74	29.40 *
708.000	8,426	69.70	44.42	33.41	20.08	5.89	1.08	0.87	31.	5.0	0.0	1.6	14.13	29.48 *
708.000	8,426	70.02	44.70	33.93	20.21	5.94	1.19	0.97	31.	5.0	0.0	1.6	13.30	29.49 *
1005.000	8,503	51.25	37.79	30.18	22.75	9.79	3.93	2.67	77.	5.0	0.0	1.3	5.69	45.40 *

1005.000	8,503	51.83	37.70	30.52	21.08	9.92	3.93	2.73	75.	5.0	0.0	1.3	4.02	47.52	*
1005.000	8,514	52.00	38.17	30.63	21.10	9.96	4.01	2.71	75.	5.0	0.0	1.3	4.12	47.71	*
1005.000	11,246	65.93	48.80	38.97	26.59	12.97	5.21	3.52	80.	5.0	0.0	1.4	4.10	47.39	*
1005.000	11,312	67.73	50.92	39.86	27.11	13.24	5.32	3.56	77.	5.0	0.0	1.3	4.45	46.76	*
1005.000	11,312	68.57	51.64	40.54	27.08	13.45	5.40	3.63	76.	5.0	0.0	1.3	4.62	46.30	*
1005.000	11,235	69.05	51.78	40.61	27.60	13.47	5.39	3.61	75.	5.0	0.0	1.3	4.48	46.52	*
Mean:		62.25	44.15	33.74	22.79	10.60	3.31	1.53	66.	5.1	0.0	1.6	6.99	41.44	
Std. Dev:		10.07	8.27	6.32	5.15	3.19	1.91	1.01	22.	0.5	0.0	0.4	3.70	7.42	
Var Coeff(%):		16.17	18.73	18.72	22.61	30.11	57.76	65.92	33.	9.1	0.0	25.4	52.90	17.91	

STH 96 Section 3

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	9.00	25,000	1,000,000	H1: õ = 0.35
Base:	6.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	29.40	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
48.000	8,196	77.60	62.00	48.10	31.22	14.46	0.06	1.81	25.	5.0	0.0	2.1	274.58	36.00	*
48.000	8,196	77.80	70.44	48.37	31.23	14.51	0.11	1.86	25.	5.0	0.0	1.9	204.96	36.00	*
71.000	8,481	50.93	36.91	28.15	19.58	10.76	5.28	3.06	74.	8.6	0.0	1.4	4.92	36.00	
71.000	8,503	50.96	36.84	28.06	19.48	10.65	5.24	3.05	74.	8.3	0.0	1.4	5.06	36.00	
71.000	8,448	50.62	36.60	27.86	19.30	10.50	5.17	3.02	73.	8.7	0.0	1.4	5.17	36.00	
71.000	8,448	50.62	36.60	27.86	19.30	10.50	5.17	3.02	73.	8.7	0.0	1.4	5.17	36.00	
71.000	11,235	64.83	46.20	35.48	24.71	13.62	6.80	4.02	72.	11.1	0.0	1.4	4.88	36.00	
71.000	11,224	65.35	46.41	35.60	24.81	13.64	6.81	4.07	70.	11.5	0.0	1.4	4.89	36.00	
71.000	11,191	65.76	46.56	35.69	24.85	13.72	6.83	4.13	68.	11.7	0.0	1.4	4.84	36.00	
71.000	11,224	65.83	46.60	35.66	24.87	13.59	6.80	4.13	69.	11.5	0.0	1.4	4.96	36.00	
178.000	8,064	76.37	60.35	48.31	34.60	17.36	7.44	3.49	48.	5.0	0.0	0.8	6.03	36.00	*
178.000	8,031	76.20	59.74	48.70	34.60	17.31	7.46	3.63	48.	5.0	0.0	0.8	6.12	36.00	*
178.000	8,075	76.27	59.17	50.32	34.60	17.35	7.50	3.62	48.	5.0	0.0	0.8	6.55	36.00	*
178.000	8,075	76.27	59.17	50.32	34.60	17.35	7.50	3.62	48.	5.0	0.0	0.8	6.55	36.00	*
216.000	8,108	78.01	58.26	45.65	33.88	18.26	7.54	4.26	48.	5.0	0.0	0.8	2.97	36.00	*

216.000	8,119	77.60	58.59	45.84	34.15	18.19	7.63	4.34	49.	5.0	0.0	0.8	3.23	36.00	*
216.000	8,119	77.00	58.60	45.85	34.17	18.16	7.65	4.35	50.	5.0	0.0	0.8	3.45	36.00	*
216.000	8,119	77.00	58.60	45.85	34.17	18.16	7.65	4.35	50.	5.0	0.0	0.8	3.45	36.00	*
276.000	8,075	67.91	50.14	38.17	27.90	14.22	5.26	3.91	51.	5.0	0.0	1.0	3.69	36.00	*
276.000	8,064	67.85	50.03	38.08	27.78	14.24	5.30	3.91	51.	5.0	0.0	1.0	3.53	36.00	*
276.000	8,108	67.47	50.49	37.85	27.70	14.04	5.27	3.91	51.	5.0	0.0	1.0	3.86	36.00	*
276.000	8,108	67.47	50.49	37.85	27.70	14.04	5.27	3.91	51.	5.0	0.0	1.0	3.86	36.00	*
329.000	8,196	69.62	49.12	38.55	27.22	13.81	5.41	2.60	50.	5.0	0.0	1.1	2.65	36.00	*
329.000	8,229	70.14	49.58	38.89	27.32	13.96	5.42	2.67	50.	5.0	0.0	1.1	2.78	36.00	*
329.000	8,229	70.24	49.52	38.93	27.20	13.91	5.31	2.60	49.	5.0	0.0	1.1	2.93	36.00	*
329.000	8,229	70.24	49.52	38.93	27.20	13.91	5.31	2.60	49.	5.0	0.0	1.1	2.93	36.00	*
424.000	8,218	66.86	42.68	32.09	17.63	4.97	1.89	2.76	31.	5.0	0.0	1.9	16.05	36.00	*
424.000	8,251	67.36	42.94	33.82	17.81	5.00	1.92	2.74	31.	5.0	0.0	1.8	16.73	36.00	*
424.000	8,338	67.46	43.39	32.56	17.85	4.97	1.90	2.70	31.	5.0	0.0	1.9	16.40	36.00	*
424.000	8,338	67.46	43.39	32.56	17.85	4.97	1.90	2.70	31.	5.0	0.0	1.9	16.40	36.00	*
533.000	8,141	61.03	33.74	25.19	14.78	4.76	1.50	1.71	35.	5.0	0.0	2.3	10.58	36.00	*
533.000	8,141	62.41	34.06	25.15	14.83	4.80	1.43	1.80	33.	5.0	0.0	2.2	9.98	36.00	*
533.000	8,152	63.08	34.20	25.21	14.86	4.78	1.42	1.76	33.	5.0	0.0	2.2	10.06	36.00	*
533.000	8,152	63.08	34.20	25.21	14.86	4.78	1.42	1.76	33.	5.0	0.0	2.2	10.06	36.00	*
759.000	8,119	65.91	46.87	36.34	24.99	13.34	6.12	2.78	56.	5.0	0.0	1.1	4.37	36.00	*
759.000	8,141	66.09	47.09	36.54	25.11	13.46	5.63	2.73	55.	5.0	0.0	1.1	3.19	36.00	*
759.000	8,119	66.16	47.05	36.59	25.06	13.38	5.59	2.83	54.	5.0	0.0	1.1	3.27	36.00	*
759.000	8,119	66.16	47.05	36.59	25.06	13.38	5.59	2.83	54.	5.0	0.0	1.1	3.27	36.00	*
783.000	7,965	79.19	60.32	51.48	39.02	21.40	8.53	5.14	51.	5.0	0.0	0.7	5.70	36.00	*
783.000	7,965	79.77	60.61	52.24	39.58	21.46	8.36	5.15	50.	5.0	0.0	0.7	6.33	36.00	*
805.000	8,097	73.06	46.22	34.78	22.82	11.19	5.53	3.21	32.	9.4	0.0	1.2	7.04	36.00	
805.000	8,075	72.69	46.17	34.66	23.13	11.16	5.64	3.46	33.	9.3	0.0	1.1	7.00	36.00	
805.000	8,086	72.92	46.00	34.75	23.08	11.10	5.55	3.42	32.	9.5	0.0	1.1	6.93	36.00	
805.000	8,086	72.92	46.00	34.75	23.08	11.10	5.55	3.42	32.	9.5	0.0	1.1	6.93	36.00	
827.000	8,185	46.71	30.86	23.00	15.45	7.20	3.02	1.37	65.	7.1	0.0	1.9	5.32	36.00	
827.000	8,196	47.19	31.01	23.08	15.67	7.30	3.05	1.43	62.	7.9	0.0	1.9	4.93	36.00	
827.000	8,196	47.34	31.01	23.15	15.70	7.33	2.79	1.44	66.	5.8	0.0	1.9	3.79	36.00	
827.000	8,196	47.34	31.01	23.15	15.70	7.33	2.79	1.44	66.	5.8	0.0	1.9	3.79	36.00	
827.000	10,906	59.39	39.91	29.80	20.05	9.46	3.30	1.81	74.	5.0	0.0	2.1	2.99	36.00	*
827.000	10,884	60.45	40.49	32.59	20.46	9.67	3.33	1.80	72.	5.0	0.0	2.0	3.68	36.00	*
827.000	10,884	60.82	40.12	31.53	20.37	9.87	3.37	2.65	72.	5.0	0.0	2.0	2.85	36.00	*
827.000	10,862	61.11	40.04	31.52	20.31	9.88	3.30	2.80	71.	5.0	0.0	2.0	2.57	36.00	*
827.000	14,714	77.28	52.89	41.01	26.96	12.91	4.48	3.02	79.	5.0	0.0	2.1	2.96	36.00	*
827.000	14,604	78.68	53.84	40.61	27.30	13.10	4.66	2.85	77.	5.0	0.0	2.0	3.02	36.00	*
827.000	14,626	79.46	54.65	40.39	27.34	13.26	4.43	3.15	74.	5.0	0.0	2.0	2.24	36.00	*
982.000	8,657	38.33	24.90	17.28	11.10	5.65	1.75	1.00	76.	8.8	0.0	2.8	4.97	36.00	
982.000	8,624	38.73	25.25	17.50	11.20	5.75	1.78	0.96	75.	8.6	0.0	2.7	5.13	36.00	
982.000	8,646	38.99	25.41	17.71	11.32	5.76	1.75	0.96	75.	8.2	0.0	2.7	4.78	36.00	
982.000	8,646	38.99	25.41	17.71	11.32	5.76	1.75	0.96	75.	8.2	0.0	2.7	4.78	36.00	
982.000	11,466	48.41	31.90	22.38	14.44	7.39	2.35	1.24	84.	8.5	0.0	2.8	4.66	36.00	
982.000	11,378	48.89	32.31	22.76	14.57	7.47	2.33	1.27	82.	8.3	0.0	2.8	4.57	36.00	
982.000	11,455	49.50	32.74	23.04	14.75	7.54	2.33	1.28	82.	7.9	0.0	2.8	4.53	36.00	
982.000	11,422	49.94	33.02	23.26	14.87	7.60	2.32	1.27	81.	7.8	0.0	2.8	4.48	36.00	
982.000	15,493	62.48	41.78	29.91	19.34	9.96	3.26	1.76	92.	8.3	0.0	2.9	4.46	36.00	
982.000	15,537	63.56	42.47	30.80	19.64	10.09	3.29	1.80	91.	8.0	0.0	2.8	4.53	36.00	
982.000	15,482	64.16	42.84	30.68	19.81	10.13	3.29	1.84	88.	8.1	0.0	2.8	4.39	36.00	

982.000	15,471	64.71	43.20	30.88	19.91	10.17	3.35	1.82	87.	8.1	0.0	2.8	4.56	36.00
Mean:		64.06	44.56	34.08	23.03	11.36	4.40	2.73	58.	6.5	0.0	1.7	12.51	44.42
Std. Dev:		11.50	10.52	9.11	7.28	4.38	2.20	1.09	19.	2.1	0.0	0.7	40.75	10.48
Var Coeff(%):		17.95	23.61	26.74	31.59	38.54	49.91	40.01	32.	31.4	0.0	41.8	325.71	23.59

STH96 Section 4

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	9.00	25,000	1,000,000	H1: õ = 0.35
Base:	6.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	31.90	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
84.000	8,854	26.03	22.15	18.80	14.87	9.75	5.50	3.09	312.	5.0	0.0	1.7	2.19	75.55	*
84.000	8,766	26.28	22.32	18.96	15.01	9.84	5.56	3.13	303.	5.9	0.0	1.7	2.15	75.94	
84.000	8,821	26.24	22.34	19.00	15.04	9.85	5.58	3.16	309.	5.1	0.0	1.7	2.16	76.44	
84.000	11,641	35.04	29.59	25.12	19.76	12.79	7.28	4.06	299.	5.0	0.0	1.7	2.09	77.29	
84.000	11,619	35.63	30.09	25.58	20.13	13.10	7.48	4.18	291.	6.6	0.0	1.6	2.12	77.82	
84.000	11,608	35.85	30.46	25.87	20.41	13.29	7.61	4.25	296.	5.0	0.0	1.6	2.17	78.42	*
84.000	11,586	36.08	30.63	26.02	20.52	13.39	7.65	4.28	293.	5.0	0.0	1.6	2.13	77.95	*
84.000	15,723	48.46	40.97	34.70	27.21	17.69	10.12	5.60	292.	5.0	0.0	1.7	2.11	77.91	*
84.000	15,712	49.33	41.76	35.37	27.77	18.10	10.40	5.74	284.	6.5	0.0	1.6	2.15	78.06	
84.000	15,690	49.83	42.20	35.74	28.06	18.33	10.52	5.87	286.	5.0	0.0	1.6	2.08	78.48	
84.000	15,668	49.91	42.53	36.00	28.25	18.48	10.59	5.90	285.	5.1	0.0	1.6	2.27	78.12	
98.000	8,712	33.27	22.26	19.15	15.53	9.53	6.47	4.59	72.	93.8	0.0	1.5	2.71	163.70	
98.000	8,712	33.33	22.44	19.26	15.59	9.62	6.52	4.59	73.	92.0	0.0	1.4	2.73	155.52	
98.000	8,701	33.34	22.50	19.36	15.67	9.53	6.46	4.66	75.	85.6	0.0	1.5	2.77	172.41	
98.000	11,466	43.05	29.74	25.50	20.65	12.64	8.50	5.99	85.	75.5	0.0	1.5	2.65	157.14	
98.000	11,400	43.42	30.22	25.76	20.85	12.94	8.68	6.01	85.	75.4	0.0	1.4	2.63	141.70	
98.000	11,411	43.80	30.49	25.98	21.05	13.00	8.71	6.11	85.	73.4	0.0	1.4	2.61	151.86	
98.000	11,389	43.94	30.73	26.19	21.19	13.10	8.77	6.12	86.	70.8	0.0	1.4	2.63	147.61	
98.000	15,383	57.69	41.39	35.30	28.57	17.59	11.72	8.03	102.	59.2	0.0	1.4	2.57	135.84	
98.000	15,361	59.01	42.09	35.87	29.04	17.93	11.91	8.19	96.	60.3	0.0	1.4	2.52	137.91	

98.000	15,361	59.36	42.61	36.31	29.38	18.17	12.08	8.28	99.	58.0	0.0	1.4	2.54	135.81	
98.000	15,372	59.58	42.89	36.48	29.53	18.33	12.19	8.31	100.	56.9	0.0	1.4	2.53	132.27	
125.000	8,218	59.27	39.89	30.50	18.70	7.32	2.79	1.50	45.	5.0	0.0	1.8	7.80	34.79	*
125.000	8,185	59.85	40.21	30.62	18.81	7.36	2.73	1.51	44.	5.0	0.0	1.8	7.45	34.98	*
125.000	8,218	60.25	40.43	30.74	18.91	7.41	2.74	1.54	44.	5.0	0.0	1.8	7.36	35.16	*
125.000	10,807	75.24	56.56	38.94	24.37	9.50	3.30	1.76	45.	5.0	0.0	1.8	9.30	35.39	*
125.000	10,774	76.78	52.31	39.64	24.95	9.76	3.44	1.88	45.	5.0	0.0	1.8	6.72	36.99	*
125.000	10,774	78.20	52.44	40.04	25.17	9.79	3.43	1.91	44.	5.0	0.0	1.8	6.40	36.84	*
125.000	10,753	78.09	52.44	40.43	25.27	9.80	3.56	1.93	45.	5.0	0.0	1.8	6.50	36.77	*
125.000	14,352	96.57	69.02	53.58	34.24	13.29	4.81	2.52	51.	5.0	0.0	1.8	8.21	37.19	*
146.000	8,031	36.13	49.69	33.02	18.12	5.24	1.40	0.93	67.	5.0	0.0	2.1	39.32	***	*
146.000	7,976	62.75	51.30	33.42	18.08	5.22	1.44	0.99	31.	5.0	0.0	1.9	22.57	22.41	*
146.000	8,009	69.53	52.11	33.31	18.17	5.26	1.46	0.91	26.	5.0	0.0	1.8	19.69	22.69	*
146.000	10,533	89.84	66.98	41.69	23.10	6.83	1.66	1.06	27.	5.0	0.0	1.9	20.11	23.46	*
146.000	10,500	93.31	68.71	42.76	23.66	7.10	1.85	1.23	25.	5.0	0.0	1.8	18.79	23.26	*
146.000	10,500	94.39	74.50	43.22	23.89	7.19	1.90	1.46	25.	5.0	0.0	1.8	20.66	22.54	*
146.000	10,533	95.02	77.85	43.58	24.05	7.22	1.86	1.46	25.	5.0	0.0	1.8	22.42	22.13	*
174.000	8,273	66.56	46.85	38.23	27.22	13.35	5.57	2.76	54.	5.0	0.0	1.2	3.03	48.18	*
174.000	8,295	67.15	47.25	38.56	27.54	13.46	5.52	2.80	53.	5.0	0.0	1.2	3.17	47.66	*
174.000	8,273	67.38	47.41	38.69	27.45	13.46	5.50	2.78	53.	5.0	0.0	1.2	3.27	47.32	*
174.000	10,950	83.93	58.74	48.20	34.24	16.94	6.79	3.63	57.	5.0	0.0	1.2	3.02	47.32	*
174.000	10,895	85.06	59.65	48.79	34.69	17.07	6.89	3.78	56.	5.0	0.0	1.2	3.09	47.37	*
174.000	10,862	86.54	60.77	49.65	35.32	17.56	7.41	4.31	55.	5.0	0.0	1.2	2.72	48.60	*
174.000	10,829	86.30	60.78	49.54	35.04	17.12	6.94	3.86	54.	5.0	0.0	1.2	3.37	47.15	*
199.000	7,889	76.21	47.80	37.28	20.41	7.78	2.03	1.77	26.	5.0	0.0	1.6	11.33	23.86	*
199.000	7,889	75.69	47.74	36.74	20.43	8.37	2.04	1.78	27.	5.0	0.0	1.6	10.65	24.63	*
199.000	7,867	75.58	48.04	36.76	20.51	7.86	2.04	1.81	26.	5.0	0.0	1.6	11.24	24.83	*
199.000	10,555	89.96	59.67	45.98	26.44	9.36	2.54	2.29	31.	5.0	0.0	1.7	12.44	27.37	*
199.000	10,489	91.84	61.19	47.37	27.05	9.86	2.68	2.44	31.	5.0	0.0	1.6	12.47	26.71	*
199.000	10,478	93.07	61.63	47.39	27.69	10.05	2.74	2.52	30.	5.0	0.0	1.6	11.91	28.52	*
199.000	10,511	93.43	62.06	48.20	27.99	10.09	2.76	2.52	30.	5.0	0.0	1.6	12.33	28.04	*
275.000	7,812	94.28	65.33	49.47	31.59	12.20	2.16	1.56	25.	5.0	0.0	1.1	27.55	32.30	*
275.000	7,889	93.94	65.30	49.54	31.68	12.65	1.96	1.63	25.	5.0	0.0	1.1	29.48	31.93	*
275.000	7,845	93.47	65.08	49.37	31.53	12.64	2.02	1.70	25.	5.0	0.0	1.1	28.46	31.98	*
327.000	7,856	91.28	68.77	54.96	37.97	17.59	5.88	2.22	29.	5.0	0.0	0.8	10.53	38.31	*
327.000	7,801	90.83	69.41	55.09	38.31	17.65	5.95	2.15	30.	5.0	0.0	0.8	10.94	38.26	*
327.000	7,932	90.64	71.81	55.14	38.39	17.83	5.90	2.10	30.	5.0	0.0	0.8	11.61	37.15	*
373.000	8,536	33.74	22.05	16.34	12.27	6.38	3.31	1.91	73.	28.7	0.0	2.4	4.11	63.23	
373.000	8,591	33.89	22.25	16.50	12.31	6.42	3.33	1.93	74.	28.4	0.0	2.4	4.20	63.03	
373.000	8,547	33.86	22.21	16.48	12.25	6.41	3.37	1.94	73.	28.8	0.0	2.4	4.40	64.24	
373.000	11,356	44.14	29.48	22.19	16.52	8.65	4.46	2.52	83.	25.7	0.0	2.4	3.88	62.73	
373.000	11,367	44.52	29.98	22.70	16.71	8.78	4.56	2.66	84.	24.7	0.0	2.3	4.03	63.22	
373.000	11,323	44.81	30.22	22.88	16.59	8.84	4.64	2.70	83.	24.8	0.0	2.3	4.47	63.71	
373.000	11,356	45.30	30.49	22.98	16.54	8.88	4.74	2.72	80.	25.8	0.0	2.3	4.88	65.06	
373.000	15,361	60.40	40.99	31.47	22.30	12.04	6.32	3.63	86.	23.6	0.0	2.3	4.87	63.35	
373.000	15,328	61.39	41.72	31.82	22.48	12.24	6.43	3.78	83.	23.9	0.0	2.3	4.99	63.06	
373.000	15,350	61.78	42.04	31.98	22.28	12.35	6.50	3.86	81.	24.3	0.0	2.3	5.31	62.63	
373.000	15,339	62.02	42.29	32.12	22.49	12.34	6.50	3.86	82.	23.5	0.0	2.3	5.28	62.89	
411.000	7,965	70.56	53.29	37.51	23.57	8.96	2.61	2.03	32.	5.0	0.0	1.4	13.19	33.23	*
411.000	7,965	70.52	53.17	37.66	23.06	9.09	2.71	1.89	32.	5.0	0.0	1.4	12.79	32.00	*
411.000	7,976	70.72	53.17	37.60	30.63	9.14	2.82	1.93	33.	5.0	0.0	1.3	17.75	300.00	*

411.000	10,621	86.73	66.92	46.80	29.10	11.67	3.83	2.30	37.	5.0	0.0	1.5	11.49	34.34 *
411.000	10,577	87.57	67.35	47.36	29.57	11.95	4.00	2.26	37.	5.0	0.0	1.4	11.10	34.93 *
411.000	10,621	88.48	68.12	47.99	30.02	12.03	4.10	2.31	37.	5.0	0.0	1.4	11.16	35.15 *
411.000	10,599	88.75	68.07	48.28	30.22	11.91	4.11	2.36	37.	5.0	0.0	1.4	11.24	34.66 *
433.000	8,141	71.13	52.41	39.01	27.41	11.21	2.82	1.72	35.	5.0	0.0	1.3	13.58	37.29 *
433.000	8,152	71.20	52.39	39.16	27.51	11.27	2.89	1.84	36.	5.0	0.0	1.3	13.30	37.52 *
433.000	8,097	71.56	52.43	39.29	27.58	11.27	2.89	1.86	35.	5.0	0.0	1.3	13.30	37.49 *
433.000	10,763	89.52	66.21	49.08	34.83	14.58	3.73	2.24	39.	5.0	0.0	1.4	12.59	37.77 *
433.000	10,742	90.64	67.84	50.10	35.41	14.78	3.76	2.27	38.	5.0	0.0	1.3	13.23	37.44 *
433.000	10,774	91.22	90.52	50.57	35.78	14.92	3.86	2.17	35.	5.0	0.0	1.2	17.92	28.15 *
433.000	10,676	91.21	68.39	50.78	35.78	14.90	3.83	2.25	37.	5.0	0.0	1.3	13.39	37.47 *
448.000	13,123	98.79	96.80	70.07	42.26	8.85	3.23	1.88	34.	5.0	0.0	1.6	34.90	24.59 *
448.000	12,969	99.57	96.66	72.04	41.87	8.44	3.09	1.67	33.	5.0	0.0	1.6	36.35	24.26 *
480.000	8,009	71.07	47.01	34.11	21.29	6.64	1.94	2.50	29.	5.0	0.0	1.7	12.39	29.97 *
480.000	7,921	70.22	46.38	34.11	20.98	6.56	1.85	2.83	29.	5.0	0.0	1.7	13.08	30.01 *
480.000	7,976	70.69	46.75	34.39	21.29	6.66	2.00	6.09	29.	5.0	0.0	1.7	12.23	30.07 *
480.000	10,555	88.24	59.58	43.76	27.36	8.65	2.60	6.02	32.	5.0	0.0	1.7	12.38	30.50 *
480.000	10,500	89.36	60.30	44.28	27.74	8.80	2.66	4.07	31.	5.0	0.0	1.7	12.34	30.49 *
480.000	10,500	90.37	61.85	44.14	27.58	8.75	2.64	3.70	31.	5.0	0.0	1.7	12.37	30.11 *
480.000	10,478	91.07	62.58	44.17	27.60	8.72	2.76	3.34	30.	5.0	0.0	1.7	11.83	29.88 *
515.000	12,826	96.06	98.47	95.92	52.22	10.49	3.46	3.69	36.	5.0	0.0	1.3	44.61	*** *
515.000	12,804	96.51	99.32	98.23	53.35	10.47	3.08	3.56	34.	5.0	0.0	1.3	47.67	*** *
535.000	8,053	74.89	45.24	32.46	21.44	8.20	1.90	0.99	28.	5.0	0.0	1.7	6.63	35.33 *
535.000	8,031	75.07	45.49	32.65	21.51	8.20	1.91	0.94	28.	5.0	0.0	1.6	6.83	35.15 *
535.000	8,086	75.91	45.85	33.01	21.74	8.28	2.15	0.95	28.	5.0	0.0	1.6	5.35	35.15 *
562.000	7,790	88.35	56.12	40.22	18.60	4.53	2.85	0.49	25.	5.0	0.0	1.5	30.62	17.47 *
562.000	7,757	88.36	57.00	41.22	18.80	4.54	3.33	0.51	25.	5.0	0.0	1.5	33.08	17.16 *
562.000	7,779	88.71	57.22	41.04	19.02	4.65	4.08	0.52	25.	5.0	0.0	1.5	34.56	17.46 *
587.000	8,360	42.93	23.24	19.03	9.66	3.37	1.55	1.32	50.	7.4	0.0	3.5	15.70	22.07
587.000	8,306	42.91	23.19	18.42	9.42	3.37	1.50	1.31	48.	8.1	0.0	3.5	15.10	22.26
587.000	8,371	41.55	23.27	18.01	9.43	3.40	1.59	1.37	52.	7.7	0.0	3.6	15.38	23.19
587.000	11,005	54.69	31.17	24.00	12.72	4.68	2.07	1.76	55.	7.1	0.0	3.5	14.46	23.72
587.000	11,049	56.38	31.64	23.93	12.83	4.78	2.05	1.79	50.	7.9	0.0	3.5	13.79	24.22
587.000	10,983	56.41	31.74	23.93	12.84	4.79	2.12	1.84	50.	8.2	0.0	3.4	14.09	24.24
587.000	10,994	55.68	31.87	24.04	12.81	4.83	2.22	1.84	52.	7.9	0.0	3.4	14.64	23.88
587.000	14,769	73.91	43.09	32.91	17.79	6.89	2.89	2.45	57.	6.8	0.0	3.4	12.97	24.64
587.000	14,692	70.26	44.05	35.63	17.94	7.15	3.45	2.58	69.	5.0	0.0	3.3	15.66	21.58 *
587.000	14,659	74.25	44.40	34.25	18.06	7.22	3.48	2.61	57.	7.2	0.0	3.2	14.65	23.34
587.000	14,725	74.17	45.01	34.41	18.19	7.28	3.50	2.65	59.	6.9	0.0	3.2	14.74	23.42
609.000	7,669	93.39	65.51	52.50	33.06	12.59	3.80	1.19	25.	5.0	0.0	0.9	16.50	32.93 *
609.000	7,702	94.00	65.39	51.55	33.20	10.85	3.42	1.37	25.	5.0	0.0	1.0	20.30	29.69 *
609.000	7,680	94.50	65.80	51.43	33.21	10.62	3.43	1.43	25.	5.0	0.0	1.0	20.79	29.20 *
632.000	8,042	62.31	38.40	27.36	18.15	7.27	2.22	1.54	39.	5.0	0.0	1.9	3.48	37.88 *
632.000	8,075	59.62	38.50	27.56	18.23	7.19	2.22	1.31	42.	5.0	0.0	1.9	4.25	37.31 *
632.000	8,064	59.69	38.62	27.65	18.51	7.23	2.22	1.35	42.	5.0	0.0	1.9	4.34	37.06 *
632.000	10,643	77.47	50.92	36.59	24.51	9.45	2.93	1.43	43.	5.0	0.0	1.9	5.04	36.65 *
632.000	10,610	76.50	51.69	38.89	24.83	9.49	2.88	0.91	43.	5.0	0.0	1.9	7.82	36.24 *
632.000	10,599	93.45	51.96	37.46	24.78	9.47	2.89	1.51	30.	5.3	0.0	1.9	3.83	36.12
632.000	10,533	94.52	51.46	40.48	24.77	9.25	2.77	3.05	29.	5.0	0.0	1.8	5.38	34.83 *
647.000	7,943	63.77	42.43	33.43	21.41	11.23	3.19	2.63	44.	5.0	0.0	1.4	6.67	41.77 *
647.000	7,965	65.38	42.52	33.52	21.48	11.22	3.22	2.62	42.	5.0	0.0	1.4	5.86	41.94 *

647.000	7,954	65.64	42.32	34.35	21.28	11.10	3.46	2.24	43.	5.0	0.0	1.4	4.96	35.83	*
647.000	10,566	81.59	53.98	49.16	27.40	14.39	4.35	2.94	47.	5.0	0.0	1.4	8.01	25.90	*
647.000	10,599	82.87	54.74	50.73	27.86	14.76	4.77	2.68	47.	5.0	0.0	1.4	7.44	25.02	*
647.000	10,599	82.73	55.44	51.41	28.20	14.92	4.85	2.73	48.	5.0	0.0	1.4	7.67	24.92	*
647.000	10,632	84.15	55.89	51.63	28.41	14.89	4.91	2.75	47.	5.0	0.0	1.4	7.38	25.09	*
677.000	8,525	38.67	25.19	19.17	13.15	6.69	3.10	1.72	70.	16.3	0.0	2.3	4.52	53.75	
677.000	8,547	38.99	25.46	19.34	13.28	6.74	3.09	1.73	71.	15.5	0.0	2.3	4.42	53.17	
677.000	8,646	39.31	25.69	19.59	13.50	6.84	3.14	1.75	72.	15.3	0.0	2.3	4.31	53.39	
677.000	11,202	50.16	33.61	25.59	18.18	9.12	4.16	2.28	82.	13.1	0.0	2.3	3.66	53.63	
677.000	11,246	50.96	34.19	26.15	18.06	9.35	4.23	2.36	81.	12.9	0.0	2.3	4.05	52.54	
677.000	11,257	51.45	34.68	26.50	18.16	9.52	4.28	2.39	80.	13.0	0.0	2.2	4.12	51.96	
677.000	11,323	51.69	35.00	26.75	18.41	9.62	4.30	2.41	82.	12.1	0.0	2.2	3.99	51.79	
677.000	15,010	67.28	47.32	35.61	24.80	13.21	5.91	3.32	96.	9.0	0.0	2.2	3.92	51.56	
677.000	15,010	65.96	48.40	36.37	25.37	13.59	6.01	3.46	114.	5.1	0.0	2.3	3.92	50.94	
677.000	15,021	65.41	51.29	36.89	25.93	13.55	6.13	3.45	114.	5.0	0.0	2.2	5.09	51.27	*
677.000	15,087	69.00	49.27	37.04	25.78	13.55	6.15	3.56	102.	6.4	0.0	2.2	4.30	52.17	
707.000	8,240	47.91	38.44	26.59	19.35	11.04	4.38	2.45	83.	5.0	0.0	1.6	4.68	44.36	*
707.000	8,174	48.14	35.41	26.89	19.54	11.15	4.42	2.48	85.	5.0	0.0	1.6	2.79	46.31	*
707.000	8,262	48.35	35.86	27.28	19.84	11.35	4.52	2.52	86.	5.0	0.0	1.5	2.94	46.46	*
707.000	10,873	61.67	45.63	34.37	24.99	14.30	5.78	3.24	90.	5.0	0.0	1.6	2.65	46.88	*
707.000	10,917	62.51	57.29	34.81	25.41	14.54	5.89	3.30	82.	5.0	0.0	1.5	7.20	55.39	*
707.000	10,895	62.56	47.26	35.79	26.13	14.97	6.03	3.38	90.	5.0	0.0	1.5	3.16	46.77	*
707.000	14,714	76.67	64.30	46.47	33.27	19.07	7.87	4.49	100.	5.0	0.0	1.6	5.06	46.30	*
707.000	14,659	77.18	61.04	46.78	33.91	19.52	8.06	4.63	103.	5.0	0.0	1.6	4.09	47.80	*
707.000	14,626	81.26	66.05	47.18	34.33	19.76	8.19	4.73	93.	5.0	0.0	1.5	4.21	46.28	*
707.000	14,615	81.32	67.29	47.79	34.60	19.87	8.17	4.73	92.	5.0	0.0	1.5	4.58	45.75	*
731.000	8,810	16.31	12.22	10.39	7.92	4.91	3.02	2.00	281.	56.9	0.0	3.1	3.09	92.22	
731.000	8,854	16.37	12.24	10.35	7.91	4.89	3.01	1.96	279.	57.2	0.0	3.2	3.09	92.40	
731.000	8,755	16.37	12.28	10.40	7.94	4.94	3.04	2.00	281.	55.6	0.0	3.1	3.07	92.28	
731.000	11,619	22.45	16.84	14.33	10.84	6.78	4.13	2.77	275.	52.0	0.0	3.0	3.08	89.21	
731.000	11,674	22.68	16.95	14.40	10.93	6.84	4.16	2.78	265.	54.8	0.0	3.0	2.98	88.83	
731.000	11,663	22.80	17.09	14.50	11.00	6.90	4.20	2.80	263.	55.0	0.0	3.0	3.03	89.01	
731.000	11,674	23.04	17.26	14.59	11.11	6.98	4.25	2.85	262.	54.1	0.0	2.9	2.95	89.13	
731.000	15,888	32.67	24.21	20.61	15.55	9.80	5.93	3.94	240.	56.0	0.0	2.8	2.96	87.48	
731.000	15,844	33.07	24.47	20.80	15.72	9.91	6.00	4.00	231.	57.4	0.0	2.8	2.95	87.75	
731.000	15,844	33.51	24.73	21.02	15.86	10.00	6.06	4.05	223.	59.1	0.0	2.8	3.01	88.01	
731.000	15,855	33.67	24.85	21.12	15.94	10.04	6.05	4.13	227.	56.0	0.0	2.8	2.92	86.58	
757.000	8,777	32.70	17.15	13.22	10.05	5.83	2.96	1.62	41.	116.6	0.0	2.8	2.29	61.10	
757.000	8,788	32.53	17.26	13.33	10.11	5.85	2.96	1.63	43.	110.9	0.0	2.8	2.18	60.85	
757.000	8,865	32.35	17.39	13.43	10.17	5.84	2.94	1.63	45.	100.1	0.0	2.8	2.15	60.49	
757.000	11,597	41.38	23.13	17.89	13.63	7.85	3.95	2.18	50.	88.5	0.0	2.7	1.91	60.59	
757.000	11,652	41.37	23.36	18.10	13.77	7.99	3.96	2.23	52.	84.6	0.0	2.7	1.67	59.33	
757.000	11,663	41.46	23.56	18.19	13.85	7.96	4.00	2.22	53.	80.0	0.0	2.7	1.96	60.48	
757.000	11,619	41.58	23.67	18.30	13.87	7.94	3.97	2.24	53.	77.4	0.0	2.7	1.90	60.07	
757.000	15,614	55.31	32.12	24.90	19.01	11.01	5.58	3.15	56.	77.4	0.0	2.6	1.84	61.25	
757.000	15,668	54.89	32.73	25.27	19.17	10.91	5.61	3.14	61.	64.9	0.0	2.6	2.30	62.54	
757.000	15,603	55.08	33.03	39.27	19.30	10.91	4.83	3.19	128.	11.5	0.0	2.8	10.15	***	
757.000	15,559	55.13	33.22	25.83	19.37	10.82	5.56	3.19	64.	56.1	0.0	2.6	2.37	62.63	
782.000	8,646	20.88	14.37	12.90	9.93	5.88	3.34	2.07	176.	55.0	0.0	2.6	2.20	78.22	
782.000	8,712	20.99	14.46	13.00	10.00	5.91	3.35	2.08	179.	53.8	0.0	2.6	2.21	77.90	
782.000	8,766	21.06	14.53	13.09	10.06	5.94	3.38	2.11	183.	52.7	0.0	2.6	2.31	78.65	

782.000	11,543	28.05	19.19	17.16	13.24	7.96	4.49	2.80	165.	62.1	0.0	2.6	1.88	76.61
782.000	11,532	28.24	19.36	17.34	13.45	8.10	4.61	2.91	166.	61.4	0.0	2.5	1.93	78.45
782.000	11,521	28.35	19.47	17.43	13.50	8.13	4.60	2.88	168.	59.2	0.0	2.5	1.88	77.38
782.000	11,554	28.52	19.59	17.56	13.63	8.18	4.63	2.88	167.	59.3	0.0	2.5	1.86	77.65
782.000	15,734	37.92	26.52	23.59	18.33	11.11	6.32	3.97	182.	56.0	0.0	2.5	1.77	78.08
782.000	15,745	37.93	26.73	23.84	18.54	11.32	6.49	4.11	190.	54.5	0.0	2.5	1.81	79.55
782.000	15,723	38.20	26.87	24.01	18.67	11.42	6.54	4.19	188.	54.2	0.0	2.4	1.82	79.40
782.000	15,756	38.49	27.04	24.20	18.87	11.52	6.59	4.18	186.	54.7	0.0	2.4	1.75	79.41
801.000	8,569	27.52	18.43	12.63	8.25	4.93	2.47	1.59	83.	34.7	0.0	3.3	7.68	48.11
801.000	8,613	27.53	18.55	12.74	8.34	4.97	2.50	1.62	86.	33.9	0.0	3.3	7.65	48.83
801.000	8,569	27.56	18.56	12.76	8.35	4.94	2.39	1.59	87.	31.5	0.0	3.3	7.33	48.78
801.000	11,323	36.14	23.76	16.67	11.02	6.63	3.31	2.14	82.	37.9	0.0	3.2	6.92	52.37
801.000	11,334	36.39	24.01	16.86	11.19	6.72	3.37	2.19	82.	37.7	0.0	3.2	6.80	53.91
801.000	11,356	36.68	24.22	17.02	11.28	6.76	3.38	2.22	82.	36.9	0.0	3.2	6.78	53.37
801.000	11,334	36.98	24.38	17.13	11.35	6.82	3.42	2.20	81.	37.0	0.0	3.1	6.83	53.24
801.000	15,504	48.19	33.29	22.89	15.44	9.44	4.40	2.93	96.	31.9	0.0	3.2	6.88	60.54
801.000	15,504	48.13	32.10	23.21	15.68	9.20	4.15	2.88	97.	30.2	0.0	3.3	5.01	62.88
801.000	15,405	49.85	32.14	23.20	15.71	9.34	4.52	2.97	80.	39.6	0.0	3.1	5.44	63.96
801.000	15,449	49.02	32.25	23.25	15.74	9.40	4.54	2.93	86.	37.3	0.0	3.1	5.47	63.73
828.000	8,690	31.94	20.54	18.80	11.67	6.45	3.25	2.10	102.	21.3	0.0	2.5	6.27	39.16
828.000	8,733	32.13	20.58	18.07	11.70	6.18	3.26	2.13	92.	24.8	0.0	2.5	6.11	49.25
828.000	8,744	32.35	20.78	18.49	11.81	6.26	3.26	2.18	96.	22.6	0.0	2.5	6.30	45.44
828.000	11,400	41.76	27.53	23.91	15.95	8.56	4.48	3.12	103.	22.4	0.0	2.4	5.24	60.94
828.000	11,367	42.28	28.07	23.89	16.30	8.78	4.59	3.22	101.	22.8	0.0	2.3	4.64	74.51
828.000	11,356	42.75	28.49	23.68	16.54	9.05	4.57	3.21	99.	23.0	0.0	2.3	3.58	61.27
828.000	11,345	42.82	28.62	23.33	16.59	9.04	4.62	3.22	94.	25.2	0.0	2.3	3.54	62.32
828.000	15,295	56.59	38.37	31.46	22.68	12.63	6.45	4.53	103.	24.9	0.0	2.2	2.97	62.46
828.000	15,262	57.52	39.07	32.01	23.13	12.99	6.65	4.71	100.	25.4	0.0	2.2	2.90	62.61
828.000	15,262	58.10	39.57	32.65	23.44	13.17	6.75	4.74	101.	24.1	0.0	2.1	3.02	62.71
828.000	15,240	58.73	39.93	33.22	23.66	13.13	6.85	4.74	101.	23.4	0.0	2.1	3.44	64.56
853.000	8,459	34.76	23.76	17.46	10.77	5.48	2.46	1.30	91.	8.7	0.0	2.9	7.94	36.47
853.000	8,580	35.11	24.06	17.72	10.87	5.70	2.54	1.35	89.	10.1	0.0	2.8	7.74	35.53
853.000	8,514	35.26	24.08	17.85	10.95	5.69	2.54	1.35	88.	9.8	0.0	2.8	7.74	35.59
853.000	11,268	44.72	31.25	23.03	14.59	7.46	3.30	1.72	102.	7.5	0.0	2.9	7.08	41.47
853.000	11,224	45.54	31.76	23.54	14.85	7.59	3.37	1.79	100.	7.4	0.0	2.8	7.17	40.58
853.000	11,268	45.80	31.96	23.72	14.96	7.63	3.40	1.79	99.	7.6	0.0	2.8	7.21	40.55
853.000	11,268	46.15	32.16	24.00	15.20	7.48	3.28	1.77	101.	6.2	0.0	2.9	7.16	41.63
853.000	15,175	59.60	42.44	31.03	20.37	10.52	4.59	2.39	107.	7.6	0.0	2.8	6.00	51.13
853.000	15,175	60.74	42.91	31.55	20.76	10.63	4.44	2.39	106.	6.9	0.0	2.8	5.36	52.08
853.000	15,164	61.63	43.33	32.01	21.06	10.83	4.58	3.50	104.	7.1	0.0	2.8	5.39	52.04
853.000	15,153	62.13	43.19	32.11	21.12	10.66	4.44	2.32	101.	7.2	0.0	2.8	5.21	52.18
876.000	8,371	44.55	30.92	23.26	15.91	8.66	3.64	1.63	76.	8.4	0.0	1.9	3.50	70.00
876.000	8,371	46.11	31.30	23.49	16.08	9.81	3.68	1.59	66.	12.0	0.0	1.8	3.83	68.53
876.000	8,273	46.12	31.21	23.42	16.07	9.00	3.76	1.73	65.	11.3	0.0	1.8	3.54	71.50
876.000	10,840	55.44	40.80	31.05	21.19	11.80	4.93	2.28	96.	5.0	0.0	1.9	3.56	68.35 *
876.000	10,884	56.52	41.64	30.85	21.51	10.94	5.19	2.55	92.	5.0	0.0	1.9	5.44	53.67 *
876.000	10,928	58.00	42.17	31.04	21.69	11.42	5.22	2.52	88.	5.6	0.0	1.9	4.62	51.39
876.000	10,884	58.24	42.40	31.28	21.89	11.41	5.28	2.57	88.	5.3	0.0	1.9	4.80	52.07
876.000	14,461	75.17	55.51	41.07	29.39	15.78	7.03	3.28	95.	5.0	0.0	1.9	3.59	50.67
876.000	14,450	77.99	56.04	41.74	29.90	16.12	7.26	3.50	85.	6.8	0.0	1.8	3.48	51.22
876.000	14,450	80.66	56.57	42.07	30.18	16.96	7.43	3.52	72.	10.5	0.0	1.7	3.13	49.68

876.000	14,418	80.86	57.09	42.32	30.37	16.66	7.38	3.52	73.	9.5	0.0	1.7	3.11	50.20
904.000	8,536	35.11	17.45	13.84	8.29	4.50	2.02	1.22	39.	49.5	0.0	3.4	6.52	32.92
904.000	8,492	35.49	17.67	13.80	8.35	4.49	2.17	1.24	38.	52.5	0.0	3.3	7.48	34.15
904.000	8,547	35.68	17.78	13.87	8.39	4.50	1.85	1.23	40.	42.8	0.0	3.4	5.50	34.11
904.000	11,235	43.72	23.74	18.49	11.30	6.08	2.45	1.63	52.	34.8	0.0	3.4	5.13	35.53
904.000	11,279	44.83	24.13	18.78	11.47	6.20	2.53	1.67	49.	35.8	0.0	3.4	5.28	35.41
904.000	11,301	45.56	24.44	18.90	11.58	6.25	2.51	1.69	48.	35.7	0.0	3.3	5.15	35.84
904.000	11,235	46.35	24.60	19.04	11.63	6.22	2.54	1.70	46.	35.8	0.0	3.3	5.26	35.42
904.000	15,175	66.83	33.95	26.43	16.25	8.83	3.46	2.41	39.	38.5	0.0	3.2	4.92	36.38
904.000	15,142	62.40	34.12	26.50	16.44	8.87	3.68	2.44	49.	34.0	0.0	3.2	4.98	37.87
904.000	15,153	63.94	34.38	26.76	16.48	8.85	3.58	2.44	47.	33.6	0.0	3.2	4.97	36.68
928.000	9,008	25.62	16.04	12.21	8.83	4.98	2.45	1.43	90.	51.1	0.0	3.4	2.95	57.75
928.000	8,953	25.63	16.09	12.28	8.85	4.98	2.44	1.39	91.	48.6	0.0	3.3	2.96	57.49
928.000	8,986	25.73	16.16	12.32	8.89	5.01	2.45	1.39	91.	48.8	0.0	3.3	2.91	57.35
928.000	11,685	35.15	21.57	16.57	12.17	6.82	3.28	1.70	82.	52.3	0.0	3.2	2.14	56.74
928.000	11,696	35.15	21.87	16.83	12.34	6.96	3.38	1.82	85.	50.2	0.0	3.1	2.26	57.33
928.000	11,685	35.32	22.02	16.97	12.42	7.00	3.41	1.80	85.	48.8	0.0	3.1	2.33	57.55
928.000	11,597	35.33	22.07	17.01	12.44	7.02	3.43	1.78	85.	48.4	0.0	3.1	2.38	57.75
928.000	15,657	48.70	30.63	23.76	17.77	10.00	4.73	2.50	87.	45.0	0.0	2.9	1.31	56.19
928.000	15,679	49.28	31.05	24.28	18.14	10.19	4.86	2.59	87.	44.3	0.0	2.9	1.34	56.85
928.000	15,679	49.55	31.26	24.52	18.16	10.17	4.81	2.70	88.	42.2	0.0	2.9	1.44	56.28
928.000	15,668	49.82	31.26	24.59	18.19	10.20	4.86	2.67	86.	43.3	0.0	2.9	1.50	56.75
951.000	8,701	28.30	19.19	15.45	10.89	5.87	2.85	1.73	122.	21.1	0.0	2.8	3.44	58.00
951.000	8,635	28.72	19.37	15.55	10.94	5.90	2.88	1.69	114.	22.6	0.0	2.7	3.57	58.28
951.000	8,635	28.86	19.84	15.64	11.00	5.93	2.93	1.72	117.	20.5	0.0	2.7	4.07	58.81
951.000	11,356	40.12	25.66	21.06	14.85	8.18	4.10	2.31	86.	33.1	0.0	2.5	3.15	60.53
951.000	11,356	39.49	26.07	21.46	15.11	8.34	4.19	2.40	100.	28.4	0.0	2.5	3.31	60.74
951.000	11,400	40.09	26.27	21.79	15.30	8.45	4.21	2.42	98.	28.2	0.0	2.5	3.16	60.16
951.000	11,334	39.97	26.52	22.00	15.47	8.49	4.23	2.44	104.	25.3	0.0	2.5	3.22	60.27
951.000	15,350	55.01	36.06	30.09	21.37	11.95	5.96	3.44	97.	28.9	0.0	2.4	2.83	60.48
951.000	15,350	56.53	36.86	30.85	21.91	12.25	6.10	3.70	93.	28.8	0.0	2.3	2.82	60.42
951.000	15,427	56.99	37.23	31.22	22.16	12.38	6.14	3.63	94.	28.0	0.0	2.3	2.79	60.15
951.000	15,460	57.58	37.77	31.56	22.43	12.47	6.16	3.63	94.	26.8	0.0	2.3	2.75	59.85
975.000	8,492	30.11	21.89	15.70	11.44	6.58	3.39	2.18	107.	23.4	0.0	2.4	5.32	60.10
975.000	8,580	30.42	22.26	16.14	11.59	6.63	3.44	2.23	112.	21.0	0.0	2.4	5.46	60.69
975.000	8,547	30.07	22.01	15.98	11.57	6.60	3.42	2.23	113.	21.3	0.0	2.4	5.27	60.82
975.000	11,235	39.85	30.04	21.22	15.80	9.00	4.59	2.96	123.	17.2	0.0	2.4	5.40	59.42
975.000	11,235	39.80	29.36	21.62	15.96	9.14	4.68	2.99	120.	20.0	0.0	2.3	4.40	60.43
975.000	11,290	40.29	28.53	21.76	16.19	9.21	4.72	3.06	109.	25.0	0.0	2.3	3.25	61.58
975.000	11,257	35.89	29.23	21.80	15.97	9.25	4.70	3.03	197.	5.1	0.0	2.5	4.31	59.78
975.000	15,131	49.31	39.88	29.76	21.83	12.99	6.57	4.15	190.	6.5	0.0	2.4	4.08	59.10
975.000	15,153	51.22	39.80	30.29	22.23	13.25	6.89	4.40	182.	7.2	0.0	2.3	3.99	61.88
975.000	15,153	52.80	40.16	30.69	22.28	13.40	6.65	4.26	172.	7.0	0.0	2.3	3.61	57.81
975.000	15,164	53.60	40.97	30.79	22.22	13.46	6.72	4.31	165.	7.8	0.0	2.3	4.24	57.67

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Mean:	56.40	39.41	30.32	20.27	9.86	4.39	2.72	90.	22.8	0.0	2.2	7.38	46.90
Std. Dev:	21.72	17.40	13.21	8.04	3.65	2.06	1.33	68.	23.9	0.0	0.7	7.43	21.16
Var Coeff(%):	38.52	44.15	43.56	39.64	37.04	47.08	48.97	75.	100.0	0.0	31.8	100.74	45.12

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US14 Section 1

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	9.00	25,000	1,000,000	H1: õ = 0.35
Base:	6.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	38.10	2,700		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock
0.000	9,359	29.20	17.30	9.50	6.76	4.60	3.20	3.00	46.	107.2	0.0	4.8	16.86	29.61
0.000	9,414	29.06	14.87	9.58	6.71	4.41	3.30	2.87	42.	177.5	0.0	4.8	13.52	84.07
0.000	9,326	28.61	14.26	9.57	6.67	4.33	3.10	2.87	41.	209.6	0.0	4.8	11.72	80.89
0.000	12,234	35.19	17.53	11.93	8.42	5.56	4.36	3.72	42.	312.9	0.0	4.7	12.27	93.57
0.000	12,267	35.22	17.67	12.05	8.60	5.69	4.67	3.74	41.	355.1	0.0	4.6	12.59	109.00
0.000	12,245	35.17	17.51	12.13	8.73	5.86	4.65	3.55	40.	426.1	0.0	4.4	11.73	123.95
0.000	12,278	35.03	17.09	12.09	8.66	5.87	5.19	3.55	40.	497.8	0.0	4.3	12.60	115.25
0.000	16,085	44.89	22.54	16.02	11.52	7.72	8.04	5.17	42.	474.5	0.0	4.2	14.08	123.80
0.000	16,107	44.41	22.09	15.88	11.52	7.72	6.43	5.33	42.	473.3	0.0	4.2	11.40	144.80
0.000	16,052	44.13	24.44	15.92	11.57	7.71	6.63	5.34	49.	237.5	0.0	4.5	13.61	143.04
0.000	16,009	44.00	30.53	15.93	11.57	7.92	8.52	5.25	63.	93.3	0.0	4.8	20.44	23.85
30.000	9,348	33.24	16.51	11.52	9.00	6.02	4.22	3.37	32.	410.1	0.0	3.2	8.89	162.32
30.000	9,403	32.87	16.42	11.27	8.89	6.00	4.31	3.34	32.	445.2	0.0	3.2	9.44	300.00
30.000	9,491	33.38	16.46	11.32	8.93	6.09	4.18	3.26	32.	463.1	0.0	3.3	8.76	300.00
30.000	11,685	42.63	21.80	15.60	12.06	8.16	5.46	4.35	34.	336.3	0.0	3.0	7.76	120.33
30.000	11,784	38.45	21.93	16.13	12.46	8.25	5.46	4.38	47.	212.4	0.0	3.1	6.69	116.81
30.000	11,795	31.56	21.93	16.02	12.28	8.56	5.67	4.59	92.	111.1	0.0	2.9	6.57	300.00
30.000	11,850	35.31	22.04	16.20	12.29	8.65	5.54	4.55	62.	163.8	0.0	3.0	6.77	300.00
30.000	15,043	50.38	30.34	23.47	17.37	11.91	7.78	6.27	54.	153.7	0.0	2.7	5.69	248.50
30.000	15,131	44.13	30.29	23.41	17.54	12.02	7.77	6.35	89.	94.1	0.0	2.7	5.07	300.00
30.000	15,197	48.31	30.24	23.20	17.73	12.20	7.94	6.63	60.	153.8	0.0	2.6	5.27	107.70
30.000	15,219	44.42	30.23	23.25	17.72	12.23	7.97	6.61	85.	107.2	0.0	2.6	5.07	300.00
56.000	9,183	33.41	15.33	14.21	11.27	7.25	4.66	3.36	34.	500.0	0.0	2.6	3.26	118.64 *
56.000	9,216	32.63	15.11	13.88	11.31	7.28	4.87	3.42	36.	500.0	0.0	2.6	3.55	149.58 *
56.000	9,304	32.30	15.01	14.40	11.36	7.52	5.54	3.61	39.	500.0	0.0	2.5	5.84	110.08 *
56.000	12,003	43.60	17.76	18.48	15.04	9.70	6.87	4.76	35.	500.0	0.0	2.7	8.44	*** *
56.000	12,047	43.06	17.49	18.65	15.16	9.90	7.33	4.91	36.	500.0	0.0	2.7	10.39	*** *
56.000	12,091	42.43	18.14	20.49	15.20	10.04	7.10	4.89	38.	500.0	0.0	2.5	8.41	*** *
56.000	12,179	42.06	18.25	19.14	15.29	10.15	6.85	4.99	39.	500.0	0.0	2.6	7.41	*** *
56.000	15,460	57.60	22.19	26.98	20.88	13.89	8.88	6.43	35.	500.0	0.0	2.5	12.20	*** *
56.000	15,482	56.71	23.28	26.19	21.16	15.74	8.80	6.90	37.	500.0	0.0	2.4	10.40	*** *
56.000	15,559	56.00	24.43	26.53	21.33	15.45	8.72	6.93	38.	500.0	0.0	2.3	7.70	*** *
56.000	15,559	55.46	24.68	26.45	21.40	14.94	14.00	6.95	41.	500.0	0.0	2.2	11.89	*** *

75.000	9,337	26.61	17.24	13.97	10.80	6.83	4.43	3.34	83.	108.0	0.0	2.8	3.71	114.58	
75.000	9,513	26.36	17.21	13.94	10.67	6.79	4.39	3.02	88.	105.0	0.0	2.9	3.87	111.66	
75.000	9,545	26.31	17.35	14.07	10.92	6.95	4.33	3.76	94.	97.8	0.0	2.9	2.98	96.67	
75.000	11,992	37.30	23.23	18.95	14.78	9.44	5.64	5.15	69.	115.0	0.0	2.7	2.19	85.03	
75.000	11,992	36.52	23.20	18.97	14.69	9.52	5.42	6.17	77.	98.1	0.0	2.7	1.68	8.02	
75.000	12,058	36.04	23.37	19.10	14.77	9.68	5.60	6.09	83.	95.3	0.0	2.7	1.91	4.76	
75.000	12,080	36.02	23.48	19.24	14.83	9.73	5.61	6.07	85.	91.6	0.0	2.7	1.94	4.38	
75.000	15,592	50.13	32.57	26.98	21.00	13.37	7.76	7.30	81.	80.8	0.0	2.5	1.61	79.53	
75.000	15,625	50.32	32.82	27.20	20.93	13.51	7.98	7.01	80.	83.5	0.0	2.5	2.09	82.47	
75.000	15,625	50.62	32.98	27.39	20.89	13.65	8.08	7.30	79.	85.5	0.0	2.4	2.26	82.34	
75.000	15,668	50.85	33.04	27.45	20.80	13.61	8.26	7.09	77.	89.6	0.0	2.4	2.78	88.26	
116.000	9,205	42.87	23.02	16.82	11.72	6.63	4.20	3.71	34.	64.9	0.0	2.9	7.89	86.92	
116.000	9,293	44.67	22.93	16.95	11.94	6.72	4.41	3.94	30.	79.4	0.0	2.8	8.06	86.60	
116.000	9,260	44.56	22.84	16.87	11.78	6.66	4.17	3.61	30.	75.8	0.0	2.9	7.55	87.91	
116.000	11,466	51.58	29.39	22.20	15.54	7.83	4.78	4.69	44.	39.2	0.0	3.0	7.20	60.48	
116.000	11,510	53.43	28.42	22.39	15.73	8.29	5.00	4.83	37.	56.9	0.0	2.9	6.26	69.89	
116.000	11,532	51.69	29.11	22.41	15.74	8.88	5.23	4.98	41.	54.9	0.0	2.8	5.86	79.04	
116.000	11,565	52.90	29.06	22.55	15.78	7.50	4.99	5.18	41.	40.5	0.0	3.0	8.34	53.49	
116.000	14,747	66.14	39.82	31.03	21.53	12.41	6.41	6.41	52.	35.8	0.0	2.7	4.02	84.50	
116.000	14,703	65.41	40.09	31.28	21.78	11.78	5.65	6.96	60.	24.7	0.0	2.8	3.24	12.73	
116.000	14,725	64.96	40.33	31.17	21.95	12.37	6.47	6.78	58.	31.1	0.0	2.6	4.04	2.07	
116.000	14,725	65.33	40.27	31.13	22.04	12.43	6.73	6.89	55.	34.0	0.0	2.6	4.37	0.66	
132.000	8,975	49.69	21.33	14.39	10.22	7.78	3.36	4.20	25.	85.3	0.0	3.2	12.79	93.45	*
132.000	9,030	48.84	21.11	14.58	10.27	8.00	3.33	4.49	25.	94.4	0.0	3.1	11.90	84.13	*
132.000	9,008	47.39	20.47	14.76	10.42	8.07	3.16	6.72	25.	106.0	0.0	3.1	9.62	88.53	*
132.000	11,499	64.92	28.66	20.28	14.06	10.35	3.67	9.93	25.	62.6	0.0	3.1	8.81	73.65	*
132.000	11,510	63.39	28.93	20.13	14.14	10.61	4.20	6.00	25.	78.7	0.0	3.0	9.78	83.44	*
132.000	11,488	63.00	29.59	20.06	14.29	10.48	4.41	9.94	25.	80.4	0.0	2.9	10.13	99.44	*
132.000	11,499	62.11	29.61	20.04	14.25	10.34	4.40	10.32	25.	83.7	0.0	2.9	9.74	97.63	*
132.000	14,966	77.25	43.72	28.13	19.94	13.11	3.40	15.28	40.	18.5	0.0	3.3	8.66	94.66	
132.000	14,802	78.84	37.72	27.75	19.68	13.37	6.21	12.70	25.	97.8	0.0	2.7	6.55	102.43	*
132.000	14,659	80.47	53.89	27.51	19.59	13.37	6.54	16.46	31.	35.1	0.0	2.7	15.23	21.49	
132.000	14,933	79.77	50.73	26.88	19.04	12.98	5.78	5.23	31.	35.6	0.0	2.9	13.97	24.70	
161.000	9,699	40.39	21.54	14.52	8.09	4.32	1.14	2.64	50.	13.0	0.0	5.2	6.74	25.87	
161.000	9,820	40.93	25.09	14.54	8.16	4.30	0.98	2.55	55.	8.1	0.0	5.5	8.99	36.00	
161.000	9,831	39.94	22.53	14.39	9.49	4.21	0.95	2.34	64.	7.1	0.0	5.5	4.11	36.00	
161.000	12,398	50.96	30.38	19.17	11.35	5.24	3.25	3.33	48.	18.7	0.0	4.6	14.03	30.78	
161.000	12,475	50.26	42.01	19.51	11.53	5.80	3.88	3.27	60.	13.0	0.0	4.4	19.89	16.78	
161.000	12,629	48.25	28.78	19.54	11.66	6.23	3.09	3.19	55.	25.4	0.0	4.3	9.72	31.69	
161.000	12,794	49.15	28.61	19.76	11.56	6.35	2.88	2.88	53.	25.4	0.0	4.4	8.68	29.68	
161.000	16,118	64.67	35.92	27.20	16.80	8.55	5.41	4.18	48.	36.3	0.0	3.8	10.68	37.17	
161.000	16,261	66.31	35.07	27.45	16.88	8.99	5.24	4.31	42.	45.5	0.0	3.7	9.09	36.54	
161.000	16,491	66.96	13.54	27.50	17.87	9.11	5.07	4.36	25.	500.0	0.0	5.9	33.92	***	*
161.000	16,524	68.43	15.56	27.31	19.87	9.12	5.36	4.55	25.	500.0	0.0	4.9	27.24	***	*
176.000	8,821	42.01	18.61	16.53	8.82	5.17	2.89	2.71	28.	72.6	0.0	3.7	10.45	24.04	
176.000	8,755	40.91	18.78	17.70	8.87	5.19	2.62	2.29	31.	54.1	0.0	3.6	10.01	21.52	
176.000	8,766	40.74	18.74	26.70	8.97	5.53	2.76	2.64	33.	49.5	0.0	3.4	15.03	***	
176.000	11,148	51.03	25.39	10.09	11.95	6.82	3.48	3.37	25.	281.9	0.0	4.3	20.47	57.72	*
176.000	11,224	54.13	25.72	17.88	12.32	6.97	3.61	3.40	28.	71.9	0.0	3.5	6.85	75.30	
176.000	11,180	54.23	25.60	18.24	12.15	6.96	2.83	3.26	29.	50.3	0.0	3.7	4.73	55.99	
176.000	11,246	54.37	26.02	18.13	12.41	7.12	2.87	3.46	30.	50.3	0.0	3.7	4.96	70.24	

176.000	14,494	87.95	37.28	15.32	18.42	10.15	4.48	4.67	25.	61.6	0.0	4.2	25.82	1.72 *
176.000	14,549	74.36	38.70	15.69	18.65	10.76	5.53	5.41	25.	148.1	0.0	3.7	21.98	58.19 *
176.000	14,571	68.93	39.04	15.20	18.91	10.97	5.21	4.91	25.	247.3	0.0	3.5	20.23	53.02 *
207.000	9,008	33.23	15.57	13.84	9.22	5.48	3.69	2.83	34.	229.0	0.0	3.3	7.64	59.17
207.000	9,030	33.41	11.13	13.78	9.22	5.55	3.50	2.69	30.	500.0	0.0	3.4	9.90	*** *
207.000	9,019	33.22	11.39	13.72	9.25	5.62	3.51	2.59	30.	500.0	0.0	3.5	9.38	*** *
207.000	11,641	45.92	16.82	18.56	12.55	7.24	3.64	2.55	26.	461.7	0.0	3.4	6.13	***
207.000	11,663	46.53	16.31	18.93	13.10	7.75	4.46	3.58	27.	500.0	0.0	3.2	7.07	*** *
207.000	11,718	46.87	17.34	19.17	13.15	7.85	4.34	3.68	27.	500.0	0.0	3.1	5.21	*** *
207.000	11,663	46.58	17.76	19.22	13.19	7.88	4.47	3.70	27.	500.0	0.0	3.0	5.05	*** *
207.000	15,164	60.60	21.85	26.85	18.44	10.91	6.22	4.93	27.	500.0	0.0	2.9	7.64	*** *
207.000	15,120	61.80	21.78	27.56	18.92	11.33	6.92	5.36	27.	500.0	0.0	2.8	9.64	*** *
207.000	15,120	61.58	22.51	27.92	19.15	11.33	6.85	5.11	27.	500.0	0.0	2.7	8.34	*** *
207.000	15,175	62.50	23.46	27.88	19.26	11.37	6.98	5.22	27.	500.0	0.0	2.7	7.61	*** *
225.000	8,865	40.43	21.27	16.78	11.20	6.04	3.87	2.75	36.	59.3	0.0	3.0	8.23	59.22
225.000	8,953	40.44	21.08	16.98	11.24	6.09	3.78	2.90	36.	62.4	0.0	3.0	7.76	55.84
225.000	8,953	40.30	18.45	16.86	11.07	6.08	3.48	3.06	29.	120.9	0.0	3.0	6.41	54.45
225.000	11,224	54.08	28.24	23.17	15.19	7.96	4.50	3.88	36.	45.6	0.0	2.9	6.59	52.53
225.000	11,268	54.14	23.23	23.50	15.37	8.25	4.54	3.98	26.	159.6	0.0	2.8	6.08	***
225.000	11,334	53.79	23.54	23.82	15.50	8.80	4.50	4.02	26.	157.5	0.0	2.7	4.90	***
225.000	11,334	53.82	24.03	23.76	15.15	8.49	4.42	4.16	27.	127.0	0.0	2.8	5.53	45.85
225.000	14,703	73.68	32.59	33.50	21.61	11.13	5.54	5.15	27.	97.4	0.0	2.7	5.54	***
225.000	14,725	74.91	32.98	35.24	21.80	11.49	5.87	5.56	26.	106.2	0.0	2.6	6.15	***
225.000	14,692	74.83	33.51	35.96	22.00	11.44	5.96	5.73	27.	93.3	0.0	2.6	6.63	***
225.000	14,736	75.07	34.30	39.16	22.89	11.54	6.17	5.78	29.	78.8	0.0	2.5	7.80	***
256.000	8,514	50.78	23.33	16.18	12.57	7.86	4.72	3.41	25.	74.1	0.0	2.5	10.01	80.46 *
256.000	8,679	50.34	23.53	16.37	12.67	7.85	4.70	3.43	25.	80.8	0.0	2.5	9.28	80.06 *
256.000	8,755	50.27	23.52	16.39	12.67	7.90	4.39	3.53	25.	79.1	0.0	2.5	8.65	67.44 *
256.000	11,093	67.26	33.32	23.30	17.56	10.56	6.08	4.26	25.	62.8	0.0	2.3	7.68	72.10 *
256.000	11,235	66.92	33.58	23.53	17.89	10.87	6.02	4.50	25.	67.6	0.0	2.3	7.01	66.77 *
256.000	11,323	66.96	33.78	24.04	18.03	10.98	6.14	4.66	25.	69.0	0.0	2.3	6.68	68.04 *
256.000	11,356	67.14	33.85	24.02	18.14	11.04	6.70	4.65	25.	75.2	0.0	2.3	7.56	82.94 *
256.000	14,461	89.74	47.83	35.02	25.38	14.92	8.56	5.59	25.	56.7	0.0	2.1	5.91	71.58 *
256.000	14,505	90.56	48.45	35.53	25.83	15.28	8.44	5.87	25.	54.6	0.0	2.1	5.25	66.30
256.000	14,494	90.66	48.49	35.73	25.93	15.29	8.81	6.03	25.	57.3	0.0	2.1	5.79	72.40 *
256.000	14,538	91.28	48.56	36.02	26.09	15.38	10.12	6.19	25.	62.1	0.0	2.0	7.70	107.70 *
280.000	8,547	74.28	31.69	25.92	13.97	7.11	1.56	3.68	25.	6.1	0.0	2.9	8.91	24.09 *
280.000	8,646	72.86	31.49	26.15	13.98	7.74	1.82	5.68	25.	7.7	0.0	2.8	9.44	23.62 *
280.000	8,810	68.77	31.80	25.65	14.35	6.97	2.17	4.96	25.	9.8	0.0	2.7	5.41	26.40 *
280.000	11,005	88.67	41.93	35.82	18.98	9.65	2.35	4.32	26.	7.1	0.0	2.7	8.09	23.35
280.000	11,169	89.96	42.32	39.17	18.98	9.35	1.46	4.01	26.	5.0	0.0	3.0	13.18	20.24 *
280.000	11,268	89.88	41.86	39.11	19.14	9.20	3.63	5.62	25.	10.3	0.0	2.5	9.69	20.62 *
280.000	11,411	88.66	42.15	96.54	17.29	7.15	10.91	6.06	26.	7.1	0.0	2.9	30.30	***
300.000	8,668	72.93	35.10	21.57	12.59	7.08	3.21	2.87	25.	9.3	0.0	2.8	15.04	27.82 *
300.000	8,723	72.58	34.93	21.94	12.62	7.22	3.29	2.97	25.	9.7	0.0	2.7	14.72	26.76 *
300.000	8,832	71.37	34.97	22.13	12.71	7.59	3.27	2.93	25.	10.8	0.0	2.7	14.21	26.60 *
300.000	11,126	90.07	46.84	29.91	17.58	9.18	3.86	3.40	25.	9.5	0.0	2.6	10.04	28.66 *
300.000	11,191	93.22	47.45	29.82	17.94	9.63	4.20	3.53	25.	9.4	0.0	2.6	11.64	30.78 *
300.000	11,224	93.83	47.82	29.94	18.15	9.91	4.19	3.62	25.	9.5	0.0	2.5	11.67	31.55 *
300.000	11,257	93.00	47.95	30.43	18.33	9.57	4.52	3.87	25.	9.6	0.0	2.5	11.23	31.03 *
300.000	14,418	87.55	66.54	40.42	26.77	14.76	6.04	4.72	59.	5.6	0.0	2.3	8.14	47.63

300.000	14,461	84.84	66.48	39.24	26.91	13.59	6.36	4.86	64.	5.0	0.0	2.4	9.89	44.37	
326.000	8,393	71.63	35.85	20.88	15.31	8.17	3.69	3.21	25.	11.6	0.0	2.4	12.68	41.27	*
326.000	8,448	69.54	35.61	19.95	15.39	8.20	3.91	3.28	25.	13.5	0.0	2.4	13.30	32.80	*
326.000	8,569	68.79	35.39	19.61	15.21	8.18	3.90	3.26	25.	14.5	0.0	2.4	13.47	30.99	*
326.000	10,742	91.46	46.02	24.04	19.40	9.99	4.39	3.44	25.	11.4	0.0	2.5	14.47	23.99	*
326.000	10,785	93.73	46.75	24.19	20.18	10.44	4.72	3.78	25.	11.5	0.0	2.4	15.26	23.25	*
326.000	10,840	93.70	47.00	24.32	20.41	10.52	4.80	3.81	25.	11.8	0.0	2.4	15.10	23.28	*
326.000	10,840	91.80	47.17	99.35	20.80	11.13	4.87	3.94	25.	10.3	0.0	2.0	18.30	***	*
356.000	9,205	62.82	29.74	22.80	14.08	7.46	2.54	3.00	25.	18.2	0.0	2.8	3.76	36.55	*
356.000	9,315	62.47	31.21	23.02	14.69	7.58	2.93	3.17	26.	19.0	0.0	2.7	3.54	42.56	
356.000	9,293	61.30	25.65	23.02	14.69	7.54	2.82	3.17	25.	28.2	0.0	2.8	5.02	45.39	*
356.000	11,740	75.97	30.27	30.66	19.76	10.00	4.31	5.93	25.	41.2	0.0	2.6	6.01	***	*
356.000	11,773	75.46	36.24	30.94	19.07	10.33	3.31	10.04	29.	19.0	0.0	2.7	5.94	37.16	
356.000	11,806	74.74	36.31	31.23	19.28	10.44	2.98	14.36	32.	15.0	0.0	2.8	7.13	37.50	
356.000	11,883	74.28	40.75	31.26	19.30	10.52	4.65	10.89	32.	20.2	0.0	2.5	5.42	36.27	
356.000	14,955	91.67	48.99	42.85	26.72	14.14	5.88	18.36	35.	20.5	0.0	2.4	3.80	39.46	
356.000	14,878	94.95	45.69	43.30	27.33	14.41	3.18	19.54	40.	8.9	0.0	2.8	11.73	43.10	
377.000	8,393	52.29	16.76	16.92	12.69	7.68	3.56	3.16	25.	129.2	0.0	2.6	9.34	***	*
377.000	8,514	52.20	17.26	16.90	12.74	8.26	3.77	3.15	25.	155.1	0.0	2.5	8.24	56.80	*
377.000	8,580	51.08	17.92	17.17	12.71	8.81	3.78	3.09	25.	153.9	0.0	2.4	8.48	300.00	*
377.000	10,785	71.07	26.76	24.57	16.85	9.62	4.84	3.93	25.	56.5	0.0	2.5	8.21	80.51	*
377.000	10,994	71.00	29.14	25.77	17.11	9.59	5.21	4.21	25.	50.5	0.0	2.5	8.29	58.52	*
377.000	11,093	68.53	28.82	25.85	17.02	9.56	5.35	4.26	25.	59.7	0.0	2.5	8.23	55.13	*
377.000	11,169	67.66	29.35	25.93	18.01	9.72	5.30	4.11	25.	63.3	0.0	2.4	6.41	71.12	*
377.000	14,538	87.34	39.83	35.61	23.67	13.64	6.70	4.87	25.	62.1	0.0	2.3	4.72	58.96	*
377.000	14,604	86.48	40.95	72.09	23.65	15.41	6.69	5.01	28.	50.0	0.0	2.2	13.77	***	
377.000	14,692	87.87	41.08	37.13	24.06	12.98	6.59	5.39	25.	54.5	0.0	2.4	5.46	49.69	*
377.000	14,670	89.60	39.52	37.05	24.65	12.51	5.19	5.33	25.	42.6	0.0	2.6	4.43	61.87	*
394.000	8,558	41.00	23.68	17.98	11.99	7.15	3.80	3.59	41.	42.2	0.0	2.7	5.64	56.70	
394.000	8,799	41.41	24.21	18.34	12.30	7.43	4.04	4.08	42.	43.7	0.0	2.6	5.78	59.14	
394.000	8,854	41.50	24.34	18.50	12.39	7.44	4.25	4.16	43.	44.9	0.0	2.6	6.49	58.62	
394.000	11,356	54.68	32.79	25.35	16.66	10.09	5.48	3.98	45.	37.7	0.0	2.5	6.02	51.00	
394.000	11,444	54.48	33.14	25.93	16.94	10.50	5.75	3.87	47.	38.1	0.0	2.5	6.03	48.96	
394.000	11,433	54.34	33.13	25.99	17.04	10.56	5.89	3.81	47.	38.6	0.0	2.4	6.16	50.17	
394.000	11,499	54.51	34.38	25.93	17.15	10.68	6.16	3.93	49.	36.0	0.0	2.4	6.87	52.51	
394.000	14,988	72.97	45.55	35.41	23.54	14.26	7.28	5.56	52.	28.9	0.0	2.4	4.80	55.32	
394.000	14,922	74.63	46.40	35.72	23.94	14.68	7.46	5.70	49.	30.0	0.0	2.3	4.78	58.50	
394.000	14,988	74.92	45.81	35.87	24.04	14.93	7.68	5.56	47.	33.9	0.0	2.3	4.72	58.76	
394.000	15,010	74.61	45.52	35.98	24.53	15.00	7.65	6.15	48.	33.9	0.0	2.3	3.96	68.92	
425.000	8,843	52.21	40.67	29.72	21.50	10.24	3.99	3.03	70.	5.0	0.0	2.0	5.84	45.76	*
425.000	8,887	48.49	40.68	30.26	22.57	10.57	4.69	3.20	86.	5.0	0.0	1.9	7.77	50.20	*
425.000	8,876	48.99	43.10	29.35	25.23	10.66	4.65	3.50	84.	5.0	0.0	1.8	9.88	300.00	*
425.000	11,082	60.17	59.78	39.28	28.47	13.30	5.68	4.13	83.	5.0	0.0	1.8	11.45	45.46	*
425.000	11,367	68.07	62.35	41.37	27.42	14.86	6.07	4.83	72.	5.0	0.0	1.8	8.86	47.65	*
425.000	11,499	65.02	65.27	44.06	24.69	14.25	4.23	3.71	66.	5.0	0.0	2.1	16.14	***	*
425.000	11,586	60.25	86.50	42.96	24.77	15.67	5.30	4.84	84.	5.0	0.0	1.9	18.94	***	*
425.000	14,725	75.52	82.37	56.24	38.50	19.63	6.52	4.61	87.	5.0	0.0	1.9	15.99	***	*
425.000	14,736	90.63	83.01	57.75	38.28	19.28	6.22	4.33	62.	5.0	0.0	1.8	11.46	48.75	*
425.000	14,999	89.34	75.60	56.72	41.08	20.74	7.46	5.43	73.	5.0	0.0	1.8	8.94	43.54	*
425.000	14,878	79.09	73.57	54.72	45.48	19.56	6.90	5.08	86.	5.0	0.0	1.8	14.89	300.00	*
473.000	8,788	36.00	20.29	9.74	9.69	7.46	4.30	2.90	26.	500.0	0.0	3.0	15.98	18.63	*

473.000	8,887	35.70	20.10	9.46	9.80	7.31	3.72	2.70	26.	500.0	0.0	3.1	14.39	54.15	*
473.000	8,810	34.24	18.24	8.77	8.98	6.44	3.29	2.01	27.	500.0	0.0	3.5	13.99	55.42	*
473.000	11,334	48.38	25.86	14.82	14.54	10.17	5.43	3.78	26.	439.7	0.0	2.6	9.06	39.57	
473.000	11,411	48.25	24.15	14.48	14.14	10.09	5.27	3.69	25.	500.0	0.0	2.7	8.58	56.45	*
473.000	11,477	48.41	24.70	15.33	14.81	10.92	6.24	4.65	27.	500.0	0.0	2.4	9.45	81.62	*
473.000	11,554	48.44	25.01	15.18	14.71	10.85	6.29	4.57	27.	500.0	0.0	2.5	10.05	62.87	*
473.000	14,988	64.97	32.44	22.78	19.97	14.32	7.79	5.54	27.	424.8	0.0	2.3	5.61	300.00	
473.000	15,065	65.86	33.36	22.41	20.03	14.70	8.12	5.79	26.	469.7	0.0	2.3	6.84	300.00	
473.000	15,098	66.02	32.31	23.44	19.74	14.58	8.17	5.65	26.	470.9	0.0	2.3	5.68	300.00	
473.000	15,109	65.99	32.35	22.98	19.37	14.61	8.30	5.82	26.	500.0	0.0	2.3	6.63	300.00	*
483.000	8,569	34.30	27.16	20.11	11.74	6.88	3.26	2.83	116.	5.0	0.0	3.1	9.23	29.19	*
483.000	8,558	24.27	26.87	19.96	11.69	6.91	3.31	2.91	214.	5.0	0.0	2.9	13.99	***	*
483.000	8,668	28.09	27.04	20.04	12.00	6.69	2.86	2.48	157.	5.0	0.0	3.2	11.30	32.00	*
483.000	11,126	50.38	37.08	27.63	16.41	9.45	4.35	3.64	89.	7.3	0.0	2.8	7.96	30.89	
483.000	11,159	40.50	37.43	27.90	16.82	9.61	4.55	3.80	144.	5.0	0.0	2.8	9.59	32.61	*
483.000	11,202	49.35	37.62	28.09	16.99	9.96	4.74	3.98	104.	5.3	0.0	2.7	8.00	32.93	
483.000	11,235	47.24	37.72	28.19	17.43	10.10	4.81	4.02	116.	5.0	0.0	2.7	7.72	36.09	*
483.000	14,659	64.30	51.65	38.71	24.96	13.52	5.83	4.77	106.	5.0	0.0	2.6	6.00	44.89	*
483.000	14,681	75.53	51.49	39.49	26.13	12.93	4.27	4.91	73.	5.0	0.0	2.8	4.18	54.30	*
483.000	14,615	73.65	52.39	39.28	26.05	14.59	5.72	5.46	86.	5.0	0.0	2.5	3.77	53.66	*
483.000	14,692	71.40	52.00	39.56	26.18	14.05	5.09	5.30	87.	5.0	0.0	2.6	4.83	53.54	*
496.000	8,503	51.63	28.22	25.41	15.66	7.47	3.94	4.35	38.	19.7	0.0	2.3	7.69	37.96	
496.000	8,547	51.44	28.36	24.64	15.66	7.35	4.26	4.15	37.	21.7	0.0	2.3	8.27	44.03	
496.000	8,646	51.83	28.52	24.47	15.61	7.41	4.38	4.55	36.	23.5	0.0	2.3	8.29	44.77	
496.000	10,983	67.33	38.41	32.89	20.73	9.69	5.38	5.24	40.	16.5	0.0	2.3	7.98	41.78	
496.000	11,126	68.17	39.40	33.01	21.34	10.17	5.41	5.41	41.	16.4	0.0	2.2	6.75	47.92	
496.000	11,093	68.29	39.72	35.40	21.33	10.18	5.27	5.98	45.	13.1	0.0	2.2	7.97	34.25	
496.000	11,257	68.42	40.13	39.98	21.93	10.65	5.13	6.28	54.	9.1	0.0	2.2	9.00	26.08	
496.000	14,527	88.70	55.79	49.54	29.72	14.48	5.89	7.81	63.	5.0	0.0	2.3	5.04	33.44	*
496.000	14,549	89.97	56.11	45.86	31.06	15.18	6.23	7.42	59.	6.8	0.0	2.2	2.61	10.86	
496.000	14,571	90.55	57.38	45.22	30.87	15.30	6.22	7.46	58.	7.0	0.0	2.2	2.07	11.23	
496.000	14,582	90.67	55.88	46.30	31.15	15.40	6.32	7.60	56.	7.7	0.0	2.1	2.67	11.42	
529.000	8,525	49.77	26.83	21.33	14.99	8.46	5.50	3.66	28.	58.2	0.0	2.1	6.92	89.62	
529.000	8,635	49.38	27.57	21.76	14.91	8.47	5.75	4.04	31.	51.4	0.0	2.1	8.13	73.45	
529.000	8,668	50.07	27.72	21.65	15.18	8.53	5.39	3.70	31.	49.3	0.0	2.1	6.75	86.77	
529.000	10,829	63.59	36.74	28.89	20.57	11.07	7.64	5.68	33.	41.4	0.0	2.0	7.66	74.01	
529.000	11,049	64.90	37.57	29.26	20.79	11.37	7.38	6.05	33.	40.0	0.0	2.0	6.90	77.88	
529.000	11,148	60.94	37.73	29.58	20.86	11.65	8.06	6.26	43.	35.1	0.0	2.0	7.76	84.54	
529.000	11,180	63.70	38.20	29.85	20.96	11.80	7.68	5.65	38.	37.1	0.0	2.0	7.04	86.95	
529.000	14,450	83.21	51.24	40.68	28.71	15.39	9.43	6.78	43.	26.6	0.0	2.0	6.12	72.75	
529.000	14,428	81.70	51.76	41.70	29.33	15.90	9.57	8.83	49.	23.9	0.0	1.9	5.75	76.00	
529.000	14,407	74.52	52.69	42.30	29.79	16.12	9.27	7.49	82.	11.8	0.0	1.9	5.61	74.98	
529.000	14,450	75.59	53.69	42.59	29.89	16.30	8.86	7.61	84.	10.0	0.0	2.0	5.06	66.15	
554.000	8,887	40.07	25.84	21.44	14.38	10.12	4.74	3.30	62.	34.7	0.0	2.1	4.56	58.51	
554.000	8,942	40.06	25.83	21.31	14.24	9.15	4.65	3.29	64.	31.3	0.0	2.3	4.22	58.20	
554.000	8,920	40.06	25.87	21.27	14.42	8.61	4.66	3.39	66.	28.1	0.0	2.3	4.44	67.04	
554.000	11,795	51.54	33.80	28.26	19.31	11.29	6.25	4.36	72.	26.9	0.0	2.3	4.55	73.37	
554.000	11,740	51.93	33.93	27.88	19.63	11.26	6.36	4.41	69.	28.3	0.0	2.3	4.34	73.21	
554.000	11,762	52.27	34.18	27.89	19.48	10.94	6.26	4.38	69.	26.3	0.0	2.3	4.94	75.17	
554.000	11,729	51.10	34.14	27.80	19.17	10.82	6.22	4.43	76.	24.1	0.0	2.3	5.42	80.56	
554.000	15,328	63.06	45.61	37.78	26.74	15.23	8.47	5.91	124.	11.5	0.0	2.3	4.39	71.36	

554.000	15,328	64.04	46.04	38.11	27.05	16.38	8.85	6.31	110.	17.5	0.0	2.1	3.50	117.35	
554.000	15,317	69.26	46.13	38.07	27.11	16.48	8.77	6.31	73.	27.6	0.0	2.1	2.91	123.35	
554.000	15,317	69.77	46.19	38.04	27.04	15.85	8.78	6.32	70.	27.7	0.0	2.1	3.73	70.23	
576.000	8,547	39.82	29.56	16.48	10.69	7.07	4.31	3.38	49.	28.8	0.0	2.8	14.76	30.76	
576.000	8,701	38.39	27.78	16.63	10.85	7.17	4.25	3.42	55.	29.9	0.0	2.8	12.80	44.30	
576.000	8,744	37.57	26.95	16.61	10.94	7.22	4.37	3.50	57.	31.9	0.0	2.8	12.06	47.47	
576.000	11,213	46.15	34.82	22.81	14.98	9.78	5.88	4.56	77.	24.0	0.0	2.6	10.16	47.43	
576.000	11,268	50.03	36.89	24.66	15.24	9.93	5.90	4.66	68.	21.0	0.0	2.6	10.63	34.69	
576.000	11,312	50.82	36.27	22.20	15.53	10.02	5.84	4.67	55.	32.1	0.0	2.6	10.85	62.72	
576.000	11,356	50.95	33.76	21.33	15.70	10.08	5.78	4.73	47.	44.8	0.0	2.6	9.39	96.02	
576.000	14,922	67.83	47.26	29.99	22.26	14.02	8.18	6.31	54.	35.5	0.0	2.4	8.91	102.86	
576.000	14,944	66.93	54.87	31.25	22.54	14.32	8.23	6.43	72.	20.6	0.0	2.4	11.47	35.35	
576.000	14,955	71.02	54.05	32.53	22.72	14.37	7.71	6.41	63.	20.1	0.0	2.4	10.41	52.69	
576.000	14,999	71.69	54.91	33.44	22.80	14.45	7.61	6.41	66.	17.1	0.0	2.4	10.44	58.20	
635.000	9,118	37.56	25.69	18.95	14.26	8.49	4.56	3.76	74.	30.5	0.0	2.4	3.88	64.83	
635.000	9,194	37.94	26.39	19.00	14.08	8.46	4.52	3.92	75.	28.4	0.0	2.5	4.65	63.08	
635.000	9,238	38.14	26.60	18.84	13.99	8.38	4.58	3.83	74.	28.2	0.0	2.5	5.37	65.22	
635.000	11,608	51.50	35.25	26.24	19.39	11.44	6.08	4.90	71.	25.8	0.0	2.3	3.85	63.37	
635.000	11,696	52.41	35.44	26.67	19.48	11.69	6.23	5.00	67.	27.5	0.0	2.2	3.71	63.40	
635.000	11,663	52.90	34.62	27.17	19.60	11.82	6.29	5.06	64.	30.0	0.0	2.2	3.13	64.02	
635.000	11,729	53.77	34.86	26.46	19.55	11.86	6.30	5.05	57.	35.4	0.0	2.2	3.18	63.50	
635.000	14,758	72.07	50.35	36.51	27.72	16.50	8.80	6.61	66.	23.6	0.0	2.0	4.14	63.10	
635.000	14,769	72.75	51.30	38.54	27.50	16.87	8.76	6.69	72.	19.8	0.0	2.0	3.96	115.49	
635.000	14,769	73.19	51.08	38.66	27.48	16.97	9.21	6.89	67.	22.7	0.0	2.0	4.36	109.24	
635.000	14,769	73.18	55.67	38.32	27.47	16.92	9.31	6.83	75.	17.1	0.0	2.0	6.79	113.60	
652.000	9,129	21.64	14.81	12.35	9.14	6.48	4.07	3.19	115.	130.9	0.0	3.0	3.70	252.12	
652.000	9,118	21.48	14.74	12.24	9.06	6.39	3.97	3.08	120.	121.0	0.0	3.0	3.67	253.68	
652.000	9,205	21.64	14.85	12.38	9.15	6.46	4.03	3.16	120.	124.1	0.0	3.0	3.64	243.80	
652.000	11,916	29.37	20.34	16.91	12.54	8.76	5.49	4.10	118.	111.7	0.0	2.9	3.56	275.87	
652.000	11,971	29.31	20.36	16.99	12.62	8.85	5.58	4.26	121.	112.2	0.0	2.8	3.53	290.05	
652.000	11,992	29.31	20.43	17.03	12.70	8.92	5.65	4.34	121.	115.6	0.0	2.8	3.52	300.00	
652.000	11,971	29.22	20.31	16.91	12.58	8.80	5.50	4.21	122.	111.3	0.0	2.9	3.42	300.00	
652.000	15,921	39.37	28.96	24.13	18.02	12.46	7.71	5.68	164.	70.3	0.0	2.7	3.27	300.00	
652.000	15,943	38.96	28.93	24.20	18.10	12.59	7.69	6.05	178.	64.7	0.0	2.7	3.15	300.00	
652.000	15,932	40.48	28.77	24.04	17.97	12.44	7.54	5.89	136.	83.7	0.0	2.7	3.06	300.00	
652.000	15,987	40.21	28.67	23.98	17.97	12.48	7.61	6.01	138.	86.2	0.0	2.7	3.04	300.00	
666.000	8,854	38.18	27.54	20.69	14.41	8.96	4.13	3.46	97.	13.4	0.0	2.4	4.13	83.82	
666.000	8,843	38.54	27.28	21.05	14.51	8.51	4.22	3.54	91.	14.6	0.0	2.4	4.13	77.00	
666.000	8,832	38.41	26.98	21.00	14.65	8.52	4.15	3.43	93.	13.9	0.0	2.4	3.49	89.21	
666.000	11,257	50.52	37.54	29.03	20.19	12.55	5.91	4.61	109.	9.3	0.0	2.2	3.90	83.14	
666.000	11,356	50.78	37.23	29.52	20.35	12.08	5.81	4.54	112.	8.1	0.0	2.3	3.50	77.46	
666.000	11,444	50.91	36.29	29.54	20.54	12.03	5.84	4.65	107.	10.0	0.0	2.3	3.02	87.44	
666.000	11,510	51.00	36.19	29.09	20.62	12.14	5.93	4.78	106.	11.1	0.0	2.2	2.67	57.14	
666.000	14,977	66.03	51.74	42.96	28.42	17.99	8.15	6.20	133.	5.0	0.0	2.1	4.97	53.63	*
666.000	15,032	67.93	50.69	43.10	28.36	18.09	8.43	6.20	130.	5.1	0.0	2.1	4.09	52.06	
666.000	15,043	70.70	49.85	42.50	28.19	17.89	8.46	6.14	101.	11.3	0.0	2.0	3.78	55.38	
666.000	15,120	68.24	49.95	44.20	28.27	17.79	8.47	6.08	127.	5.8	0.0	2.1	4.15	44.20	
676.000	9,216	42.03	27.31	16.49	12.63	7.25	3.87	3.57	46.	36.7	0.0	2.9	8.48	58.42	
676.000	9,282	41.75	24.32	16.53	12.61	7.33	3.91	3.56	40.	54.8	0.0	2.8	5.78	62.98	
676.000	9,326	41.64	24.12	16.53	12.64	7.33	3.98	3.58	40.	57.7	0.0	2.8	5.81	65.20	
676.000	11,795	54.63	33.05	23.22	17.68	10.19	5.49	4.73	44.	45.2	0.0	2.6	5.08	64.70	

676.000	11,905	53.99	33.30	23.30	17.78	10.24	5.56	4.80	47.	42.8	0.0	2.6	5.25	65.53	
676.000	11,971	54.61	33.24	23.34	17.72	10.23	5.57	4.81	45.	45.2	0.0	2.6	5.27	65.80	
676.000	12,003	54.51	33.04	23.36	17.74	10.23	5.49	4.77	46.	45.4	0.0	2.6	4.89	64.41	
676.000	14,900	71.82	46.25	33.45	25.37	14.44	7.58	6.44	54.	29.9	0.0	2.3	4.05	62.47	
676.000	14,944	71.85	46.17	33.92	25.54	14.56	7.75	6.63	54.	30.6	0.0	2.3	3.93	64.08	
676.000	14,966	71.48	45.57	33.59	25.30	14.49	7.55	6.73	54.	31.1	0.0	2.3	3.54	62.07	
676.000	15,021	71.57	45.58	33.65	25.34	14.41	7.45	6.69	54.	30.2	0.0	2.3	3.42	61.49	
713.000	9,161	19.76	16.55	13.49	9.69	7.23	4.65	3.65	320.	35.9	0.0	2.7	5.48	123.98	
713.000	9,271	19.77	16.43	13.31	9.21	6.80	3.73	2.68	348.	14.2	0.0	3.3	5.66	76.00	
713.000	9,150	19.61	16.42	13.41	9.61	7.30	4.20	3.21	332.	29.4	0.0	2.9	5.11	117.59	
713.000	11,992	26.48	21.80	17.98	14.87	9.11	5.04	3.69	390.	5.1	0.0	3.2	1.64	73.30	
713.000	12,003	27.24	22.70	18.64	17.52	9.93	5.74	4.29	418.	5.0	0.0	2.8	3.96	300.00	
713.000	12,014	27.00	22.37	18.32	14.89	9.71	5.17	3.70	377.	7.6	0.0	3.0	2.10	66.52	
713.000	12,036	27.13	22.51	18.80	14.91	11.23	6.00	4.92	389.	18.4	0.0	2.5	3.50	300.00	
713.000	15,800	38.88	31.75	26.80	21.00	15.52	7.88	6.15	380.	5.2	0.0	2.6	3.59	300.00	
713.000	15,844	38.54	31.57	26.28	19.85	15.31	7.57	5.95	339.	13.4	0.0	2.6	4.70	300.00	
713.000	15,778	38.85	31.89	26.48	19.77	14.63	7.90	6.47	309.	19.7	0.0	2.5	3.70	300.00	
713.000	15,811	39.29	32.18	26.85	19.89	13.70	7.53	6.35	318.	10.5	0.0	2.7	3.03	283.00	
728.000	9,085	20.70	16.51	14.44	10.91	7.28	3.75	3.91	371.	5.1	0.0	3.2	2.87	1.73	
728.000	9,183	20.36	16.13	14.08	10.46	6.77	3.07	3.94	340.	5.2	0.0	3.6	4.37	14.78	
728.000	9,161	20.19	16.01	14.00	10.13	6.44	2.64	3.51	313.	5.0	0.0	4.0	5.91	169.34	*
728.000	11,707	28.29	22.53	19.60	14.86	9.65	4.29	5.13	315.	5.0	0.0	3.3	4.58	11.15	*
728.000	11,795	29.33	23.42	20.56	15.68	10.47	5.00	6.39	329.	5.2	0.0	2.9	3.88	14.62	
728.000	11,740	29.42	23.28	20.19	15.57	10.17	4.83	5.32	317.	5.2	0.0	3.0	3.39	5.71	
728.000	11,784	29.22	22.84	19.74	15.15	9.75	4.63	4.93	313.	5.0	0.0	3.2	3.02	3.21	*
728.000	15,230	41.18	32.59	28.38	21.89	14.14	6.81	7.31	294.	5.0	0.0	2.8	3.20	3.80	*
728.000	15,262	42.34	32.86	29.09	21.90	13.86	6.49	8.09	272.	5.0	0.0	2.8	3.51	13.46	*
728.000	15,262	42.54	32.85	29.09	21.87	13.83	6.26	8.28	264.	5.0	0.0	2.9	3.91	16.20	*
728.000	15,262	42.89	33.12	29.27	22.08	14.10	6.91	7.77	275.	5.1	0.0	2.7	2.90	7.20	
767.000	8,766	26.67	17.87	11.95	9.96	5.85	3.34	2.61	79.	64.6	0.0	3.3	5.59	300.00	
767.000	9,019	27.72	18.65	13.48	10.42	6.41	3.86	3.07	84.	62.3	0.0	3.1	5.48	83.33	
767.000	9,085	27.65	18.40	12.73	10.08	6.13	3.61	2.83	79.	67.4	0.0	3.3	5.91	300.00	
767.000	11,455	37.03	25.24	17.89	14.24	8.65	5.08	3.88	83.	55.7	0.0	2.9	5.18	300.00	
767.000	11,488	36.87	25.19	17.70	14.16	8.60	5.06	3.85	82.	57.6	0.0	2.9	5.33	300.00	
767.000	11,597	36.69	25.10	17.34	13.98	8.43	4.85	3.61	84.	55.6	0.0	3.0	5.34	300.00	
767.000	11,663	36.77	25.41	17.72	14.24	8.81	5.15	3.95	85.	59.6	0.0	2.9	5.30	300.00	
767.000	15,197	50.87	35.54	25.65	20.13	13.51	7.96	6.07	79.	68.6	0.0	2.5	5.32	76.73	
767.000	15,175	50.67	35.63	26.82	20.21	12.79	7.52	5.77	94.	46.3	0.0	2.6	4.52	77.95	
767.000	15,175	51.06	35.60	27.61	19.66	12.80	7.30	5.69	95.	42.9	0.0	2.7	4.47	115.20	
767.000	15,098	47.11	35.67	29.70	19.98	13.04	6.94	5.87	200.	8.4	0.0	2.8	4.73	61.79	
780.000	8,733	41.63	24.03	20.35	14.87	9.34	4.96	4.07	41.	69.0	0.0	2.1	2.00	65.73	
780.000	8,766	41.28	23.81	20.58	14.65	8.98	4.60	3.65	45.	55.1	0.0	2.2	2.32	127.50	
780.000	8,799	41.53	24.28	20.31	14.95	9.20	4.83	3.84	44.	58.9	0.0	2.1	1.78	64.72	
780.000	11,499	53.52	32.42	28.13	20.17	12.38	6.63	5.09	51.	48.8	0.0	2.0	2.48	146.17	
780.000	11,532	53.57	32.72	28.68	20.98	13.08	7.38	5.81	50.	59.1	0.0	1.9	2.56	75.19	
780.000	11,488	53.11	32.13	27.72	20.61	12.72	6.72	5.04	50.	55.1	0.0	2.0	1.50	66.50	
780.000	11,510	53.29	33.20	27.94	20.84	12.87	6.79	5.13	54.	46.0	0.0	2.0	1.48	65.69	
780.000	15,208	71.75	46.58	39.89	28.93	17.88	9.26	6.82	65.	32.2	0.0	1.9	1.95	63.41	
780.000	15,262	72.64	46.92	41.55	30.02	18.13	9.30	7.13	69.	29.0	0.0	1.9	2.04	63.71	
780.000	15,273	73.15	47.59	40.54	30.46	18.41	9.52	7.24	66.	31.7	0.0	1.9	1.25	64.46	
780.000	15,284	73.42	48.12	40.15	30.21	18.37	9.48	7.00	66.	30.6	0.0	1.9	1.19	63.58	

794.000	8,733	36.39	18.49	16.68	12.86	9.13	5.67	3.51	32.	448.7	0.0	1.9	2.26	300.00	
794.000	8,766	34.66	19.03	16.89	13.05	8.94	5.60	3.59	39.	287.7	0.0	2.0	2.28	100.87	
794.000	8,788	34.81	19.42	17.09	13.24	8.93	5.88	3.85	39.	278.1	0.0	2.0	3.00	107.56	
794.000	11,510	46.31	26.83	23.44	18.11	12.09	8.21	5.17	42.	219.8	0.0	1.9	3.57	97.29	
794.000	11,488	46.70	27.08	23.76	18.28	12.33	8.58	5.22	41.	241.6	0.0	1.8	3.96	90.02	
794.000	11,510	46.97	26.92	23.89	18.34	12.26	8.58	5.18	40.	248.3	0.0	1.8	4.02	89.49	
794.000	11,565	46.48	26.98	24.13	18.65	12.44	8.61	5.43	42.	239.2	0.0	1.8	3.65	99.12	
794.000	15,186	63.05	37.98	33.58	25.78	17.18	11.71	7.01	45.	170.4	0.0	1.7	3.56	88.30	
794.000	15,230	64.10	38.47	34.22	26.44	17.73	11.91	7.18	44.	176.1	0.0	1.7	3.20	89.91	
794.000	15,230	64.35	39.05	34.50	26.70	17.89	12.24	7.40	45.	170.7	0.0	1.6	3.39	90.20	
794.000	15,219	64.73	39.50	34.79	26.88	17.98	12.63	7.58	44.	173.7	0.0	1.6	3.87	88.82	
826.000	8,832	27.37	21.54	18.81	14.17	8.68	4.37	3.40	242.	5.0	0.0	2.5	2.43	62.50	*
826.000	8,898	27.71	21.90	19.17	14.52	8.99	4.68	3.72	249.	5.0	0.0	2.4	2.14	65.73	*
826.000	8,953	27.66	22.02	19.20	14.48	9.00	4.82	3.77	254.	5.0	0.0	2.4	2.22	68.60	*
826.000	11,400	39.35	30.36	26.29	19.85	12.29	6.27	4.80	208.	6.5	0.0	2.2	1.90	63.46	
826.000	11,586	39.95	30.82	26.52	20.06	12.70	6.36	5.06	210.	6.5	0.0	2.2	2.21	61.37	
826.000	11,586	40.14	31.20	27.06	20.60	13.06	6.89	5.44	224.	5.2	0.0	2.1	1.60	66.73	
826.000	11,641	40.20	31.31	27.06	20.51	12.98	7.11	5.33	212.	9.1	0.0	2.1	1.49	71.15	
826.000	15,186	54.69	44.13	37.74	28.77	17.78	9.46	6.70	213.	5.0	0.0	2.0	2.42	67.78	*
826.000	15,230	55.44	44.80	38.19	29.01	18.04	10.12	7.07	216.	5.0	0.0	2.0	2.27	74.67	*
826.000	15,175	55.77	45.12	38.48	29.20	18.26	9.92	7.20	207.	6.0	0.0	1.9	2.46	69.87	
826.000	15,219	56.10	45.46	38.74	29.40	18.41	10.51	7.27	207.	7.6	0.0	1.9	2.51	77.44	
853.000	10,895	62.54	15.95	12.57	9.73	6.44	4.07	3.41	25.	309.9	0.0	4.1	15.64	96.96	*
853.000	10,873	21.62	15.99	12.45	9.65	6.28	4.30	2.90	185.	92.9	0.0	3.6	5.34	108.09	
853.000	10,950	34.30	15.71	12.39	9.67	6.89	4.16	3.16	37.	500.0	0.0	3.5	5.86	80.80	*
853.000	13,935	26.10	20.86	17.35	13.52	9.74	5.75	4.62	336.	55.2	0.0	3.1	2.47	300.00	
853.000	13,803	44.04	20.53	17.45	13.40	9.28	5.90	4.63	38.	500.0	0.0	3.2	3.91	100.28	*
853.000	13,990	77.56	20.67	17.52	13.33	9.41	5.72	4.40	25.	417.6	0.0	3.6	13.61	300.00	*
853.000	14,044	59.64	20.67	17.66	13.49	9.53	5.88	4.66	25.	500.0	0.0	3.6	8.70	300.00	*
853.000	17,578	35.43	29.22	24.84	19.42	14.01	8.63	6.75	390.	38.0	0.0	2.6	2.37	300.00	
853.000	17,413	34.80	29.06	24.95	19.44	14.06	8.73	6.78	455.	24.7	0.0	2.6	2.44	300.00	
853.000	17,852	33.50	29.24	25.17	19.53	13.86	8.72	6.87	568.	9.0	0.0	2.8	2.76	97.07	
853.000	17,808	37.09	28.88	25.11	19.29	13.57	8.32	6.57	291.	55.9	0.0	2.7	2.15	300.00	
869.000	9,041	40.63	21.31	14.74	11.57	7.01	4.15	3.68	31.	127.3	0.0	2.8	6.75	300.00	
869.000	9,150	40.72	21.68	14.84	11.67	7.04	4.27	3.80	32.	123.1	0.0	2.8	7.29	300.00	
869.000	9,194	40.41	22.63	14.79	11.63	6.93	4.13	3.78	35.	87.4	0.0	2.9	7.97	208.32	
869.000	11,630	50.48	31.80	20.13	16.00	9.53	5.53	5.10	44.	57.7	0.0	2.7	7.90	107.67	
869.000	11,696	51.03	83.24	20.44	16.11	9.62	5.69	5.07	65.	21.4	0.0	2.8	20.87	***	
869.000	11,729	51.28	30.01	20.62	16.35	9.71	5.73	5.28	40.	76.9	0.0	2.7	6.37	300.00	
869.000	11,740	51.83	30.59	20.62	16.45	9.64	5.61	5.12	40.	71.5	0.0	2.7	6.52	300.00	
869.000	15,153	62.60	41.02	28.89	22.91	13.43	7.87	6.11	59.	46.8	0.0	2.5	5.46	300.00	
869.000	15,251	65.56	41.52	29.43	23.63	13.93	8.18	6.33	51.	56.3	0.0	2.4	5.18	300.00	
869.000	15,262	64.26	41.59	29.65	23.87	14.04	8.24	6.24	55.	52.7	0.0	2.4	4.93	300.00	
869.000	15,273	62.75	41.83	29.71	23.97	14.03	8.19	6.14	63.	44.7	0.0	2.4	4.92	300.00	
893.000	9,282	41.93	21.10	19.59	12.50	8.44	4.12	3.17	33.	116.9	0.0	2.5	4.78	43.89	
893.000	9,524	40.75	21.21	18.89	13.00	7.76	4.43	3.34	37.	109.5	0.0	2.6	4.51	81.37	
893.000	9,535	40.91	21.22	19.17	13.15	7.87	4.56	3.50	37.	113.5	0.0	2.6	4.82	78.93	
893.000	11,850	53.37	30.52	26.27	17.68	10.43	5.75	4.53	46.	51.6	0.0	2.5	4.57	64.31	
893.000	11,927	50.57	33.54	26.36	18.03	10.72	6.11	4.64	71.	28.6	0.0	2.4	5.56	71.84	
893.000	11,992	51.75	36.93	28.79	17.88	10.72	6.01	4.57	84.	16.4	0.0	2.5	8.35	37.20	
893.000	14,845	69.39	51.15	54.71	24.65	14.94	8.22	5.93	108.	5.0	0.0	2.3	12.84	***	*

893.000	14,933	69.16	47.28	37.93	24.98	15.26	8.51	6.13	71.	22.7	0.0	2.2	6.05	52.00	
893.000	14,966	68.48	46.96	37.82	24.98	15.10	8.31	5.91	75.	21.5	0.0	2.2	5.81	53.30	
893.000	14,922	68.57	45.63	37.34	24.99	15.34	8.51	5.97	67.	26.9	0.0	2.2	5.18	59.22	
926.000	9,545	42.22	22.53	32.77	15.04	7.88	4.63	3.49	51.	45.9	0.0	2.4	12.12	***	
926.000	9,589	42.33	22.84	18.79	13.33	7.89	4.65	3.48	38.	86.3	0.0	2.6	4.72	117.94	
926.000	9,524	40.76	24.52	18.26	12.98	7.34	4.50	3.40	49.	46.8	0.0	2.8	6.53	87.69	
926.000	12,146	51.11	30.88	24.30	18.41	9.86	6.13	4.73	54.	48.8	0.0	2.6	4.68	76.11	
926.000	12,245	51.71	35.14	23.76	17.46	10.51	6.19	4.65	61.	35.3	0.0	2.6	7.63	74.31	
926.000	12,256	51.27	30.15	23.79	17.32	11.25	6.29	4.58	46.	81.3	0.0	2.4	3.68	177.44	
926.000	12,267	51.64	30.08	24.31	18.12	10.89	6.39	4.59	46.	77.5	0.0	2.4	3.48	81.00	
926.000	15,295	64.13	41.09	33.06	25.02	15.16	8.51	6.10	62.	46.9	0.0	2.2	2.36	73.13	
926.000	15,603	63.73	40.59	34.14	24.87	14.75	8.63	6.36	66.	44.7	0.0	2.2	3.48	81.38	
926.000	15,570	63.40	40.73	36.03	24.27	14.76	8.76	6.94	70.	40.6	0.0	2.2	5.13	65.05	
926.000	15,723	63.23	40.54	34.23	24.70	14.74	8.89	6.77	67.	46.7	0.0	2.2	4.08	88.29	
955.000	8,777	41.50	18.12	13.72	10.33	6.86	4.08	3.39	25.	263.5	0.0	2.8	6.74	79.07	*
955.000	8,832	42.13	18.39	13.74	10.40	6.98	4.11	3.47	25.	255.4	0.0	2.8	7.32	76.51	*
955.000	8,909	42.46	18.45	13.82	10.42	6.97	4.10	3.43	25.	251.8	0.0	2.9	7.30	76.37	*
955.000	11,213	55.78	25.07	19.04	14.22	9.44	5.57	4.55	25.	203.3	0.0	2.6	6.87	300.00	*
955.000	11,367	54.56	25.35	19.22	14.23	9.44	5.70	4.56	25.	231.1	0.0	2.6	6.30	255.97	*
955.000	11,455	55.59	26.30	19.27	14.37	9.57	5.77	4.85	25.	212.3	0.0	2.6	7.24	300.00	*
955.000	11,477	53.24	26.07	19.33	14.35	9.59	5.73	4.93	26.	225.3	0.0	2.6	6.28	266.01	
955.000	14,856	65.00	36.66	27.14	20.02	13.29	7.85	7.23	37.	111.0	0.0	2.5	6.06	222.90	
955.000	14,878	68.69	37.81	27.39	19.99	13.28	8.06	6.91	32.	118.0	0.0	2.5	7.09	168.60	
955.000	14,834	66.72	37.71	27.52	19.89	13.24	8.07	6.98	35.	106.8	0.0	2.5	6.94	139.76	
955.000	14,878	64.59	36.47	27.71	20.14	13.45	8.18	7.03	37.	119.8	0.0	2.4	5.67	161.35	
975.000	8,481	39.48	23.37	23.21	12.28	6.89	3.93	3.00	58.	24.4	0.0	2.6	10.28	23.96	
975.000	8,591	38.97	23.39	21.46	12.27	6.88	3.93	3.02	59.	26.3	0.0	2.6	8.80	28.70	
975.000	8,635	39.22	23.24	20.08	12.18	6.66	3.94	3.01	54.	30.0	0.0	2.7	8.38	34.92	
975.000	10,983	51.91	32.02	27.46	16.58	8.55	5.14	3.81	61.	19.4	0.0	2.6	9.19	34.33	
975.000	11,060	51.78	32.08	25.59	16.67	9.14	5.21	3.95	56.	26.3	0.0	2.6	7.04	49.32	
975.000	11,071	53.71	32.04	25.19	16.80	9.46	5.33	4.06	46.	33.8	0.0	2.5	6.28	57.92	
975.000	11,148	52.82	32.04	24.95	16.91	10.12	5.46	4.11	48.	37.5	0.0	2.5	5.08	65.38	
975.000	14,494	70.04	45.42	33.85	23.33	12.96	7.07	5.26	58.	23.0	0.0	2.4	5.79	76.49	
975.000	14,582	70.34	44.87	33.88	23.48	12.88	7.24	5.42	56.	25.3	0.0	2.4	5.93	69.63	
975.000	14,560	70.22	44.52	33.00	23.68	13.39	7.33	5.52	53.	29.2	0.0	2.4	4.93	66.28	
975.000	14,615	69.76	44.24	33.73	23.73	14.05	7.40	5.57	54.	30.2	0.0	2.3	4.09	97.90	

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Mean:		54.15	32.41	25.54	17.76	10.67	5.79	4.99	76.	103.8	0.0	2.7	7.06	53.08
Std. Dev:		17.56	12.43	10.56	6.02	3.39	1.99	2.00	83.	146.3	0.0	0.6	4.43	172.43
Var Coeff(%):		32.42	38.34	41.35	33.87	31.76	34.36	40.11	100.	100.0	0.0	23.8	62.68	324.85

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US14 Section 2

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	9.00	25,000	1,000,000	H1: õ = 0.35
Base:	6.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	57.60	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
0.000	8,393	59.33	22.88	20.20	12.39	6.72	3.96	3.01	25.	16.6	0.0	4.1	9.95	36.79	*
0.000	8,470	58.83	22.39	20.36	12.47	6.80	4.03	3.05	25.	18.9	0.0	4.1	10.24	36.79	*
0.000	8,481	58.41	21.67	20.33	12.47	6.85	4.05	3.09	25.	20.7	0.0	4.1	10.56	37.28	*
0.000	11,071	76.01	27.22	25.54	16.09	8.98	5.06	3.78	25.	21.7	0.0	4.2	10.64	42.38	*
0.000	11,060	75.73	27.36	26.79	16.48	9.27	5.23	3.94	25.	23.5	0.0	4.0	10.70	38.04	*
0.000	11,137	75.78	27.96	27.05	16.56	9.39	5.30	4.01	25.	23.8	0.0	4.0	10.40	37.09	*
0.000	11,104	75.32	27.87	27.04	16.56	9.42	5.28	4.03	25.	24.4	0.0	4.0	10.27	37.16	*
80.000	8,371	21.74	9.65	7.17	6.90	4.52	3.46	2.74	48.	500.0	0.0	6.3	8.67	300.00	*
80.000	8,295	22.41	10.21	8.31	7.08	4.50	3.49	2.67	46.	500.0	0.0	5.7	6.47	231.41	*
80.000	11,159	35.49	27.80	14.90	9.56	6.32	4.73	3.56	90.	16.9	0.0	5.9	16.66	26.10	
92.000	8,942	25.43	12.23	9.91	8.44	5.41	3.36	2.38	43.	500.0	0.0	5.2	1.73	96.65	*
92.000	9,118	26.13	12.38	10.05	8.52	5.47	3.36	2.39	42.	500.0	0.0	5.3	1.61	92.72	*
92.000	9,161	25.21	12.41	10.07	8.53	5.47	3.36	2.39	46.	453.7	0.0	5.3	1.52	92.69	
92.000	11,499	33.74	16.88	13.69	11.61	7.43	4.51	3.19	44.	413.4	0.0	4.9	1.22	90.11	
92.000	11,718	33.92	17.07	13.77	11.69	7.53	4.54	3.22	44.	409.4	0.0	4.9	1.22	87.77	
92.000	11,872	33.76	17.20	13.91	11.75	7.60	4.58	3.25	46.	392.3	0.0	4.9	1.19	87.36	
92.000	11,916	33.62	17.29	14.00	11.80	7.63	4.60	3.26	47.	370.2	0.0	4.9	1.17	87.46	
92.000	15,471	42.33	24.21	19.53	16.49	10.59	6.26	4.44	63.	190.3	0.0	4.7	0.82	83.41	
92.000	15,657	42.04	24.60	19.74	16.72	10.76	6.40	4.54	67.	183.8	0.0	4.7	0.87	84.76	
92.000	15,712	41.88	24.81	19.89	16.81	10.83	6.45	4.59	70.	171.3	0.0	4.7	0.90	84.97	
92.000	15,679	40.71	24.95	19.99	16.90	10.88	6.49	4.60	79.	145.8	0.0	4.7	0.90	85.43	
122.000	8,799	67.49	24.32	17.44	9.87	5.51	3.28	2.50	25.	6.2	0.0	5.4	15.59	26.85	*
122.000	8,876	65.28	24.93	16.10	9.67	6.39	3.16	2.36	25.	7.6	0.0	5.4	16.72	31.15	*
122.000	8,975	65.57	25.19	15.63	9.89	6.06	3.12	2.44	25.	7.3	0.0	5.5	16.03	38.82	*
122.000	11,378	78.98	32.37	23.03	13.54	8.85	4.35	2.95	25.	12.0	0.0	4.7	11.69	29.46	*
122.000	11,389	77.96	33.31	21.62	13.72	7.82	4.62	3.16	25.	11.3	0.0	4.9	11.19	40.03	*
122.000	11,433	77.20	35.73	21.61	13.79	7.66	4.46	3.03	25.	10.5	0.0	4.9	11.33	40.48	*
135.000	9,096	49.81	21.36	15.88	11.69	6.24	3.71	2.81	25.	45.2	0.0	4.7	4.61	72.57	*
135.000	9,096	49.88	20.98	15.90	11.26	6.37	3.82	3.02	25.	46.7	0.0	4.7	5.31	82.86	*
135.000	9,238	50.27	21.71	16.50	11.44	6.53	3.94	3.19	25.	48.3	0.0	4.7	5.25	83.44	*
135.000	11,543	62.91	30.27	23.06	15.54	8.75	5.08	3.83	29.	32.9	0.0	4.3	5.11	62.74	

135.000	11,597	62.50	30.18	23.15	15.52	8.89	5.26	3.78	29.	36.4	0.0	4.2	5.48	60.01	
135.000	11,586	62.18	29.91	22.67	15.53	9.05	5.32	4.01	28.	43.4	0.0	4.2	5.10	72.52	
135.000	11,674	62.39	29.70	22.43	15.51	9.01	5.33	3.76	27.	45.0	0.0	4.3	5.03	80.11	
163.000	9,129	35.55	20.52	15.97	11.45	6.93	3.93	3.09	54.	41.8	0.0	4.4	3.23	72.10	
163.000	9,008	35.54	20.41	15.90	11.32	6.96	4.10	3.28	51.	47.1	0.0	4.2	3.94	118.54	
163.000	8,986	35.53	20.78	16.23	11.50	7.28	4.43	3.61	51.	52.0	0.0	4.0	4.49	108.79	
163.000	11,378	47.70	28.35	22.31	15.35	9.61	5.54	4.41	53.	35.7	0.0	3.9	4.26	75.68	
163.000	11,323	47.51	28.42	22.47	16.48	9.44	5.78	4.56	56.	35.1	0.0	3.8	3.90	91.32	
163.000	11,411	47.39	28.39	22.39	16.15	9.31	5.69	4.46	57.	33.8	0.0	3.9	4.26	89.70	
163.000	11,477	47.02	28.50	22.28	15.88	9.73	5.56	4.44	57.	35.4	0.0	3.9	3.48	120.98	
163.000	14,626	63.04	39.62	31.26	22.04	13.09	7.86	6.17	63.	26.2	0.0	3.6	4.48	103.89	
163.000	14,637	63.54	40.13	31.51	23.20	13.94	7.98	6.34	63.	28.0	0.0	3.5	2.77	74.65	
163.000	14,670	63.54	40.41	31.82	23.06	13.57	8.39	6.65	64.	27.9	0.0	3.5	4.35	92.50	
163.000	14,670	63.78	40.48	31.88	23.01	13.34	8.62	6.68	62.	28.9	0.0	3.5	5.15	104.17	
201.000	8,404	59.61	28.04	20.43	15.97	8.13	4.02	3.18	25.	17.7	0.0	3.4	2.67	59.24	*
201.000	8,371	59.11	28.11	20.50	16.28	7.76	4.17	3.43	25.	17.8	0.0	3.4	4.00	54.41	*
201.000	8,437	59.55	29.11	21.02	18.27	7.99	4.11	3.51	25.	18.3	0.0	3.3	4.26	300.00	*
201.000	10,742	78.06	38.65	27.85	20.81	9.83	5.01	4.23	25.	13.7	0.0	3.4	2.36	51.73	*
201.000	10,829	78.23	39.59	28.66	19.88	10.41	5.31	4.49	26.	13.4	0.0	3.4	2.84	57.85	
201.000	10,873	78.03	39.95	29.07	20.09	10.52	5.32	4.43	27.	12.7	0.0	3.3	2.73	57.20	
201.000	10,807	77.93	40.29	29.05	20.51	10.74	5.43	4.61	27.	13.0	0.0	3.3	2.47	57.36	
222.000	8,569	58.39	35.85	25.13	17.41	9.54	3.74	2.67	44.	5.0	0.0	3.2	3.40	44.40	*
222.000	8,646	58.11	36.64	23.66	17.48	9.65	3.77	2.79	44.	5.0	0.0	3.3	4.53	134.58	*
222.000	8,723	57.46	36.29	22.30	17.50	9.64	3.76	2.69	43.	6.1	0.0	3.3	5.29	68.40	
222.000	11,367	75.25	47.57	29.13	23.54	12.73	4.61	3.17	45.	5.1	0.0	3.4	6.05	66.91	
222.000	11,378	75.14	48.19	29.28	23.96	13.02	4.90	3.32	45.	5.6	0.0	3.3	5.93	61.68	
222.000	11,422	74.96	48.52	29.00	24.28	13.23	4.99	3.32	45.	6.0	0.0	3.2	6.49	53.03	
222.000	11,455	74.53	48.68	29.09	24.27	13.21	5.03	3.33	46.	5.7	0.0	3.2	6.26	52.86	
243.000	8,317	75.67	29.98	23.77	17.38	8.25	4.65	3.81	25.	7.4	0.0	3.2	8.66	53.73	*
243.000	8,393	73.12	30.17	23.74	16.92	8.19	4.66	3.93	25.	8.4	0.0	3.3	7.66	55.24	*
276.000	9,074	46.78	27.62	21.33	15.95	8.52	4.54	3.07	49.	17.9	0.0	3.5	1.72	66.28	
276.000	9,008	46.64	27.40	21.52	16.29	8.52	4.82	3.11	47.	20.9	0.0	3.3	2.31	69.96	
276.000	9,096	46.31	27.15	21.91	15.76	8.49	4.57	3.09	51.	18.1	0.0	3.5	2.57	67.55	
276.000	11,444	63.23	37.35	35.77	21.74	11.43	5.72	3.81	68.	5.7	0.0	3.3	6.05	35.97	
276.000	11,466	62.99	38.05	30.07	21.20	11.56	5.96	3.98	53.	12.2	0.0	3.3	2.33	61.43	
276.000	11,532	62.43	38.27	30.43	20.54	11.73	5.99	4.08	55.	11.8	0.0	3.3	3.02	63.56	
276.000	11,488	62.24	38.30	30.65	20.06	11.73	5.93	4.14	56.	11.0	0.0	3.3	3.65	49.99	
303.000	8,788	37.31	23.14	17.39	11.98	7.28	4.00	3.37	61.	22.7	0.0	4.1	4.16	75.67	
303.000	8,733	36.51	22.80	17.32	12.41	7.17	4.08	3.37	65.	22.6	0.0	4.0	3.76	72.55	
303.000	8,766	36.13	22.57	17.36	12.24	7.22	4.11	3.35	65.	23.9	0.0	4.0	3.96	102.83	
303.000	11,499	49.85	30.28	23.69	16.75	9.56	5.11	4.18	62.	20.6	0.0	4.0	2.80	64.98	
303.000	11,510	49.11	30.62	24.22	17.37	9.77	5.53	4.50	68.	20.1	0.0	3.8	3.31	73.43	
303.000	11,521	48.59	30.99	24.17	17.17	9.94	5.67	4.54	71.	19.6	0.0	3.8	3.74	73.38	
303.000	11,554	48.43	30.77	24.31	17.25	9.89	5.59	4.46	72.	19.3	0.0	3.8	3.53	72.50	
303.000	15,284	65.72	42.85	34.51	24.11	13.99	7.43	5.85	83.	12.9	0.0	3.7	2.75	93.34	
303.000	15,284	66.37	42.91	34.63	24.42	14.01	7.50	5.92	81.	13.6	0.0	3.7	2.64	65.67	
303.000	15,306	66.46	43.26	35.71	24.72	13.82	7.82	6.13	85.	12.2	0.0	3.6	3.88	85.22	
303.000	15,317	66.57	43.57	35.60	24.96	13.89	7.93	6.25	84.	12.7	0.0	3.6	3.76	75.19	
351.000	8,799	29.12	16.74	12.31	9.58	6.37	3.78	3.08	51.	105.8	0.0	4.6	4.63	78.52	
351.000	9,183	29.84	16.81	12.48	10.34	6.31	3.79	3.07	52.	110.2	0.0	4.7	3.15	300.00	
351.000	9,183	29.68	16.71	12.45	10.28	6.49	3.88	3.19	51.	128.1	0.0	4.6	3.09	83.96	

351.000	11,817	39.86	22.74	17.12	13.42	8.70	4.99	3.98	52.	96.0	0.0	4.5	3.33	73.83	
351.000	11,850	39.67	22.59	17.13	13.52	8.81	5.08	4.08	51.	105.2	0.0	4.5	3.17	74.98	
351.000	11,850	39.39	22.44	17.13	13.48	8.70	5.11	4.12	52.	107.2	0.0	4.5	2.98	78.79	
351.000	11,872	39.46	22.54	17.37	13.70	8.99	5.42	4.42	51.	123.4	0.0	4.3	3.12	84.57	
351.000	15,614	54.44	32.06	24.59	18.03	12.34	7.07	5.54	55.	78.5	0.0	4.3	4.20	193.71	
351.000	15,581	54.35	31.51	24.73	18.20	12.02	7.19	5.65	53.	84.0	0.0	4.3	3.45	226.20	
351.000	15,548	54.30	31.14	24.71	18.60	12.06	7.21	5.74	52.	91.1	0.0	4.2	2.74	82.48	
351.000	15,559	54.36	31.23	24.64	18.79	12.00	7.11	5.80	53.	87.0	0.0	4.3	2.47	81.16	
377.000	8,624	56.54	34.98	27.01	23.22	11.47	5.54	4.20	49.	10.3	0.0	2.5	3.35	300.00	
377.000	8,635	56.46	34.19	28.28	23.11	12.19	5.67	4.10	49.	12.0	0.0	2.4	3.52	58.86	
377.000	8,712	55.86	34.53	27.33	22.59	11.86	5.61	4.06	50.	11.5	0.0	2.5	2.57	59.00	
377.000	11,115	73.20	47.31	36.86	29.99	15.92	7.24	5.28	59.	6.6	0.0	2.4	2.58	55.36	
377.000	11,213	72.77	44.65	35.45	28.31	15.50	7.04	5.09	48.	11.3	0.0	2.5	2.61	55.29	
377.000	11,180	72.26	45.01	35.72	29.90	15.75	7.23	5.49	52.	10.6	0.0	2.4	3.36	57.49	
377.000	11,235	71.77	43.88	35.05	28.46	15.80	7.13	5.24	47.	13.3	0.0	2.5	3.21	55.48	
402.000	8,657	43.88	22.43	16.49	12.02	7.72	4.19	3.11	30.	56.8	0.0	3.9	4.63	170.65	
402.000	8,679	43.86	22.34	16.47	11.99	7.54	4.16	3.10	30.	53.3	0.0	4.0	4.45	169.04	
402.000	8,657	43.91	22.40	16.51	12.05	7.93	4.23	3.20	29.	62.2	0.0	3.8	4.75	172.67	
402.000	11,159	58.46	30.88	23.08	16.48	10.07	5.57	3.91	32.	38.0	0.0	3.7	3.75	120.08	
402.000	11,169	58.46	31.66	23.28	16.73	10.49	5.77	4.18	33.	37.5	0.0	3.6	4.41	130.24	
402.000	11,224	58.73	31.78	23.47	16.82	10.56	5.88	4.22	33.	39.0	0.0	3.6	4.41	124.57	
402.000	11,213	58.64	31.60	23.49	16.90	10.41	5.99	4.26	33.	40.2	0.0	3.6	4.18	135.39	
402.000	14,769	78.26	44.72	33.16	24.05	14.70	7.81	5.44	38.	28.2	0.0	3.4	3.38	62.27	
402.000	14,758	78.95	45.36	33.58	24.44	15.06	8.21	5.80	37.	29.9	0.0	3.3	3.68	64.85	
402.000	14,834	79.53	45.87	33.93	24.69	15.51	8.42	6.00	37.	31.2	0.0	3.3	3.94	164.21	
429.000	8,481	47.92	28.93	22.31	16.01	8.42	3.95	2.89	54.	8.6	0.0	3.4	0.90	54.80	
429.000	8,657	47.97	29.37	22.50	16.17	8.53	4.05	2.88	56.	8.6	0.0	3.4	1.10	55.39	
429.000	8,646	47.59	29.14	22.41	16.09	8.67	4.00	2.97	57.	8.8	0.0	3.4	0.85	53.70	
429.000	11,180	62.18	39.29	30.40	21.90	11.43	5.30	3.33	65.	5.8	0.0	3.4	0.85	54.25	
429.000	11,202	62.33	59.97	30.76	22.15	11.87	5.52	3.70	62.	5.0	0.0	3.1	11.05	21.51	*
429.000	11,213	62.52	39.09	30.80	22.14	11.92	5.53	3.80	63.	7.3	0.0	3.2	0.94	54.40	
429.000	11,279	61.63	39.36	30.86	22.18	12.01	5.70	3.87	66.	7.1	0.0	3.2	0.94	55.53	
429.000	14,867	41.84	54.06	43.60	31.42	17.41	8.06	5.47	236.	5.0	0.0	2.8	20.21	***	*
429.000	14,889	49.61	53.94	43.44	31.19	17.32	7.87	5.32	178.	5.0	0.0	2.9	15.43	***	*
466.000	9,019	44.23	25.31	17.07	10.87	5.32	3.57	2.86	48.	9.3	0.0	5.0	9.46	41.92	
466.000	8,975	43.93	24.63	16.79	11.07	4.96	3.55	2.82	54.	5.8	0.0	5.4	9.46	45.59	
466.000	9,107	44.14	24.95	16.64	10.72	4.98	3.56	2.84	48.	9.4	0.0	5.3	10.36	44.90	
466.000	11,488	56.22	32.41	22.36	14.68	6.83	4.76	3.75	48.	10.4	0.0	4.8	9.47	48.53	
466.000	11,488	56.73	32.72	22.42	14.96	7.18	5.00	3.93	46.	12.0	0.0	4.6	9.17	51.53	
466.000	11,444	57.16	32.31	22.47	14.79	7.33	5.16	3.95	44.	13.3	0.0	4.6	9.16	51.56	
466.000	11,422	57.21	31.54	22.63	15.09	8.04	5.51	4.24	41.	18.9	0.0	4.3	8.14	56.77	
466.000	14,878	75.51	38.66	31.36	21.09	11.17	6.82	5.06	36.	27.2	0.0	4.1	5.72	63.78	
479.000	8,799	42.64	19.85	15.36	9.64	6.13	3.61	2.55	29.	50.8	0.0	4.9	7.04	39.11	
479.000	8,975	42.52	19.59	13.11	9.79	6.21	3.64	2.61	27.	83.1	0.0	5.1	7.89	73.51	
479.000	9,096	42.09	19.63	12.75	9.87	6.21	3.57	2.65	27.	84.6	0.0	5.2	8.04	171.20	
479.000	11,301	54.04	26.47	17.69	13.64	8.52	4.74	3.42	29.	66.5	0.0	4.7	6.74	300.00	
479.000	11,378	53.75	26.26	18.17	14.01	8.74	4.85	3.52	29.	73.5	0.0	4.6	5.73	67.29	
479.000	11,488	53.94	26.46	18.39	14.20	8.93	5.12	3.60	29.	86.4	0.0	4.5	5.82	71.93	
479.000	11,652	53.87	26.55	18.66	14.30	9.00	5.22	3.60	30.	86.1	0.0	4.5	5.71	73.93	
479.000	14,966	71.55	37.77	27.11	20.61	12.71	7.01	4.86	33.	52.7	0.0	4.0	4.31	67.16	
479.000	15,010	71.88	38.35	27.94	21.17	13.16	7.36	5.13	34.	54.1	0.0	3.9	4.14	69.13	

479.000	15,021	72.46	38.69	27.30	21.37	13.27	7.36	5.13	33.	56.7	0.0	3.9	4.63	68.04	
479.000	14,977	71.35	39.55	30.53	21.56	13.24	7.40	5.09	39.	37.4	0.0	3.8	3.46	103.71	
515.000	8,240	49.13	21.53	17.10	12.05	5.67	3.49	2.20	25.	28.8	0.0	4.3	5.84	52.89	*
515.000	8,273	48.33	21.78	17.33	12.08	5.79	3.14	2.15	26.	25.8	0.0	4.4	3.90	54.74	
515.000	8,338	47.58	21.74	17.28	12.14	5.81	3.41	2.19	27.	28.4	0.0	4.3	4.88	54.70	
515.000	10,884	61.82	30.67	23.98	16.57	7.85	4.61	2.85	33.	18.3	0.0	4.1	5.10	52.88	
515.000	10,961	61.64	30.96	24.14	16.67	7.96	3.76	2.86	37.	13.2	0.0	4.3	2.05	53.66	
515.000	11,016	61.12	31.39	24.17	16.70	8.02	3.71	3.18	39.	11.9	0.0	4.3	1.60	54.06	
515.000	11,016	60.18	31.39	24.16	16.69	7.99	4.07	3.00	40.	12.7	0.0	4.2	3.00	53.70	
515.000	14,648	78.98	43.60	35.63	23.64	11.63	5.41	4.48	50.	8.6	0.0	4.1	2.92	54.87	
531.000	8,602	38.10	17.99	12.33	8.75	5.02	3.56	2.16	31.	59.7	0.0	5.5	9.20	91.85	
531.000	8,701	37.23	18.16	12.46	8.88	5.11	3.41	2.20	34.	52.9	0.0	5.5	8.21	93.39	
531.000	8,679	37.04	18.06	12.41	8.81	5.02	2.73	2.11	37.	36.6	0.0	5.8	5.30	64.39	
531.000	11,246	49.33	24.78	17.18	12.18	6.91	4.47	3.07	36.	42.2	0.0	5.3	7.46	87.64	
531.000	11,367	48.52	25.14	17.56	12.45	7.10	4.96	3.13	38.	45.0	0.0	5.1	8.49	89.98	
531.000	11,334	48.85	25.06	17.59	12.42	6.98	4.01	3.07	39.	32.8	0.0	5.3	5.33	72.21	
531.000	11,422	50.11	25.27	17.81	12.63	7.15	3.43	3.19	40.	27.4	0.0	5.5	3.38	54.65	
531.000	15,054	67.92	35.83	24.76	17.57	9.59	4.44	3.99	44.	18.6	0.0	5.3	3.14	52.65	
531.000	15,054	68.07	36.38	25.73	18.22	10.30	6.23	4.57	40.	31.2	0.0	4.7	5.93	82.25	
531.000	15,087	67.93	36.11	25.92	18.29	10.24	5.72	4.33	41.	26.9	0.0	4.8	4.36	68.55	
531.000	15,131	65.31	36.69	26.19	18.46	10.43	7.02	4.61	45.	31.3	0.0	4.5	7.42	86.70	
587.000	9,216	23.49	11.50	9.81	7.35	4.22	2.91	1.89	54.	233.8	0.0	6.6	4.98	100.88	
587.000	11,499	31.69	20.25	14.04	10.15	4.46	3.86	2.67	102.	20.0	0.0	7.1	11.66	45.77	
587.000	11,466	31.31	15.22	13.79	10.26	6.00	4.03	2.82	50.	260.4	0.0	5.7	4.81	115.51	
587.000	11,466	30.87	15.98	13.67	10.27	6.14	3.96	2.88	56.	179.2	0.0	5.7	3.73	112.43	
598.000	9,030	33.28	12.94	10.56	7.90	5.17	2.81	2.46	28.	372.3	0.0	6.1	2.61	65.82	
598.000	9,150	34.46	12.81	10.67	8.10	4.86	2.89	2.47	26.	402.9	0.0	6.2	3.02	83.28	
598.000	9,227	32.37	12.75	10.74	7.89	4.96	2.86	2.49	30.	354.1	0.0	6.3	2.92	75.22	
598.000	11,433	39.57	17.30	14.93	10.89	6.97	4.05	2.98	34.	286.4	0.0	5.5	2.85	195.81	
598.000	11,554	39.59	17.16	14.72	10.97	7.15	4.11	2.46	34.	342.9	0.0	5.4	2.22	75.10	
598.000	11,663	39.76	17.63	14.69	10.94	7.11	4.17	2.58	34.	312.7	0.0	5.5	2.76	78.20	
598.000	11,784	41.76	18.02	14.68	10.89	7.14	4.05	2.37	32.	290.6	0.0	5.7	2.94	289.02	
598.000	15,120	55.07	25.61	21.18	15.93	10.11	5.83	3.38	35.	208.5	0.0	5.0	2.23	76.30	
598.000	15,208	54.48	26.13	21.42	16.04	10.29	6.13	4.13	36.	199.8	0.0	4.9	2.87	82.29	
598.000	15,295	54.62	25.61	21.39	15.98	10.01	6.02	4.39	36.	211.3	0.0	5.0	2.96	85.70	
598.000	15,251	55.06	25.48	21.48	15.79	10.22	6.09	4.06	35.	235.0	0.0	4.9	3.06	237.09	
630.000	9,063	20.43	14.57	9.98	6.54	4.56	2.83	2.25	135.	38.7	0.0	6.9	9.27	47.58	
630.000	9,205	20.35	15.60	10.05	6.68	4.89	2.99	2.33	153.	34.0	0.0	6.7	11.13	50.85	
630.000	9,194	20.81	16.74	9.89	6.64	4.90	2.88	2.26	159.	23.7	0.0	6.9	13.32	45.05	
630.000	11,576	31.02	20.86	13.04	8.99	6.41	3.94	3.13	86.	47.3	0.0	6.4	11.52	68.38	
630.000	11,696	31.07	18.07	13.27	9.10	6.47	3.98	3.19	66.	100.3	0.0	6.2	7.27	68.10	
630.000	11,751	31.06	18.08	13.28	9.16	6.46	4.03	3.21	67.	102.7	0.0	6.1	7.17	72.28	
630.000	11,806	30.94	18.58	13.31	9.25	6.57	4.06	3.20	71.	93.3	0.0	6.1	7.68	77.33	
630.000	15,767	39.54	25.09	18.55	12.96	9.29	5.70	4.57	86.	89.1	0.0	5.8	6.60	82.57	
630.000	15,745	40.13	31.58	18.70	13.32	9.45	5.79	4.87	132.	28.0	0.0	5.9	12.18	46.86	
630.000	15,789	38.91	27.71	18.89	13.41	9.21	5.81	4.83	119.	47.4	0.0	5.8	8.19	99.98	
642.000	8,733	26.29	11.54	11.44	8.28	5.36	2.87	2.36	41.	362.3	0.0	5.4	4.20	176.59	
651.000	8,876	27.11	14.15	10.93	7.72	5.20	3.50	2.62	47.	166.6	0.0	5.5	6.37	99.29	
651.000	8,953	27.02	14.16	10.94	7.73	5.19	3.50	2.59	48.	166.9	0.0	5.6	6.39	99.92	
651.000	8,964	27.17	14.14	10.98	7.80	5.24	3.50	2.62	47.	174.4	0.0	5.5	6.10	108.02	
651.000	11,685	35.08	19.30	14.92	10.75	7.20	4.76	3.56	51.	149.6	0.0	5.2	5.63	136.29	

651.000	11,696	35.01	19.32	15.05	10.75	7.23	4.84	3.61	52.	146.0	0.0	5.1	5.89	117.96	
651.000	11,740	34.96	19.37	15.13	10.82	7.27	4.89	3.64	53.	145.6	0.0	5.1	5.90	120.47	
651.000	11,773	34.71	19.41	15.19	10.93	7.36	4.89	3.66	55.	144.6	0.0	5.1	5.54	133.63	
651.000	15,581	47.82	27.44	21.37	15.47	10.46	7.02	5.16	55.	130.8	0.0	4.8	5.58	149.33	
651.000	15,559	40.18	27.42	21.64	15.72	10.61	7.16	5.33	109.	74.2	0.0	4.7	5.28	161.94	
651.000	15,614	40.15	27.45	21.79	16.06	10.67	7.21	5.37	112.	72.7	0.0	4.6	4.95	233.50	
651.000	15,581	39.94	27.42	21.88	16.23	10.70	7.23	5.44	114.	72.7	0.0	4.6	4.77	287.28	
675.000	9,041	22.44	12.39	11.09	8.56	5.85	3.30	2.56	68.	239.6	0.0	5.1	2.42	72.23	
675.000	9,063	22.68	12.44	11.12	8.64	5.89	3.32	2.59	66.	254.1	0.0	5.0	2.36	72.32	
675.000	9,129	22.63	12.49	11.04	8.63	5.87	3.32	2.57	67.	247.2	0.0	5.1	2.11	72.76	
675.000	11,927	28.69	16.85	14.93	11.60	7.76	4.46	3.44	83.	173.3	0.0	5.0	1.90	76.04	
675.000	11,916	28.87	16.90	14.91	11.67	7.80	4.51	3.47	81.	180.5	0.0	5.0	1.71	77.28	
675.000	11,916	29.14	16.98	14.91	11.71	7.82	4.54	3.50	79.	184.1	0.0	4.9	1.55	78.08	
675.000	11,916	29.39	16.98	14.88	11.69	7.77	4.51	3.48	76.	186.4	0.0	5.0	1.48	78.12	
675.000	15,910	39.81	23.92	21.22	16.50	10.89	6.42	4.92	86.	144.0	0.0	4.7	1.49	82.05	
675.000	15,932	40.50	24.06	21.42	16.60	10.96	6.54	4.99	80.	159.3	0.0	4.6	1.46	84.90	
675.000	16,009	41.00	24.17	21.25	16.69	11.00	6.56	5.05	77.	166.8	0.0	4.7	1.13	84.85	
675.000	15,965	41.78	24.25	21.21	16.78	11.01	6.59	5.05	72.	181.5	0.0	4.6	1.04	86.04	
693.000	8,986	23.81	17.92	15.77	10.14	6.36	3.59	2.67	225.	5.2	0.0	5.2	5.34	45.90	*
693.000	8,997	22.29	17.65	15.87	10.22	6.41	3.57	2.72	254.	5.1	0.0	5.1	5.32	46.56	*
693.000	9,063	21.57	17.57	15.98	9.94	6.41	3.61	2.69	271.	5.1	0.0	5.1	6.30	38.61	*
693.000	11,488	36.66	24.05	22.01	13.43	8.54	4.68	3.59	128.	15.6	0.0	4.6	5.58	35.60	
736.000	8,942	36.99	16.66	12.68	12.11	5.33	3.63	2.82	30.	141.8	0.0	4.9	7.39	300.00	
736.000	9,052	35.59	16.61	13.81	12.05	5.32	3.73	2.85	35.	112.2	0.0	4.8	7.31	50.52	
736.000	9,172	35.59	16.33	14.03	11.65	5.48	3.77	2.83	35.	133.5	0.0	4.8	6.70	56.50	
736.000	11,356	50.35	21.81	19.59	18.80	7.05	5.02	3.80	29.	126.4	0.0	4.3	10.59	300.00	
736.000	11,466	52.93	22.02	18.19	15.09	7.31	5.15	3.93	25.	175.8	0.0	4.6	6.10	59.80	*
736.000	11,477	52.87	22.48	18.17	14.18	7.74	5.11	3.95	25.	177.0	0.0	4.6	4.22	83.31	*
736.000	11,576	52.72	22.62	17.20	13.94	7.46	5.08	4.03	25.	167.7	0.0	4.8	5.32	76.60	
736.000	14,889	61.31	31.81	24.48	18.96	10.33	7.02	5.35	38.	75.3	0.0	4.4	5.04	80.91	
736.000	14,944	61.59	31.35	22.54	19.29	10.65	7.34	6.12	33.	127.6	0.0	4.3	5.91	300.00	
736.000	14,977	62.30	31.54	22.24	19.33	10.80	7.51	5.76	32.	148.0	0.0	4.3	6.37	300.00	
736.000	14,999	62.87	30.20	23.85	19.24	11.37	7.64	5.64	30.	209.6	0.0	4.1	4.19	125.35	
748.000	8,777	36.91	22.15	11.36	9.51	4.84	3.43	2.85	46.	20.0	0.0	5.7	13.00	23.20	
748.000	8,810	36.70	21.94	11.19	8.43	4.85	3.41	3.05	46.	19.9	0.0	6.0	14.82	22.32	
748.000	8,942	37.37	21.82	11.30	8.19	4.87	3.44	2.92	44.	21.1	0.0	6.2	15.31	23.41	
748.000	11,356	50.30	28.26	15.98	11.26	6.46	5.08	4.33	40.	22.9	0.0	5.7	14.02	35.13	
748.000	11,521	48.34	28.30	15.98	11.37	6.60	5.20	3.94	45.	23.5	0.0	5.6	14.09	34.86	
748.000	11,608	48.73	28.56	15.87	11.48	6.68	4.71	4.02	46.	21.3	0.0	5.7	13.07	31.94	
748.000	11,674	51.38	28.50	15.85	11.63	6.70	5.02	3.84	39.	26.4	0.0	5.7	13.42	32.20	
748.000	14,911	62.44	37.60	22.85	16.67	9.31	6.47	4.84	50.	21.0	0.0	5.1	10.82	62.44	
779.000	9,513	21.27	15.44	10.28	7.20	4.84	2.73	2.32	149.	30.8	0.0	6.9	8.27	84.30	
779.000	9,644	21.07	15.36	10.25	7.22	4.80	2.87	2.41	152.	34.0	0.0	6.9	8.31	90.73	
779.000	9,611	21.51	15.31	10.33	7.06	4.75	2.73	2.39	142.	32.4	0.0	7.1	8.39	65.79	
779.000	11,916	37.61	20.84	14.17	9.88	6.51	3.68	3.22	55.	54.6	0.0	6.4	7.81	81.44	
779.000	11,795	35.91	20.72	14.34	10.02	6.64	3.65	3.42	62.	51.1	0.0	6.2	7.01	83.82	
779.000	11,828	37.07	20.66	14.46	9.91	6.62	3.63	3.29	57.	53.1	0.0	6.3	7.14	68.49	
779.000	11,850	36.57	20.54	14.59	10.13	6.65	3.57	3.29	60.	50.3	0.0	6.2	6.19	79.03	
779.000	15,317	46.89	29.52	21.07	15.15	9.83	5.02	4.44	81.	36.1	0.0	5.5	5.04	128.53	
779.000	15,372	62.32	29.74	21.39	15.93	9.93	5.07	4.36	34.	76.6	0.0	5.5	4.27	58.97	
779.000	15,471	45.00	30.19	21.76	15.61	9.98	5.31	4.54	105.	28.7	0.0	5.4	4.90	125.39	

808.000	9,161	38.38	19.19	10.15	7.05	4.41	2.83	2.61	35.	26.6	0.0	7.3	15.72	25.23	
808.000	9,074	37.06	14.64	10.48	7.04	4.30	2.91	2.65	27.	117.1	0.0	7.0	8.64	59.19	
808.000	15,175	53.03	26.67	22.61	14.81	8.81	5.57	5.51	46.	74.9	0.0	5.4	6.24	51.57	
808.000	15,098	54.63	22.51	22.50	15.06	8.87	5.81	5.73	32.	298.2	0.0	5.2	6.97	63.31	
834.000	8,415	28.59	14.39	12.69	9.54	5.68	3.46	2.40	43.	150.4	0.0	4.6	3.07	93.46	
834.000	8,646	32.06	14.99	12.91	9.59	5.71	3.41	2.40	36.	165.3	0.0	4.9	3.12	86.49	
834.000	8,810	32.47	14.88	13.20	9.67	5.83	3.51	2.46	35.	198.2	0.0	4.8	3.53	88.71	
834.000	11,191	42.93	21.13	18.38	13.62	7.90	4.81	3.15	38.	123.6	0.0	4.4	3.43	93.56	
834.000	11,279	43.12	20.61	18.60	13.70	7.96	4.80	3.22	37.	143.0	0.0	4.4	3.59	91.77	
834.000	11,356	43.74	20.58	18.24	13.75	8.09	4.74	3.22	35.	162.7	0.0	4.5	2.66	84.14	
834.000	11,477	43.16	21.90	18.23	13.82	8.13	4.76	3.21	40.	102.9	0.0	4.5	2.28	82.16	
834.000	14,955	59.71	28.23	26.48	20.11	11.77	6.61	4.51	35.	155.7	0.0	4.0	3.44	78.30	
861.000	8,986	43.48	19.53	13.67	9.67	6.17	3.53	3.17	26.	75.0	0.0	5.1	7.15	99.81	
861.000	9,096	43.17	19.23	13.78	9.70	6.09	3.45	3.04	27.	74.8	0.0	5.2	6.26	95.19	
861.000	9,107	42.60	19.10	13.83	9.71	6.03	3.54	3.03	27.	78.8	0.0	5.2	6.04	92.88	
861.000	11,455	61.81	26.17	19.20	13.42	8.14	4.41	3.98	25.	46.5	0.0	4.9	5.68	88.91	*
861.000	11,499	61.13	26.43	19.28	13.46	8.30	4.37	4.23	25.	50.0	0.0	4.9	5.47	86.91	*
861.000	11,608	61.59	26.42	19.31	13.51	8.29	4.39	4.22	25.	50.2	0.0	4.9	5.45	89.48	*
861.000	11,619	62.66	26.23	19.41	13.55	8.31	4.33	4.24	25.	46.5	0.0	5.0	5.44	87.62	*
877.000	8,437	47.98	20.97	14.66	10.49	5.24	3.30	3.38	25.	28.8	0.0	5.0	6.54	58.19	*
877.000	8,415	47.08	21.81	14.61	10.59	5.24	3.57	3.00	26.	27.5	0.0	4.9	8.31	56.29	
877.000	8,525	45.20	20.45	14.33	10.56	6.70	3.55	3.12	25.	60.7	0.0	4.6	6.30	61.17	*
877.000	10,961	58.87	28.32	20.07	14.56	10.58	4.56	3.79	26.	61.5	0.0	4.1	5.87	136.49	
877.000	11,038	72.25	28.35	22.06	14.93	7.62	4.80	3.85	25.	18.9	0.0	4.6	8.24	62.44	*
877.000	11,126	62.42	28.40	22.54	14.76	7.75	4.89	3.76	26.	33.6	0.0	4.4	6.78	51.57	
877.000	11,202	62.90	28.58	23.72	14.50	7.66	5.56	3.90	26.	34.3	0.0	4.4	10.01	35.94	
927.000	8,964	27.91	15.57	13.20	9.07	5.50	3.27	2.37	63.	66.8	0.0	5.2	4.18	77.27	
927.000	8,975	27.65	15.56	12.99	9.08	5.44	3.26	2.32	65.	64.0	0.0	5.3	4.02	94.39	
927.000	8,953	27.89	15.62	13.22	9.05	5.48	3.26	2.33	64.	64.2	0.0	5.3	4.27	74.30	
927.000	11,652	37.65	21.96	18.86	12.76	7.66	4.52	3.22	72.	48.2	0.0	4.9	4.50	66.94	
927.000	11,740	38.84	19.28	18.50	12.88	7.74	4.62	3.29	46.	139.7	0.0	4.7	4.42	95.12	
927.000	11,762	39.06	18.94	18.46	12.89	7.77	4.70	3.34	43.	171.4	0.0	4.7	4.60	99.43	
927.000	11,795	38.66	19.40	18.28	12.93	7.81	4.74	3.36	46.	145.4	0.0	4.6	4.28	118.61	
927.000	15,416	51.83	29.58	26.77	18.80	11.41	6.75	4.65	64.	66.5	0.0	4.3	3.82	105.14	
927.000	15,383	51.47	28.50	26.53	18.81	11.54	6.95	4.85	58.	91.0	0.0	4.2	3.90	123.27	
927.000	15,394	51.58	31.20	26.72	18.98	11.64	7.02	4.93	73.	52.8	0.0	4.3	3.64	121.28	
927.000	15,416	51.99	31.60	26.87	19.07	11.70	7.07	4.90	73.	51.1	0.0	4.3	3.66	119.05	
964.000	8,646	39.19	18.62	13.99	9.61	5.11	3.15	2.51	34.	38.6	0.0	5.3	5.79	70.16	
964.000	8,701	38.72	18.56	13.78	9.56	5.06	3.13	2.54	35.	38.3	0.0	5.4	5.74	69.10	
964.000	8,744	37.99	18.63	13.97	9.58	5.07	3.06	2.46	38.	33.9	0.0	5.4	5.48	69.03	
964.000	11,400	50.41	25.20	19.04	13.13	7.24	4.25	3.34	38.	35.7	0.0	5.1	4.86	79.07	
964.000	11,389	49.88	25.30	17.25	13.17	7.30	4.14	3.49	36.	40.8	0.0	5.2	4.96	71.70	
964.000	11,433	49.58	25.39	19.49	13.22	7.33	4.27	3.52	40.	33.6	0.0	5.0	4.95	67.21	
964.000	11,608	49.88	25.54	18.81	13.34	7.42	4.34	3.55	40.	37.0	0.0	5.1	4.51	77.03	
964.000	15,054	69.91	35.80	25.06	18.76	10.45	5.94	4.85	35.	37.2	0.0	4.7	4.62	72.06	
964.000	15,120	60.91	36.44	24.57	18.94	10.75	6.13	5.04	53.	29.1	0.0	4.6	5.27	300.00	
964.000	15,109	56.39	36.74	26.35	18.92	10.80	6.28	5.08	79.	19.1	0.0	4.6	5.32	74.87	
964.000	15,186	52.59	37.17	25.17	19.23	10.93	6.32	5.08	105.	14.6	0.0	4.6	5.95	300.00	
988.000	8,953	31.10	15.01	11.63	7.63	4.32	2.81	2.19	44.	58.2	0.0	6.6	7.28	51.40	
988.000	8,964	30.95	15.09	11.57	7.71	4.28	2.82	2.17	45.	55.5	0.0	6.6	7.24	57.65	
988.000	9,030	30.91	15.08	11.51	7.71	4.29	2.86	2.21	45.	57.2	0.0	6.6	7.33	59.98	

988.000	11,828	41.44	20.43	15.77	10.70	5.87	3.87	2.92	45.	56.6	0.0	6.3	6.88	67.54
988.000	11,872	41.25	20.47	15.96	10.71	6.02	3.93	3.01	46.	57.4	0.0	6.2	6.83	61.17
988.000	11,872	41.03	20.48	15.83	10.68	6.01	3.91	3.01	46.	56.5	0.0	6.2	6.72	63.87
988.000	11,883	40.84	20.52	15.74	10.70	6.08	3.93	3.04	46.	59.9	0.0	6.2	6.57	68.12
988.000	15,833	56.26	29.36	22.81	15.63	8.56	5.70	4.29	49.	47.9	0.0	5.7	6.72	74.72
988.000	15,866	55.53	29.20	22.60	15.65	8.57	5.58	4.23	50.	48.3	0.0	5.7	6.23	78.67
988.000	15,855	55.62	29.43	22.81	16.15	8.96	5.90	4.55	50.	54.7	0.0	5.4	5.93	83.57
988.000	15,921	55.76	29.06	22.57	15.65	8.63	5.69	4.32	49.	53.5	0.0	5.7	6.38	80.93
Mean:		48.81	26.36	20.01	14.52	8.46	4.87	3.70	52.	82.2	0.0	4.7	5.56	72.55
Std. Dev:		15.05	9.04	6.73	5.00	2.74	1.38	1.03	34.	99.8	0.0	1.0	3.37	35.35
Var Coeff(%):		30.82	34.30	33.62	34.43	32.37	28.28	27.91	65.	100.0	0.0	21.0	60.53	48.73

US14 Section 3

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	9.00	25,000	1,000,000	H1: õ = 0.35
Base:	6.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	44.70	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
0.000	9,820	34.14	12.48	9.11	6.39	3.24	1.79	1.34	30.	155.0	0.0	7.5	6.21	60.24	
0.000	9,842	41.98	13.29	9.48	6.65	3.27	1.94	1.24	25.	80.6	0.0	7.4	8.93	55.85	*
0.000	9,875	62.79	12.96	9.11	6.96	3.32	1.96	1.34	25.	13.2	0.0	8.3	26.66	53.12	*
0.000	12,344	67.57	17.53	12.39	8.72	4.44	2.33	1.61	25.	20.1	0.0	7.9	18.61	60.78	*
0.000	12,530	35.69	17.72	13.00	8.98	4.45	2.31	1.51	59.	51.9	0.0	6.9	4.85	57.12	
0.000	12,574	44.80	17.81	12.66	8.80	4.50	2.37	1.59	33.	97.8	0.0	7.1	5.96	61.35	
0.000	12,607	36.57	17.64	12.83	8.50	4.48	2.41	1.57	53.	60.8	0.0	7.1	6.26	54.63	
0.000	15,910	41.76	23.30	17.89	11.81	6.26	3.30	2.20	80.	44.8	0.0	6.4	5.60	53.92	
0.000	15,899	42.22	24.70	17.85	11.79	6.41	3.42	2.56	84.	38.5	0.0	6.3	6.41	53.28	
0.000	15,987	42.28	24.67	17.86	11.81	6.42	3.44	2.36	83.	40.1	0.0	6.4	6.42	53.73	
0.000	16,228	42.44	24.37	18.11	11.73	6.43	3.31	2.25	84.	39.1	0.0	6.5	6.01	47.02	
31.000	8,788	30.60	14.95	9.63	5.94	2.89	2.58	2.11	45.	37.1	0.0	6.9	15.38	36.23	
31.000	8,898	30.22	15.05	9.65	5.91	2.96	2.62	2.07	46.	37.9	0.0	7.0	15.49	35.06	

31.000	8,920	30.27	15.23	9.54	5.81	3.03	2.56	2.05	47.	36.7	0.0	7.0	15.46	34.05	
31.000	11,543	38.47	19.79	12.00	7.52	4.59	3.41	2.65	45.	53.9	0.0	6.6	14.86	37.60	
31.000	11,565	38.76	19.28	12.11	7.60	4.42	3.50	2.74	43.	59.6	0.0	6.6	14.75	38.31	
31.000	11,641	39.35	19.54	12.23	7.68	4.44	3.52	2.76	43.	56.8	0.0	6.6	14.79	38.43	
31.000	11,652	39.28	19.68	12.33	7.86	4.76	3.51	2.69	42.	66.0	0.0	6.4	13.92	41.13	
31.000	15,383	54.28	25.17	16.52	10.33	6.37	4.76	3.68	36.	94.9	0.0	6.3	13.59	37.62	
31.000	15,394	53.33	25.65	16.74	10.51	5.81	4.94	3.77	40.	63.0	0.0	6.5	14.80	38.85	
31.000	15,317	78.73	25.48	16.74	10.63	6.15	4.96	3.85	25.	31.5	0.0	6.8	18.59	40.91	*
31.000	15,284	51.47	25.40	16.87	10.51	6.83	4.98	3.96	40.	93.3	0.0	5.9	13.11	36.77	
75.000	8,920	51.36	18.19	12.28	9.83	5.60	3.38	2.15	25.	45.9	0.0	4.6	14.36	300.00	*
75.000	8,920	50.27	18.30	12.39	9.85	5.64	3.62	2.17	25.	54.6	0.0	4.5	13.72	300.00	*
75.000	8,953	49.91	18.38	12.42	9.82	5.64	3.64	2.24	25.	57.2	0.0	4.5	13.39	300.00	*
75.000	11,180	65.59	25.31	17.56	13.45	7.62	4.87	3.13	25.	46.5	0.0	4.1	12.22	90.24	*
75.000	11,323	64.31	25.13	17.65	13.36	7.70	4.84	2.94	25.	55.3	0.0	4.1	11.30	84.07	*
75.000	11,356	64.69	25.13	17.77	13.48	7.83	4.57	3.04	25.	53.8	0.0	4.1	10.91	76.63	*
75.000	11,367	63.98	25.14	17.84	13.48	7.85	4.94	2.92	25.	61.0	0.0	4.0	10.93	80.36	*
75.000	14,780	78.20	36.17	25.46	18.70	10.44	5.39	3.84	25.	64.9	0.0	3.7	4.94	60.51	*
75.000	14,538	79.41	36.37	25.80	18.78	10.80	4.33	4.24	25.	46.8	0.0	3.8	3.21	47.25	
97.000	11,356	42.01	21.98	20.87	15.87	6.42	3.86	2.96	60.	40.0	0.0	3.9	9.54	44.56	
97.000	11,389	43.48	21.99	21.12	16.05	6.48	3.93	3.24	53.	46.8	0.0	3.9	9.71	44.57	
97.000	15,021	60.43	30.83	28.94	21.84	8.50	4.85	3.63	55.	31.7	0.0	3.9	9.58	42.45	
97.000	15,043	58.58	30.48	29.87	21.83	8.87	5.30	3.91	59.	35.8	0.0	3.8	9.92	44.81	
97.000	15,131	59.56	30.75	28.53	21.67	8.99	5.37	3.92	52.	42.7	0.0	3.8	8.72	45.87	
97.000	15,153	58.90	31.46	28.72	21.48	9.12	5.46	4.00	58.	37.0	0.0	3.8	8.33	47.02	
127.000	8,349	61.30	30.44	23.62	17.04	9.37	4.53	3.11	25.	23.3	0.0	2.3	3.10	56.19	*
127.000	8,371	61.23	30.59	23.96	16.93	9.12	5.11	3.19	25.	25.0	0.0	2.3	5.20	70.15	*
127.000	8,437	60.92	31.09	23.86	17.07	9.12	6.07	3.19	25.	29.6	0.0	2.2	7.30	70.89	*
127.000	10,928	78.84	39.88	31.71	22.27	11.81	8.43	3.89	25.	31.8	0.0	2.2	8.46	69.90	*
127.000	10,950	79.02	40.92	32.20	23.06	12.32	7.48	4.07	25.	29.5	0.0	2.2	5.53	71.76	*
127.000	11,016	79.57	40.06	32.06	22.54	12.50	7.76	4.19	25.	31.5	0.0	2.2	6.49	82.34	*
127.000	11,016	79.45	39.92	32.09	22.82	12.82	6.50	4.35	25.	28.2	0.0	2.2	3.35	59.95	*
140.000	8,360	52.30	27.04	19.93	14.78	8.00	4.06	3.84	26.	33.7	0.0	2.7	3.08	59.80	
140.000	8,426	51.43	27.09	20.03	14.82	8.12	4.06	3.76	28.	33.2	0.0	2.7	2.75	58.57	
140.000	8,514	50.96	27.19	20.10	14.89	8.20	4.22	3.81	29.	34.7	0.0	2.7	3.18	60.89	
140.000	11,093	68.51	37.15	27.65	20.22	10.81	5.46	4.57	30.	27.2	0.0	2.6	2.95	59.29	
140.000	11,169	67.05	37.39	27.87	20.43	11.01	5.57	4.28	33.	26.3	0.0	2.6	2.92	59.44	
140.000	11,169	66.48	37.56	27.95	20.45	11.09	5.72	3.03	34.	26.8	0.0	2.6	3.27	60.87	
140.000	11,159	67.06	37.69	27.93	20.48	11.17	5.74	3.41	33.	27.0	0.0	2.6	3.28	60.42	
150.000	8,975	46.31	32.69	25.42	17.27	9.27	4.00	3.67	83.	5.0	0.0	2.7	2.81	66.94	*
150.000	8,876	46.71	31.35	25.20	17.32	9.37	4.20	3.63	82.	5.5	0.0	2.7	2.11	52.08	
150.000	8,931	44.64	32.20	25.35	17.29	9.35	4.09	3.49	89.	5.0	0.0	2.7	3.31	69.91	*
180.000	8,558	57.27	45.81	34.33	22.84	15.05	5.83	3.71	68.	5.0	0.0	1.7	8.18	49.97	*
180.000	8,459	59.61	42.85	33.79	22.93	15.11	5.82	3.98	64.	5.0	0.0	1.7	5.97	60.39	*
180.000	8,525	59.41	41.54	33.96	23.06	14.04	5.95	3.87	65.	5.0	0.0	1.8	3.83	63.72	*
180.000	10,742	73.38	53.89	44.98	30.85	17.46	7.84	4.44	68.	5.0	0.0	1.7	4.17	71.91	*
203.000	8,997	52.70	42.00	32.34	20.99	11.19	7.37	4.70	82.	5.0	0.0	2.0	10.59	45.65	*
203.000	11,191	65.85	55.69	43.33	28.57	14.80	9.74	0.22	85.	5.0	0.0	1.8	10.78	50.46	*
228.000	7,812	72.12	54.46	41.28	29.99	15.73	7.54	4.35	44.	5.0	0.0	1.3	4.31	49.90	*
228.000	7,801	75.35	54.15	40.62	30.39	15.63	7.50	4.36	40.	5.0	0.0	1.3	2.56	50.70	*
228.000	8,064	78.04	54.80	42.24	35.19	15.71	7.40	4.40	40.	5.0	0.0	1.3	5.34	47.02	*
402.000	8,613	78.08	71.07	58.37	41.04	24.32	9.69	1.74	54.	5.0	0.0	1.0	10.86	78.19	*

402.000	8,679	79.22	71.54	58.25	41.16	24.52	9.61	1.73	53.	5.0	0.0	1.0	10.85	82.02	*
426.000	7,790	70.49	44.64	33.97	25.07	15.77	9.42	6.52	25.	24.2	0.0	1.3	4.48	72.45	
426.000	7,790	68.61	45.07	34.45	25.30	16.01	9.43	6.26	30.	20.0	0.0	1.3	4.22	69.75	
426.000	7,735	69.81	45.62	34.36	25.21	15.88	9.24	6.38	28.	20.0	0.0	1.3	4.40	66.89	
426.000	10,325	75.02	58.32	43.78	30.92	19.81	11.42	7.18	67.	7.7	0.0	1.4	5.46	86.34	
426.000	10,412	79.12	60.68	44.02	31.68	20.14	11.49	7.81	57.	8.7	0.0	1.4	5.73	106.61	
426.000	10,390	73.62	60.06	44.27	32.17	20.28	11.48	7.78	79.	5.0	0.0	1.4	5.24	127.49	*
465.000	8,843	53.09	32.41	30.69	20.42	14.43	8.86	5.99	37.	63.2	0.0	1.5	4.82	57.24	
465.000	11,049	67.42	41.82	40.13	26.48	18.34	11.16	7.43	40.	49.3	0.0	1.5	5.01	54.26	
465.000	11,071	70.11	41.82	36.51	26.42	18.15	11.10	7.98	30.	76.5	0.0	1.5	3.27	160.37	
465.000	11,169	70.97	41.96	35.05	22.03	18.40	11.50	9.27	26.	110.0	0.0	1.6	8.94	36.48	
486.000	8,251	44.37	33.36	28.20	21.56	12.84	7.19	5.28	120.	5.5	0.0	1.7	1.87	74.18	
486.000	8,371	48.00	33.36	28.36	20.54	12.80	7.00	5.04	72.	16.8	0.0	1.7	2.29	167.85	
486.000	8,426	44.85	33.29	28.02	20.94	12.57	6.72	4.81	117.	5.1	0.0	1.9	1.76	66.77	
486.000	10,972	58.64	44.55	37.31	27.69	16.90	9.11	6.55	119.	5.0	0.0	1.8	2.17	66.84	*
486.000	11,049	53.11	44.72	37.56	27.31	16.87	8.94	6.31	139.	5.0	0.0	1.8	4.57	64.15	*
486.000	11,049	56.66	45.89	35.49	27.49	17.26	9.39	6.64	129.	5.0	0.0	1.8	2.51	65.90	*
486.000	11,093	55.03	44.59	35.96	31.24	17.69	9.72	7.03	145.	5.0	0.0	1.7	3.12	76.26	*
486.000	14,582	70.79	57.52	47.28	38.45	22.46	11.43	7.69	139.	5.0	0.0	1.8	3.38	64.33	*
486.000	14,593	71.68	57.35	47.87	38.87	23.44	12.57	8.74	147.	5.0	0.0	1.7	2.01	70.12	*
486.000	14,593	72.04	57.22	48.07	38.56	23.51	12.66	8.82	147.	5.0	0.0	1.7	1.65	70.20	*
486.000	14,637	69.82	57.40	47.89	39.09	23.80	12.94	8.92	158.	5.0	0.0	1.6	2.54	71.99	*
513.000	8,591	62.75	44.02	35.66	25.51	13.02	6.82	4.77	60.	5.0	0.0	1.7	3.81	60.93	*
513.000	8,503	64.54	43.54	35.15	24.65	13.32	7.24	5.13	52.	7.2	0.0	1.7	4.22	63.77	
513.000	8,635	63.96	44.01	35.69	31.45	13.32	7.13	5.06	63.	5.0	0.0	1.6	4.91	47.58	*
513.000	10,829	68.13	56.98	46.47	31.01	16.75	8.21	5.35	77.	5.0	0.0	1.7	7.98	55.46	*
513.000	10,939	65.70	57.83	48.39	31.41	17.42	8.93	5.98	87.	5.0	0.0	1.6	9.33	46.07	*
513.000	10,950	69.92	58.03	51.45	31.64	17.61	8.90	6.01	78.	5.0	0.0	1.6	9.16	35.49	*
513.000	11,005	69.91	57.76	50.07	28.65	17.39	8.95	5.84	77.	5.0	0.0	1.7	8.86	27.11	*
528.000	8,766	54.02	53.74	30.09	23.08	14.82	9.39	7.30	90.	5.0	0.0	1.6	12.46	30.27	*
528.000	8,821	54.44	39.60	29.93	23.21	15.01	9.50	7.39	55.	26.5	0.0	1.5	4.73	93.54	
528.000	11,213	60.54	52.97	39.02	30.83	19.07	11.54	8.76	129.	5.0	0.0	1.5	4.95	80.94	*
528.000	11,290	68.48	46.80	40.96	32.70	20.44	12.80	10.04	56.	34.8	0.0	1.3	1.89	108.18	
528.000	11,367	68.58	44.43	40.60	31.24	19.73	11.81	9.09	49.	40.6	0.0	1.4	2.15	92.32	
528.000	15,010	66.04	60.94	53.65	42.73	26.25	15.27	11.84	199.	5.0	0.0	1.4	6.22	85.41	*
528.000	15,054	66.56	60.06	53.89	44.19	26.32	15.16	12.13	198.	5.0	0.0	1.4	6.57	87.39	*
528.000	15,098	67.53	60.47	54.27	44.77	26.65	15.32	11.83	196.	5.0	0.0	1.4	6.37	87.40	*
528.000	15,098	63.81	61.17	54.20	43.72	26.59	15.20	11.65	212.	5.0	0.0	1.4	7.84	83.12	*
570.000	8,371	52.52	22.52	19.99	12.30	8.21	4.77	4.31	25.	53.7	0.0	2.8	10.33	36.32	*
570.000	8,558	52.45	23.86	19.96	12.36	8.12	4.87	3.88	25.	53.4	0.0	2.8	9.07	36.94	*
570.000	8,580	52.41	24.03	20.08	12.50	8.19	4.54	3.84	25.	50.9	0.0	2.8	8.24	37.84	*
570.000	11,126	52.86	30.52	27.50	17.00	11.24	6.18	5.64	45.	46.8	0.0	2.6	5.48	37.25	
570.000	11,235	52.13	29.57	26.93	16.37	10.35	5.79	5.65	46.	43.1	0.0	2.8	6.39	35.01	
570.000	11,312	53.02	31.07	26.13	16.83	11.14	6.37	5.12	44.	50.9	0.0	2.7	5.58	45.25	
582.000	8,733	56.65	35.32	29.44	21.04	12.09	6.27	4.53	45.	18.5	0.0	1.9	2.45	62.24	
582.000	8,887	54.04	35.53	29.31	21.04	12.38	6.66	4.82	55.	17.1	0.0	1.9	2.65	65.51	
582.000	8,920	52.70	35.09	28.96	20.75	11.93	6.36	5.04	61.	14.4	0.0	2.0	2.75	64.91	
582.000	11,224	66.27	46.61	38.46	28.04	16.92	8.43	6.44	79.	9.1	0.0	1.8	1.71	58.46	
582.000	11,367	62.79	46.85	38.73	28.31	19.06	8.54	6.50	107.	5.8	0.0	1.8	3.98	185.77	
582.000	11,422	57.50	47.38	39.04	28.92	18.40	8.93	6.89	129.	5.0	0.0	1.8	4.48	56.37	*
582.000	11,477	67.88	47.31	38.90	28.81	16.88	8.37	6.21	79.	8.5	0.0	1.9	1.20	58.86	

582.000	14,845	68.33	62.85	51.73	38.59	22.35	10.67	7.80	137.	5.0	0.0	1.8	8.17	56.50	*
582.000	14,845	71.63	65.09	52.74	39.02	22.20	11.17	8.39	128.	5.0	0.0	1.8	7.33	59.47	*
582.000	14,878	68.43	64.85	52.96	39.15	21.96	11.34	8.53	139.	5.0	0.0	1.8	8.77	62.09	*
582.000	14,878	71.75	65.16	52.43	38.76	21.71	10.60	7.76	123.	5.0	0.0	1.8	7.85	57.22	*
602.000	7,878	79.34	52.50	39.70	25.24	12.41	6.80	5.74	32.	5.0	0.0	1.5	8.26	38.10	*
602.000	7,932	77.70	52.98	39.88	25.26	12.31	6.25	4.96	32.	5.0	0.0	1.6	7.62	37.35	*
668.000	8,371	49.33	34.71	28.29	18.59	11.67	6.29	4.44	68.	11.5	0.0	1.9	5.11	50.01	
668.000	8,437	46.46	34.69	27.96	18.50	11.73	6.36	4.66	95.	6.1	0.0	2.0	5.39	52.18	
668.000	10,862	64.87	45.88	37.93	24.65	15.58	8.35	5.73	70.	10.2	0.0	1.9	5.16	46.61	
668.000	10,972	57.75	46.42	38.74	25.07	16.01	8.64	6.13	111.	5.0	0.0	1.9	5.99	45.47	*
668.000	11,082	56.21	46.77	38.50	25.13	16.05	8.55	6.15	117.	5.0	0.0	1.9	5.99	47.75	*
668.000	11,126	60.83	47.11	38.41	25.13	16.11	8.79	6.20	103.	5.0	0.0	1.9	5.81	48.25	*
668.000	14,494	72.59	63.89	59.11	34.43	21.80	10.98	7.44	117.	5.0	0.0	1.8	10.07	29.40	*
668.000	14,593	73.23	64.30	49.67	35.05	22.04	11.33	7.19	121.	5.0	0.0	1.8	5.61	94.66	*
668.000	14,615	72.22	63.95	49.55	35.24	22.11	11.13	6.92	124.	5.0	0.0	1.8	5.88	106.20	*
685.000	8,196	54.22	34.40	27.17	19.65	10.05	6.08	4.38	45.	14.6	0.0	2.0	5.32	62.61	
685.000	8,360	57.36	34.27	27.51	19.84	10.43	5.79	4.52	37.	18.7	0.0	2.0	3.78	68.43	
685.000	8,415	58.17	34.79	27.69	19.95	10.60	6.04	4.53	35.	20.1	0.0	2.0	4.25	70.29	
685.000	10,829	66.10	45.50	35.84	25.85	13.38	8.76	5.27	59.	12.3	0.0	1.9	6.73	64.51	
685.000	11,005	69.50	46.81	37.07	26.76	14.12	9.91	5.92	51.	17.4	0.0	1.8	7.38	68.39	
685.000	11,093	65.12	46.87	37.01	26.88	14.11	10.01	5.63	69.	12.4	0.0	1.9	7.79	67.50	
685.000	11,093	68.20	46.85	37.02	27.27	14.12	9.65	5.78	56.	15.1	0.0	1.8	6.76	65.38	
707.000	8,525	47.95	31.20	24.65	15.89	9.11	5.86	3.76	51.	19.1	0.0	2.3	8.54	45.03	
707.000	8,635	46.81	31.15	24.57	16.27	9.19	5.89	3.81	59.	17.0	0.0	2.3	7.91	53.96	
707.000	8,646	43.43	31.04	24.65	16.32	9.25	6.15	3.94	76.	13.9	0.0	2.3	8.69	54.02	
707.000	10,862	63.25	41.22	33.12	21.73	11.99	7.81	4.66	52.	16.7	0.0	2.2	8.24	50.81	
707.000	10,862	64.58	41.72	33.61	22.96	12.47	8.17	4.99	50.	18.2	0.0	2.1	7.34	71.25	
707.000	10,928	65.63	41.80	33.44	22.47	12.46	8.23	4.81	46.	20.8	0.0	2.1	7.84	60.76	
707.000	10,950	67.23	41.87	33.48	22.28	12.62	11.89	5.05	35.	42.3	0.0	1.9	12.93	55.96	
707.000	14,165	79.07	57.95	46.85	31.52	16.41	10.92	5.56	86.	5.9	0.0	2.1	8.78	61.86	
707.000	14,176	78.13	58.28	47.15	31.69	16.61	11.24	5.71	92.	5.1	0.0	2.1	9.09	61.25	
707.000	14,187	78.54	58.83	47.16	31.83	16.72	11.02	5.77	91.	5.0	0.0	2.1	8.76	63.15	
736.000	8,733	36.33	26.79	23.25	15.32	8.23	5.30	3.43	134.	5.3	0.0	2.7	7.97	54.96	
787.000	9,688	30.36	23.71	19.53	13.50	5.24	5.12	3.22	165.	5.0	0.0	4.0	15.74	40.26	*
787.000	9,809	26.44	23.88	19.53	13.37	4.87	3.22	3.22	177.	5.0	0.0	4.4	15.10	37.70	*
787.000	12,146	55.88	32.69	26.85	18.75	9.82	5.73	4.50	52.	30.2	0.0	3.0	5.11	69.42	
787.000	12,431	60.15	31.60	26.75	18.66	8.20	5.65	4.31	40.	33.2	0.0	3.3	8.59	47.69	
787.000	12,508	64.73	32.30	26.65	18.63	10.07	6.09	4.40	29.	61.2	0.0	3.0	5.45	77.42	
787.000	12,409	51.56	32.48	26.75	18.78	9.45	5.65	3.99	75.	20.7	0.0	3.2	5.56	62.23	
787.000	15,581	65.05	44.61	37.77	26.76	14.78	7.39	5.11	116.	7.9	0.0	2.9	2.69	60.98	
787.000	15,636	68.26	44.08	37.43	26.43	18.00	6.61	5.42	87.	16.3	0.0	2.7	6.67	104.69	
787.000	16,009	64.47	45.01	37.37	26.37	15.82	6.44	5.50	129.	5.0	0.0	3.2	3.63	108.18	*
787.000	15,987	74.83	45.63	37.38	26.40	16.25	6.09	6.01	65.	17.5	0.0	2.9	4.86	107.38	
798.000	8,525	44.76	29.34	20.66	12.24	10.04	5.08	3.94	43.	32.4	0.0	2.6	11.47	28.47	
798.000	8,624	44.41	31.58	19.98	12.19	9.06	5.01	3.85	51.	20.2	0.0	2.8	13.27	31.53	
798.000	8,712	44.34	28.24	20.06	12.38	9.04	5.01	3.87	42.	33.9	0.0	2.7	9.77	34.20	
798.000	11,082	56.98	38.48	28.03	17.17	12.79	6.93	5.29	51.	26.9	0.0	2.5	9.56	33.04	
798.000	11,191	56.56	37.86	27.82	18.53	15.67	6.94	5.28	50.	37.1	0.0	2.2	7.80	48.58	
798.000	11,323	56.02	46.43	27.31	17.52	13.93	6.87	5.18	76.	11.4	0.0	2.5	14.56	37.23	
798.000	11,323	53.65	38.80	27.01	17.53	12.52	6.96	5.20	65.	22.8	0.0	2.5	8.97	43.54	
798.000	14,813	75.31	56.81	38.32	24.63	18.30	10.08	7.33	66.	18.6	0.0	2.3	10.34	40.03	

798.000	14,856	78.49	52.38	38.06	24.35	17.75	9.97	7.22	47.	31.2	0.0	2.3	8.47	40.38	
877.000	8,086	56.89	43.74	32.80	23.74	13.87	7.79	4.50	72.	5.0	0.0	1.6	4.97	64.13	*
877.000	8,229	55.91	45.78	32.78	24.21	14.66	8.02	4.38	78.	5.0	0.0	1.5	5.27	59.48	*
877.000	10,742	65.83	58.50	43.01	32.14	19.74	10.44	5.75	97.	5.0	0.0	1.5	4.84	57.81	*
877.000	10,763	64.14	59.30	44.27	32.52	19.86	10.62	5.74	102.	5.0	0.0	1.4	6.31	58.62	*
877.000	10,818	63.79	64.15	44.45	32.80	20.00	10.70	5.80	101.	5.0	0.0	1.4	7.86	***	*
877.000	10,796	63.09	70.28	44.61	32.86	19.91	10.82	5.96	100.	5.0	0.0	1.4	9.80	***	*
877.000	14,242	79.39	76.12	59.65	43.33	26.11	13.76	7.09	115.	5.0	0.0	1.4	7.97	59.15	*
882.000	8,349	49.55	33.72	25.82	17.79	10.35	6.04	4.27	57.	14.3	0.0	2.1	5.86	73.95	
882.000	8,360	48.20	33.61	25.75	17.70	10.48	5.89	4.22	63.	12.8	0.0	2.1	5.41	71.93	
882.000	8,448	46.91	33.68	25.85	18.24	10.43	5.86	4.18	76.	9.4	0.0	2.1	5.12	68.14	
882.000	11,093	56.75	45.19	34.80	24.57	14.54	8.30	5.63	111.	5.0	0.0	2.1	5.72	98.97	*
882.000	11,115	51.85	45.57	34.95	24.52	14.69	8.55	5.80	131.	5.0	0.0	2.0	6.84	90.21	*
882.000	11,115	51.56	45.66	35.05	24.98	14.78	8.65	5.99	134.	5.0	0.0	2.0	6.63	73.94	*
882.000	11,148	51.70	45.53	35.00	24.90	14.51	8.52	5.89	132.	5.0	0.0	2.0	6.78	74.87	*
882.000	14,834	68.70	61.97	47.98	34.43	21.51	11.58	7.69	140.	5.0	0.0	1.9	5.79	123.98	*
882.000	14,824	69.70	62.49	48.30	34.04	21.88	11.59	7.81	136.	5.0	0.0	1.9	5.71	93.24	*
882.000	14,878	69.67	62.47	48.46	33.69	19.98	11.53	7.81	131.	5.0	0.0	2.0	7.07	81.27	*
882.000	14,867	68.00	62.32	48.50	33.71	19.83	11.56	7.86	136.	5.0	0.0	1.9	7.40	81.44	*
895.000	8,317	50.93	40.12	24.37	17.21	11.05	7.70	5.42	54.	15.5	0.0	1.9	12.73	54.32	
895.000	8,273	60.43	39.61	23.63	17.41	11.27	7.90	5.28	26.	30.4	0.0	1.9	12.62	47.23	
895.000	8,371	61.28	45.57	23.00	17.27	11.58	8.07	5.50	30.	21.3	0.0	2.0	16.41	20.16	
895.000	10,665	75.74	44.90	30.07	23.62	15.85	10.54	7.03	25.	56.2	0.0	1.7	9.05	300.00	*
895.000	10,610	73.50	43.52	30.54	23.81	16.05	10.91	7.43	25.	69.6	0.0	1.7	8.19	100.07	*
895.000	10,961	70.69	45.94	32.22	24.91	16.37	11.04	7.43	32.	52.0	0.0	1.7	7.63	96.57	
895.000	11,049	77.84	58.87	33.13	24.23	16.62	11.22	7.42	35.	21.8	0.0	1.8	13.54	31.18	
914.000	9,161	35.37	25.04	20.68	12.81	6.94	6.14	0.89	88.	25.0	0.0	2.9	13.90	37.89	
914.000	9,129	37.19	25.16	21.44	12.98	7.33	5.80	1.72	82.	24.2	0.0	2.9	12.15	34.41	
914.000	11,477	46.46	35.41	28.43	19.21	11.58	7.87	1.54	118.	15.6	0.0	2.5	8.34	64.01	
914.000	11,543	39.12	36.22	28.70	19.72	11.67	8.04	2.28	210.	5.0	0.0	2.5	9.77	75.10	*
914.000	14,560	50.65	50.52	40.09	26.24	15.74	10.65	6.75	202.	5.0	0.0	2.3	11.31	49.50	*
925.000	8,525	45.09	30.35	24.73	18.20	12.74	7.87	5.74	49.	51.8	0.0	1.7	3.71	214.55	
925.000	8,613	45.54	30.97	24.79	18.41	12.82	7.94	5.80	50.	50.0	0.0	1.7	3.69	269.57	
925.000	8,635	45.50	30.93	24.95	18.42	12.79	7.93	5.80	50.	49.7	0.0	1.7	3.73	231.59	
925.000	11,191	64.07	40.88	33.59	24.61	16.98	10.45	7.59	39.	59.9	0.0	1.7	3.68	196.05	
925.000	11,312	54.43	41.44	33.86	24.90	17.19	10.74	7.78	95.	26.9	0.0	1.7	4.01	213.23	
925.000	11,268	53.53	41.49	33.54	25.28	17.42	11.03	8.05	101.	26.8	0.0	1.6	3.75	300.00	
925.000	11,334	53.40	41.80	33.79	25.31	17.42	11.00	8.02	110.	23.4	0.0	1.6	3.89	300.00	
925.000	14,802	64.36	56.99	44.39	33.96	23.19	14.19	10.12	190.	5.2	0.0	1.7	4.09	84.62	
925.000	14,824	61.74	57.63	44.62	34.27	23.41	14.54	10.41	208.	5.0	0.0	1.6	4.68	88.50	*
925.000	14,867	67.71	56.96	45.13	34.83	23.57	14.67	10.50	181.	5.1	0.0	1.7	3.74	91.51	
925.000	14,911	61.33	61.83	45.53	34.41	23.59	14.78	10.66	206.	5.0	0.0	1.6	6.29	***	*
948.000	8,602	53.91	32.04	27.39	19.24	13.38	7.41	4.83	32.	55.0	0.0	1.7	3.63	94.71	
948.000	8,723	53.39	32.36	29.50	20.70	13.25	7.51	4.97	39.	40.0	0.0	1.7	3.32	102.17	
948.000	8,723	53.46	32.42	28.49	19.44	13.77	7.51	4.98	36.	48.9	0.0	1.7	3.95	68.69	
948.000	10,983	76.30	42.73	38.00	24.22	17.47	10.00	6.36	25.	61.6	0.0	1.7	5.83	41.75	
948.000	11,104	73.10	42.75	37.09	23.47	17.07	10.14	6.80	29.	56.3	0.0	1.7	6.57	39.83	
948.000	11,246	71.54	43.31	36.39	26.60	17.77	10.15	6.78	33.	51.0	0.0	1.6	2.78	195.58	
966.000	8,733	55.39	39.60	38.68	24.02	14.73	8.45	6.09	93.	5.0	0.0	1.6	6.51	38.50	*
966.000	8,744	56.90	39.83	35.19	24.46	14.53	8.50	6.11	71.	10.7	0.0	1.5	4.45	87.75	
966.000	11,049	68.80	52.24	47.12	35.70	19.47	10.89	7.66	101.	5.0	0.0	1.5	3.79	77.60	*

966.000	11,104	63.83	52.13	49.17	34.48	18.79	11.01	7.83	113.	5.0	0.0	1.5	6.03	83.50	*
966.000	11,104	72.15	52.44	51.49	31.76	19.06	11.37	7.99	91.	5.0	0.0	1.5	7.17	37.35	*
966.000	11,159	71.97	52.49	47.69	30.83	19.18	11.21	7.98	85.	6.9	0.0	1.5	5.65	46.41	
Mean:		59.60	40.91	32.32	22.93	13.66	7.77	5.27	73.	24.5	0.0	2.6	7.15	59.74	
Std. Dev:		12.23	13.79	11.61	8.78	5.57	3.06	2.23	46.	23.6	0.0	1.6	3.91	24.36	
Var Coeff(%):		20.52	33.70	35.93	38.27	40.81	39.38	42.31	62.	96.6	0.0	61.2	54.65	40.78	

US14 Section 4

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT) (Version 5.1)

District: 11
County: 111
Highway/Road: 111111

	Thickness(in)	MODULI RANGE(psi) Minimum	Maximum	Poisson Ratio Values
Pavement:	9.00	25,000	1,000,000	H1: õ = 0.35
Base:	6.00	5,000	500,000	H2: õ = 0.35
Subbase:	0.00	0	0	H3: õ = 0.35
Subgrade:	63.00	5,000		H4: õ = 0.40

Station	Load (lbs)	Measured Deflection (mils): R1	R2	R3	R4	R5	R6	R7	Calculated Moduli values (ksi): SURF(E1)	BASE(E2)	SUBB(E3)	SUBG(E4)	Absolute ERR/Sens	Dpth to Bedrock	
0.000	8,657	37.91	29.85	20.27	16.39	8.39	3.24	3.06	92.	5.0	0.0	4.0	8.07	300.00	*
0.000	8,635	37.82	30.63	21.10	13.69	8.25	2.87	2.86	84.	5.0	0.0	4.2	11.58	44.73	*
0.000	8,569	41.52	33.14	20.80	19.43	8.31	3.45	2.81	79.	5.0	0.0	3.7	11.93	109.81	*
0.000	11,027	76.69	43.58	30.24	22.84	11.63	6.37	4.69	33.	10.0	0.0	3.2	3.33	59.84	
25.000	8,635	40.41	26.79	22.61	15.35	9.14	5.45	3.89	82.	12.1	0.0	3.3	4.39	68.53	
25.000	8,635	40.45	26.77	22.53	15.58	9.22	5.57	3.97	80.	13.2	0.0	3.3	4.24	83.34	
25.000	8,679	40.25	26.68	22.44	15.38	9.06	5.23	3.81	84.	10.9	0.0	3.4	3.83	75.55	
25.000	11,093	56.13	36.11	31.14	20.90	12.52	6.67	4.84	74.	10.2	0.0	3.2	3.20	62.09	
25.000	11,126	55.68	36.73	30.17	21.22	12.77	8.13	5.27	65.	18.5	0.0	3.0	4.78	101.05	
25.000	11,115	55.91	36.80	30.91	21.20	13.00	7.41	6.00	73.	12.9	0.0	3.1	3.43	74.85	
25.000	11,137	55.81	36.98	24.13	21.44	12.80	7.51	5.83	49.	31.1	0.0	3.1	4.66	223.44	
25.000	14,637	67.30	50.91	34.67	29.79	18.10	9.84	7.23	97.	10.9	0.0	3.0	3.82	300.00	
25.000	14,670	66.25	51.51	33.17	30.00	18.33	9.89	7.23	98.	12.0	0.0	3.0	4.96	159.15	
25.000	14,648	66.41	51.72	33.15	30.05	18.61	9.87	7.52	97.	12.2	0.0	3.0	5.07	142.95	
25.000	14,626	67.26	51.78	33.36	30.10	18.72	10.05	7.80	90.	14.4	0.0	3.0	4.95	158.45	
51.000	8,404	55.33	35.20	26.86	16.11	10.39	4.62	3.28	49.	5.0	0.0	3.2	6.29	31.12	*
51.000	8,481	55.96	35.52	26.43	16.39	10.20	5.04	3.48	46.	6.1	0.0	3.2	6.20	35.47	
51.000	8,492	55.66	35.41	26.19	16.43	10.11	4.50	3.18	48.	5.0	0.0	3.3	5.18	37.39	*

51.000	10,763	74.78	46.96	35.07	21.52	13.13	5.56	4.10	43.	5.0	0.0	3.2	5.24	33.89	*
51.000	10,862	72.00	47.56	36.03	22.14	13.56	6.50	4.24	51.	5.0	0.0	3.1	5.66	34.18	*
51.000	10,917	71.43	47.57	36.48	22.43	13.63	6.56	4.31	52.	5.0	0.0	3.0	5.37	34.42	*
51.000	10,939	72.91	47.94	36.25	22.58	13.98	6.62	4.34	51.	5.0	0.0	3.0	5.50	36.17	*
80.000	8,744	52.08	36.53	26.41	18.20	11.95	5.24	4.40	66.	5.0	0.0	3.0	4.79	69.03	*
80.000	8,964	50.46	36.26	26.41	18.17	11.52	5.14	3.93	72.	5.0	0.0	3.1	4.64	69.31	*
80.000	11,016	61.78	47.81	35.46	24.30	15.76	6.42	5.17	76.	5.0	0.0	2.8	7.84	66.07	*
80.000	11,268	64.53	47.87	35.94	24.18	13.79	6.46	5.17	68.	5.0	0.0	3.0	5.36	58.51	*
80.000	11,400	66.57	48.36	35.81	24.29	14.65	6.59	5.43	67.	5.0	0.0	3.0	4.99	61.58	*
80.000	11,356	66.59	48.38	35.79	24.28	13.14	6.65	5.72	64.	5.0	0.0	3.1	4.66	62.94	*
120.000	8,624	46.20	27.51	23.29	15.93	10.53	5.81	4.54	44.	29.6	0.0	3.0	3.39	71.57	
120.000	8,613	45.84	27.51	23.46	15.96	10.53	5.89	4.56	45.	30.1	0.0	3.0	3.39	68.16	
120.000	8,635	47.19	27.80	23.18	15.98	10.49	5.86	4.78	41.	30.9	0.0	3.0	3.33	77.25	
120.000	11,093	57.64	38.06	32.53	21.53	14.04	7.45	5.54	72.	12.2	0.0	3.0	3.75	54.07	
120.000	11,082	52.36	40.06	32.60	22.06	14.54	8.10	6.36	116.	5.0	0.0	3.0	4.51	62.91	*
120.000	14,725	70.58	54.80	44.12	30.27	18.92	9.66	8.35	106.	5.0	0.0	3.0	4.32	72.20	*
120.000	14,780	71.70	55.71	43.45	30.86	19.26	9.85	8.46	105.	5.0	0.0	3.0	3.73	108.37	*
120.000	14,878	71.08	55.39	44.55	31.20	19.50	10.13	9.31	110.	5.0	0.0	2.9	3.86	91.32	*
136.000	8,295	48.26	36.91	26.26	17.36	10.17	5.44	3.89	68.	5.0	0.0	3.0	6.19	49.60	*
136.000	8,415	49.83	35.66	24.99	18.32	10.14	5.50	4.15	66.	5.0	0.0	3.0	4.53	62.10	*
136.000	10,928	69.73	44.98	32.74	22.67	13.81	7.36	4.75	47.	9.7	0.0	2.9	4.30	74.56	
136.000	10,906	70.16	45.14	33.50	23.62	15.50	7.74	6.63	45.	12.6	0.0	2.7	3.99	90.65	
136.000	10,961	70.72	43.39	34.40	23.67	14.33	7.69	4.93	43.	12.8	0.0	2.8	3.06	73.83	
136.000	11,027	69.45	44.07	35.00	24.04	13.59	7.63	4.83	52.	8.6	0.0	2.9	3.81	73.69	
146.000	8,920	34.22	29.09	20.09	15.28	10.07	4.74	3.73	140.	5.0	0.0	3.7	6.29	51.89	*
146.000	8,920	34.12	28.97	20.00	15.19	10.38	4.74	3.78	143.	5.0	0.0	3.6	7.00	300.00	*
146.000	8,997	34.47	28.59	20.16	15.25	10.43	4.67	3.89	142.	5.0	0.0	3.7	6.78	300.00	*
146.000	11,213	41.54	41.30	31.22	20.55	13.85	6.05	5.17	148.	5.0	0.0	3.2	12.20	49.07	*
146.000	11,312	43.72	41.32	27.75	21.02	13.96	6.44	5.72	143.	5.0	0.0	3.3	8.15	300.00	*
146.000	11,290	40.81	39.95	28.10	21.26	14.56	6.61	5.87	169.	5.0	0.0	3.2	9.15	300.00	*
146.000	14,834	68.06	53.72	38.26	29.07	19.37	9.08	7.39	113.	5.0	0.0	3.2	5.32	51.67	*
146.000	14,911	60.58	53.55	38.80	29.78	19.44	9.81	7.79	147.	5.0	0.0	3.0	5.32	57.02	*
146.000	14,900	62.80	54.17	38.85	29.70	20.87	9.83	7.86	142.	5.0	0.0	3.0	6.70	300.00	*
146.000	14,889	68.66	56.22	39.27	30.31	19.81	10.28	8.13	118.	5.0	0.0	3.0	4.64	58.11	*
176.000	8,854	44.11	30.81	22.48	16.00	9.22	9.13	3.69	56.	28.6	0.0	2.9	12.38	93.10	
176.000	8,876	43.45	30.90	21.99	15.96	11.17	5.58	3.48	74.	13.4	0.0	3.2	5.59	135.84	
176.000	11,213	49.70	41.28	26.96	21.03	12.91	9.94	4.41	98.	14.8	0.0	2.9	10.49	180.72	
176.000	11,279	50.05	41.93	27.23	21.22	12.19	9.21	4.37	108.	8.4	0.0	3.1	10.52	164.83	
176.000	11,334	51.92	43.07	27.35	21.43	11.55	8.31	4.67	103.	5.2	0.0	3.4	10.39	109.96	
176.000	11,400	53.09	41.88	27.64	21.56	12.79	9.65	4.69	90.	12.2	0.0	3.0	9.90	242.42	
176.000	14,747	63.04	56.01	37.54	29.18	16.27	15.42	6.15	133.	8.4	0.0	2.8	13.24	300.00	
188.000	8,481	35.75	28.08	20.02	11.57	5.83	3.08	2.59	81.	5.0	0.0	4.8	10.33	28.41	*
188.000	8,635	36.57	28.19	20.15	11.58	5.68	3.25	2.48	80.	5.0	0.0	4.9	11.65	28.03	*
188.000	8,755	36.23	28.44	20.39	11.79	5.77	3.35	3.06	84.	5.0	0.0	4.9	11.86	28.57	*
188.000	11,060	47.88	36.63	26.69	15.72	7.72	4.16	3.78	79.	5.0	0.0	4.7	9.91	30.32	*
188.000	11,082	46.90	37.31	26.87	16.00	7.82	4.33	4.29	84.	5.0	0.0	4.6	10.49	31.38	*
188.000	11,159	49.75	37.67	27.00	15.79	7.85	4.47	4.34	76.	5.0	0.0	4.6	10.91	29.48	*
188.000	14,286	81.47	49.22	36.57	22.57	11.24	5.76	6.33	50.	5.0	0.0	4.3	5.72	36.24	*
225.000	8,723	23.48	23.11	19.17	13.55	5.85	3.54	2.27	193.	5.0	0.0	4.7	15.37	46.31	*
225.000	8,788	26.02	23.11	19.15	13.42	5.97	3.51	2.00	165.	5.0	0.0	4.8	11.88	48.38	*
225.000	8,876	32.86	23.26	19.21	13.46	6.11	3.47	2.08	115.	5.0	0.0	4.9	5.60	50.00	*

225.000	11,060	32.18	31.86	26.80	18.96	8.61	4.48	2.45	177.	5.0	0.0	4.3	16.54	50.40	*
225.000	11,268	39.23	32.66	27.12	19.37	9.05	4.74	2.80	136.	5.0	0.0	4.2	10.32	53.05	*
225.000	11,290	34.33	33.06	27.38	19.54	9.34	4.80	2.80	172.	5.0	0.0	4.1	14.43	55.47	*
225.000	11,301	49.92	33.30	28.37	19.76	9.34	4.55	3.02	91.	5.0	0.0	4.2	5.13	54.27	*
276.000	8,327	42.76	23.68	18.52	11.05	6.45	3.56	2.61	45.	12.4	0.0	4.5	6.00	31.89	
276.000	8,437	42.00	23.78	18.37	11.11	6.36	3.65	2.69	47.	12.7	0.0	4.6	6.64	33.55	
276.000	8,426	44.49	23.98	18.87	11.24	6.64	3.65	2.70	42.	13.4	0.0	4.5	5.89	31.69	
276.000	10,983	56.14	32.89	26.65	15.57	9.05	4.59	3.44	55.	8.2	0.0	4.4	5.60	29.83	
276.000	11,060	56.35	33.40	27.86	15.89	9.11	4.89	3.57	58.	7.5	0.0	4.3	6.69	27.90	
276.000	11,126	59.59	33.77	28.18	16.10	9.77	4.93	3.59	48.	10.5	0.0	4.1	5.99	27.88	
276.000	11,137	60.49	34.11	28.12	16.50	9.54	4.98	3.58	47.	10.0	0.0	4.1	5.49	30.33	
276.000	14,560	78.14	46.87	43.15	22.65	13.00	6.41	4.37	62.	5.0	0.0	4.1	7.37	23.18	*
276.000	14,637	74.76	48.33	47.29	23.29	13.55	6.82	4.90	71.	5.0	0.0	3.9	8.41	20.84	*
284.000	8,975	27.22	27.17	19.31	13.77	9.40	2.80	2.19	160.	5.0	0.0	4.4	17.63	106.49	*
284.000	8,986	30.28	24.72	19.41	13.83	12.85	2.90	2.33	155.	5.0	0.0	4.2	18.30	80.58	*
284.000	9,074	29.20	25.02	19.33	13.77	8.16	2.80	2.22	143.	5.0	0.0	4.7	12.38	43.93	*
284.000	11,334	53.54	34.06	26.26	18.88	11.51	3.48	2.94	77.	5.0	0.0	4.4	7.98	137.70	*
284.000	11,499	54.01	34.33	27.32	19.05	10.41	3.72	3.00	77.	5.0	0.0	4.5	5.62	45.27	*
284.000	11,554	57.03	34.57	27.40	19.16	10.87	3.81	3.09	71.	5.0	0.0	4.4	5.63	44.61	*
284.000	11,499	56.52	34.63	26.79	19.38	10.12	3.48	2.99	69.	5.0	0.0	4.5	5.96	44.81	*
284.000	14,922	74.06	48.56	39.65	27.27	14.54	3.65	3.39	66.	5.0	0.0	4.3	15.80	40.23	*
320.000	8,404	38.69	25.04	21.06	15.63	9.13	4.63	3.01	83.	12.2	0.0	3.4	1.76	62.47	
320.000	8,448	37.92	25.11	20.83	15.69	9.09	4.44	3.13	97.	8.1	0.0	3.5	1.82	59.59	
320.000	8,404	39.18	23.56	20.72	15.54	9.03	4.61	3.08	63.	22.4	0.0	3.4	2.78	64.74	
320.000	11,104	53.09	33.82	28.59	21.72	12.52	6.02	4.13	78.	12.3	0.0	3.3	2.81	59.18	
320.000	11,126	48.80	34.71	29.00	22.16	12.48	6.66	4.13	122.	5.0	0.0	3.4	1.39	68.88	*
320.000	11,169	51.28	34.03	29.03	21.93	12.74	6.37	4.27	96.	9.3	0.0	3.3	2.18	62.18	
320.000	11,191	48.63	35.52	28.99	22.01	12.85	6.32	4.34	121.	5.0	0.0	3.4	2.13	59.70	*
320.000	14,813	60.31	48.37	40.39	30.88	17.69	9.74	5.57	148.	5.0	0.0	3.1	4.14	72.67	*
346.000	8,613	42.91	29.55	23.74	17.39	9.59	5.01	3.24	91.	5.0	0.0	3.3	1.63	63.92	*
346.000	8,635	43.02	29.14	23.07	17.89	9.67	5.06	3.33	90.	5.7	0.0	3.3	0.81	65.71	
346.000	8,624	45.22	29.24	23.96	18.16	9.73	5.17	3.61	75.	8.1	0.0	3.2	1.67	67.88	
346.000	8,624	45.22	29.24	23.96	18.16	9.73	5.17	3.61	75.	8.1	0.0	3.2	1.67	67.88	
346.000	11,104	57.72	39.85	38.20	26.19	12.87	6.58	4.57	88.	5.0	0.0	3.0	7.68	61.43	*
346.000	11,159	58.35	40.76	32.34	21.79	13.23	6.81	4.88	84.	5.0	0.0	3.2	3.58	61.13	*
346.000	11,202	58.69	40.62	35.05	18.63	13.33	6.97	4.79	77.	5.9	0.0	3.3	9.42	22.90	
346.000	11,268	60.52	40.96	33.70	19.47	13.43	7.06	4.89	69.	7.7	0.0	3.2	7.79	28.01	
346.000	14,802	64.70	56.81	46.00	27.59	18.00	9.12	6.40	114.	5.0	0.0	3.1	9.42	31.72	*
346.000	14,824	69.35	56.95	45.72	27.87	18.60	9.49	6.60	104.	5.0	0.0	3.1	7.17	33.55	*
346.000	14,813	65.08	60.31	45.22	28.04	18.88	9.74	6.88	117.	5.0	0.0	3.0	9.24	35.19	*
346.000	14,813	71.61	52.01	45.67	29.75	19.01	9.92	6.79	107.	5.0	0.0	3.0	3.69	49.03	*
374.000	8,755	30.77	28.48	22.43	14.05	8.39	5.35	3.83	158.	5.0	0.0	3.6	10.61	38.72	*
374.000	8,701	30.84	28.31	22.90	14.02	8.33	5.24	3.81	154.	5.0	0.0	3.6	10.71	35.18	*
374.000	11,180	56.91	38.56	30.04	18.88	11.10	6.97	4.84	70.	8.2	0.0	3.5	7.93	39.17	
374.000	11,235	55.00	39.54	33.18	19.19	11.44	7.15	5.11	88.	5.0	0.0	3.5	9.55	28.78	*
374.000	11,323	56.02	39.21	30.89	19.34	11.55	6.97	5.04	81.	6.3	0.0	3.5	7.49	38.47	
374.000	11,334	57.60	37.66	30.51	19.52	11.72	7.09	5.23	67.	10.6	0.0	3.4	6.30	43.46	
374.000	14,878	44.19	53.98	43.80	27.10	15.69	8.79	6.57	211.	5.0	0.0	3.2	17.30	***	*
374.000	14,856	46.74	52.59	42.02	28.09	16.26	9.51	7.06	206.	5.0	0.0	3.1	13.73	***	*
374.000	14,824	47.07	51.49	42.11	28.98	16.61	9.90	7.26	213.	5.0	0.0	3.0	12.68	***	*
374.000	14,824	68.33	51.79	42.31	28.37	16.57	9.70	7.46	108.	5.0	0.0	3.2	5.77	60.19	*

425.000	8,602	25.78	14.61	11.39	8.93	6.28	3.63	2.78	55.	154.6	0.0	5.0	3.37	73.44	
425.000	8,470	25.07	14.16	11.13	8.63	6.08	3.50	2.70	56.	154.5	0.0	5.1	3.24	72.56	
425.000	8,799	25.87	14.52	11.24	8.83	6.30	3.66	2.69	54.	182.1	0.0	5.1	3.78	73.58	
425.000	11,356	34.35	19.40	15.63	12.18	8.67	4.97	3.68	54.	171.6	0.0	4.7	2.61	72.43	
425.000	11,433	34.72	19.57	15.79	12.31	8.93	5.17	3.83	52.	202.6	0.0	4.6	2.84	300.00	
425.000	11,543	34.04	19.62	15.77	12.35	9.00	5.11	3.75	57.	183.0	0.0	4.7	2.76	300.00	
425.000	11,521	32.78	19.67	15.82	12.37	9.12	5.16	3.78	65.	159.3	0.0	4.7	2.82	300.00	
425.000	15,328	34.97	27.83	22.94	18.07	12.96	7.20	5.29	294.	22.0	0.0	4.4	2.80	68.74	
425.000	15,350	37.26	27.85	23.08	18.34	13.42	7.23	5.56	208.	42.5	0.0	4.3	2.88	64.79	
425.000	15,383	40.66	27.78	23.15	18.36	13.55	6.66	5.65	130.	58.2	0.0	4.4	3.78	56.73	
425.000	15,405	44.86	27.80	23.18	18.35	13.32	6.22	5.56	85.	75.4	0.0	4.6	4.30	53.94	
435.000	8,755	46.67	17.76	15.49	11.47	7.13	3.85	2.69	25.	85.2	0.0	4.7	5.31	68.64	*
435.000	8,821	46.26	17.80	15.61	11.59	7.20	3.87	2.79	25.	95.9	0.0	4.7	4.73	68.29	*
435.000	8,613	47.05	15.89	15.22	11.31	7.08	3.84	2.60	25.	97.9	0.0	4.7	7.69	71.34	*
435.000	11,115	55.79	22.92	21.28	15.92	9.75	5.12	3.68	25.	142.6	0.0	4.2	3.37	67.62	*
506.000	8,536	45.13	26.99	20.05	15.90	10.07	7.59	5.65	34.	75.7	0.0	2.8	7.03	205.21	
506.000	8,635	46.55	26.94	19.95	15.96	9.85	7.52	5.19	31.	79.7	0.0	2.8	7.22	162.39	
506.000	8,733	46.00	26.82	20.26	15.94	9.94	7.56	6.85	32.	80.5	0.0	2.8	6.90	178.95	
506.000	10,928	60.31	36.61	27.30	21.68	13.87	9.61	6.34	34.	60.6	0.0	2.7	5.52	102.07	
506.000	11,038	56.02	43.59	27.11	21.79	14.04	9.99	6.38	67.	20.0	0.0	2.7	9.88	77.55	
506.000	11,082	56.34	37.98	27.98	21.78	13.86	10.38	7.03	49.	42.7	0.0	2.6	7.12	204.13	
506.000	11,093	55.72	37.04	27.39	21.97	14.00	10.21	6.74	47.	49.8	0.0	2.6	6.28	219.32	
506.000	14,538	72.87	52.49	39.00	30.78	19.76	13.47	8.67	67.	27.8	0.0	2.5	5.30	94.04	
506.000	14,615	77.53	54.33	39.67	31.36	19.65	14.17	8.79	55.	30.7	0.0	2.5	6.53	174.05	
506.000	14,703	74.76	50.07	39.55	31.48	19.75	14.56	8.55	51.	47.7	0.0	2.4	4.98	202.58	
506.000	14,725	75.52	50.87	39.87	31.65	19.96	14.13	8.49	53.	42.0	0.0	2.4	4.53	210.07	
528.000	8,437	44.36	27.34	20.71	14.08	8.54	5.78	4.09	45.	22.9	0.0	3.4	7.09	65.69	
528.000	8,514	45.04	27.35	20.93	14.44	8.90	6.01	4.46	42.	27.6	0.0	3.3	6.60	76.07	
528.000	8,525	44.49	26.96	21.07	14.17	9.04	5.84	4.16	43.	28.1	0.0	3.3	6.26	59.87	
528.000	11,093	53.67	36.54	28.71	19.30	11.60	7.20	5.29	78.	10.4	0.0	3.4	5.92	60.44	
528.000	11,159	58.39	36.99	28.84	19.89	12.19	7.50	5.58	52.	19.4	0.0	3.2	5.12	76.38	
528.000	11,213	57.89	37.00	28.71	19.89	12.57	7.48	5.59	53.	20.6	0.0	3.2	4.51	79.33	
528.000	11,246	57.78	37.07	29.65	20.01	13.75	7.85	5.78	53.	24.6	0.0	3.0	4.95	60.73	
528.000	14,856	68.20	51.22	48.32	28.04	17.59	10.20	7.34	113.	5.0	0.0	3.1	7.36	29.62	*
528.000	14,944	68.43	51.83	41.81	28.55	16.71	10.44	7.63	112.	5.0	0.0	3.2	6.31	70.66	*
528.000	14,977	65.61	51.87	40.83	30.91	16.93	10.67	7.86	126.	5.0	0.0	3.1	4.90	81.60	*
528.000	14,955	69.49	52.54	41.27	29.07	16.88	10.72	7.82	110.	5.0	0.0	3.2	6.01	100.42	
535.000	9,150	47.66	36.48	19.85	15.11	9.18	4.87	3.61	63.	6.6	0.0	3.9	10.95	28.01	
535.000	9,194	42.02	33.06	20.89	16.44	9.23	4.89	3.68	94.	5.0	0.0	3.8	5.82	101.82	*
535.000	9,150	43.43	32.23	19.88	18.22	9.11	4.94	3.78	87.	6.0	0.0	3.7	6.51	81.55	
535.000	11,411	44.70	38.89	27.29	23.00	12.65	6.28	4.52	138.	5.0	0.0	3.4	6.36	300.00	*
535.000	11,586	53.05	36.41	27.82	23.40	13.27	6.69	4.92	94.	10.3	0.0	3.3	2.17	63.09	
535.000	11,543	57.74	38.64	27.90	21.30	13.22	6.79	4.91	64.	14.9	0.0	3.3	3.32	59.21	
535.000	14,494	68.19	48.61	39.11	30.98	18.50	9.31	6.75	115.	5.0	0.0	3.1	1.02	61.90	*
550.000	8,766	42.25	22.04	15.82	12.37	7.35	4.53	3.36	32.	55.6	0.0	4.2	4.68	90.69	
550.000	8,854	43.30	22.07	15.87	12.56	7.66	4.89	3.65	29.	80.4	0.0	4.1	5.28	103.27	
550.000	8,865	42.51	22.04	16.08	12.59	7.74	5.02	3.68	31.	80.8	0.0	4.0	5.32	110.61	
550.000	11,137	50.11	30.81	21.34	17.40	10.49	6.14	4.72	48.	35.8	0.0	3.8	4.12	300.00	
550.000	11,224	50.69	32.06	21.89	18.11	10.81	6.72	5.02	50.	36.9	0.0	3.7	5.22	300.00	
550.000	11,290	53.03	30.83	21.39	18.37	10.99	7.00	5.15	37.	62.7	0.0	3.5	4.88	300.00	
550.000	11,279	54.07	31.21	21.53	18.08	11.16	7.20	5.24	35.	65.2	0.0	3.5	5.57	300.00	

550.000	14,725	70.13	44.54	30.29	25.24	15.10	8.96	6.41	49.	31.8	0.0	3.5	4.50	300.00	
550.000	14,802	71.57	45.11	31.51	25.70	15.49	8.67	6.77	50.	28.0	0.0	3.5	3.59	300.00	
550.000	14,769	70.19	44.62	32.80	27.34	15.67	8.92	6.99	56.	26.4	0.0	3.4	2.38	300.00	
550.000	14,834	70.17	45.09	32.68	26.43	15.92	8.96	7.18	56.	26.5	0.0	3.4	2.73	72.06	
577.000	8,503	39.10	21.11	17.69	11.43	7.12	4.39	3.52	41.	37.6	0.0	4.1	5.63	46.74	
577.000	8,580	39.30	27.98	17.88	11.46	7.10	4.39	3.48	68.	8.9	0.0	4.4	10.06	41.14	
577.000	8,558	39.79	23.54	17.39	11.51	7.14	4.47	3.55	47.	23.2	0.0	4.2	6.54	52.75	
577.000	11,180	45.29	29.42	24.98	16.01	9.74	6.00	4.79	85.	16.1	0.0	4.0	5.99	44.83	
577.000	11,268	45.36	29.13	23.75	16.54	10.05	6.12	4.80	76.	23.4	0.0	3.9	4.31	89.21	
577.000	11,312	45.63	29.16	24.48	16.56	9.95	6.18	4.87	77.	21.9	0.0	3.9	5.00	66.43	
577.000	11,356	45.95	29.17	23.98	16.72	9.89	6.26	4.91	72.	25.1	0.0	3.9	4.86	91.79	
577.000	14,988	54.51	39.73	34.26	23.72	13.54	8.49	6.44	152.	5.3	0.0	4.0	5.21	87.12	
577.000	15,010	55.41	40.09	34.81	24.03	13.90	8.80	6.81	145.	6.9	0.0	3.8	5.21	84.09	
577.000	15,054	62.72	41.76	33.97	24.04	13.98	8.89	6.88	85.	17.2	0.0	3.7	4.82	103.77	
577.000	15,065	59.52	42.11	33.59	23.98	14.17	9.06	7.04	111.	11.5	0.0	3.7	4.96	104.77	
599.000	8,492	30.90	20.55	17.75	13.53	8.05	4.94	3.61	99.	29.5	0.0	3.6	2.47	97.81	
599.000	8,580	33.80	20.78	17.85	13.64	8.13	4.95	3.65	66.	43.8	0.0	3.6	2.31	94.95	
599.000	8,503	34.31	20.54	17.82	13.51	8.10	4.87	3.59	60.	47.5	0.0	3.6	2.32	91.04	
599.000	10,961	54.91	27.87	24.28	18.45	11.01	6.63	4.83	30.	86.3	0.0	3.4	2.46	92.13	
599.000	11,137	52.72	27.61	24.52	18.76	11.26	6.85	5.01	34.	93.1	0.0	3.3	2.40	96.56	
599.000	11,137	48.59	27.19	24.47	18.88	11.30	6.90	5.08	44.	74.4	0.0	3.3	2.48	99.21	
599.000	11,257	48.04	27.00	24.59	18.85	11.40	6.98	5.13	46.	77.0	0.0	3.3	2.53	100.06	
599.000	14,845	64.53	37.69	34.18	25.88	15.71	9.51	6.96	51.	57.2	0.0	3.2	2.49	95.31	
599.000	14,889	64.71	36.80	34.53	26.04	15.97	9.76	7.23	47.	75.2	0.0	3.2	2.75	99.94	
599.000	14,933	63.84	38.40	34.78	26.34	16.21	9.96	7.43	56.	54.8	0.0	3.1	2.59	99.89	
599.000	15,010	62.91	35.56	35.02	26.50	16.31	10.12	7.50	48.	93.1	0.0	3.1	3.82	109.30	
655.000	8,426	40.72	27.00	21.68	14.55	10.09	4.91	2.82	71.	14.3	0.0	3.3	4.22	58.04	
655.000	8,470	40.71	26.62	21.74	14.14	8.76	4.92	2.78	73.	11.3	0.0	3.5	4.62	47.99	
655.000	11,126	51.60	36.02	29.30	19.42	11.63	6.17	3.14	98.	5.0	0.0	3.6	3.89	54.86	*
655.000	11,159	47.49	36.73	28.75	20.06	14.18	6.80	3.59	130.	5.0	0.0	3.3	5.11	82.73	*
655.000	11,257	41.61	36.62	28.63	20.32	12.78	6.91	3.83	162.	5.0	0.0	3.3	6.13	109.51	*
655.000	11,224	42.95	36.56	28.24	19.93	12.70	7.26	4.02	155.	5.0	0.0	3.3	5.16	99.44	*
655.000	14,878	54.08	49.15	37.90	27.44	16.72	8.78	4.08	162.	5.0	0.0	3.3	7.11	61.79	*
655.000	14,966	52.95	51.50	39.43	28.13	17.91	8.98	4.34	173.	5.0	0.0	3.2	8.89	115.12	*
655.000	14,933	53.67	51.86	39.58	28.02	17.46	9.81	4.18	174.	5.0	0.0	3.1	8.26	103.09	*
655.000	14,966	63.56	51.93	39.78	28.28	18.20	9.74	3.63	131.	5.0	0.0	3.2	3.96	108.40	*
661.000	8,470	36.96	26.24	21.44	14.36	9.96	5.50	5.06	96.	13.5	0.0	3.2	4.84	57.61	
661.000	8,514	36.92	26.25	21.47	14.38	9.97	5.46	5.15	97.	13.6	0.0	3.2	4.78	57.66	
661.000	8,591	36.20	26.17	21.49	14.35	9.89	5.47	5.17	111.	10.5	0.0	3.3	4.91	56.53	
661.000	11,060	41.64	35.18	29.18	19.39	12.91	7.37	6.13	165.	5.0	0.0	3.3	5.70	55.05	*
661.000	11,104	43.09	35.31	29.39	19.54	12.95	7.43	5.74	157.	5.0	0.0	3.3	5.49	55.41	*
661.000	11,202	42.66	35.19	29.28	19.47	12.85	7.32	5.93	160.	5.0	0.0	3.3	5.46	55.57	*
661.000	11,235	43.32	35.46	29.52	19.87	13.22	7.48	6.31	160.	5.0	0.0	3.3	4.94	61.15	*
661.000	14,714	57.22	48.37	40.52	27.06	17.67	8.91	8.38	150.	5.0	0.0	3.2	6.76	57.61	*
661.000	14,780	55.89	48.88	40.91	27.46	18.03	9.48	7.96	163.	5.0	0.0	3.1	7.10	59.91	*
661.000	14,813	52.13	49.19	41.05	27.94	18.26	9.31	7.72	184.	5.0	0.0	3.1	9.00	67.80	*
661.000	14,780	54.11	49.19	40.89	27.94	18.25	9.33	7.79	172.	5.0	0.0	3.1	7.97	70.28	*
666.000	8,404	41.65	32.91	27.48	19.49	11.79	6.13	4.81	109.	5.0	0.0	2.7	4.73	113.19	*
666.000	8,514	41.33	33.49	27.69	19.62	11.74	6.13	4.85	111.	5.0	0.0	2.7	5.47	110.92	*
666.000	8,558	42.04	33.11	27.83	19.74	11.81	6.05	4.88	109.	5.0	0.0	2.7	4.93	114.80	*
666.000	11,180	60.00	44.75	37.07	26.07	15.11	7.63	5.93	89.	5.0	0.0	2.7	4.08	100.27	*

666.000	11,191	61.28	45.51	41.56	26.57	15.79	7.96	6.10	88.	5.0	0.0	2.6	5.99	44.41	*
666.000	11,235	61.48	46.13	39.89	26.80	16.04	8.03	6.26	89.	5.0	0.0	2.6	5.06	61.53	*
666.000	11,268	61.54	46.51	39.91	26.96	16.28	8.15	6.28	90.	5.0	0.0	2.6	4.98	64.13	*
666.000	14,659	79.93	61.50	51.91	35.87	20.49	9.96	7.41	87.	5.0	0.0	2.6	5.93	80.96	*
686.000	8,657	52.63	34.20	24.04	18.16	8.24	5.15	3.70	55.	5.0	0.0	3.5	6.18	47.48	*
686.000	8,547	52.09	34.30	22.87	18.67	8.30	5.20	3.74	54.	5.8	0.0	3.4	7.50	300.00	
686.000	11,093	64.79	46.91	30.55	24.78	10.76	6.57	4.61	61.	5.0	0.0	3.3	7.97	199.88	*
686.000	11,159	64.97	46.35	30.01	24.56	11.02	6.72	4.80	61.	5.0	0.0	3.3	7.74	174.32	*
686.000	11,202	65.04	46.31	30.43	24.46	11.11	6.81	4.83	62.	5.0	0.0	3.3	7.38	251.83	*
686.000	11,180	64.81	46.76	30.23	24.84	11.27	6.94	4.94	63.	5.0	0.0	3.3	7.81	168.04	*
735.000	8,942	25.51	15.91	12.61	8.87	5.33	2.58	1.96	110.	21.6	0.0	6.3	2.04	100.28	
735.000	8,942	29.37	15.83	12.63	8.88	5.07	2.59	1.98	63.	32.9	0.0	6.3	1.71	60.83	
735.000	8,975	30.79	15.99	12.65	8.94	5.26	2.63	1.97	54.	40.5	0.0	6.2	1.72	107.99	
735.000	11,356	40.93	22.03	17.46	12.21	7.35	3.59	2.78	56.	33.5	0.0	5.7	2.16	93.00	
735.000	11,356	42.70	22.04	17.37	12.26	7.57	3.69	2.74	47.	43.6	0.0	5.6	2.24	104.20	
735.000	11,367	41.30	22.18	17.47	12.32	7.26	3.70	2.74	54.	34.8	0.0	5.7	1.75	104.76	
735.000	11,422	37.76	22.41	17.55	12.39	7.58	3.72	2.76	77.	27.3	0.0	5.7	2.14	104.63	
735.000	15,087	50.93	32.14	25.02	17.61	10.62	5.31	4.02	92.	18.6	0.0	5.3	2.39	100.59	
735.000	15,065	49.15	32.45	25.11	17.74	11.32	5.44	4.08	109.	16.5	0.0	5.2	2.79	103.35	
735.000	15,065	51.07	32.56	25.15	17.80	12.08	5.44	4.06	88.	23.7	0.0	5.0	4.17	102.82	
735.000	15,109	50.61	32.90	25.20	17.94	11.47	5.50	4.08	97.	19.1	0.0	5.1	2.80	115.04	
760.000	8,832	26.58	11.05	8.28	5.49	3.52	3.14	1.91	35.	302.5	0.0	8.4	12.02	53.11	
760.000	8,832	25.86	11.33	8.28	5.57	3.58	2.79	1.93	40.	191.2	0.0	8.7	10.02	58.96	
760.000	8,843	26.17	11.38	8.30	5.59	3.57	2.67	1.95	40.	163.6	0.0	8.8	9.34	59.60	
760.000	11,499	30.04	14.82	11.05	7.44	4.65	3.50	2.46	54.	120.7	0.0	8.6	8.88	60.10	
760.000	11,586	30.01	15.07	11.22	7.51	4.81	3.72	2.68	55.	129.6	0.0	8.3	9.41	57.01	
760.000	11,652	29.83	14.91	11.20	7.48	4.79	3.60	2.67	56.	127.8	0.0	8.5	8.97	56.12	
760.000	11,608	29.20	14.74	11.36	7.81	4.87	3.60	2.75	58.	138.8	0.0	8.2	8.02	73.29	
760.000	15,581	36.82	19.48	15.72	10.03	6.62	4.90	3.70	68.	123.9	0.0	8.1	9.11	42.24	
760.000	15,537	36.16	19.04	15.59	9.55	6.50	4.89	3.76	68.	127.6	0.0	8.2	10.05	34.79	
760.000	15,559	37.49	19.35	15.38	9.67	6.56	4.93	3.85	62.	140.3	0.0	8.3	9.80	38.90	
760.000	15,592	37.52	19.27	15.47	12.30	6.59	5.01	3.87	62.	175.2	0.0	7.4	5.47	75.30	
792.000	8,854	22.91	13.82	9.73	7.33	3.95	2.30	2.04	95.	31.1	0.0	7.7	4.41	73.57	
792.000	8,920	23.76	13.79	9.71	7.37	4.06	2.36	2.03	81.	38.0	0.0	7.6	4.16	76.12	
792.000	8,942	23.58	13.69	9.59	7.32	3.94	2.31	2.03	83.	35.9	0.0	7.8	4.32	73.40	
792.000	11,630	24.16	18.40	12.63	9.71	5.58	3.28	2.67	238.	8.6	0.0	7.9	5.90	77.22	
792.000	11,630	25.56	18.09	12.60	10.08	5.57	3.24	2.66	173.	22.1	0.0	7.4	4.40	300.00	
792.000	11,674	25.34	18.09	12.57	9.89	5.66	3.33	2.69	178.	22.6	0.0	7.4	4.86	300.00	
792.000	11,696	26.02	17.94	12.65	9.89	5.68	3.32	2.69	156.	27.9	0.0	7.4	4.41	77.18	
792.000	15,778	31.68	23.94	17.28	14.49	7.60	4.51	3.81	267.	8.3	0.0	7.7	4.50	300.00	
792.000	15,723	31.56	23.94	17.36	14.07	7.65	4.66	3.94	249.	13.4	0.0	7.3	4.34	78.55	
792.000	15,745	31.65	23.93	17.43	13.80	7.67	4.70	3.99	248.	13.3	0.0	7.4	4.62	84.99	
792.000	15,767	31.89	23.92	17.52	13.83	7.77	4.80	3.93	236.	17.0	0.0	7.2	4.53	89.06	
806.000	8,909	17.96	10.26	8.24	6.44	4.47	2.40	1.84	88.	185.8	0.0	7.4	2.38	62.69	
806.000	8,953	18.69	10.27	8.07	6.33	4.69	2.33	1.85	76.	223.6	0.0	7.4	4.22	300.00	
806.000	8,964	18.79	10.35	7.99	6.30	4.80	2.29	1.82	75.	224.7	0.0	7.4	5.20	300.00	
806.000	11,707	22.89	13.49	10.96	8.39	5.89	3.24	2.53	99.	168.8	0.0	7.4	2.24	300.00	
806.000	11,784	23.64	13.57	10.96	8.51	6.23	3.33	2.58	87.	219.4	0.0	7.1	3.06	300.00	
806.000	11,839	23.16	13.64	10.82	8.50	6.13	3.31	2.57	95.	194.9	0.0	7.3	3.01	62.28	
806.000	11,894	22.94	13.75	10.76	8.47	5.82	3.33	2.58	102.	163.6	0.0	7.5	2.71	70.51	
806.000	15,855	28.09	18.72	15.33	12.06	7.84	4.66	3.64	171.	93.6	0.0	7.1	1.08	80.14	

806.000	15,855	31.82	18.82	15.20	12.05	7.69	4.71	3.67	98.	158.0	0.0	7.2	1.63	87.95
806.000	15,921	28.15	18.77	15.17	12.07	7.54	4.80	3.69	167.	96.5	0.0	7.2	2.10	102.02
806.000	15,965	32.45	18.75	15.15	12.14	7.52	4.87	3.71	90.	183.7	0.0	7.2	2.43	110.55
814.000	8,821	17.07	12.21	9.68	6.67	4.39	2.67	2.00	219.	30.1	0.0	7.3	4.79	74.80
814.000	8,898	17.43	12.23	9.66	6.69	4.36	2.66	1.98	192.	37.8	0.0	7.3	4.80	79.08
814.000	8,887	17.11	12.18	9.57	6.63	4.32	2.65	1.96	207.	34.0	0.0	7.4	4.94	79.23
814.000	11,586	27.10	15.76	12.66	8.94	5.95	3.52	2.65	85.	94.9	0.0	7.0	3.83	100.02
814.000	11,641	26.76	15.86	12.67	8.77	5.85	3.57	2.70	90.	88.6	0.0	7.1	4.49	78.21
814.000	11,674	26.21	15.97	12.72	8.77	5.86	3.61	2.73	100.	81.0	0.0	7.1	4.74	74.92
814.000	11,674	25.58	17.63	12.76	8.72	5.85	3.63	2.75	140.	41.0	0.0	7.3	6.63	67.00
814.000	15,603	31.60	21.91	17.50	12.06	8.18	5.11	3.86	167.	53.1	0.0	6.8	5.03	74.34
814.000	15,614	33.46	22.14	17.61	12.17	8.21	5.13	3.90	132.	65.7	0.0	6.8	4.99	76.66
814.000	15,625	31.46	22.08	17.95	12.17	8.25	5.17	3.94	182.	46.3	0.0	6.7	5.30	64.03
814.000	15,625	32.11	22.20	18.16	12.07	8.30	5.18	3.95	169.	48.6	0.0	6.7	5.57	54.44
835.000	8,964	12.17	8.53	6.98	5.95	4.18	2.83	2.17	202.	288.4	0.0	6.8	1.90	129.75
835.000	8,997	12.11	8.56	7.00	5.99	4.17	2.83	2.18	214.	268.2	0.0	6.8	1.89	132.74
835.000	9,096	12.11	8.61	7.06	5.98	4.19	2.84	2.18	224.	255.9	0.0	6.9	1.93	130.44
835.000	11,905	16.00	11.45	9.55	8.01	5.73	3.91	2.98	226.	274.5	0.0	6.5	1.75	134.78
835.000	11,905	16.29	11.56	9.68	8.20	5.84	3.97	3.07	214.	292.1	0.0	6.4	1.46	133.40
835.000	11,960	16.37	11.51	9.60	8.11	5.73	3.86	2.95	208.	280.8	0.0	6.6	1.45	126.43
835.000	12,014	16.43	11.58	9.67	8.20	5.79	3.91	3.00	211.	284.1	0.0	6.5	1.41	128.68
835.000	16,261	22.53	16.06	13.61	11.45	8.28	5.63	4.35	215.	304.1	0.0	6.1	1.25	132.82
835.000	16,415	22.75	16.19	13.69	11.53	8.35	5.66	4.37	215.	298.4	0.0	6.1	1.29	130.06
835.000	16,382	22.99	16.24	13.78	11.59	8.39	5.70	4.42	204.	315.9	0.0	6.1	1.24	132.21
835.000	16,480	23.13	16.29	13.80	11.65	8.41	5.70	4.43	204.	311.0	0.0	6.1	1.22	130.67
877.000	8,997	22.11	10.89	9.09	6.81	4.35	2.57	2.07	57.	220.6	0.0	7.4	2.18	78.76
877.000	8,997	22.13	10.83	9.13	6.80	4.30	2.56	2.07	57.	223.8	0.0	7.4	2.42	80.72
877.000	9,019	22.12	10.90	9.20	6.84	4.38	2.57	2.05	57.	220.6	0.0	7.3	2.20	77.40
877.000	11,784	21.81	15.09	12.88	9.38	5.75	3.56	2.84	218.	44.0	0.0	7.1	3.24	92.24
877.000	11,828	22.48	14.94	12.74	9.39	5.80	3.58	2.85	176.	63.0	0.0	7.0	2.89	91.30
877.000	11,839	22.76	14.96	12.81	9.46	5.69	3.61	2.91	173.	61.1	0.0	7.1	3.45	102.32
877.000	11,850	22.53	14.97	13.21	9.53	5.76	3.64	2.97	189.	54.9	0.0	7.0	3.88	100.83
877.000	15,778	27.96	21.09	18.37	13.71	8.51	5.17	4.07	392.	9.1	0.0	7.0	2.69	88.29
877.000	15,778	28.06	21.14	18.33	13.74	8.67	5.27	4.17	352.	19.4	0.0	6.6	2.43	87.94
877.000	15,745	27.76	21.04	18.27	13.79	8.67	5.30	4.20	362.	19.1	0.0	6.5	2.39	89.94
877.000	15,734	28.08	21.15	18.35	13.90	8.98	5.33	4.15	370.	17.3	0.0	6.4	1.77	81.71
888.000	9,260	25.76	10.92	8.00	5.99	3.70	2.71	2.16	39.	331.5	0.0	8.7	8.08	146.28
888.000	9,249	27.39	11.02	8.21	6.31	3.72	2.56	2.24	35.	322.2	0.0	8.6	6.42	110.13
888.000	9,238	25.75	10.98	7.03	6.15	3.65	2.41	2.24	38.	334.7	0.0	9.1	7.76	135.82
888.000	11,685	27.98	14.28	10.13	8.12	5.26	3.73	3.02	54.	312.0	0.0	7.7	7.41	300.00
888.000	11,663	27.33	15.67	10.13	8.25	5.58	3.74	3.10	65.	176.6	0.0	7.5	8.63	148.37
888.000	11,674	28.37	16.11	9.98	8.20	5.76	3.78	3.16	60.	189.7	0.0	7.6	10.19	75.43
888.000	11,707	26.63	16.30	10.78	8.54	5.84	3.98	3.13	77.	140.0	0.0	7.1	8.30	245.72
888.000	15,570	32.52	22.00	15.53	12.18	8.19	5.50	4.46	116.	102.0	0.0	6.7	6.36	120.66
888.000	15,646	33.65	22.65	17.15	12.57	8.45	6.05	4.56	117.	96.9	0.0	6.3	6.56	186.27
888.000	15,668	33.59	22.59	17.39	14.52	8.77	5.70	4.73	135.	79.9	0.0	6.1	2.97	116.69
888.000	15,712	33.48	22.18	16.48	13.10	8.51	6.24	4.53	109.	129.4	0.0	6.1	6.40	263.97
898.000	8,854	23.28	14.85	11.71	6.58	4.40	2.93	2.31	103.	28.1	0.0	7.2	10.63	26.41
898.000	8,865	23.31	15.05	14.54	6.64	4.85	2.96	2.35	131.	18.5	0.0	6.8	12.35	18.58
898.000	8,909	23.67	14.98	11.19	6.65	4.64	2.94	2.32	92.	35.6	0.0	7.1	9.72	30.76
898.000	11,652	29.67	19.82	16.17	9.04	5.96	3.93	3.21	131.	20.9	0.0	7.0	10.46	26.21

898.000	11,729	28.76	20.08	14.72	9.14	6.21	3.98	3.28	133.	26.3	0.0	6.9	8.74	36.50	
898.000	11,740	29.54	19.84	14.19	9.24	6.46	4.01	3.31	107.	40.2	0.0	6.7	8.03	46.14	
898.000	11,718	28.65	19.96	14.56	9.23	6.65	3.98	3.36	127.	33.5	0.0	6.7	8.47	39.68	
898.000	15,756	29.91	25.81	21.39	13.14	9.33	5.81	4.83	351.	6.6	0.0	6.6	8.72	35.22	*
898.000	15,778	31.79	26.10	20.37	13.31	9.29	5.96	4.93	286.	13.8	0.0	6.3	7.77	48.00	
898.000	15,789	32.64	26.04	19.25	13.37	9.22	5.98	4.99	235.	24.5	0.0	6.2	6.74	78.81	
898.000	15,822	32.63	24.39	18.98	13.94	9.19	6.02	5.13	201.	43.6	0.0	6.0	4.88	206.10	
942.000	8,865	27.42	10.89	9.20	7.81	4.29	2.74	2.11	34.	460.2	0.0	7.0	3.27	86.21	
942.000	8,931	28.05	11.57	10.48	7.83	4.43	2.74	1.96	37.	283.5	0.0	6.9	3.85	96.67	
942.000	11,576	30.18	14.78	14.27	9.61	6.17	3.78	2.81	56.	207.1	0.0	6.4	4.99	63.90	
942.000	11,674	29.32	15.25	12.69	9.39	6.34	3.86	2.98	58.	227.1	0.0	6.5	2.97	252.70	
942.000	11,696	30.39	15.84	12.25	9.63	6.43	3.87	2.94	55.	224.5	0.0	6.5	3.38	81.59	
942.000	11,707	30.98	16.07	11.96	9.33	6.74	3.92	3.01	51.	280.3	0.0	6.5	5.29	300.00	
942.000	15,460	38.33	21.95	17.49	13.02	8.89	5.57	4.75	70.	151.8	0.0	6.1	3.54	290.29	
942.000	15,548	38.09	22.37	17.50	13.17	9.61	5.71	4.51	72.	169.7	0.0	5.9	4.31	300.00	
942.000	15,548	38.80	22.25	17.08	13.01	9.30	5.76	4.55	65.	194.7	0.0	6.0	4.74	300.00	
942.000	15,603	38.77	21.87	16.98	13.02	9.50	5.80	4.58	62.	245.2	0.0	5.9	4.55	300.00	
978.000	8,766	25.60	14.31	10.85	8.61	5.17	3.46	3.08	58.	110.7	0.0	5.7	4.58	131.67	
978.000	8,788	25.24	14.41	12.22	8.58	5.14	3.48	3.04	70.	76.8	0.0	5.7	5.39	100.60	
978.000	8,843	23.71	14.52	11.37	8.60	5.23	3.50	3.14	82.	77.1	0.0	5.7	4.33	131.84	
978.000	11,444	33.35	19.47	14.92	11.60	6.91	4.66	3.70	65.	86.9	0.0	5.6	4.59	124.60	
978.000	11,554	31.67	19.42	14.54	11.68	6.89	4.71	3.77	77.	83.0	0.0	5.6	4.91	117.72	
978.000	11,619	31.59	20.82	14.58	11.73	7.09	4.88	4.00	90.	62.9	0.0	5.6	6.55	300.00	
978.000	11,630	31.19	19.91	14.72	11.65	6.92	4.75	3.97	88.	68.3	0.0	5.7	5.45	121.10	
978.000	15,361	39.88	27.50	20.74	16.27	9.76	6.57	5.26	123.	46.5	0.0	5.3	4.84	130.52	
978.000	15,416	38.80	27.49	20.61	16.24	9.81	6.61	5.40	137.	44.2	0.0	5.3	4.96	136.82	
978.000	15,405	39.90	27.06	22.81	16.19	9.73	6.66	5.68	139.	36.9	0.0	5.3	5.43	118.46	
978.000	15,416	39.27	27.11	21.09	16.26	9.67	6.78	6.02	128.	49.5	0.0	5.3	4.96	124.15	
995.000	8,415	24.64	24.33	15.08	12.01	6.20	3.43	2.60	170.	5.0	0.0	4.9	8.01	81.83	*
995.000	8,470	26.19	23.48	15.33	11.98	6.31	3.46	2.72	158.	5.0	0.0	4.9	5.99	214.25	*
995.000	8,404	26.15	21.96	15.24	11.88	6.18	3.41	2.57	159.	5.0	0.0	5.0	4.51	300.00	*
995.000	11,060	28.92	21.55	20.08	15.35	8.25	4.65	3.99	248.	5.0	0.0	5.0	5.31	80.84	*
995.000	11,268	29.29	22.53	20.33	15.50	8.26	4.86	4.13	248.	5.0	0.0	5.0	4.68	79.24	*
995.000	11,356	28.35	26.13	20.43	15.46	8.61	4.63	3.82	245.	5.0	0.0	4.9	7.82	67.83	*
995.000	15,076	36.64	27.59	26.99	19.94	11.04	7.78	6.49	318.	5.0	0.0	4.7	6.15	94.06	

Mean:		43.75	30.16	23.49	16.83	10.26	5.85	4.33	104.	55.5	0.0	4.6	5.68	77.99
Std. Dev:		15.83	12.69	9.93	6.87	4.15	2.38	1.65	64.	81.4	0.0	1.7	3.06	47.43
Var Coeff(%):		36.17	42.07	42.29	40.84	40.48	40.72	38.12	62.	100.0	0.0	37.3	53.82	60.82

APPENDIX C. STATISTICAL F-TEST S SUMMARIES

I-43 Section 1

F-Test Two-Sample for Variances

	Joint	*Midslab*
Mean	36.46153846	45.84210526
Variance	179.9358974	283.8122333
F	0.633996271	
P(F<=f) one-tail	0.200441085	
Significant (Y/N)	N	

I-43 Section 2

F-Test Two-Sample for Variances

	Joint	*Midslab*
Mean	31.56	26.45455
Variance	26.84	6.069264
F	4.422282454	
P(F<=f) one-tail	0.000517743	
Significant (Y/N)	Y	

I-43 Section 3

F-Test Two-Sample for Variances

	Joint	*Midslab*
Mean	51.21875	35.597222
Variance	1147.53125	220.69464
F	5.199633528	
P(F<=f) one-tail	4.82105E-09	
Significant (Y/N)	Y	

I-43 Section 4

F-Test Two-Sample for Variances

	Joint	*Midslab*
Mean	42.84210526	55.1358025
Variance	72.3625731	276.868827
F	0.261360493	
P(F<=f) one-tail	0.001167916	
Significant (Y/N)	Y	

STH29 Section 1

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	104.6728395	98.88387097
Variance	3073.712177	1788.635777
F	1.718467346	
P(F<=f) one-tail	0.000385375	
Significant (Y/N)	Y	

STH29 Section 2

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	104.7913669	127.4471545
Variance	3652.427171	4673.101693
F	0.781585211	
P(F<=f) one-tail	0.080026479	
Significant (Y/N)	N	

STH29 Section 3

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	150.0314465	194.112299
Variance	5616.359764	5531.45506
F	1.015349433	
P(F<=f) one-tail	0.458748627	
Significant (Y/N)	N	

STH29 Section 4

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	89.26666667	92.95
Variance	4989.374713	3407.523684
F	1.464223047	
P(F<=f) one-tail	0.194745015	
Significant (Y/N)	N	

STH96 Section 1

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	48.16176471	75.2205882
Variance	368.6152327	725.786435
F	0.507883882	
P(F<=f) one-tail	0.003101881	
Significant (Y/N)	Y	

STH96 Section 2

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	62.92307692	71.32258065
Variance	569.5991903	255.1591398
F	2.232329168	
P(F<=f) one-tail	0.012841998	
Significant (Y/N)	Y	

STH96 Section 3

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	39.8	61.21052632
Variance	173.7333333	306.5263158
F	0.566781136	
P(F<=f) one-tail	0.181666742	
Significant (Y/N)	N	

STH96 Section 4

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	64.75892857	88.34285714
Variance	854.8692889	3200.284481
F	0.267122905	
P(F<=f) one-tail	2.31315E-12	
Significant (Y/N)	Y	

US14 Section 1

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	54.447619	57.7351351
Variance	1123.87523	1655.66316
F	0.67880669	
P(F<=f) one-tail	0.00334242	
Significant (Y/N)	Y	

US14 Section 2

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	49.10204082	44.67407407
Variance	479.242941	262.0870094
F	1.82856427	
P(F<=f) one-tail	0.000218037	
Significant (Y/N)	Y	

US14 Section 3

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	62.96	69.32407407
Variance	1264.36202	1289.342593
F	0.980625342	
P(F<=f) one-tail	0.4616034	
Significant (Y/N)	N	

US14 Section 4

F-Test Two-Sample for Variances

	Joints	*Midslab*
Mean	101.8908046	85.10909091
Variance	2093.670088	2402.585588
F	0.871423727	
P(F<=f) one-tail	0.185881492	
Significant (Y/N)	N	

I-43 Joints Good

F-Test Two-Sample for Variances

	Section 1	*Section 4*
Mean	36.46153846	42.8421053
Variance	179.9358974	72.3625731
F	2.486587883	
P(F<=f) one-tail	0.039387931	
Significant (Y/N)	Y	

I-43 Joints Poor

F-Test Two-Sample for Variances

	Section 2	*Section 3*
Mean	31.56	51.21875
Variance	26.84	1147.53125
F	0.023389341	
P(F<=f) one-tail	1.02141E-14	
Significant (Y/N)	Y	

I-43 Mid-slabs Good

F-Test Two-Sample for Variances

	Section 1	*Section 4*
Mean	45.84211	55.1358
Variance	283.8122	276.8688
F	1.025078	
P(F<=f) one-tail	0.451305	
Significant (Y/N)	Y	

I-43 Mid-slabs Poor

F-Test Two-Sample for Variances

	Section 2	*Section 3*
Mean	26.45455	35.59722
Variance	6.069264	220.6946
F	0.027501	
P(F<=f) one-tail	4.7E-13	
Significant (Y/N)	Y	

STH 29 Joints Good

F-Test Two-Sample for Variances

	Section 1	*Section 3*
Mean	104.6728	150.0314
Variance	3073.712	5616.36
F	0.547278	
P(F<=f) one-tail	7.96E-05	
Significant (Y/N)	Y	

STH29 Joints Poor

F-Test Two-Sample for Variances

	Section 2	*Section 4*
Mean	104.7914	89.26667
Variance	3652.427	4989.375
F	0.732041	
P(F<=f) one-tail	0.120049	
Significant (Y/N)	N	

STH 29 Mid-slabs Good

F-Test Two-Sample for Variances

	Section 1	*Section 3*
Mean	98.88387	194.1123
Variance	1788.636	5531.455
F	0.323357	
P(F<=f) one-tail	1.14E-12	
Significant (Y/N)	0.774206	

STH29 Mid-slabs Poor

F-Test Two-Sample for Variances

	Section 2	*Section 4*
Mean	127.4472	92.95
Variance	4673.102	3407.524
F	1.371407	
P(F<=f) one-tail	0.217268	
Significant (Y/N)	N	

STH96 Joints Good

F-Test Two-Sample for Variances

	Section 2	*Section 4*
Mean	62.92308	64.75893
Variance	569.5992	854.8693
F	0.6663	
P(F<=f) one-tail	0.076938	
Significant (Y/N)	N	

STH96 Joints Poor

F-Test Two-Sample for Variances

	Section 1	*Section 3*
Mean	48.16176	39.8
Variance	368.6152	173.7333
F	2.12173	
P(F<=f) one-tail	0.11117	
Significant (Y/N)	N	

STH96 Mid-slabs Good

F-Test Two-Sample for Variances

	Section 2	*Section 4*
Mean	71.32258	88.34286
Variance	255.1591	3200.284
P(F<=f) one-tail	1.2E-11	
Significant (Y/N)	Y	

STH96 Mid-slabs Poor

F-Test Two-Sample for Variances

	Section 1	*Section 3*
Mean	75.22059	61.21053
Variance	725.7864	306.5263
F	2.367779	
P(F<=f) one-tail	0.000566	
Significant (Y/N)	Y	

US14 Joints Good

F-Test Two-Sample for Variances

	Section 1	*Section 4*
Mean	54.44762	101.8908
Variance	1123.875	2093.67
F	0.536797	
P(F<=f) one-tail	9.08E-06	
Significant (Y/N)	Y	

US14 Joints Poor

F-Test Two-Sample for Variances

	Section 2	*Section 3*
Mean	49.10204	62.96
Variance	479.2429	1264.362
F	0.379039	
P(F<=f) one-tail	4.86E-08	
Significant (Y/N)	Y	

US14 Mid-slabs Good

F-Test Two-Sample for Variances

	Section 1	*Section 4*
Mean	57.73514	85.10909
Variance	1655.663	2402.586
F	0.689117	
P(F<=f) one-tail	0.007088	
Significant (Y/N)	Y	

US14 Mid-slabs Poor

F-Test Two-Sample for Variances

	Section 2	*Section 3*
Mean	44.67407	69.32407
Variance	262.087	1289.343
F	0.203272	
P(F<=f) one-tail	0	
Significant (Y/N)	Y	

I-43 Joints Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	40.25	51.21875
Variance	121.8065	1147.531
F	0.106147	
P(F<=f) one-tail	6.5E-09	
Significant (Y/N)	Y	

I-43 Joints Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	40.25	31.56
Variance	121.8065	26.84
F	4.538243	
P(F<=f) one-tail	0.000149	
Significant (Y/N)	Y	

I-43 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	45.84211	26.45455
Variance	283.8122	6.069264
F	46.76222	
P(F<=f) one-tail	9.5E-14	
Significant (Y/N)	Y	

I-43 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	45.84211	35.59722
Variance	283.8122	220.6946
F	1.285995	
P(F<=f) one-tail	0.180437	
Significant (Y/N)	N	

I-43 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	55.1358	26.45455
Variance	276.8688	6.069264
F	45.61819	
P(F<=f) one-tail	4.1E-14	
Significant (Y/N)	Y	

I-43 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	55.1358	35.59722
Variance	276.8688	220.6946
F	1.254534	
P(F<=f) one-tail	0.165437	
Significant (Y/N)	N	

STH29 Joints Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	104.6728	102.0355
Variance	3073.712	3896.868
F	0.788765	
P(F<=f) one-tail	0.0649	
Significant (Y/N)	N	

STH29 Joints Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	150.0314	102.0355
Variance	5616.36	3896.868
F	1.44125	
P(F<=f) one-tail	0.009954	
Significant (Y/N)	Y	

STH29 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	98.88387	127.4472
Variance	1788.636	4673.102
F	0.382751	
P(F<=f) one-tail	1.09E-08	
Significant (Y/N)	Y	

STH29 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	98.88387	92.95
Variance	1788.636	3407.524
F	0.524908	
P(F<=f) one-tail	0.01715	
Significant (Y/N)	Y	

STH29 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	194.1123	127.4472
Variance	5531.455	4673.102
F	1.18368	
P(F<=f) one-tail	0.157723	
Significant (Y/N)	N	

STH29 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	194.1123	92.95
Variance	5531.455	3407.524
F	1.623306	
P(F<=f) one-tail	0.108578	
Significant (Y/N)	N	

STH96 Joints Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	64.28477	47.08974
Variance	777.5517	348.9659
F	2.22816	
P(F<=f) one-tail	7.1E-05	
Significant (Y/N)	Y	

STH96 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	71.32258	75.22059
Variance	255.1591	725.7864
F	0.351562	
P(F<=f) one-tail	0.001143	
Significant (Y/N)	N	

STH96 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	88.34286	75.22059
Variance	3200.284	725.7864
F	4.409402	
P(F<=f) one-tail	1.87E-10	
Significant (Y/N)	Y	

STH96 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	71.32258	61.21053
Variance	255.1591	306.5263
F	0.832422	
P(F<=f) one-tail	0.297416	
Significant (Y/N)	N	

STH96 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	88.34286	61.21053
Variance	3200.284	306.5263
F	10.44049	
P(F<=f) one-tail	1.17E-17	
Significant (Y/N)	Y	

US14 Joints Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	54.44762	49.10204
Variance	1123.875	479.2429
F	2.345105	
P(F<=f) one-tail	4.12E-08	
Significant (Y/N)	N	

US14 Joints Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	54.44762	62.96
Variance	1123.875	1264.362
F	0.888887	
P(F<=f) one-tail	0.239891	
Significant (Y/N)	N	

US14 Joints Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	101.8908	49.10204
Variance	2093.67	479.2429
F	4.368703	
P(F<=f) one-tail	1.34E-18	
Significant (Y/N)	Y	

US14 Joints Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	101.8908	62.96
Variance	2093.67	1264.362
F	1.65591	
P(F<=f) one-tail	0.003141	
Significant (Y/N)	Y	

US14 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	57.73514	44.67407
Variance	1655.663	262.087
F	6.317227	
P(F<=f) one-tail	1.99E-25	
Significant (Y/N)	Y	

US14 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

	Good	*Poor*
Mean	57.73514	69.32407
Variance	1655.663	1289.343
F	1.284114	
P(F<=f) one-tail	0.077922	
Significant (Y/N)	N	

US14 Mid-slabs Good v. Poor

F-Test Two-Sample for Variances

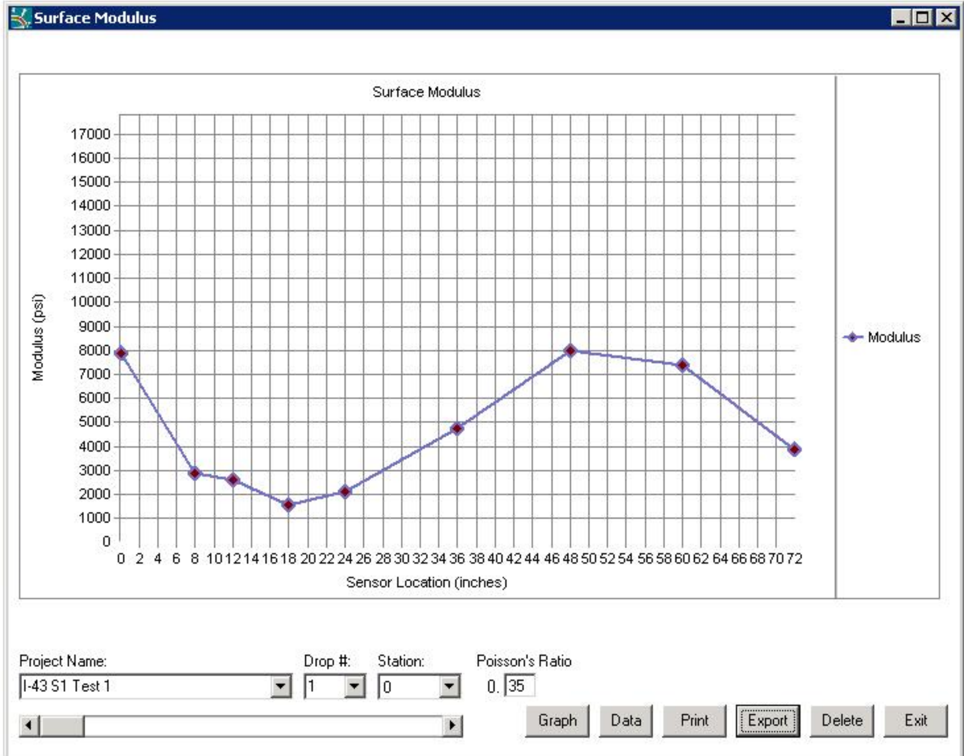
	Good	*Poor*
Mean	85.10909	44.67407
Variance	2402.586	262.087
F	9.16713	
P(F<=f) one-tail	1.97E-33	
Significant (Y/N)	Y	

US14 Mid-slabs Good v. Poor

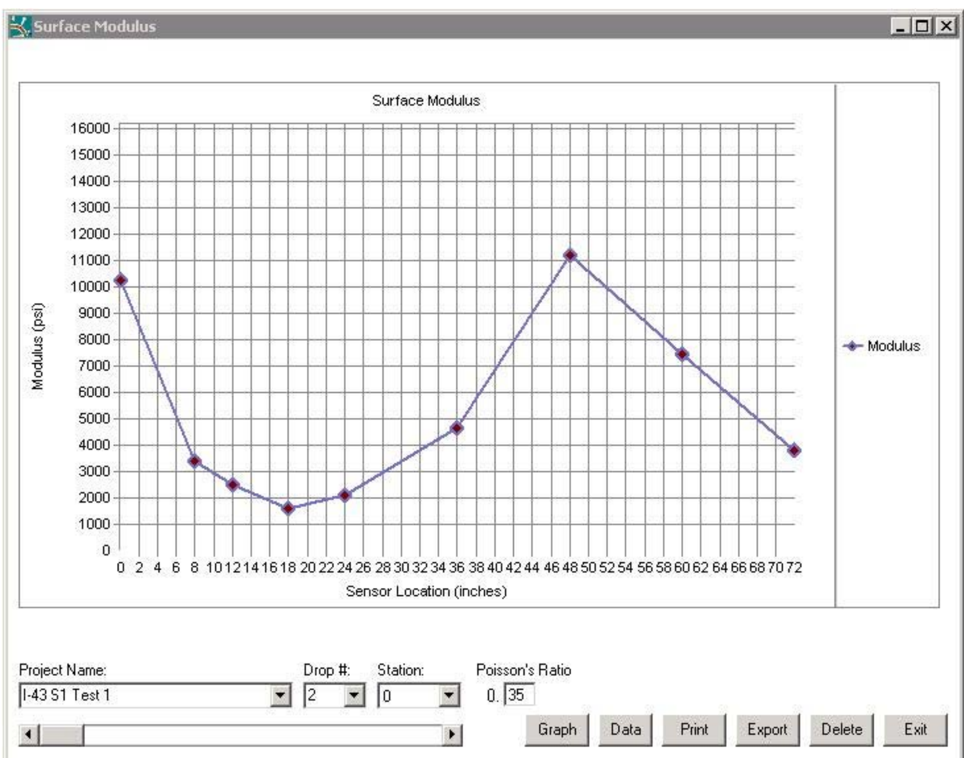
F-Test Two-Sample for Variances

	Good	*Poor*
Mean	85.10909	69.32407
Variance	2402.586	1289.343
F	1.863419	
P(F<=f) one-tail	0.00031	
Significant (Y/N)	Y	

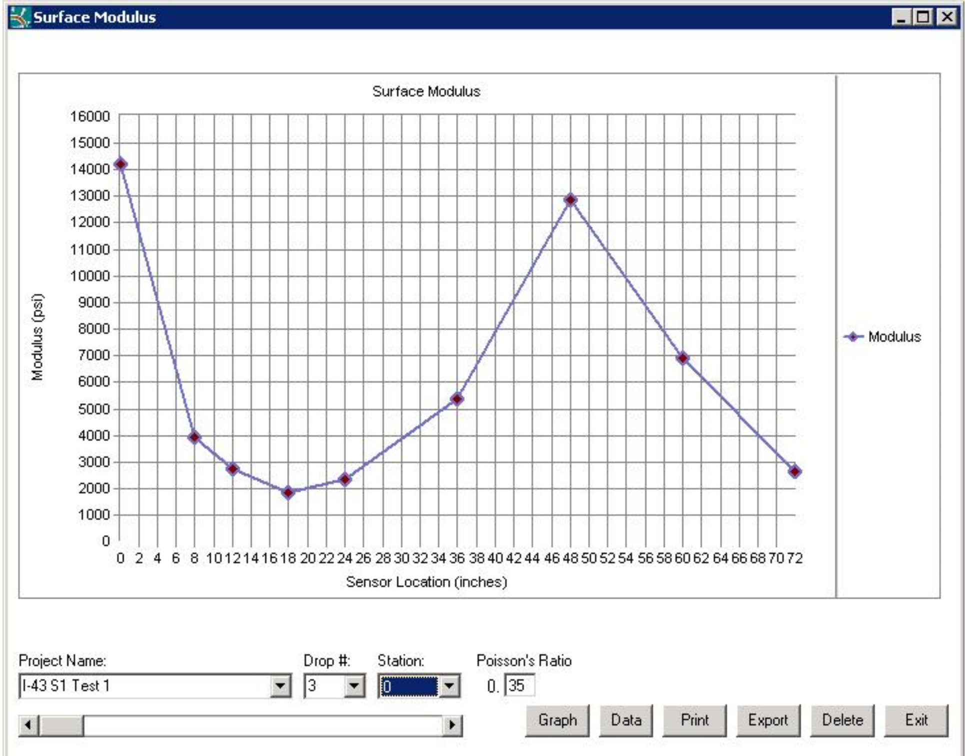
APPENDIX D. COMPOSITE MODULUS PLOTS



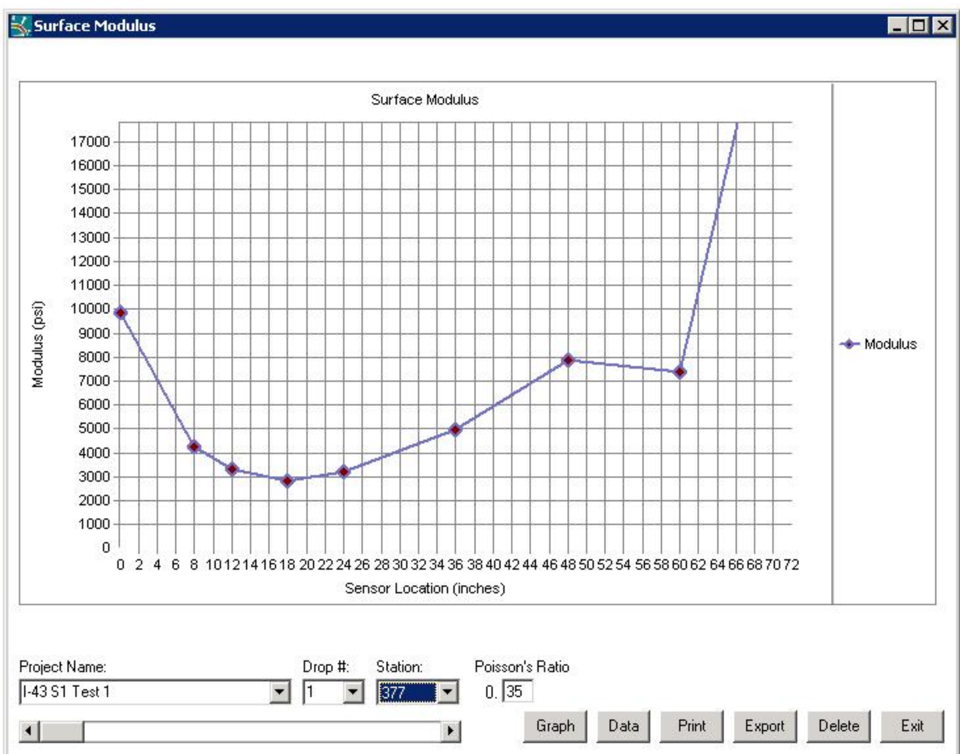
I-43 S1 Station 0 Drop 1



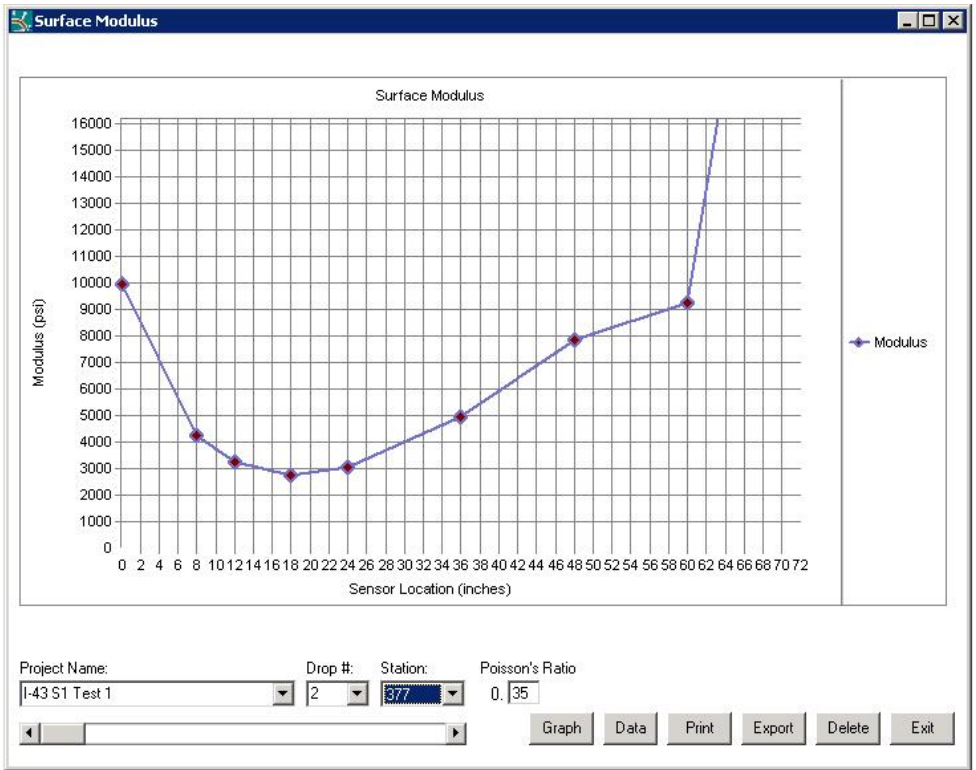
I-43 S1 Station 0 Drop 1



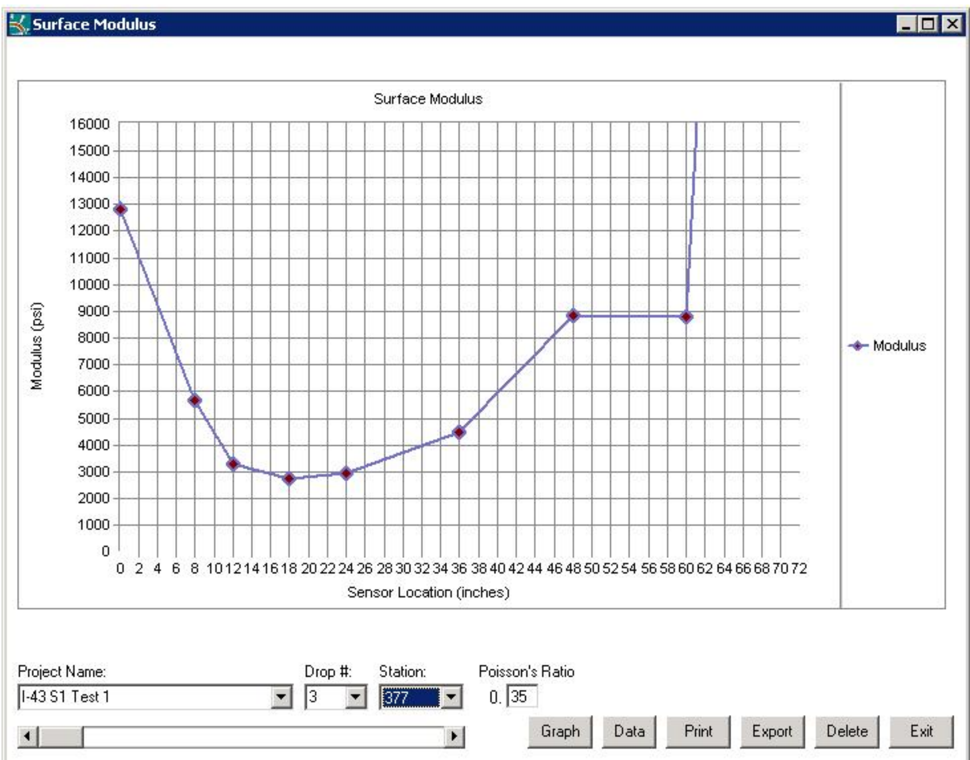
I-43 S1 Station 0 Drop 3



I-43 S1 Station 0 Drop 1



I-43 S1 Station 377 Drop 2



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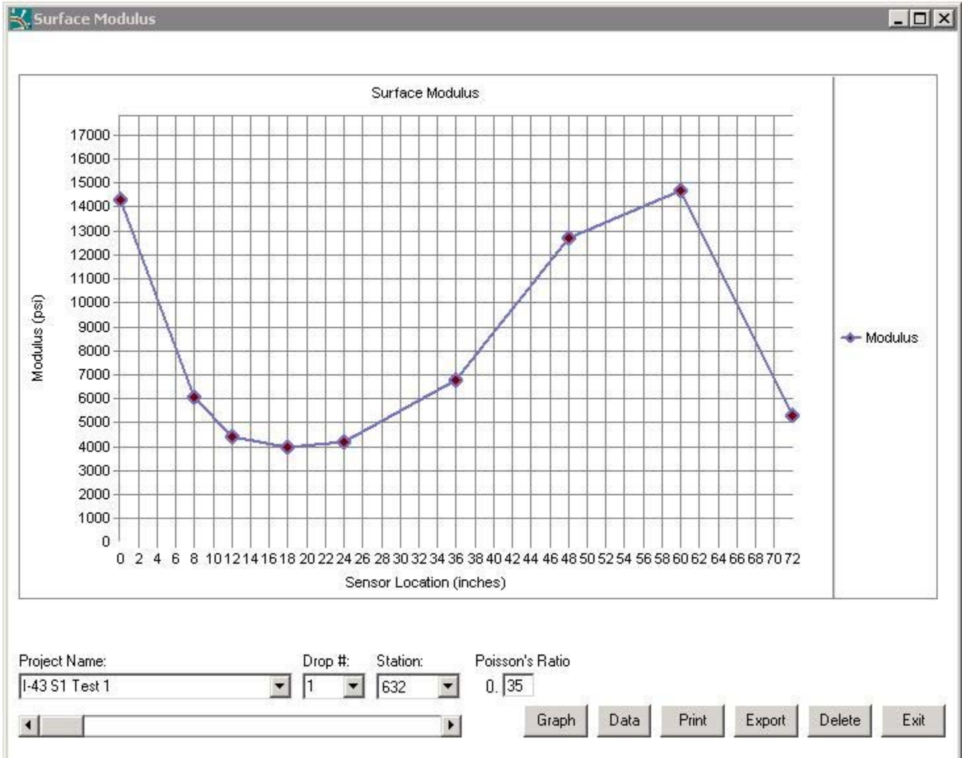
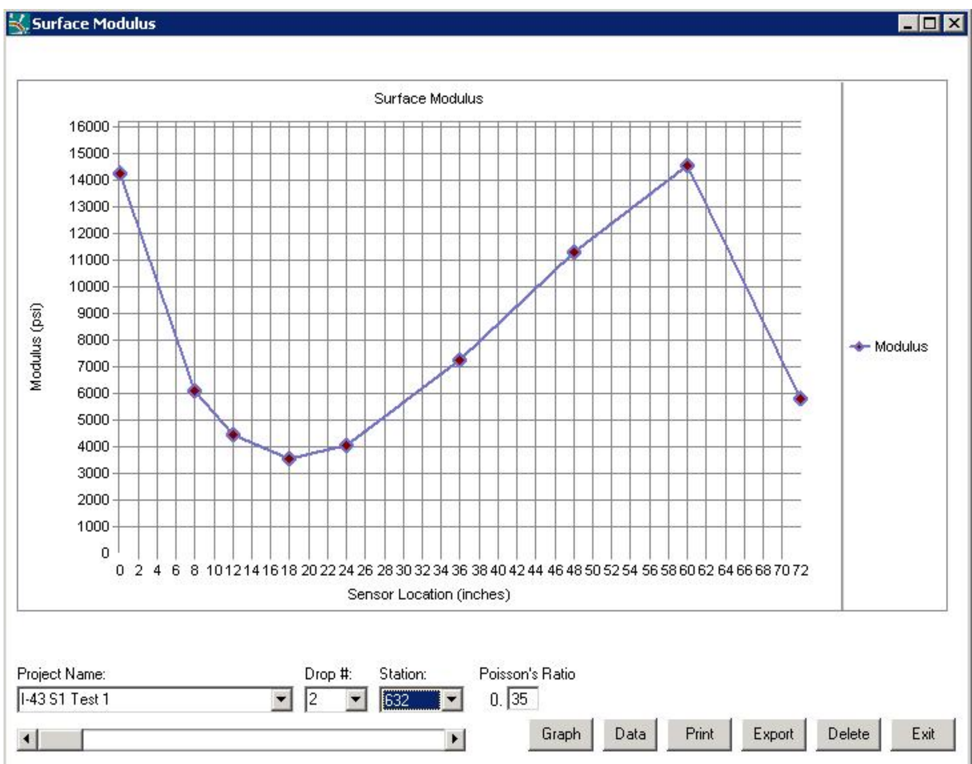
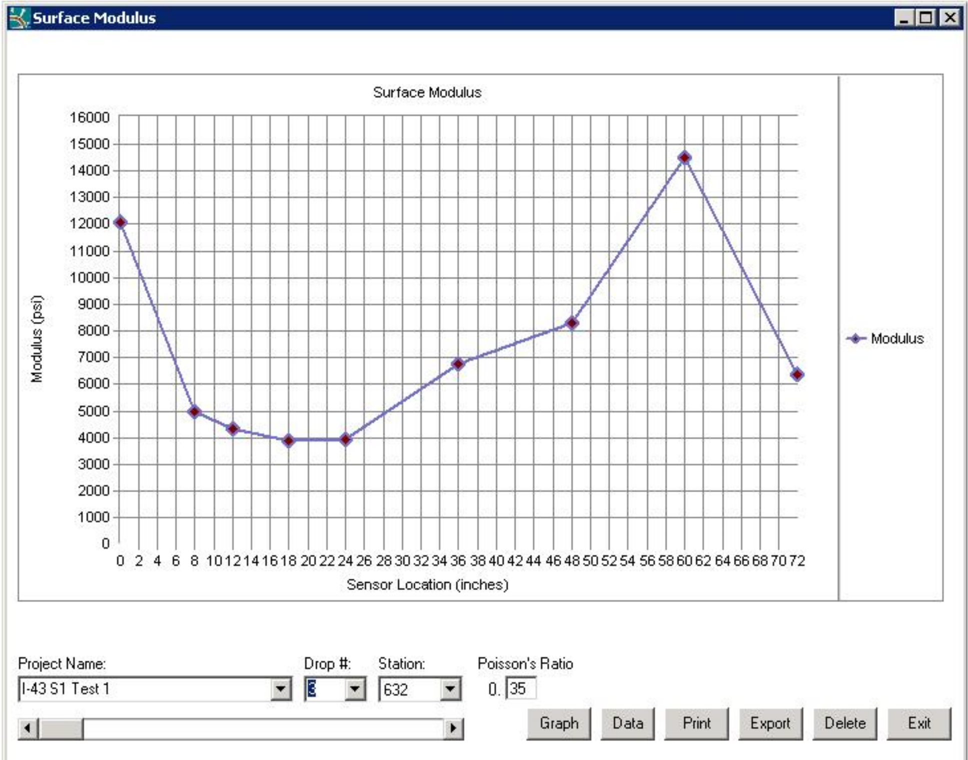


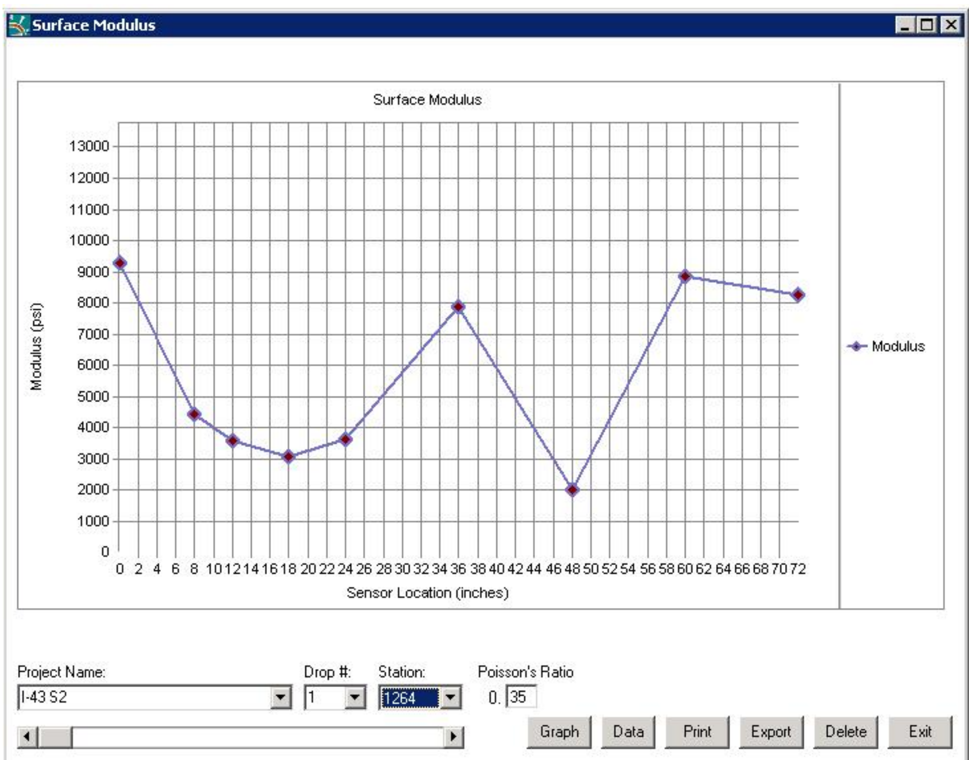
I-43 S1 Station 632 Drop 1



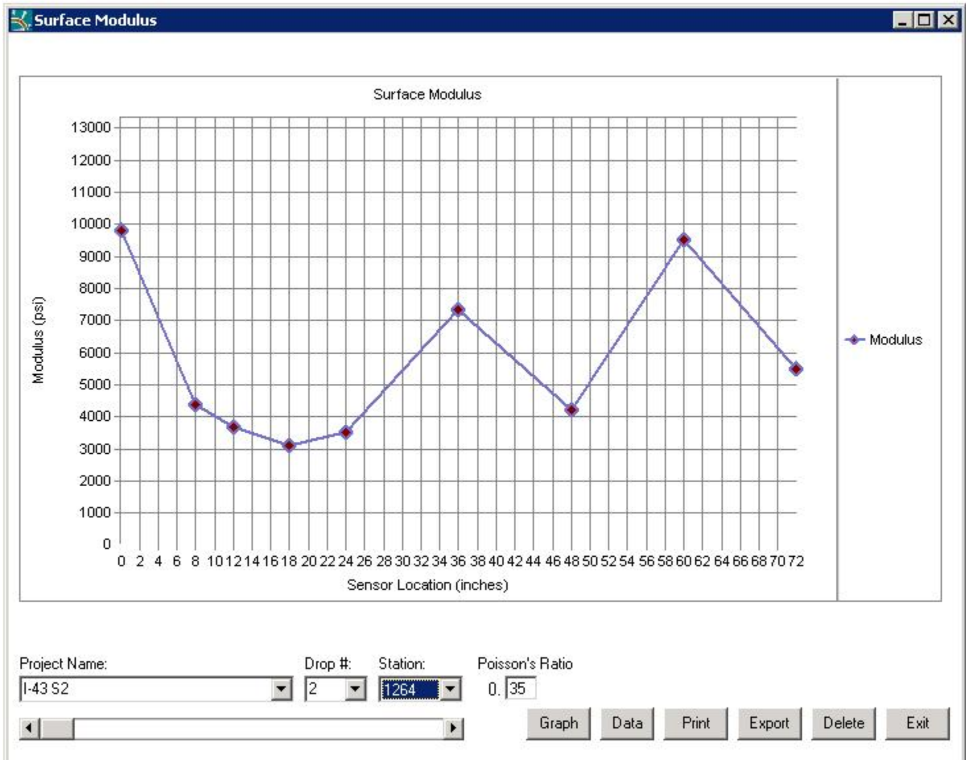
I-43 S1 Station 632 Drop 2



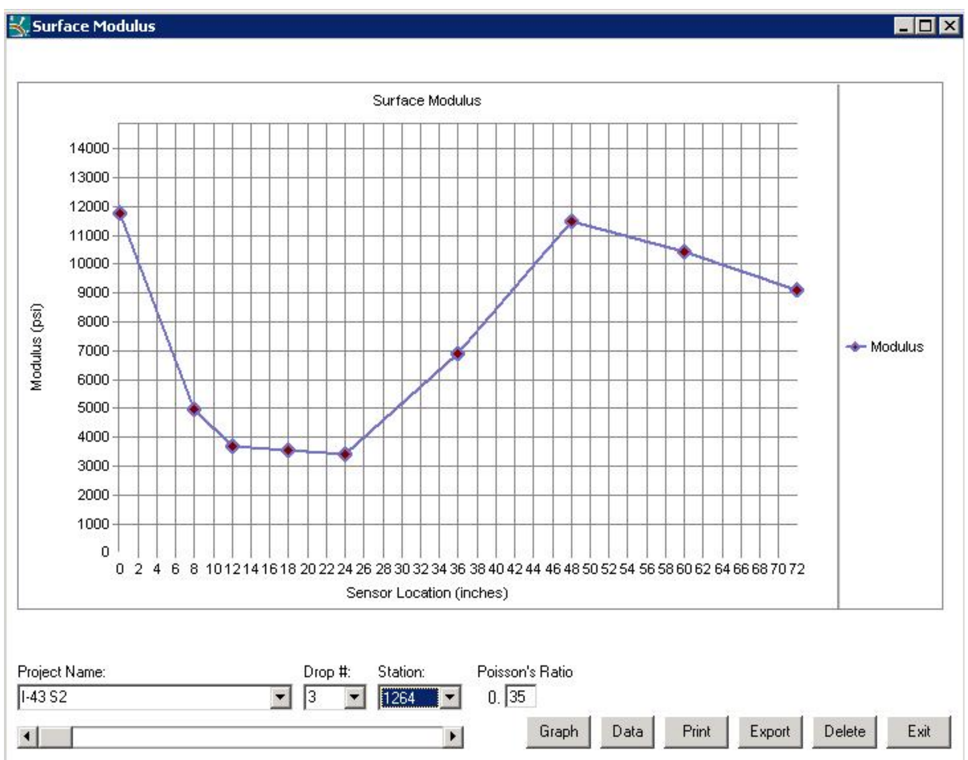
I-43 S1 Station 632 Drop 3



I-43 S2 Station 1264 Drop 1



I-43 S2 Station 1264 Drop 2



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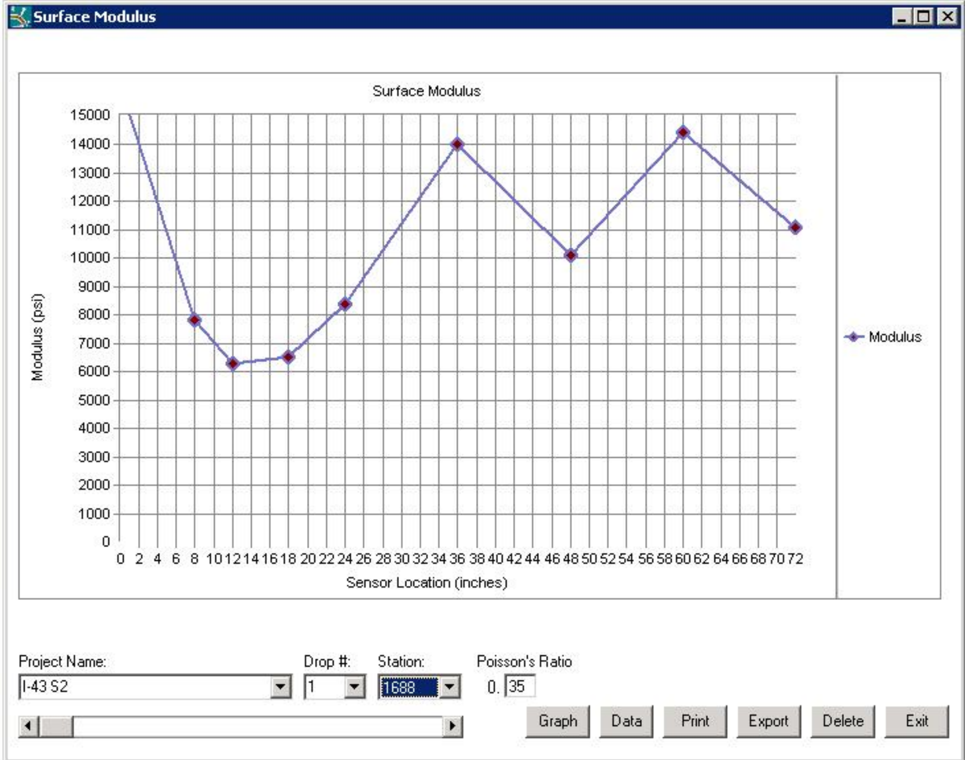
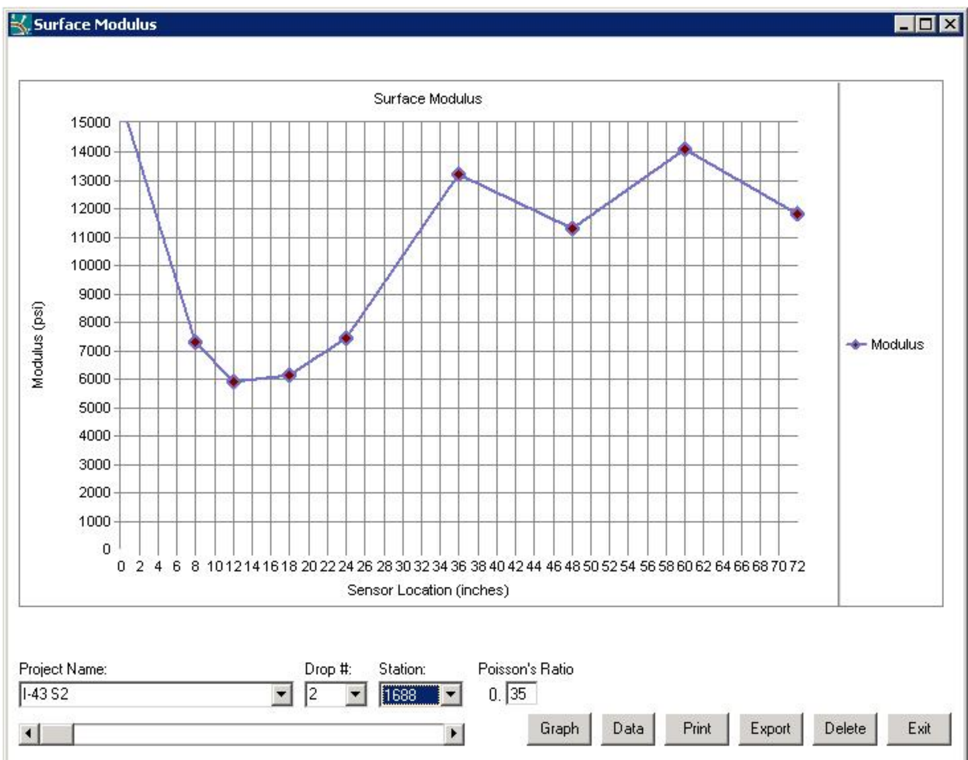
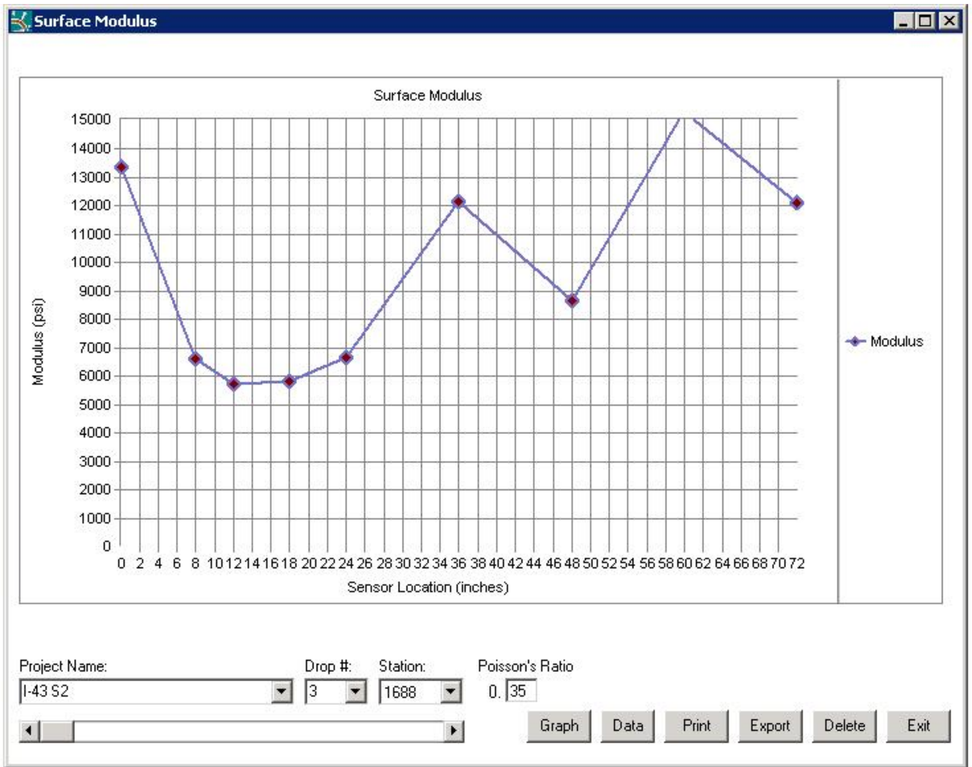


I-43 S2 Station 1688 Drop 1



I-43 S2 Station 1688 Drop 2



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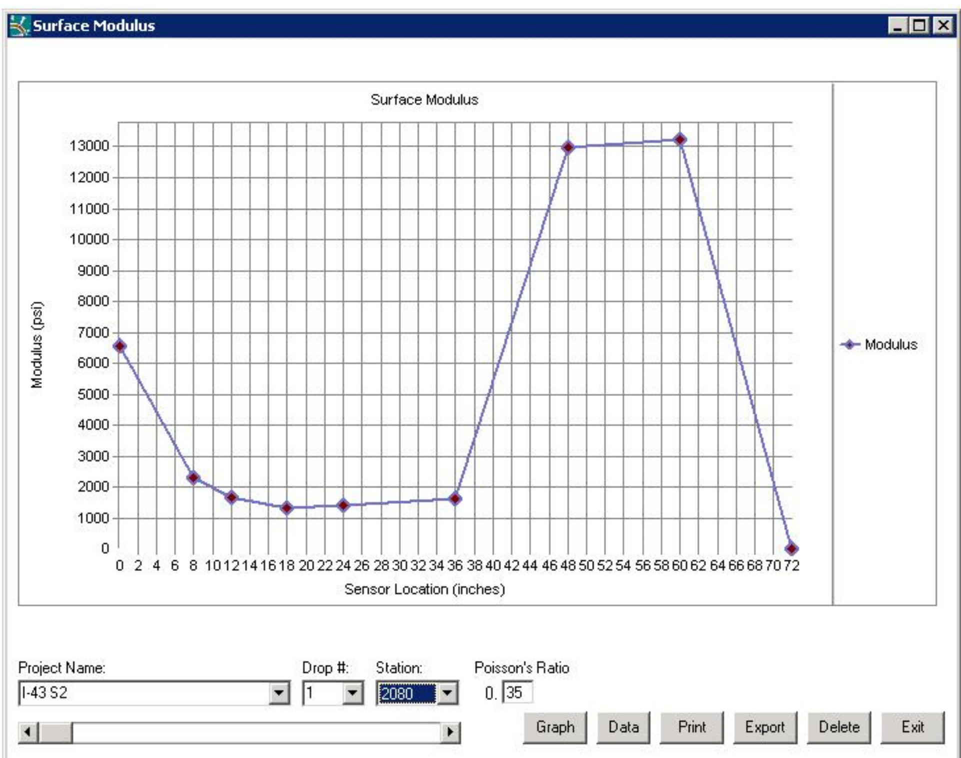
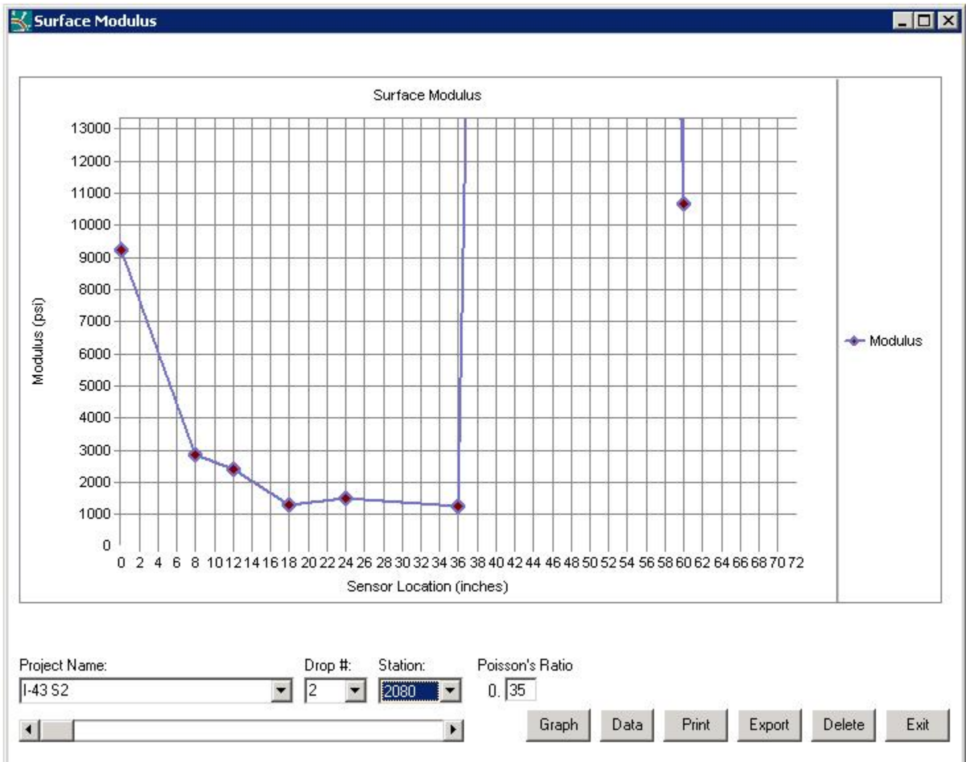
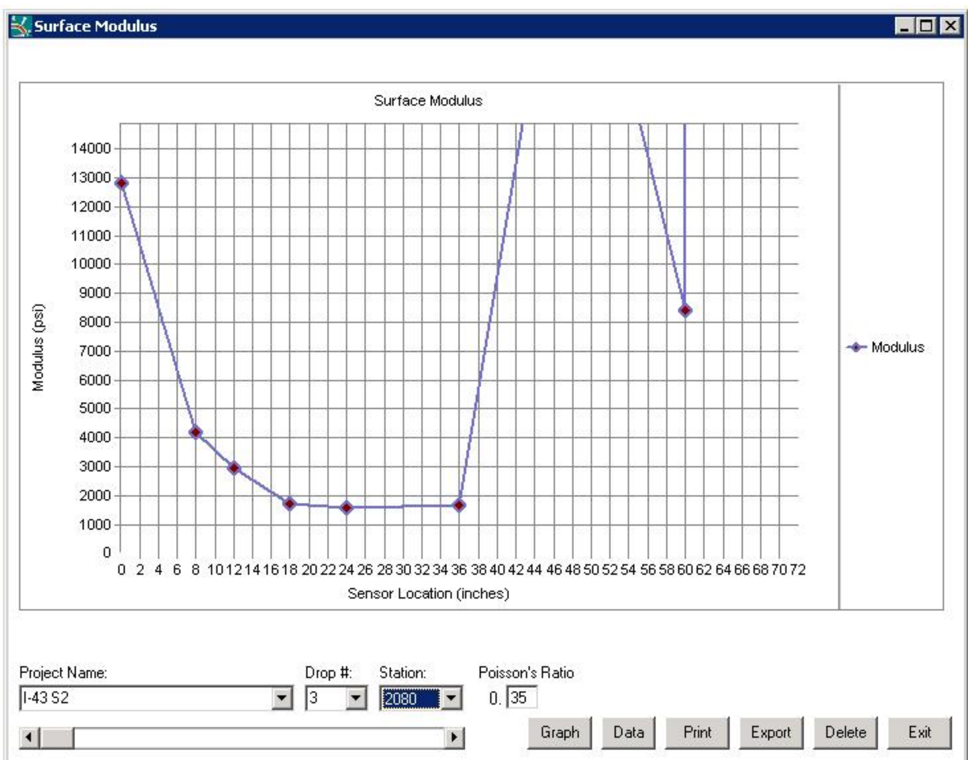


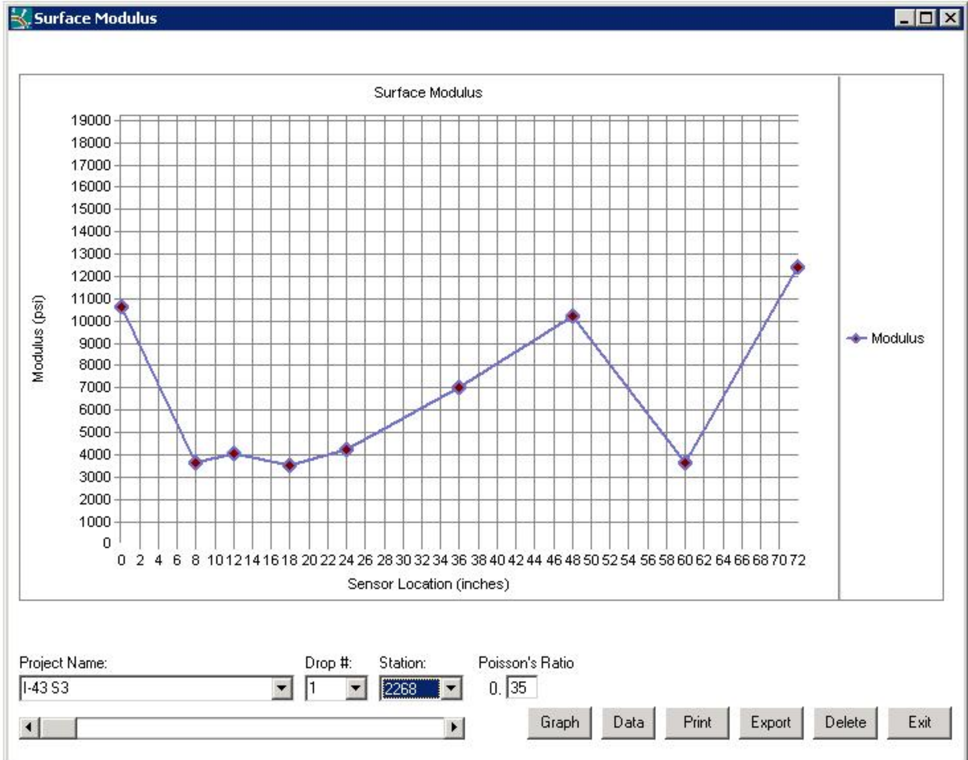
I-43 S2 Station 2080 Drop 1



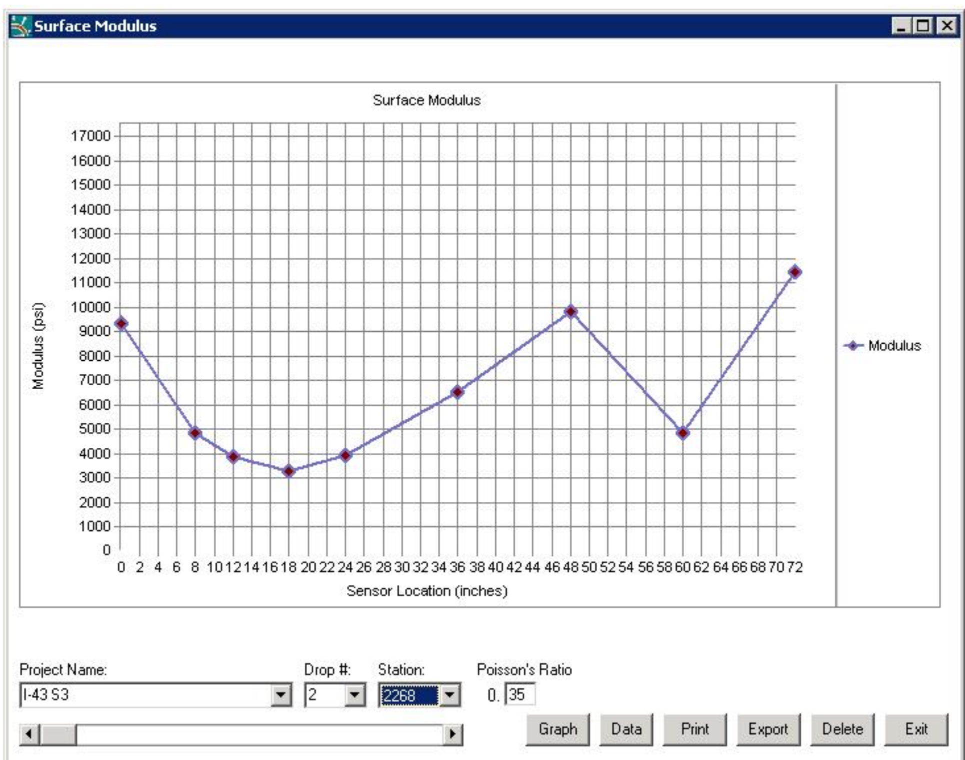
I-43 S2 Station 2080 Drop 2



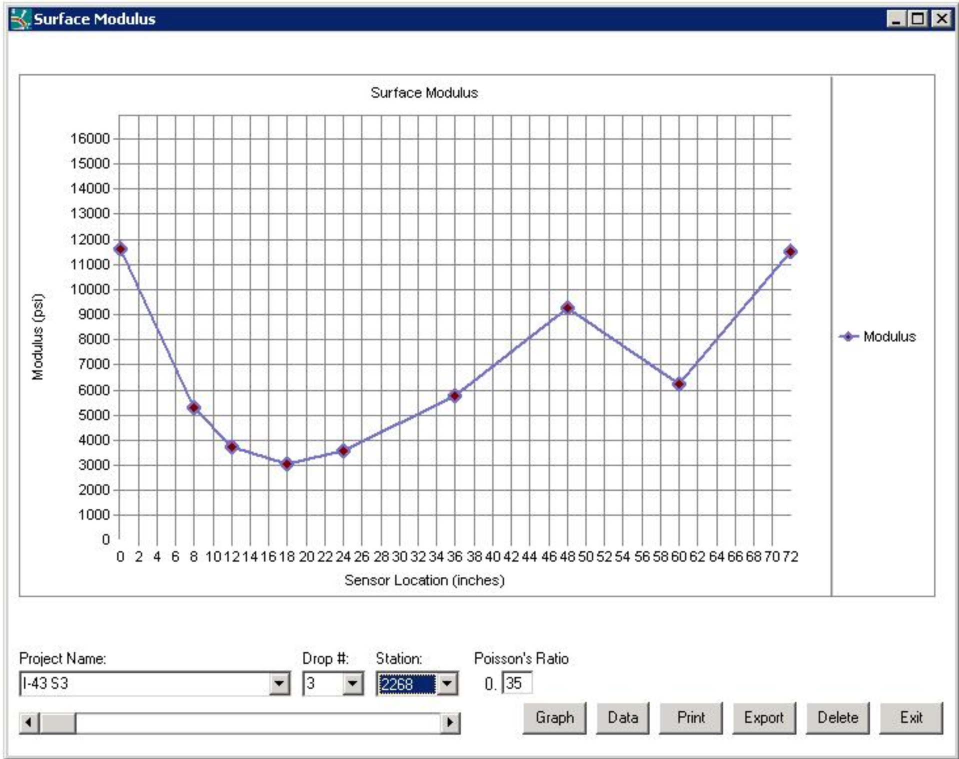
I-43 S2 Station 2080 Drop 3



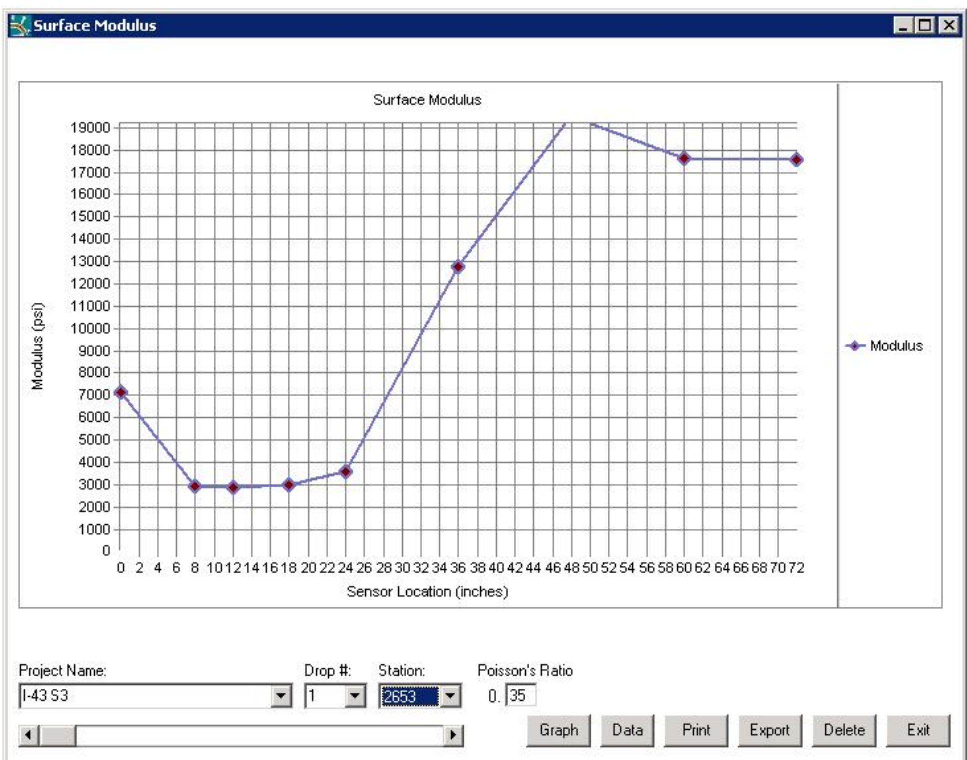
I-43 S3 Station 2268 Drop 1



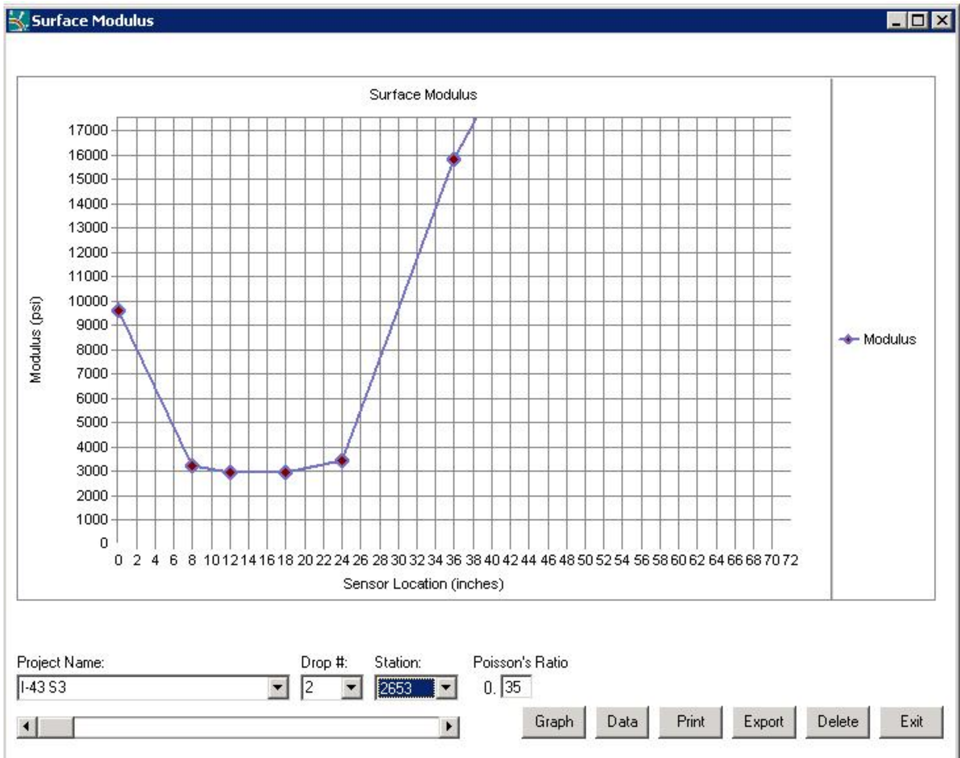
I-43 S3 Station 2268 Drop 2



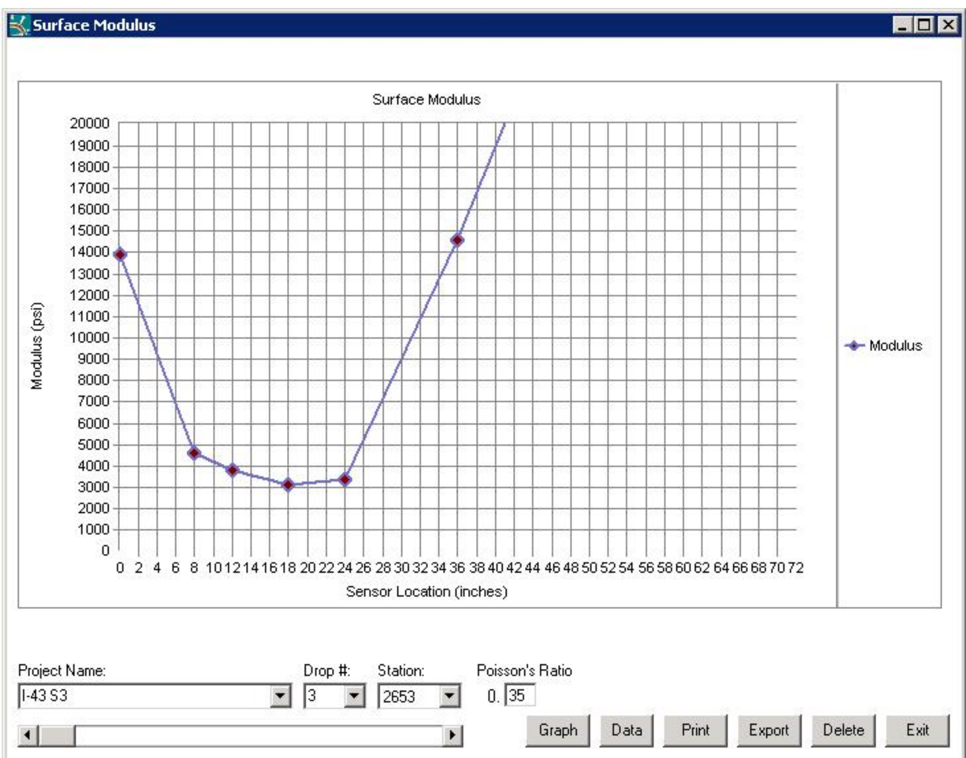
I-43 S3 Station 2268 Drop 3



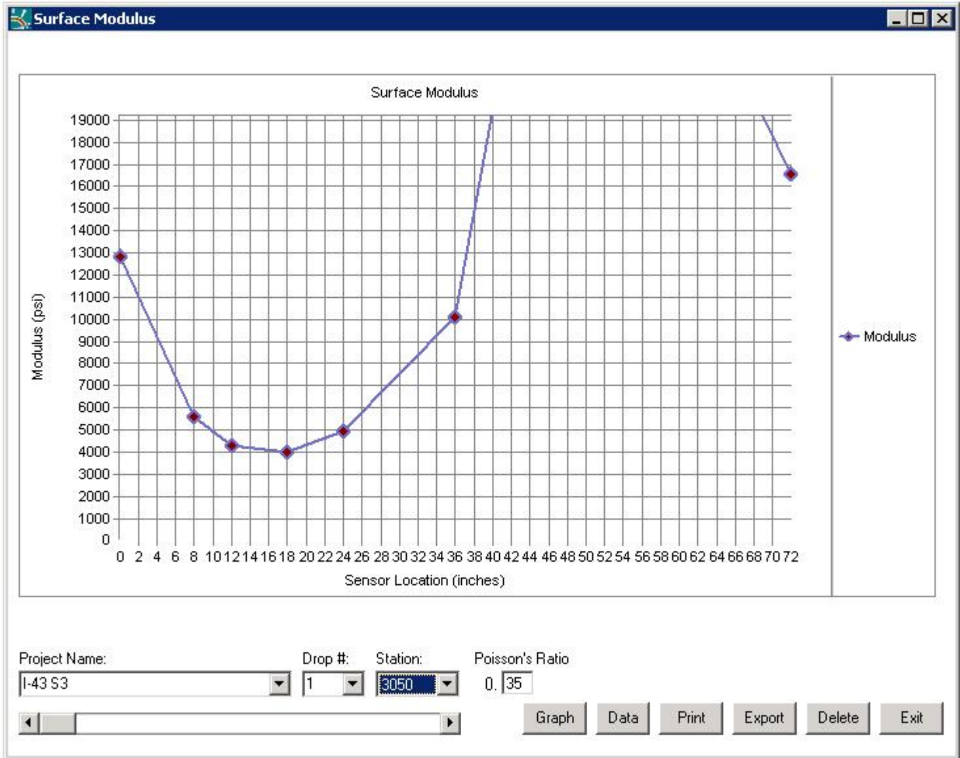
I-43 S3 Station 2653 Drop 1



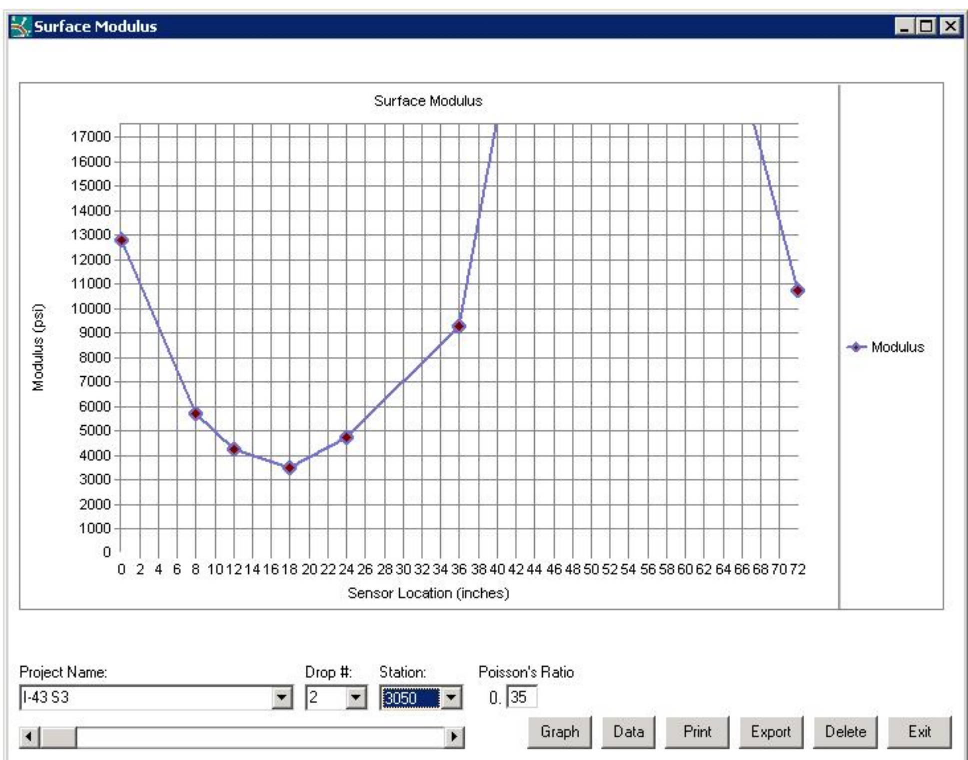
I-43 S3 Station 2653 Drop 2



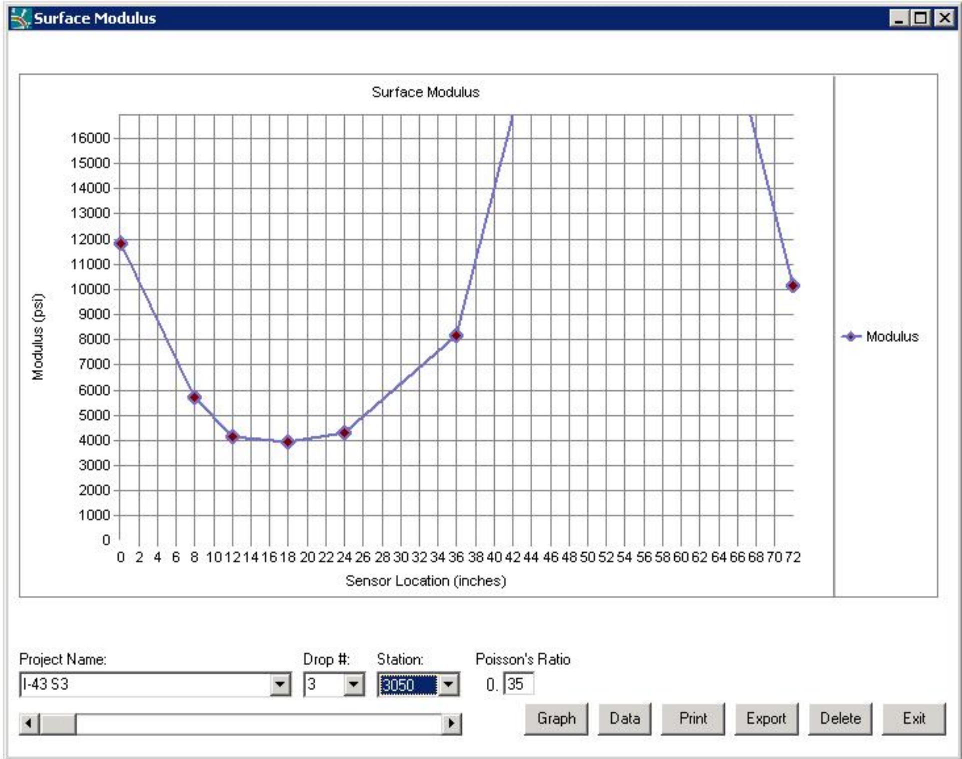
I-43 S3 Station 2653 Drop 3



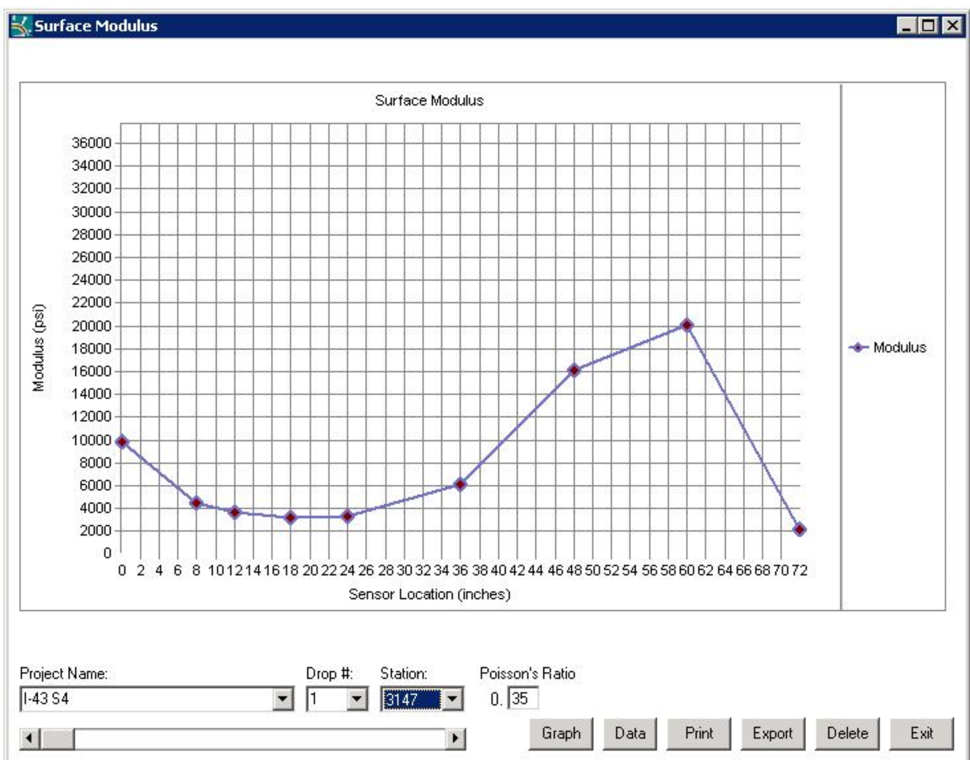
I-43 S3 Station 3050 Drop 1



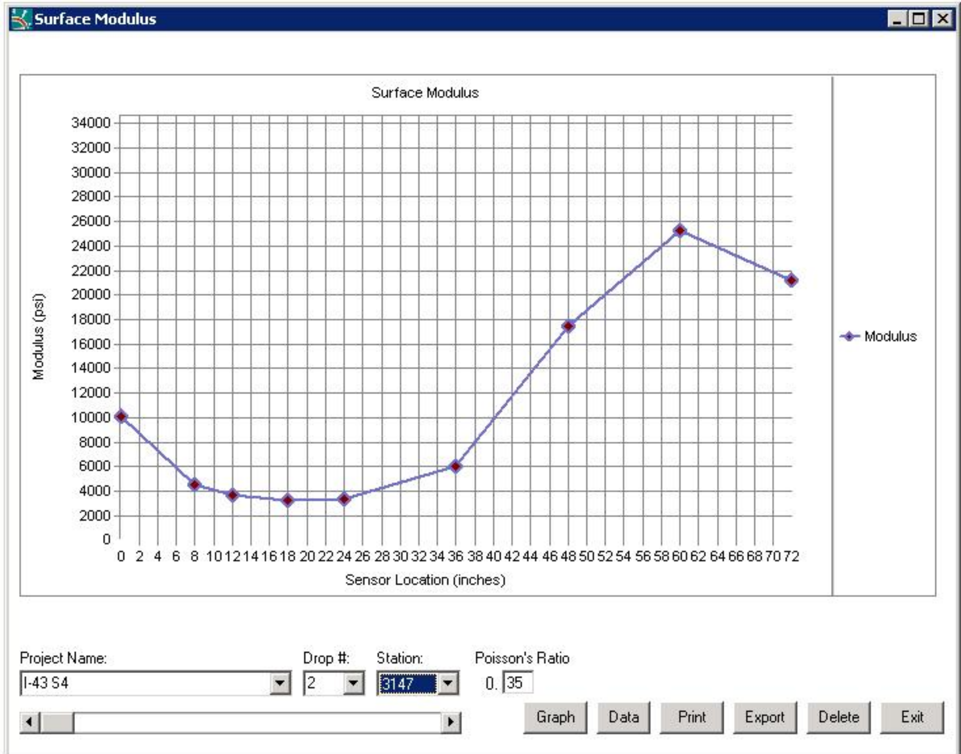
I-43 S3 Station 3050 Drop 2



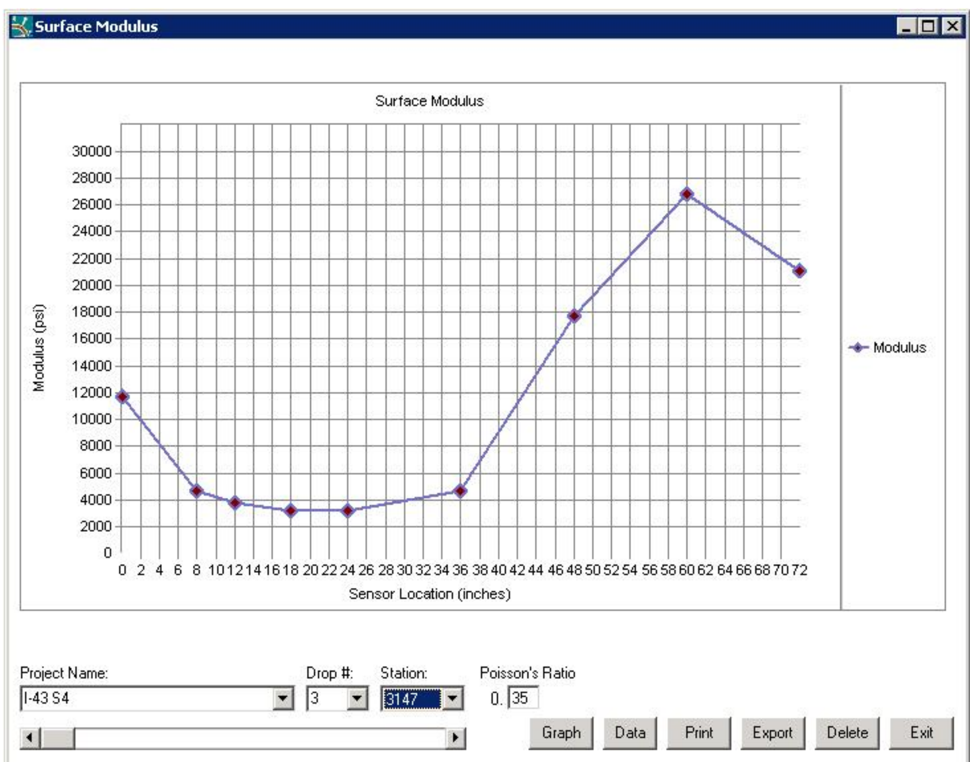
I-43 S3 Station 3050 Drop 3



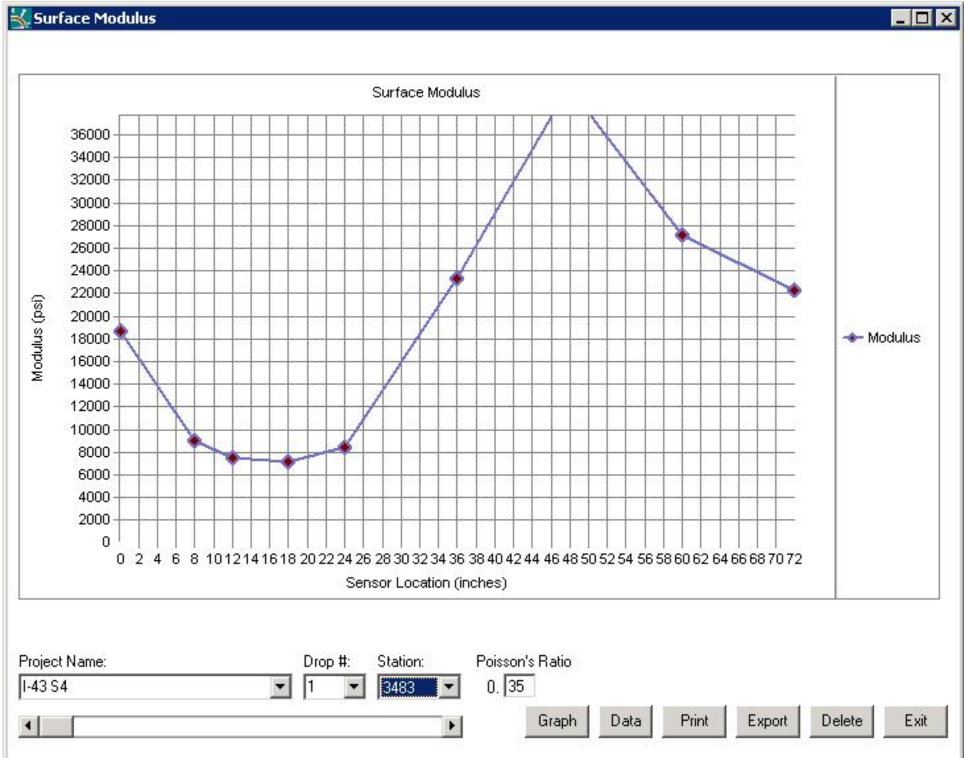
I-43 S4 Station 3147 Drop 1



I-43 S4 Station 3147 Drop 2



I-43 S4 Station 3147 Drop 3



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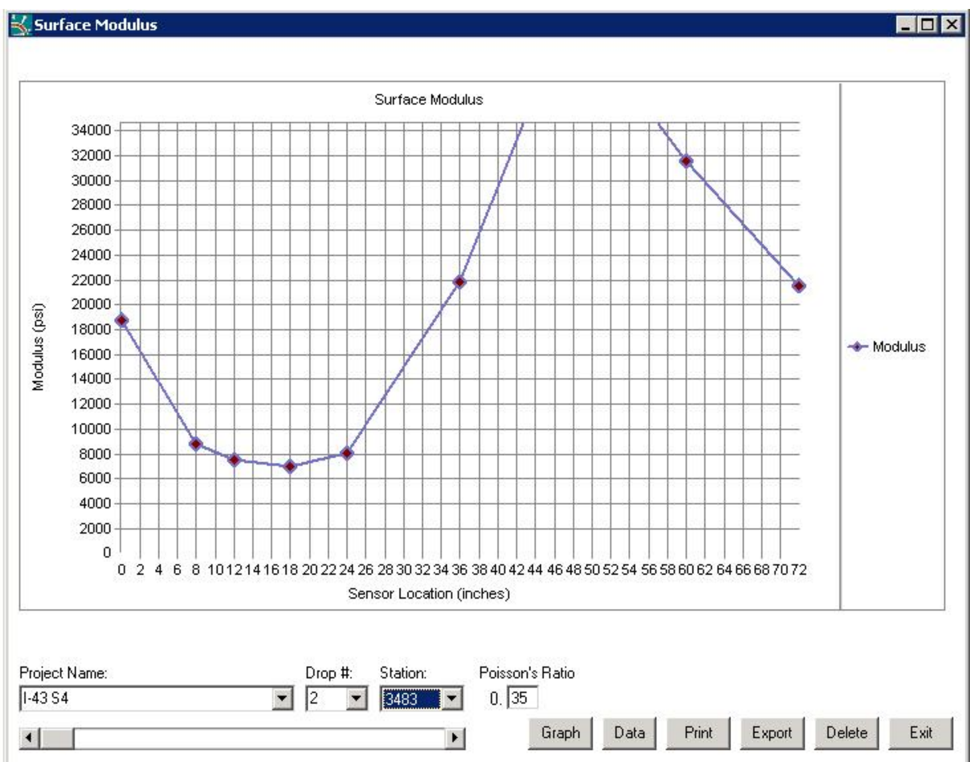
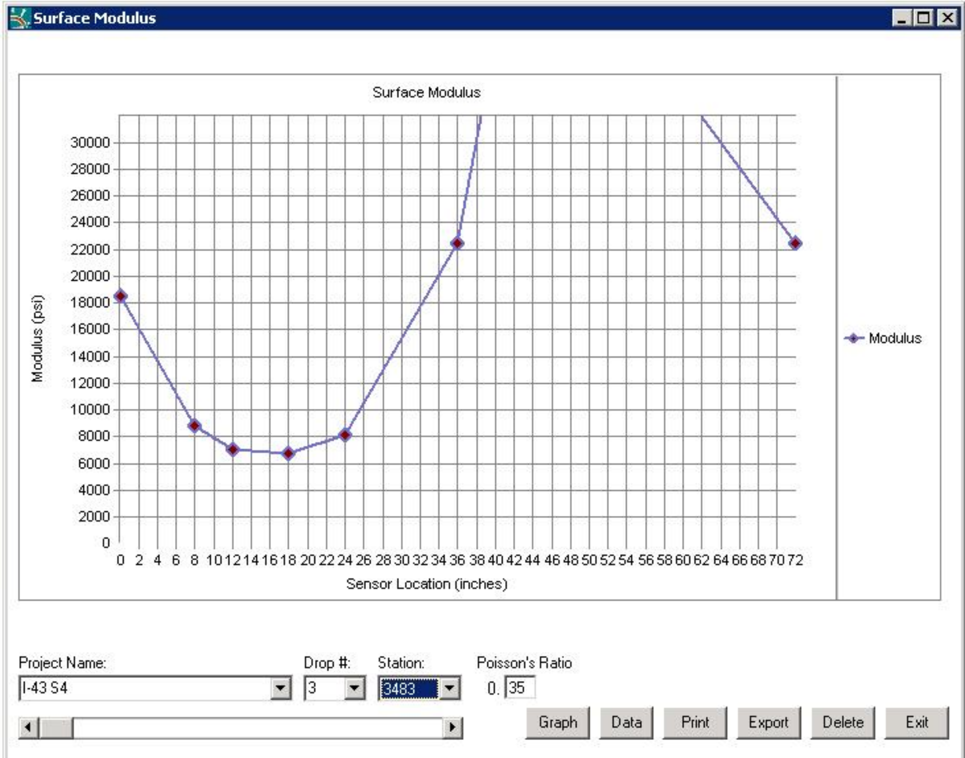


I-43 S4 Station 3483 Drop 2



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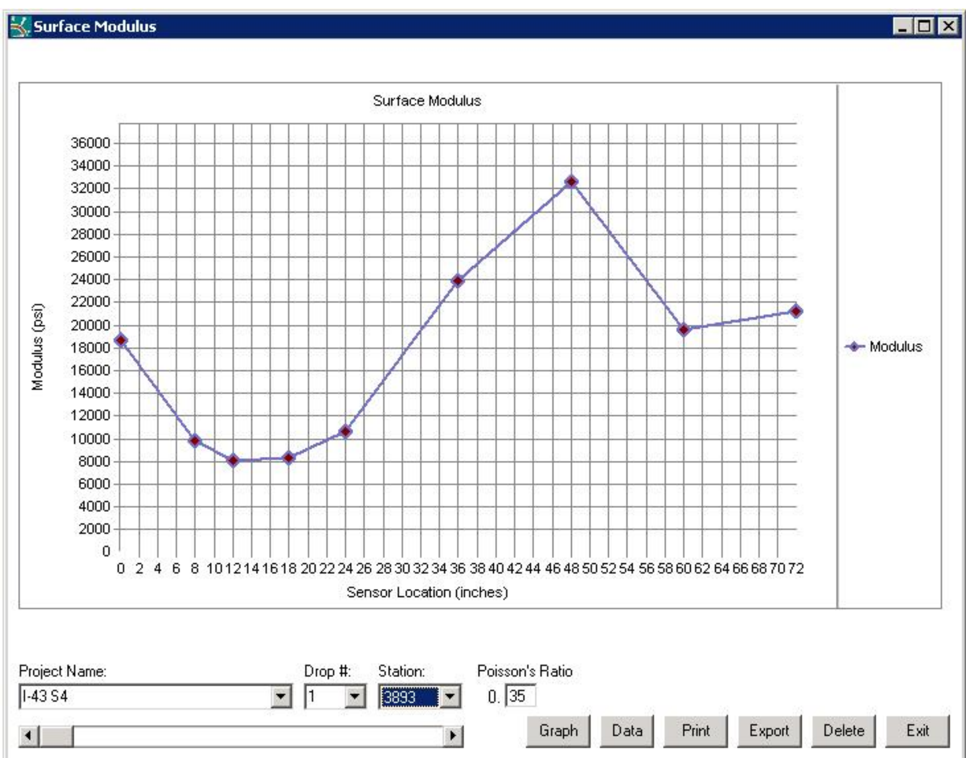
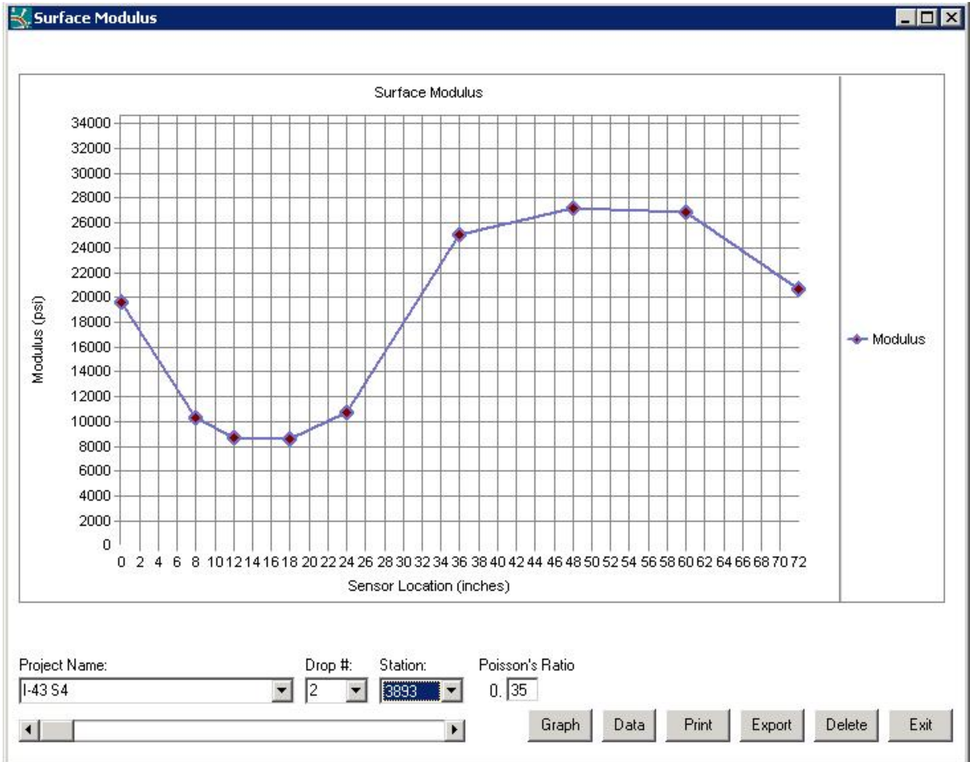


I-43 S4 Station 3893 Drop 1



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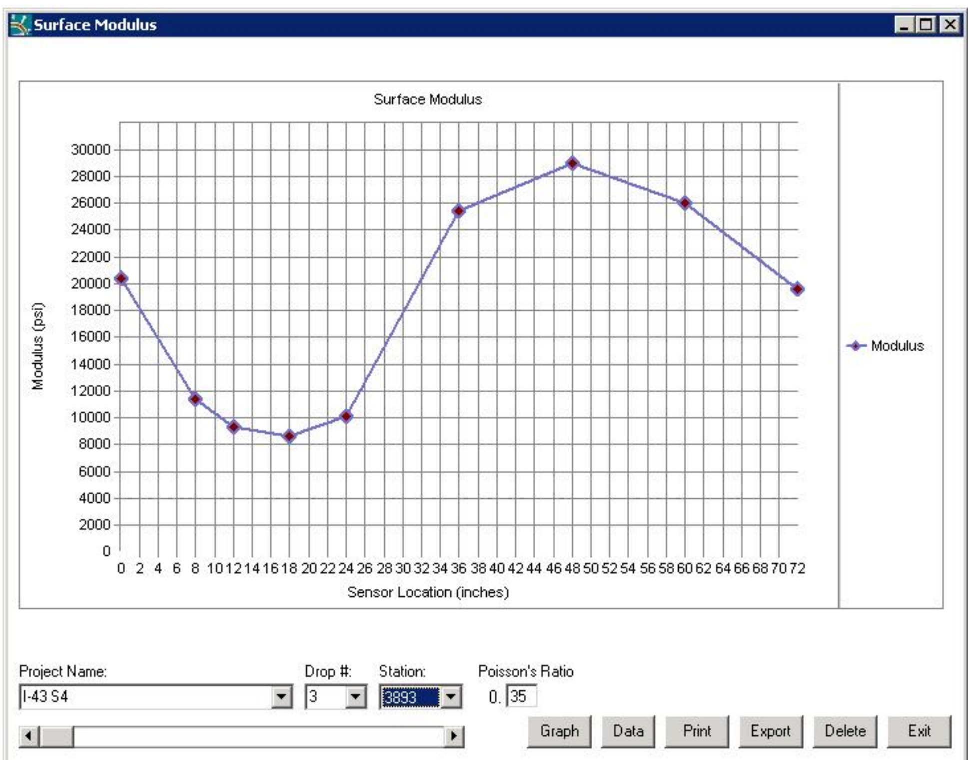
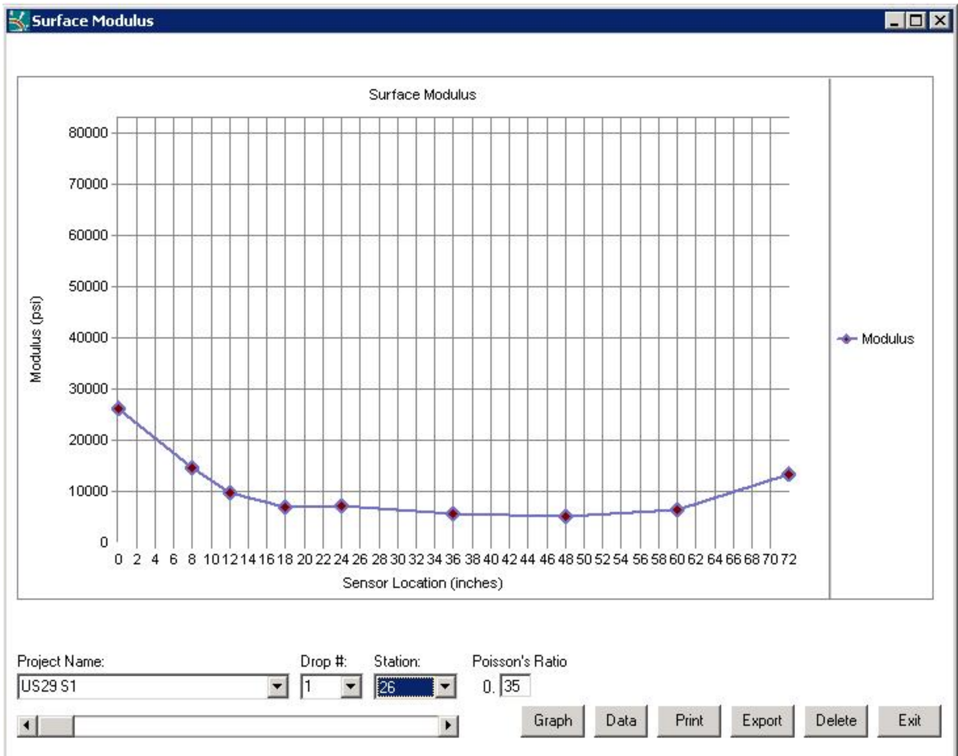
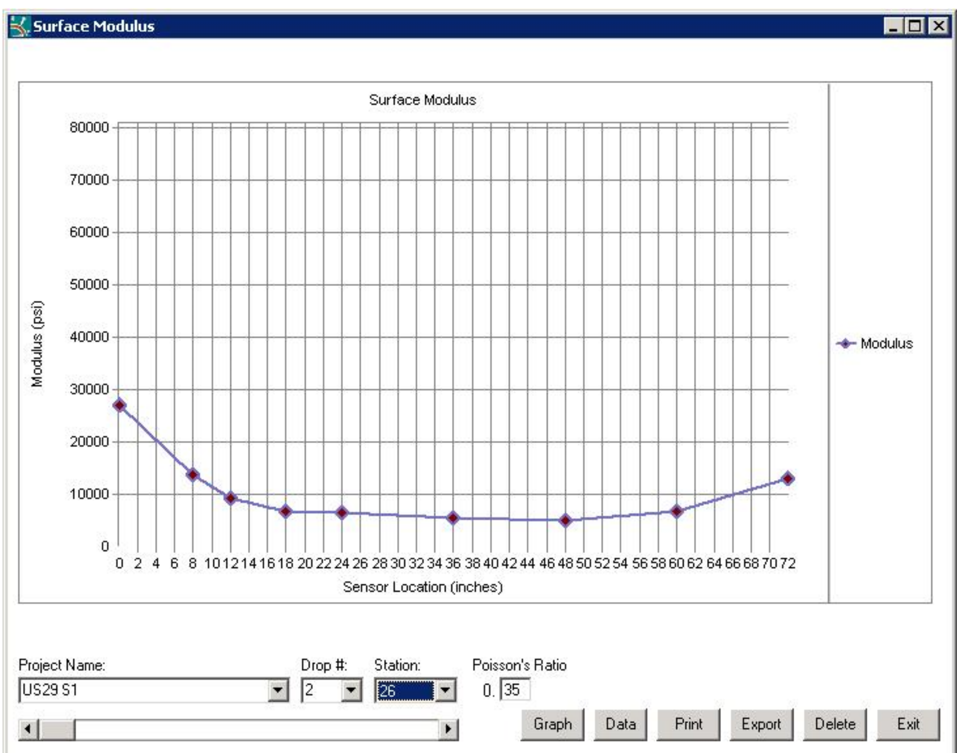


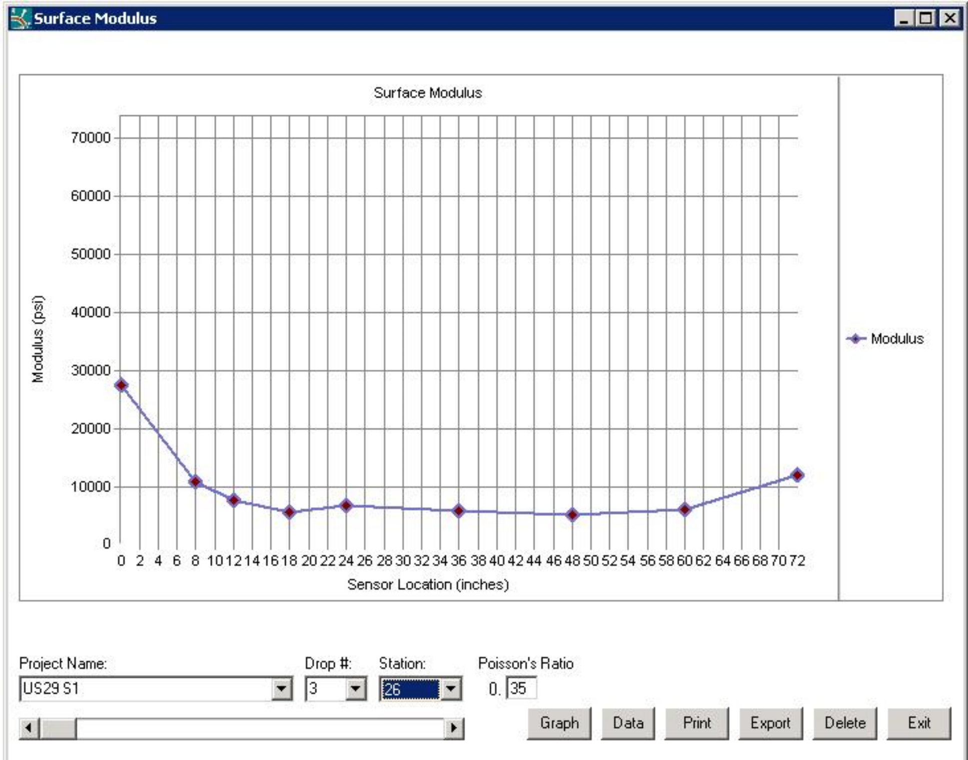
I-43 S4 Station 3893 Drop 3



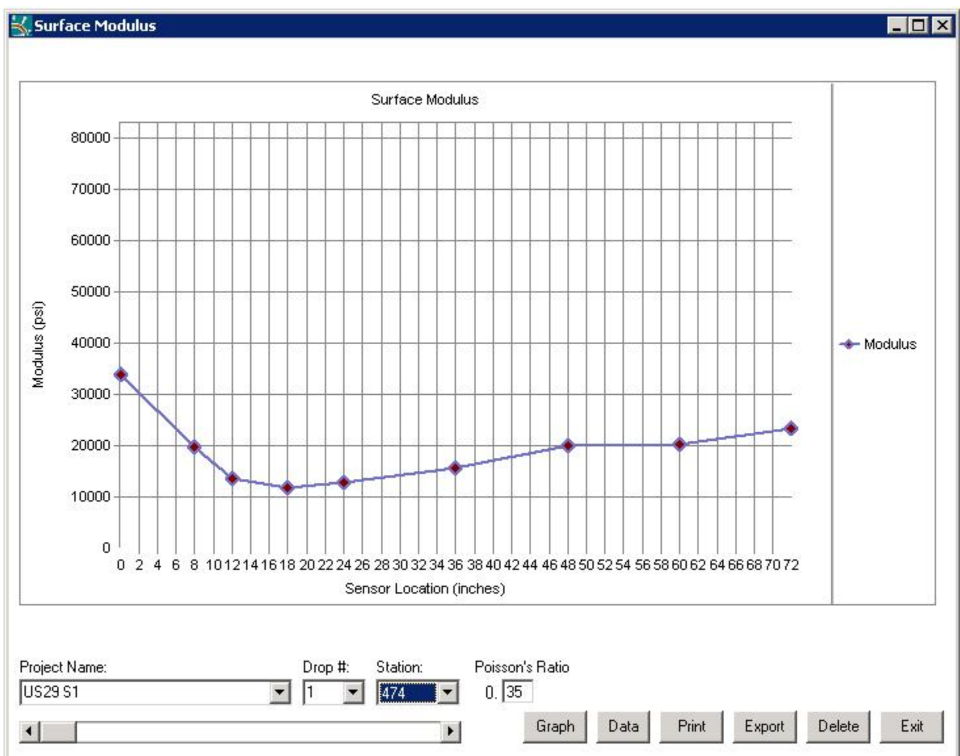
STH 29 S1 Station 26 Drop 1



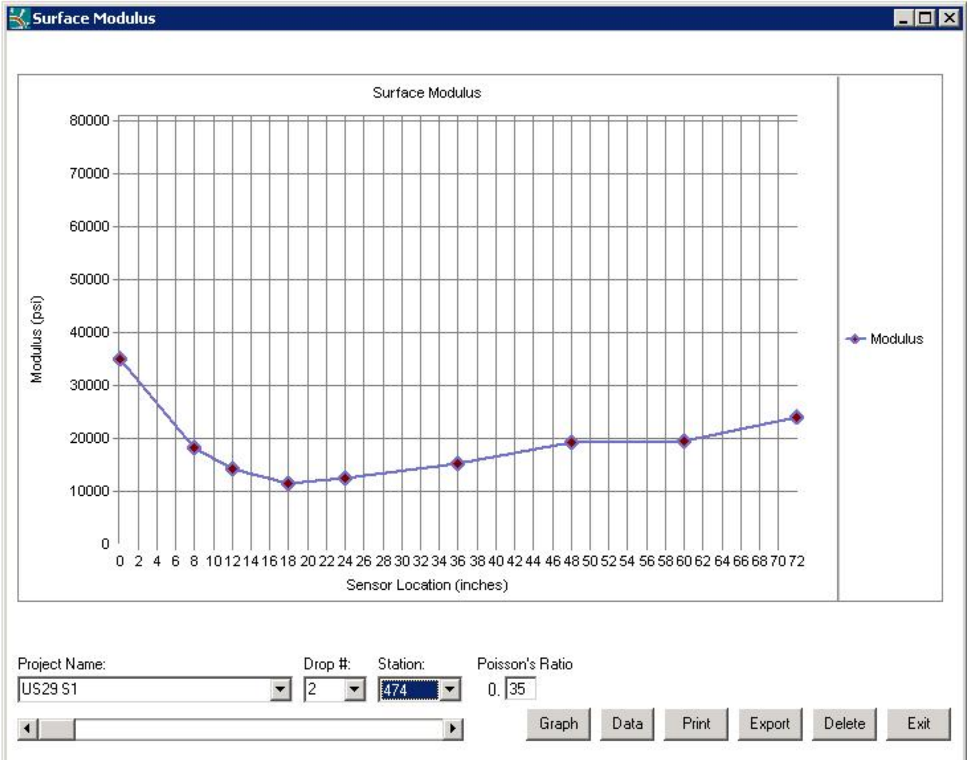
STH 29 S1 Station 26 Drop 2



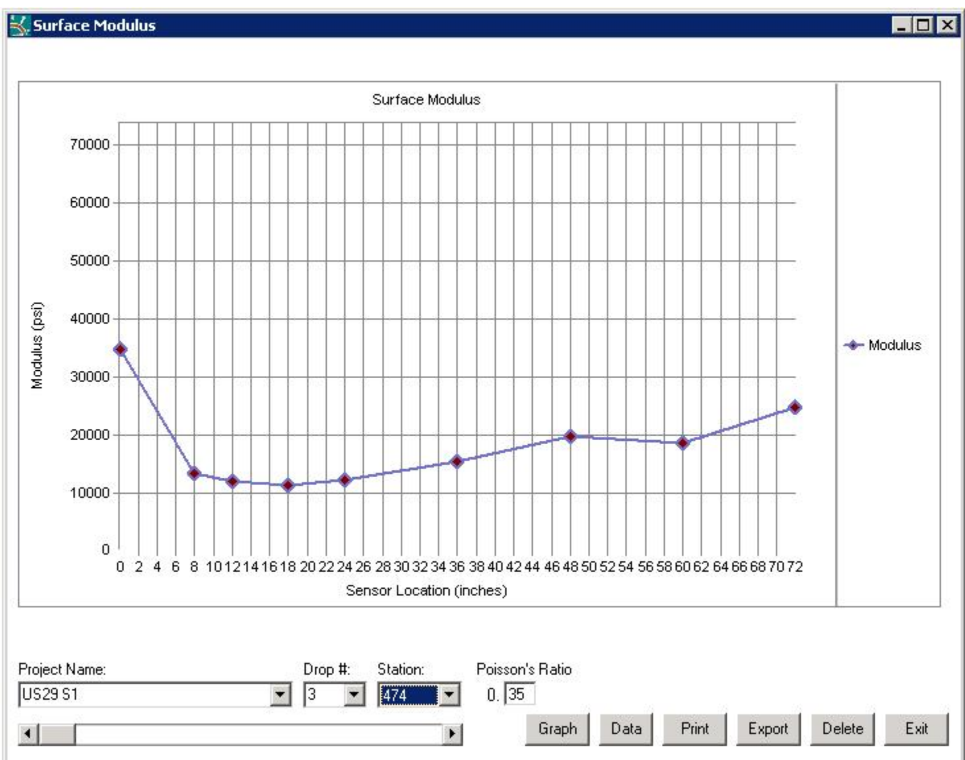
STH 29 S1 Station 26 Drop 3



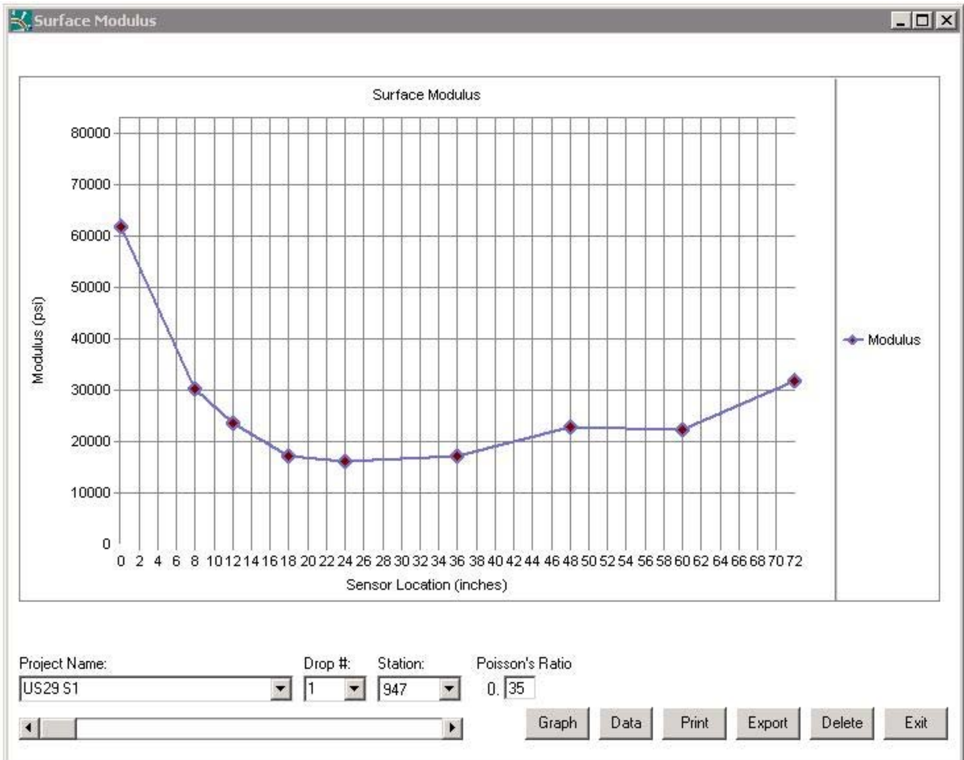
STH 29 S1 Station 474 Drop 1



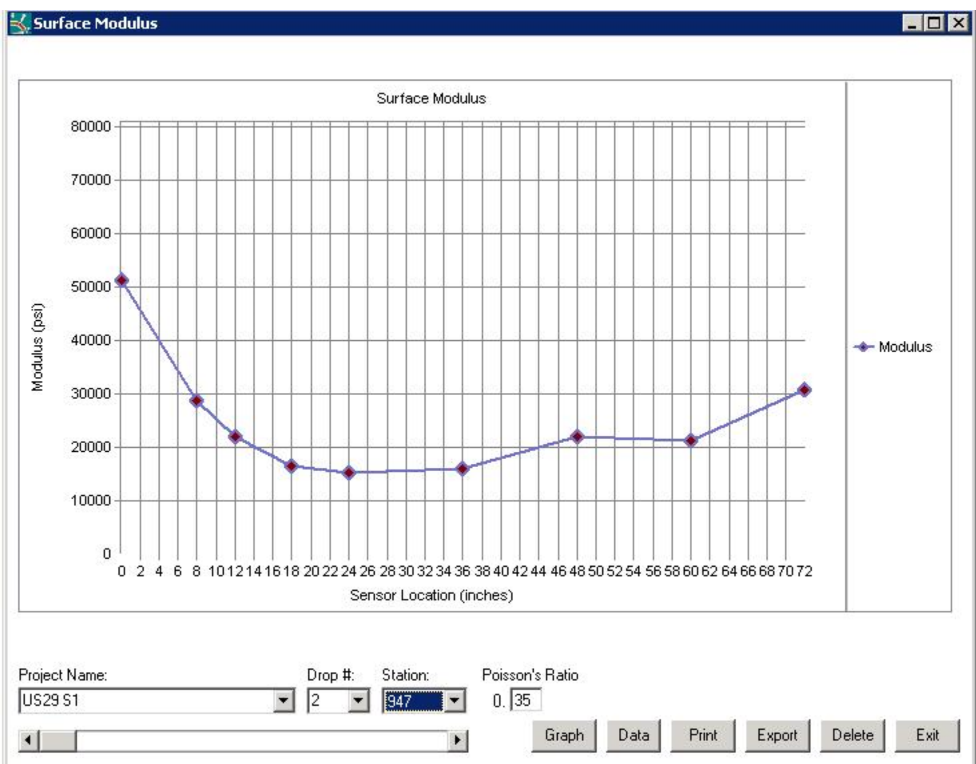
STH 29 S1 Station 474 Drop 2



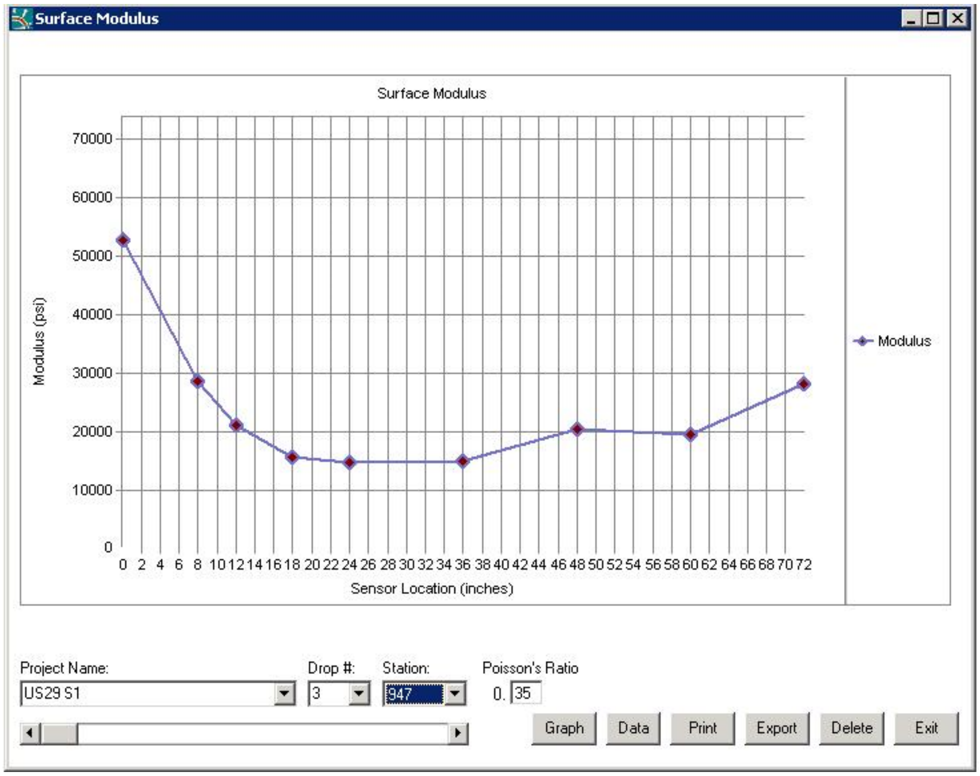
STH 29 S1 Station 474 Drop 3



STH 29 S1 Station 474 Drop 1



STH 29 S1 Station 474 Drop 2



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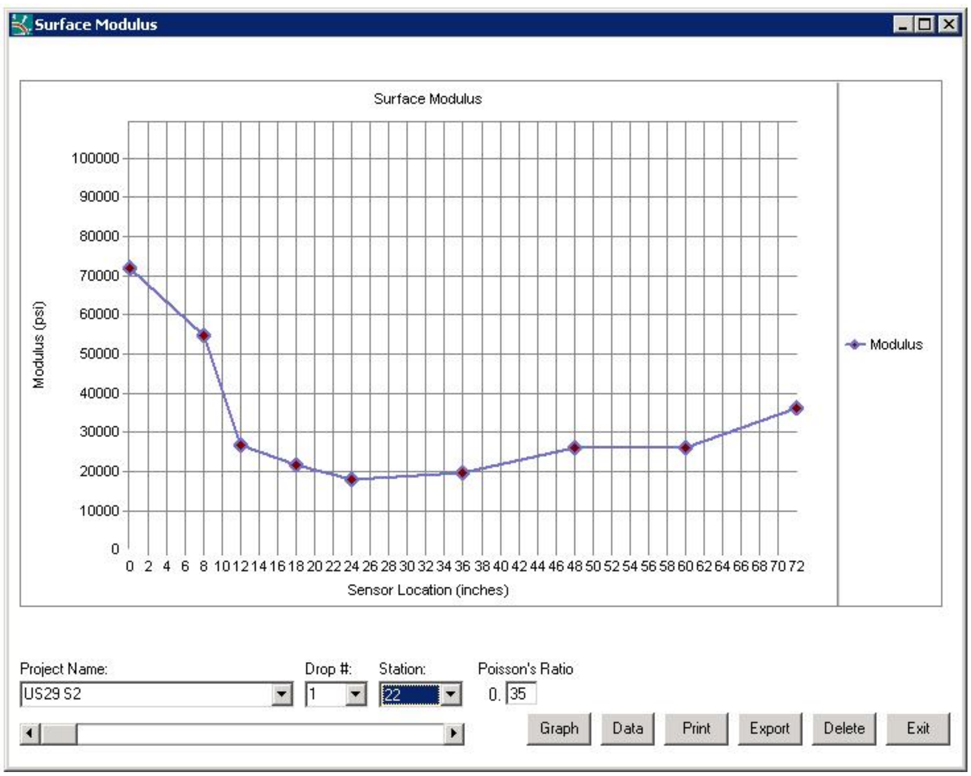
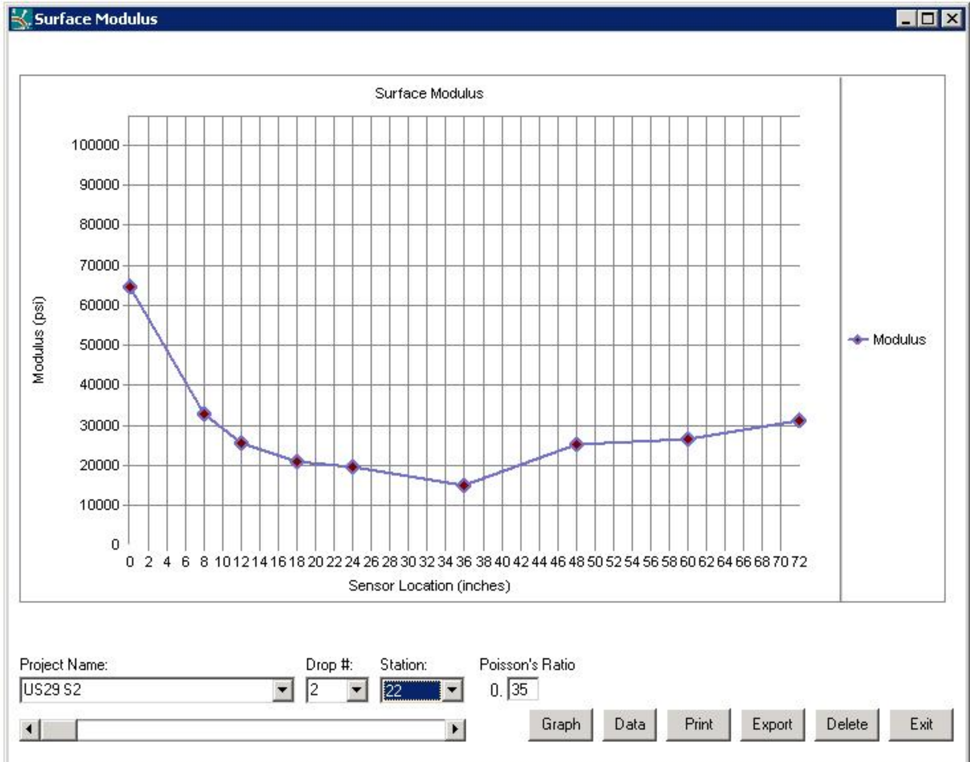
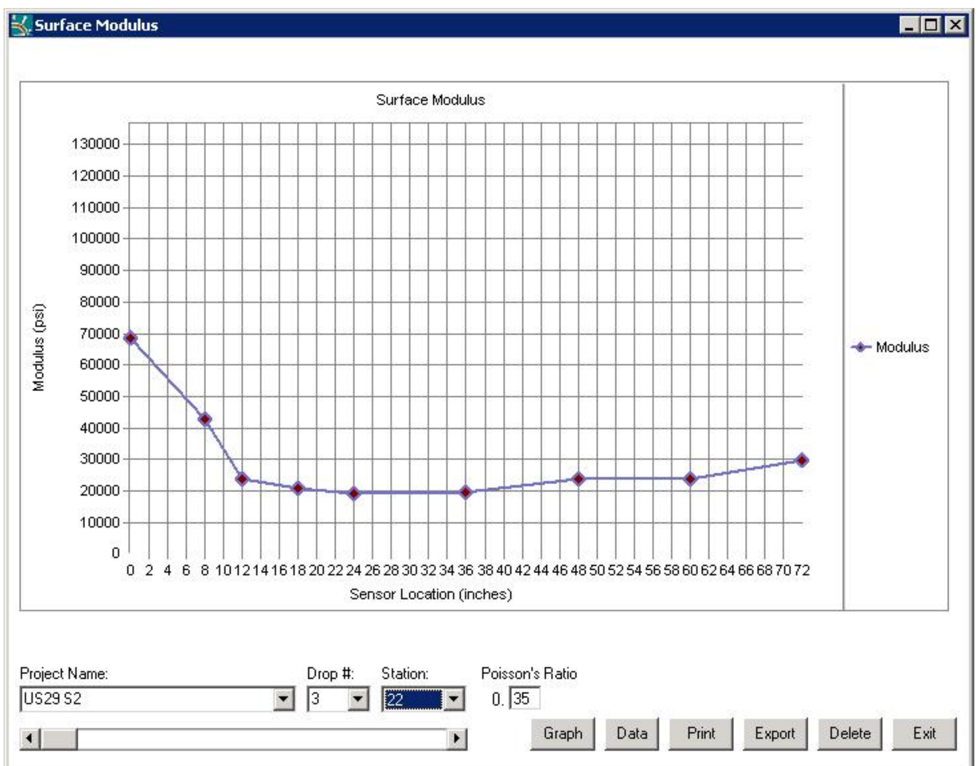


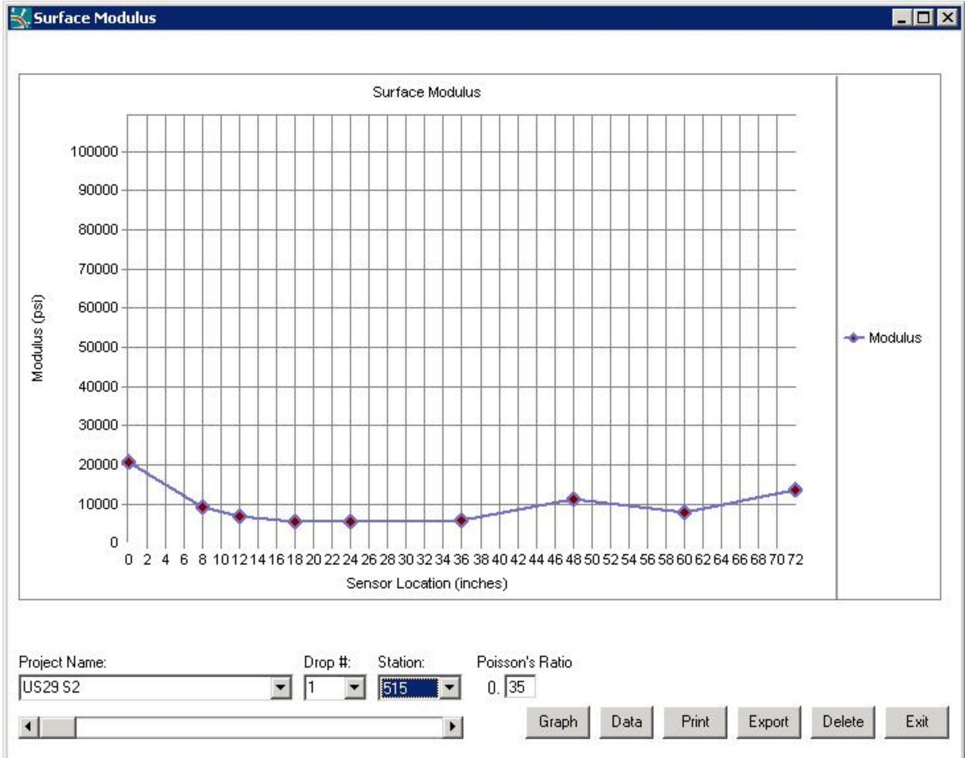
STH 29 S2 Station 22 Drop 1



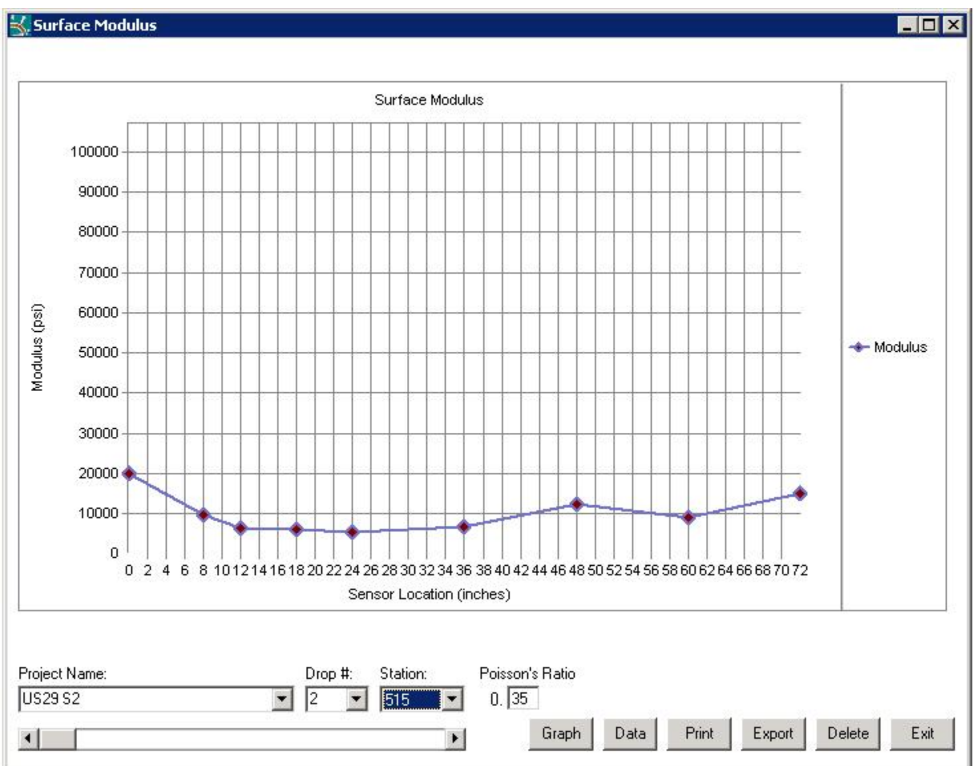
STH 29 S2 Station 22 Drop 2



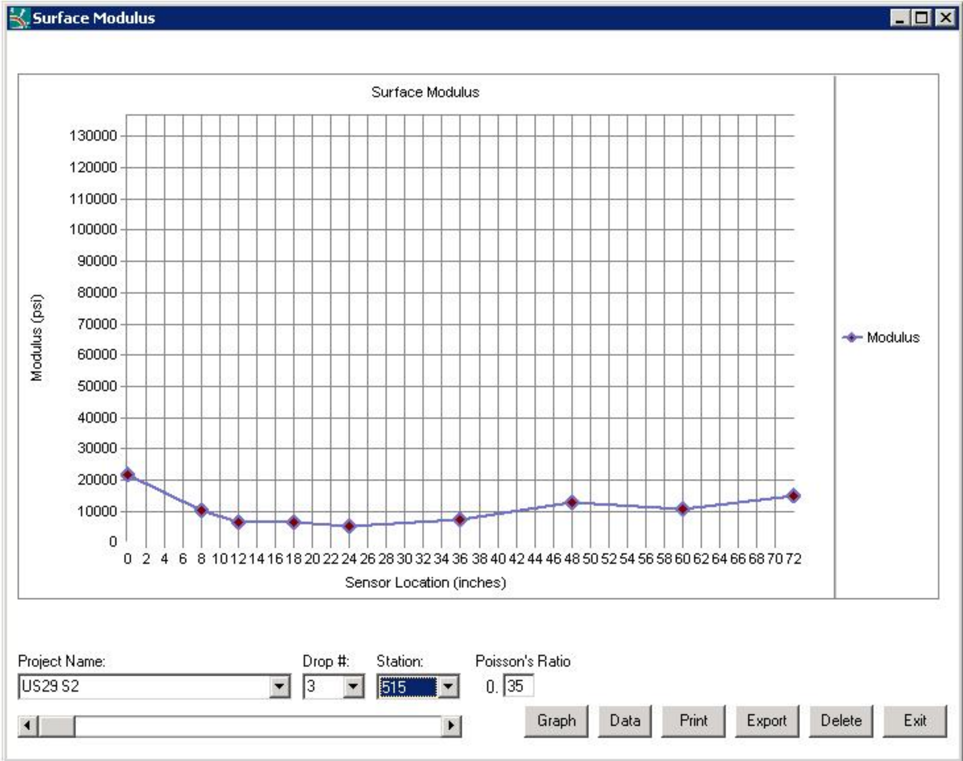
STH 29 S2 Station 22 Drop 3



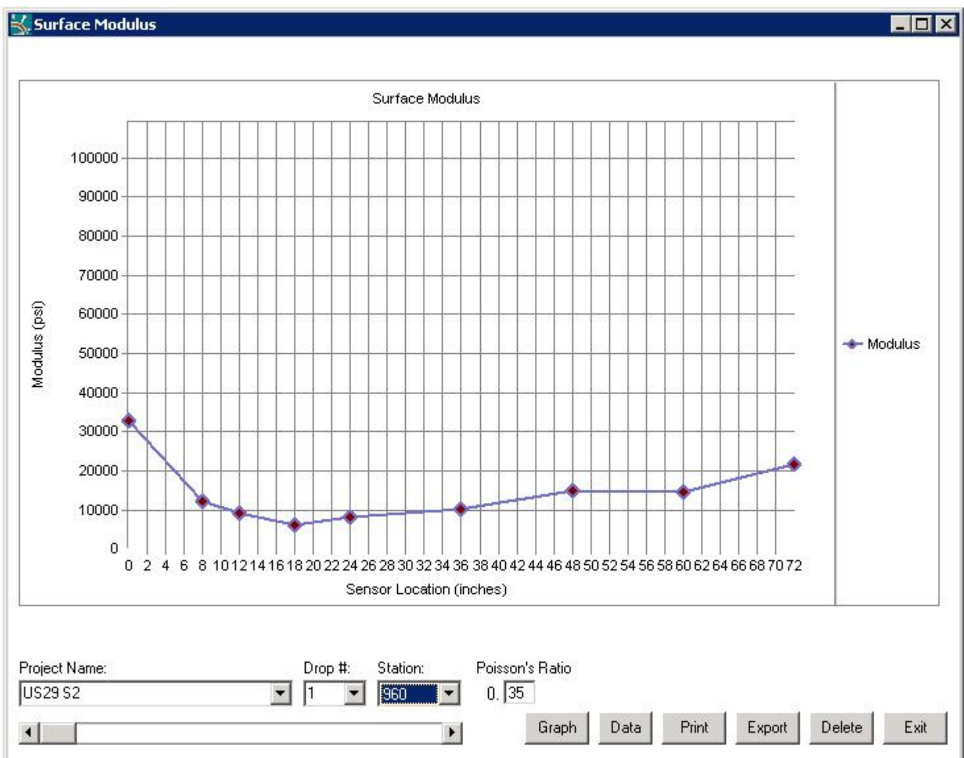
STH 29 S2 Station 515 Drop 1



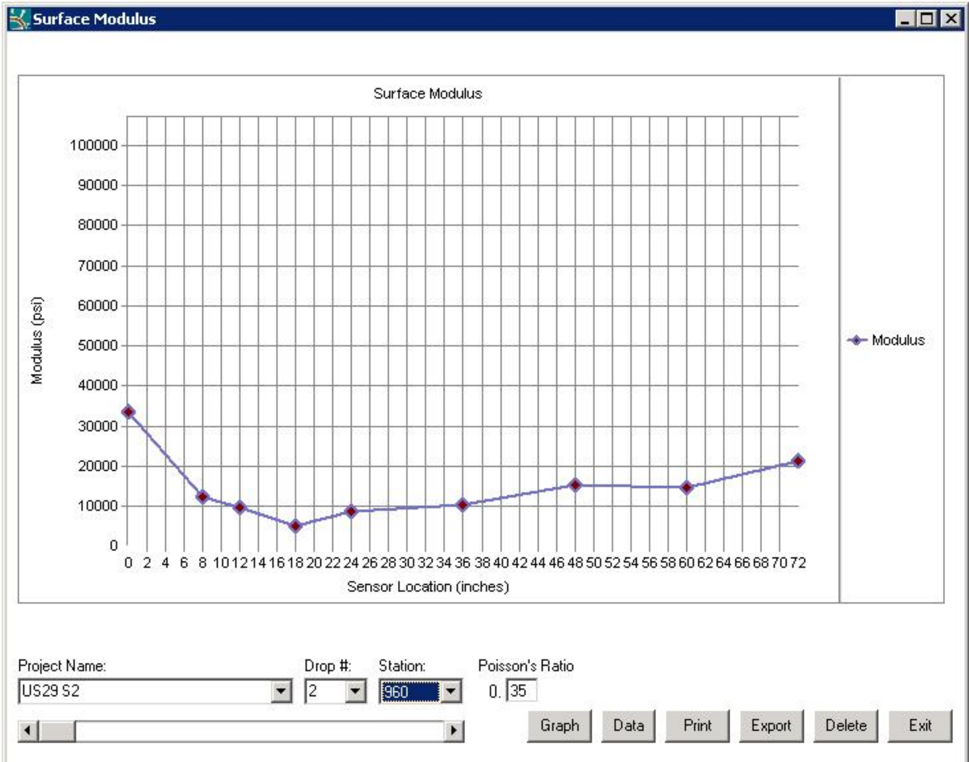
STH 29 S2 Station 515 Drop 1



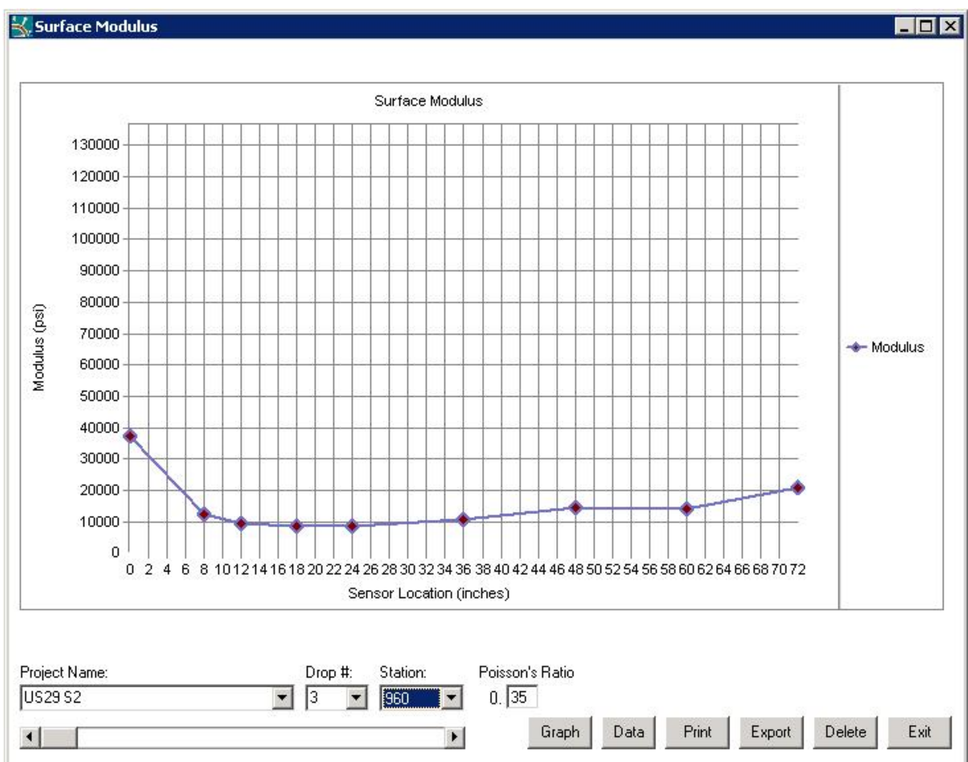
STH 29 S2 Station 515 Drop 3



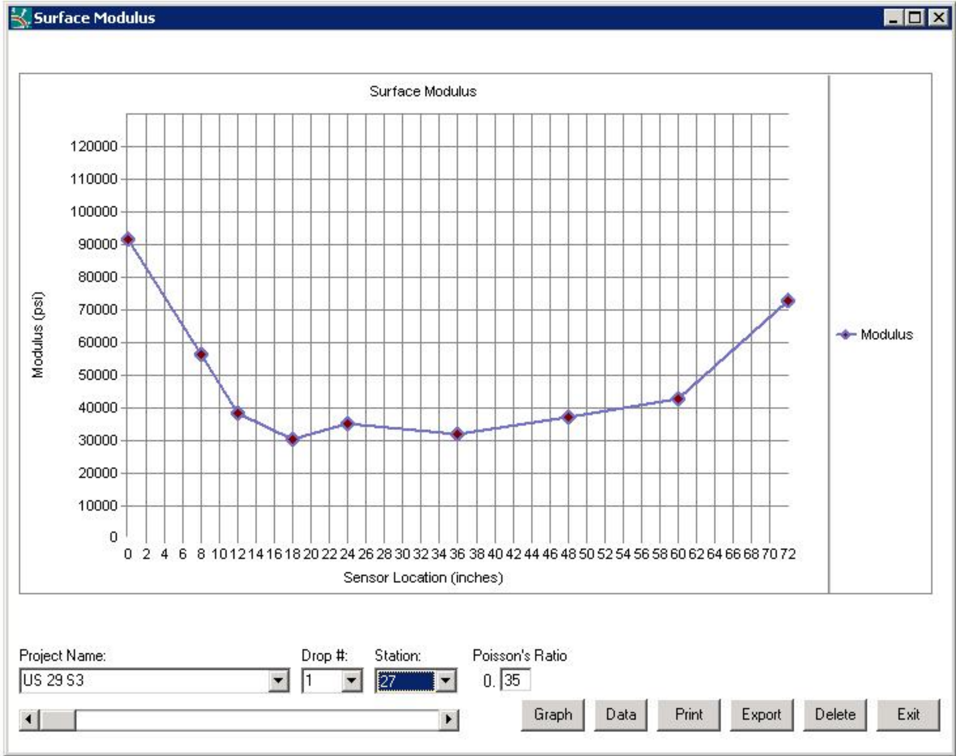
STH 29 S2 Station 960 Drop 1



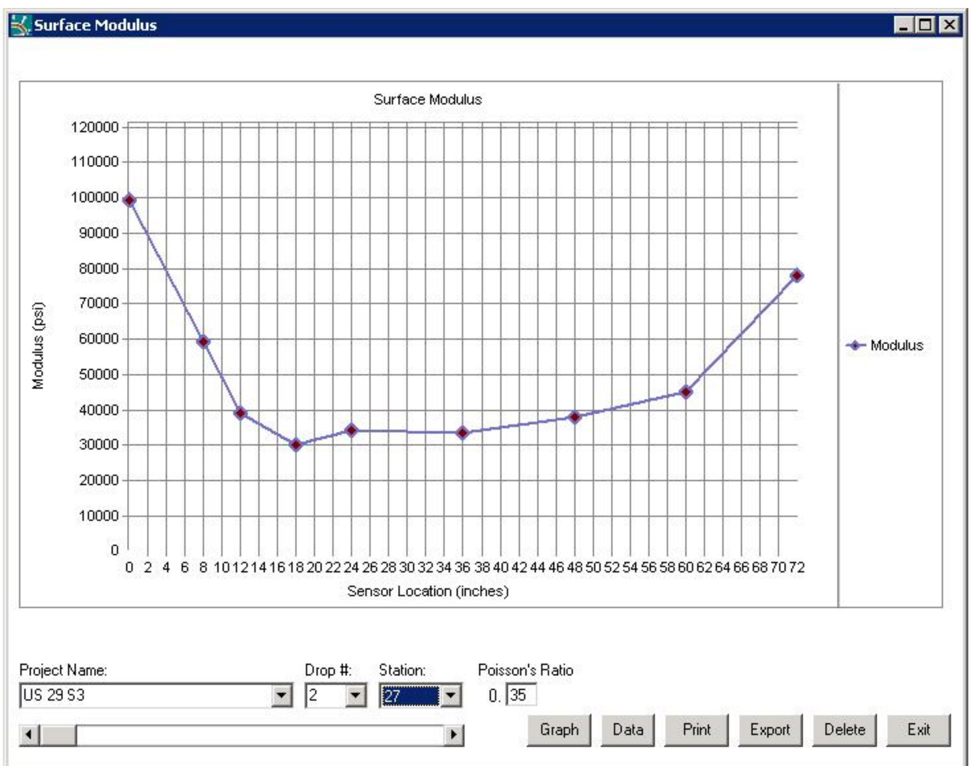
STH 29 S2 Station 960 Drop 2



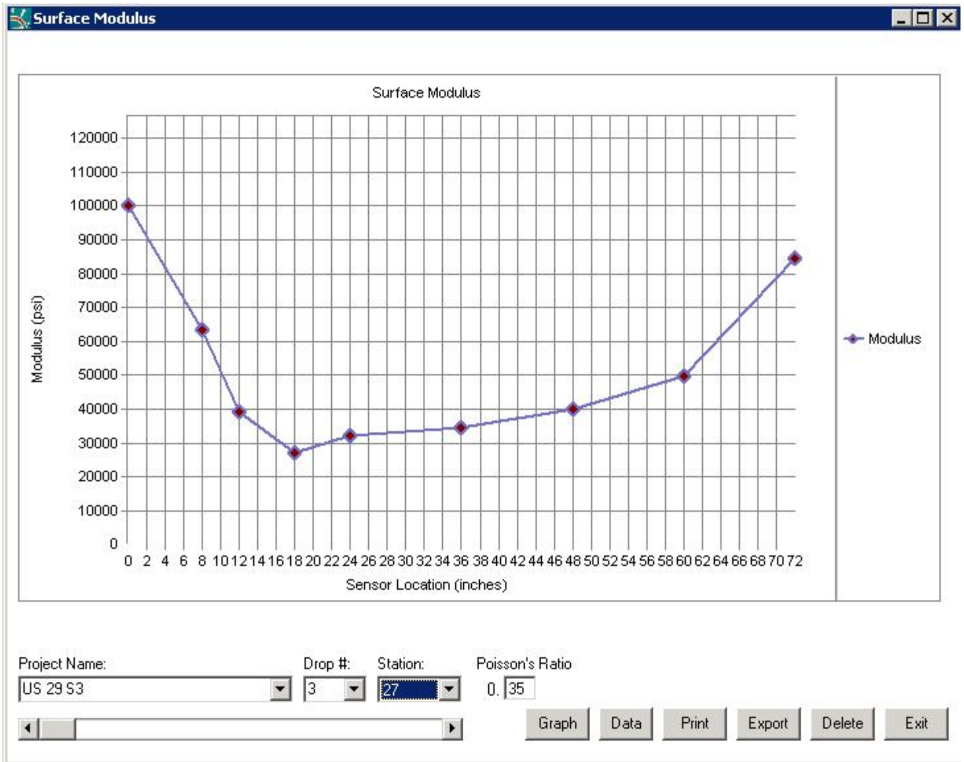
STH 29 S2 Station 960 Drop 3



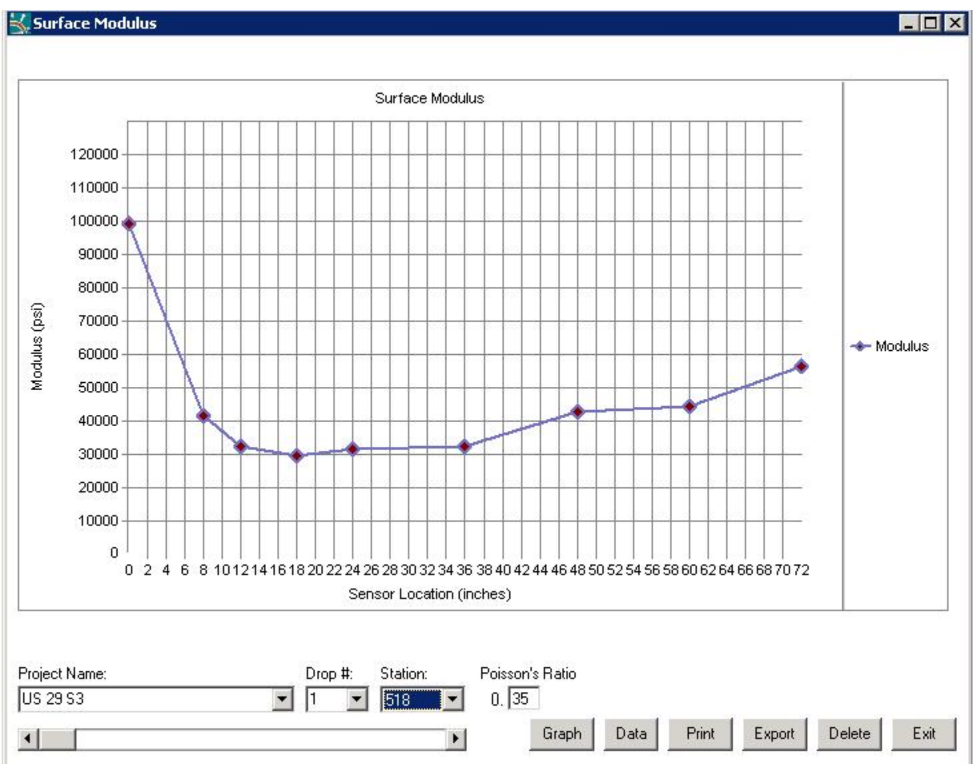
STH 29 S3 Station 27 Drop 1



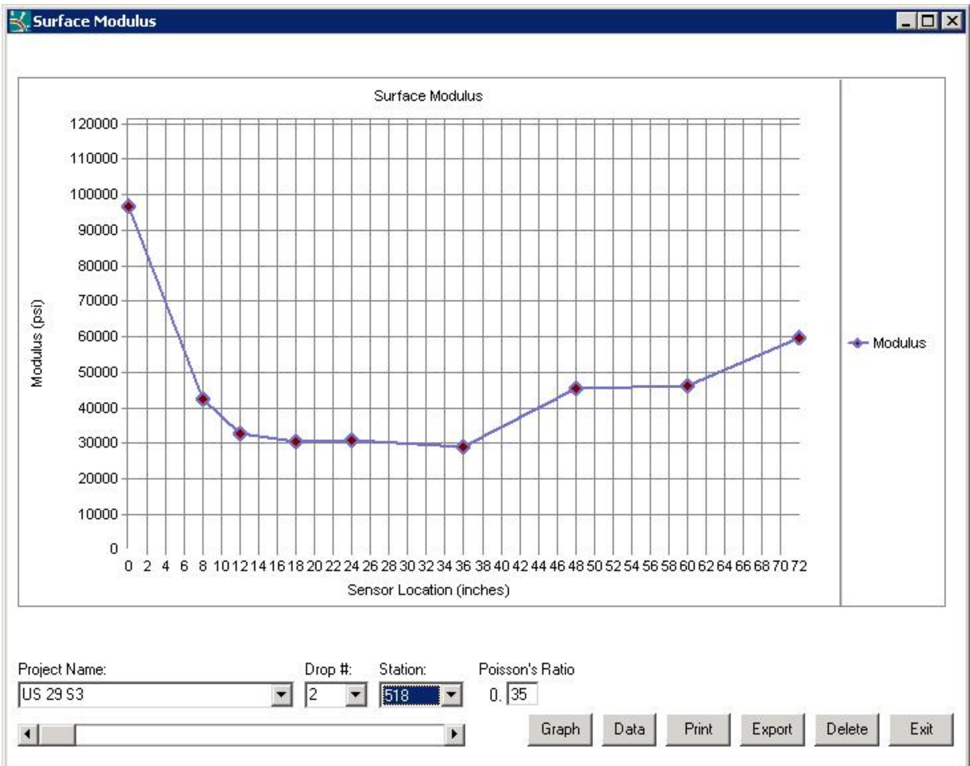
STH 29 S3 Station 27 Drop 2



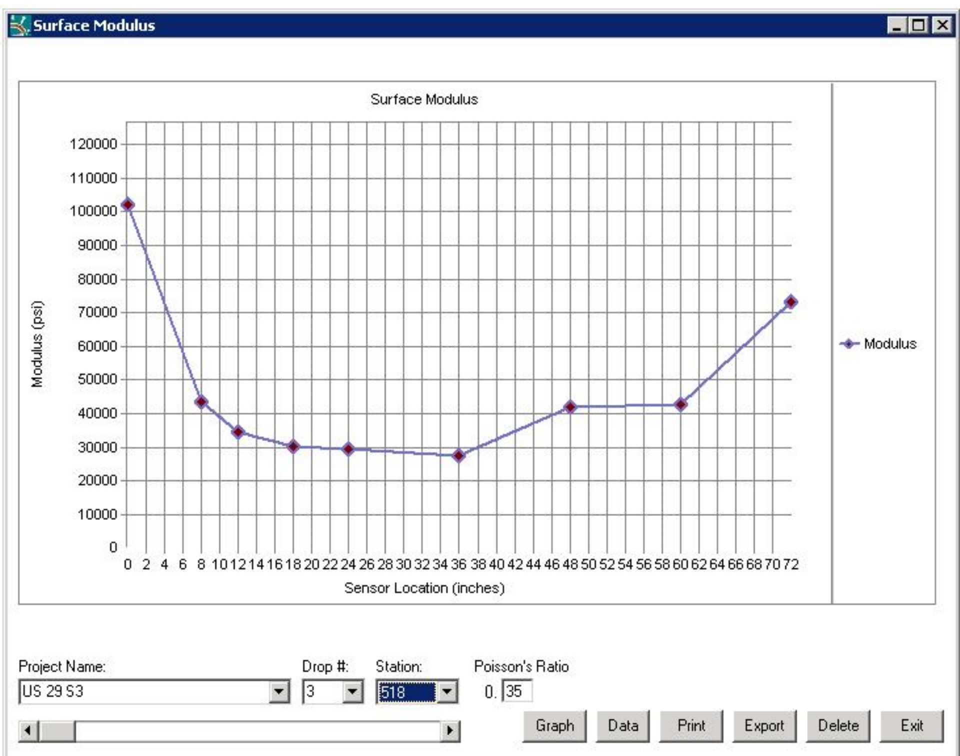
STH 29 S3 Station 27 Drop 3



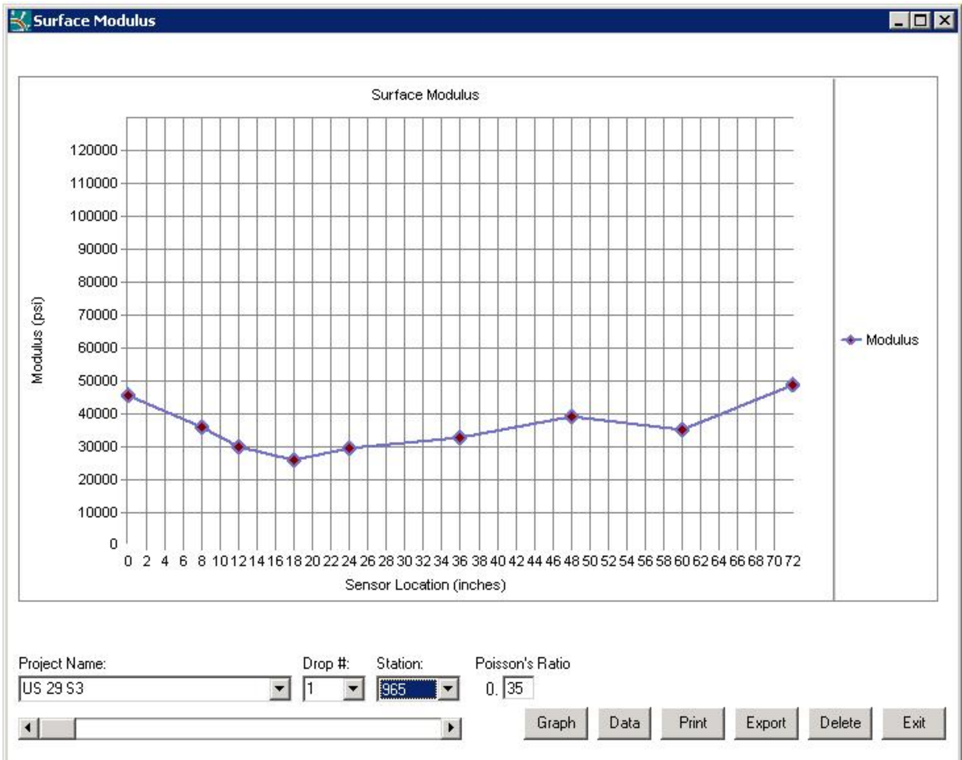
STH 29 S3 Station 518 Drop 1



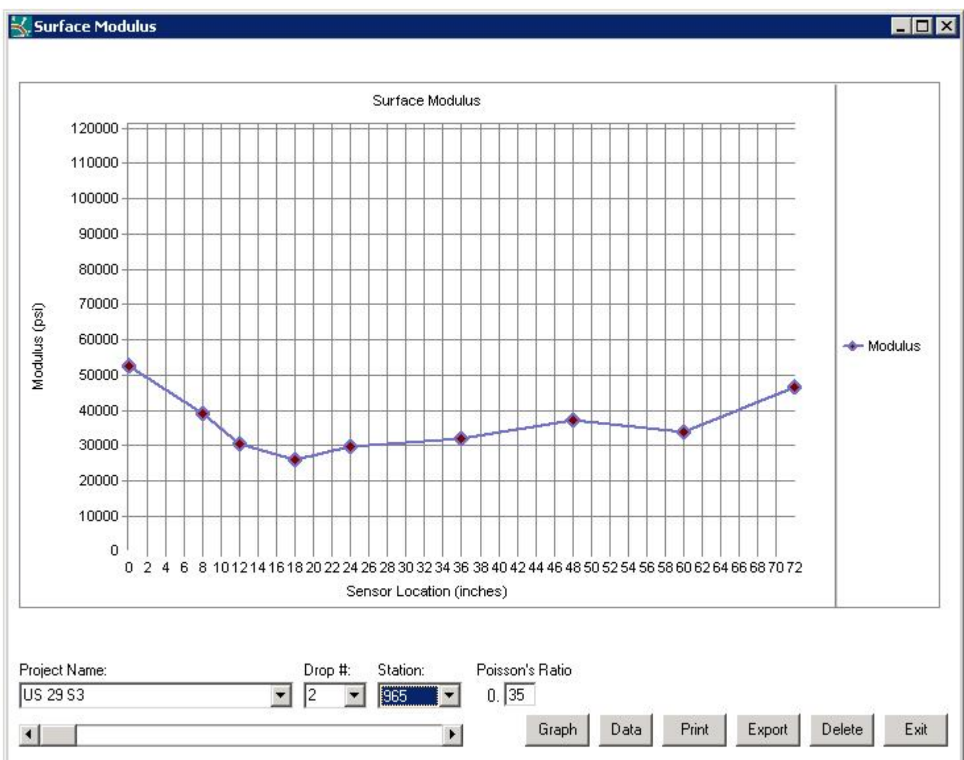
STH 29 S3 Station 518 Drop 2



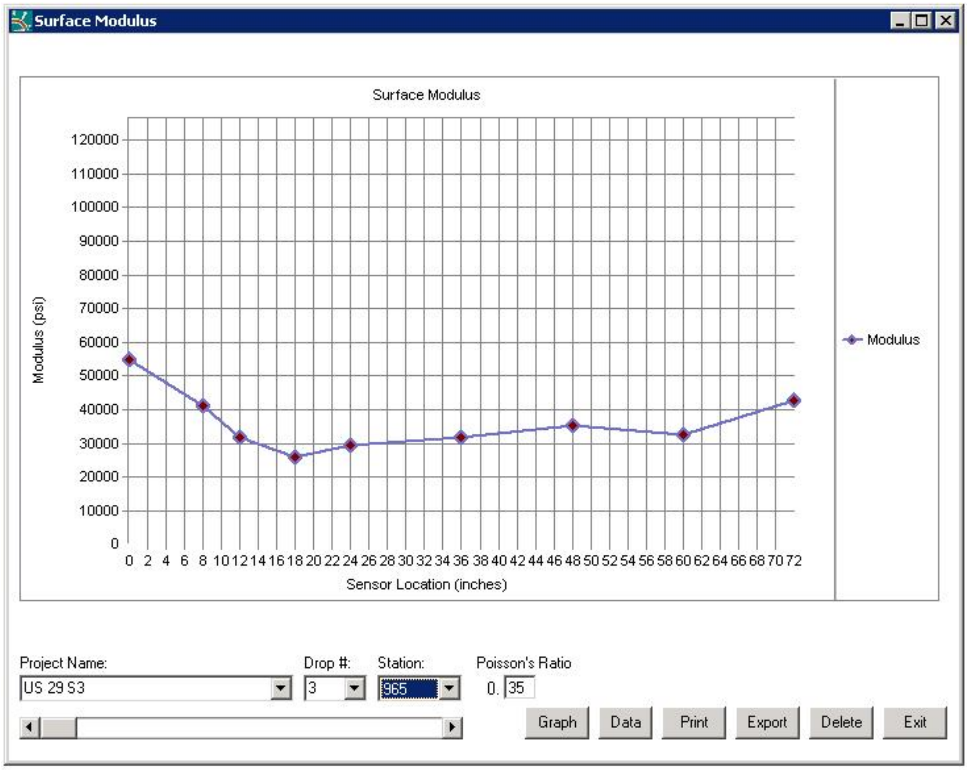
STH 29 S3 Station 518 Drop 3



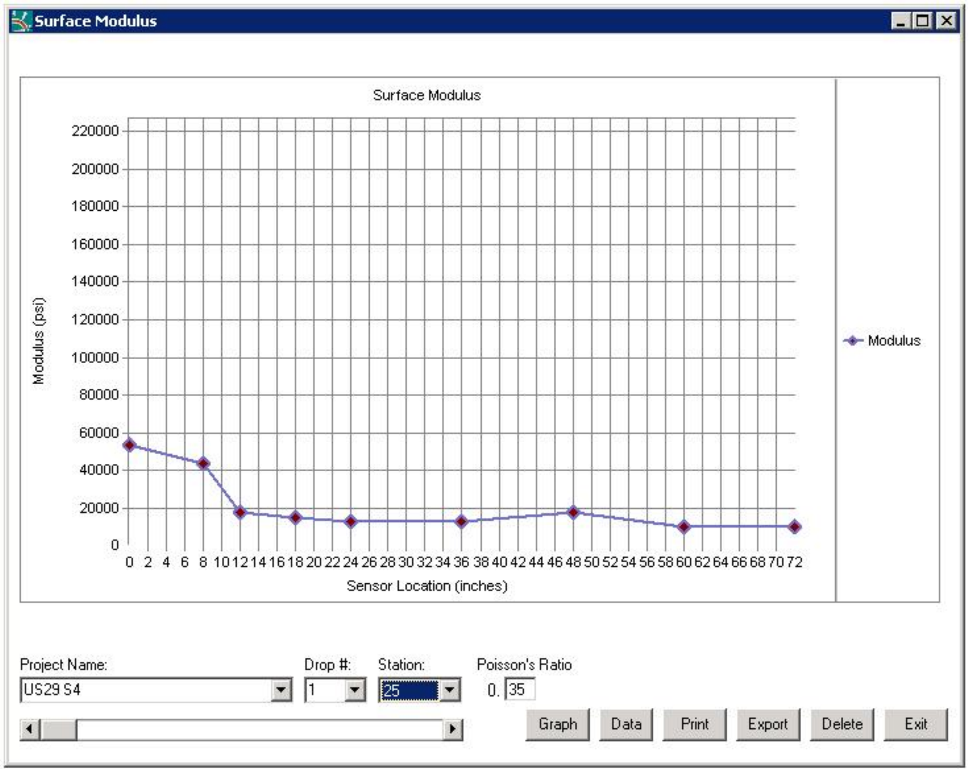
STH 29 S3 Station 965 Drop 1



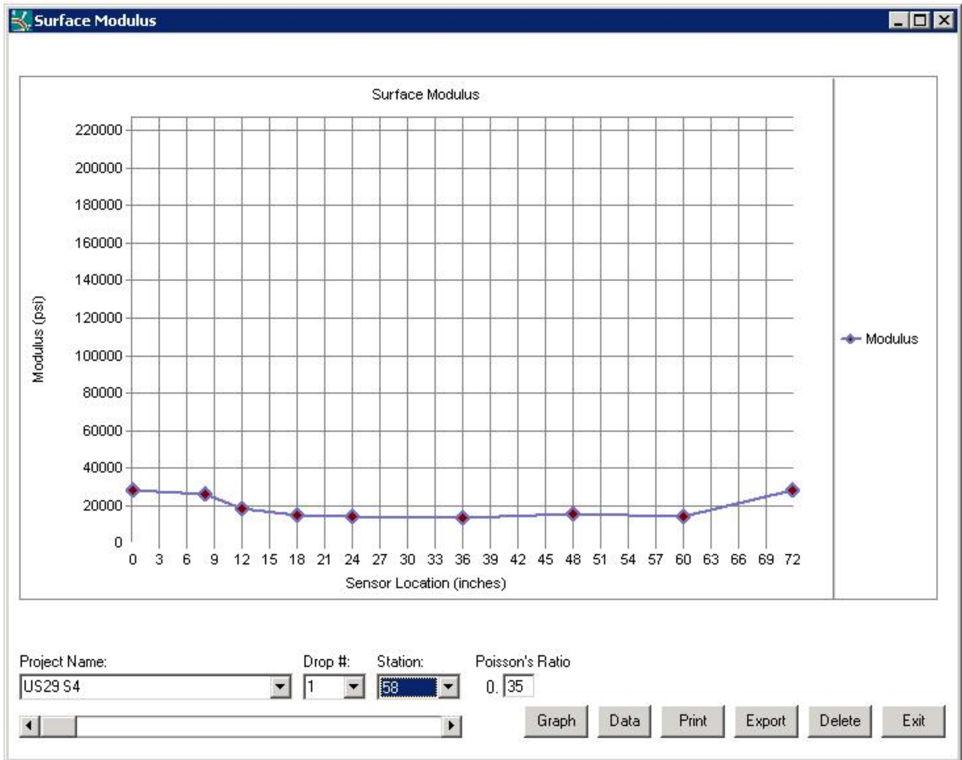
STH 29 S3 Station 965 Drop 2



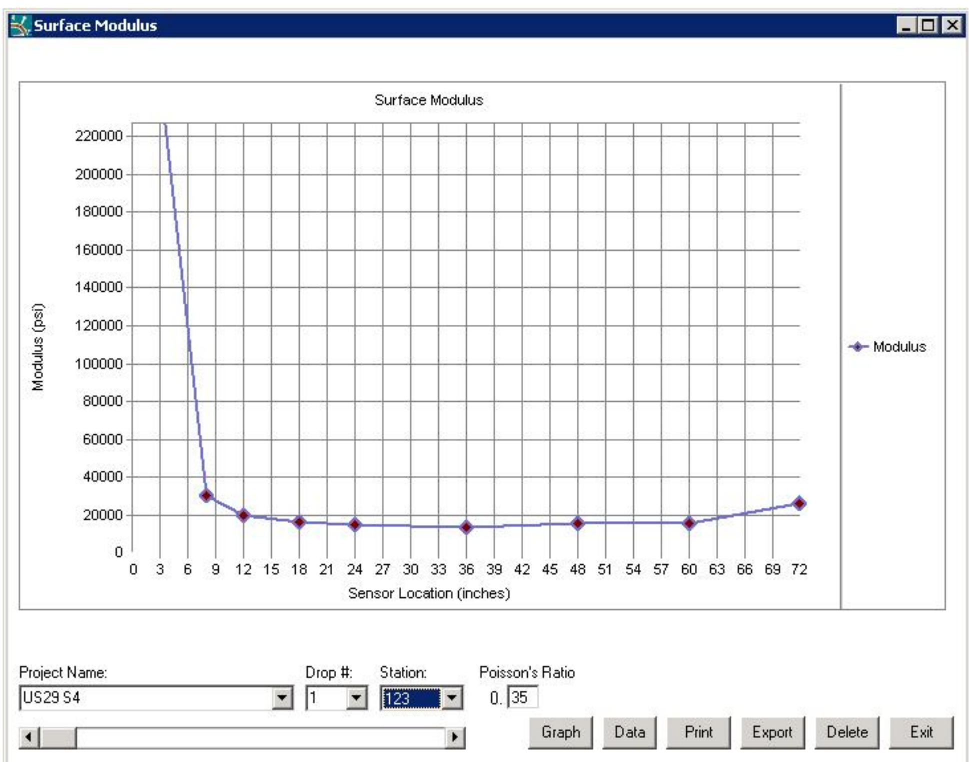
STH 29 S3 Station 965 Drop 3



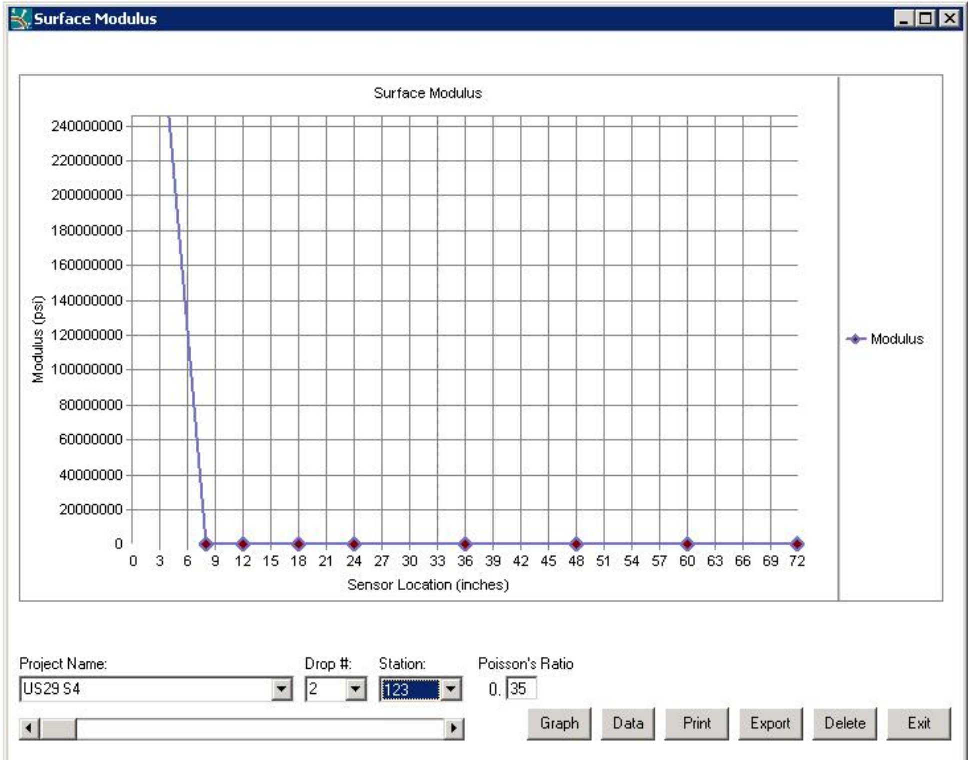
STH 29 S4 Station 25 Drop 1



STH 29 S4 Station 58 Drop 1



STH 29 S4 Station 123 Drop 1



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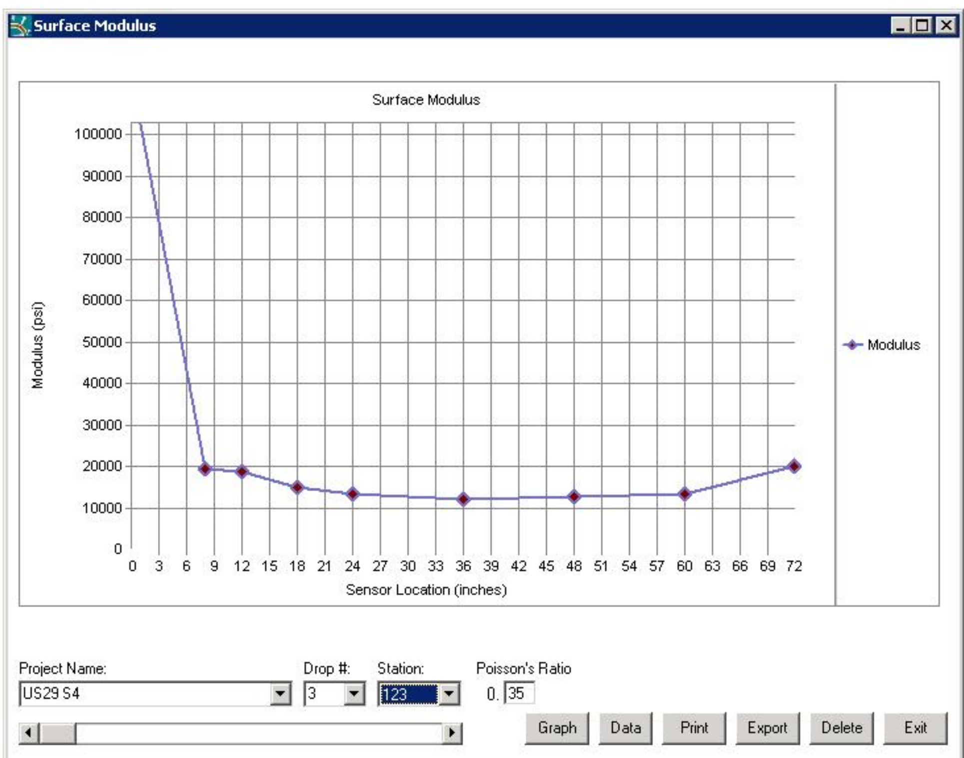

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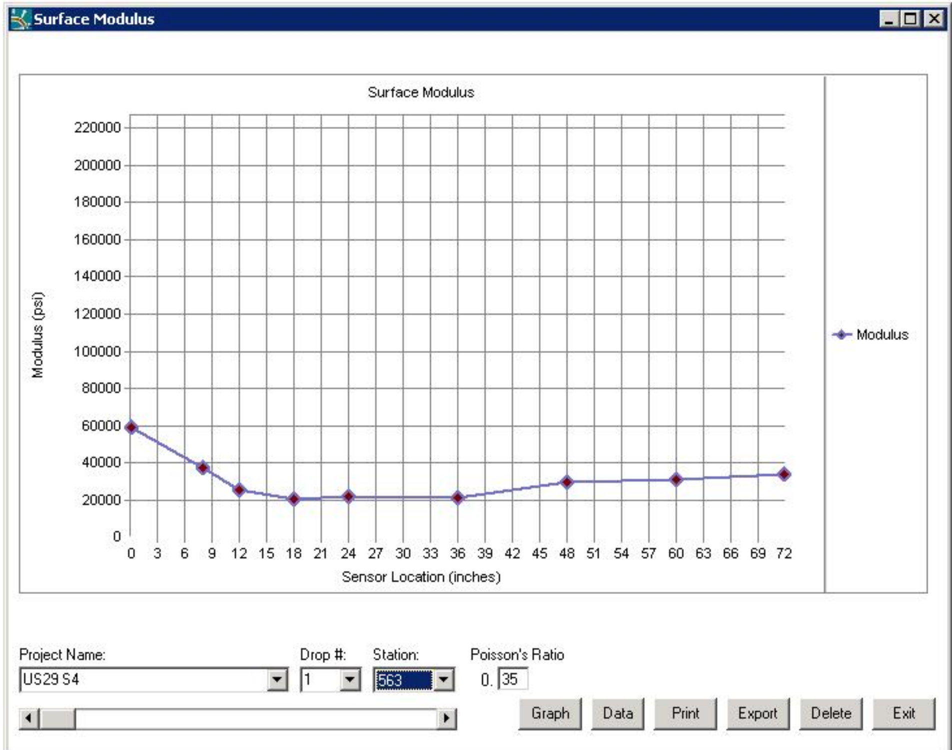
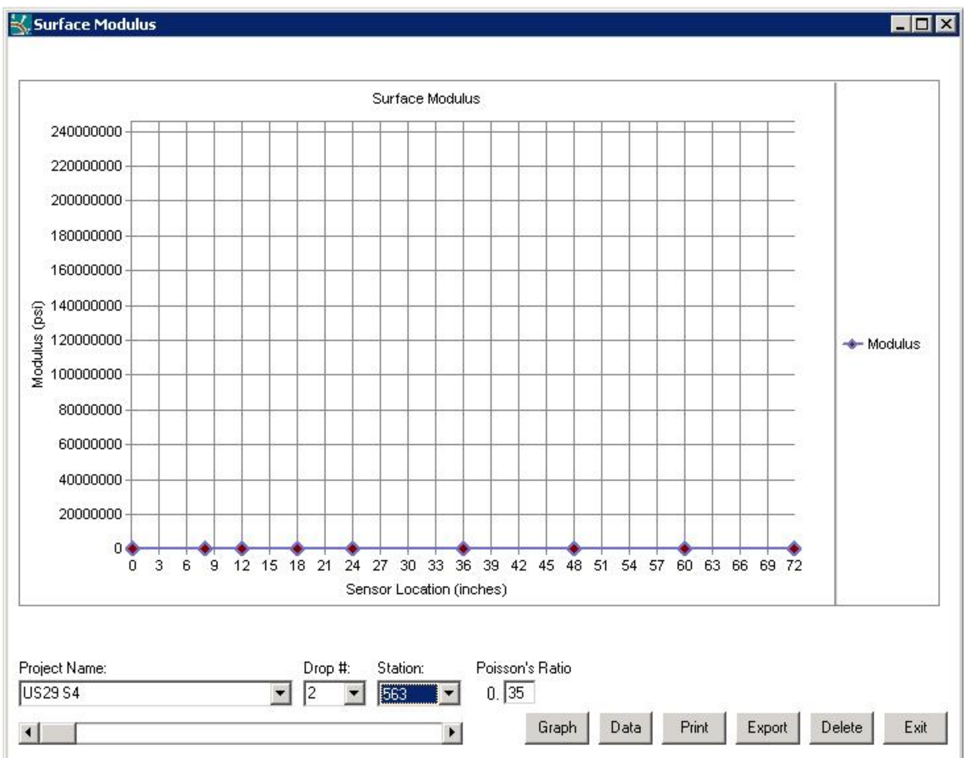
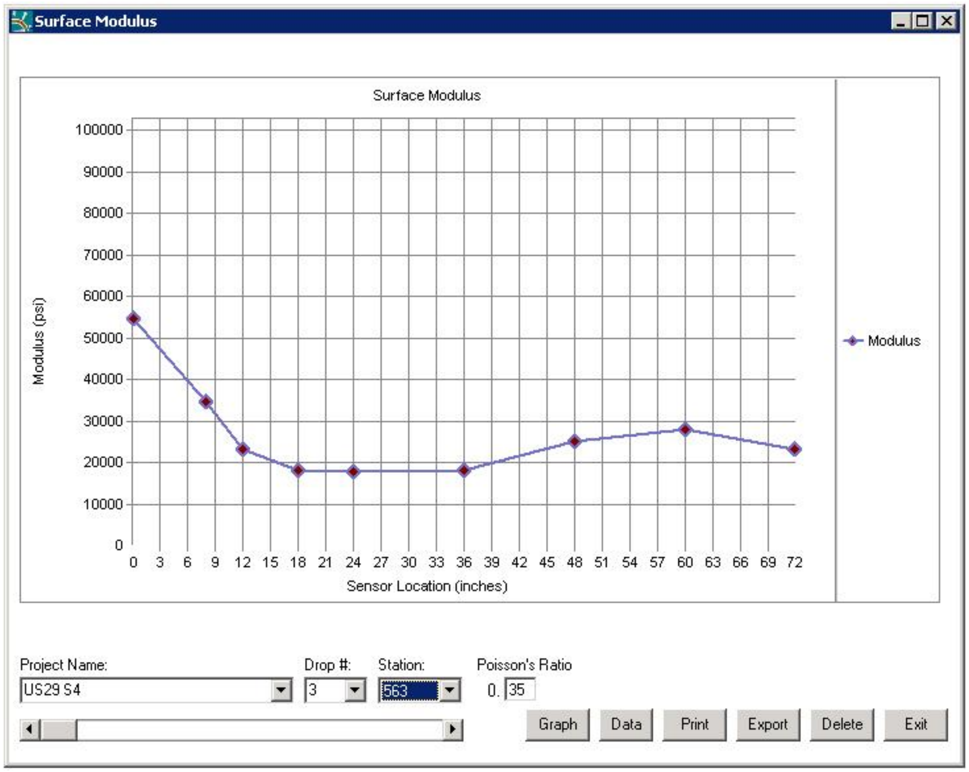


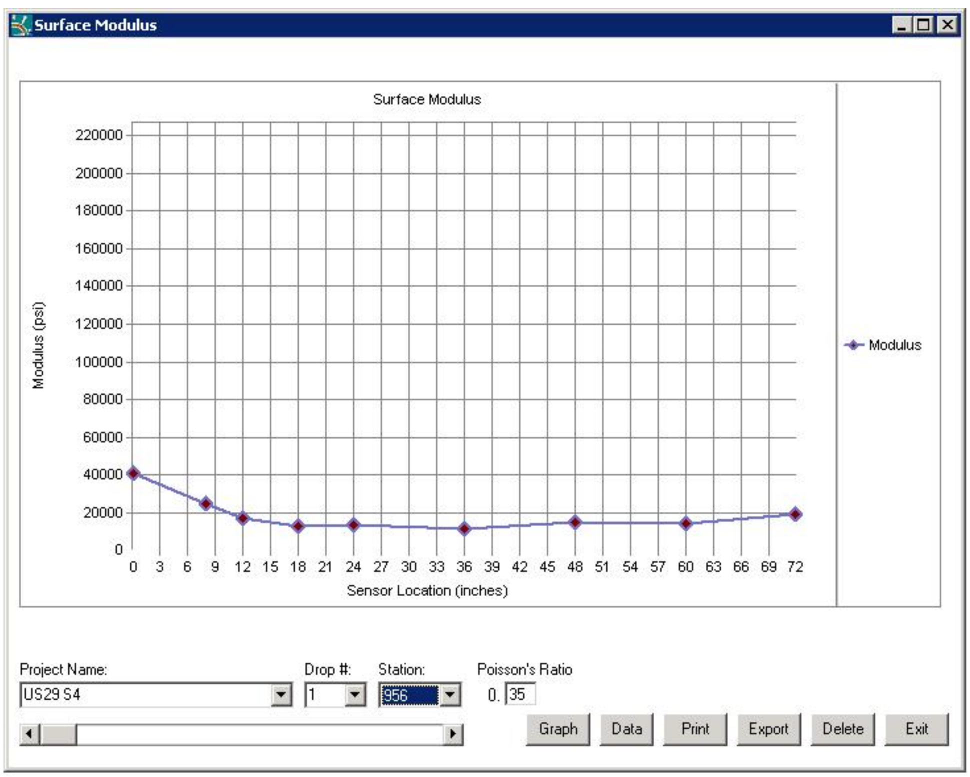
STH 29 S4 Station 563 Drop 1



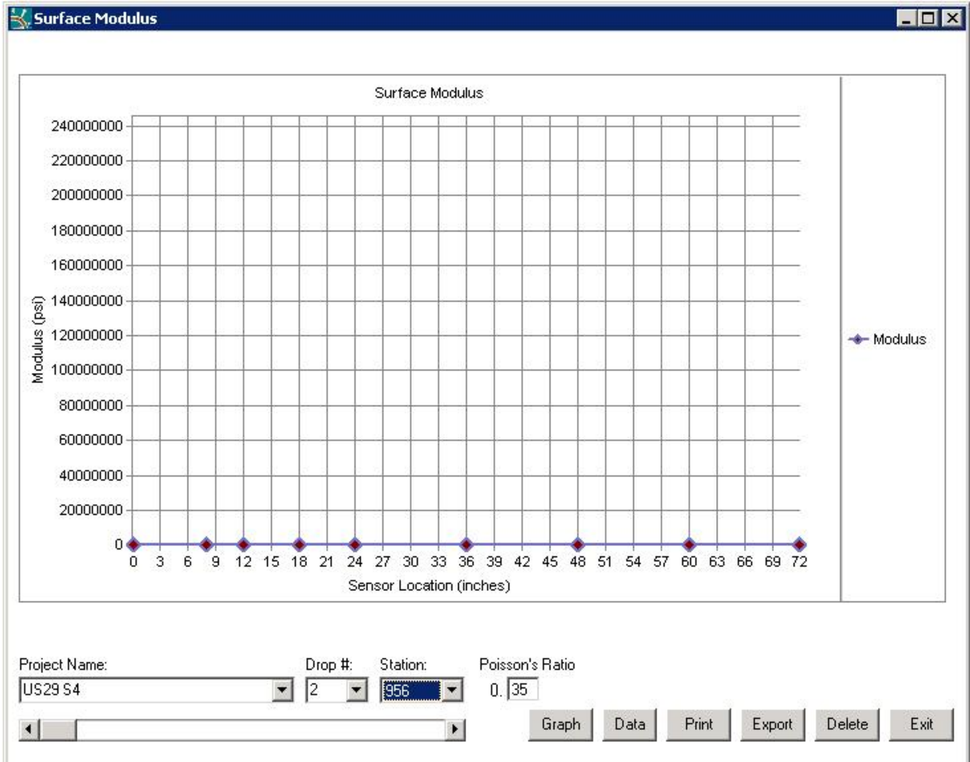
STH 29 S4 Station 563 Drop 2



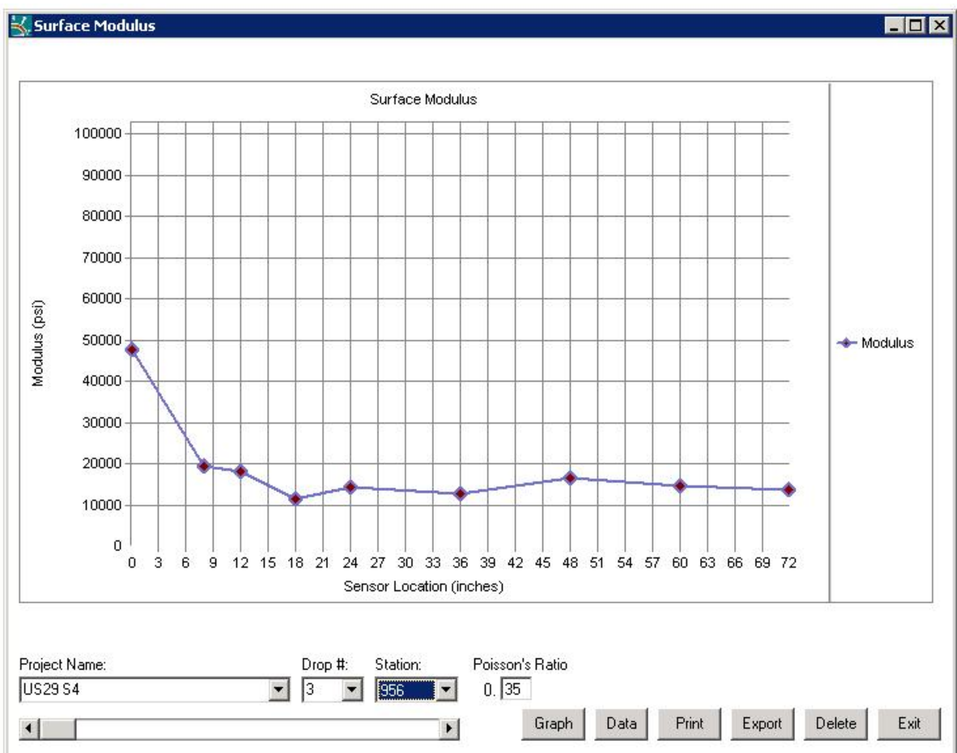
STH 29 S4 Station 563 Drop 3



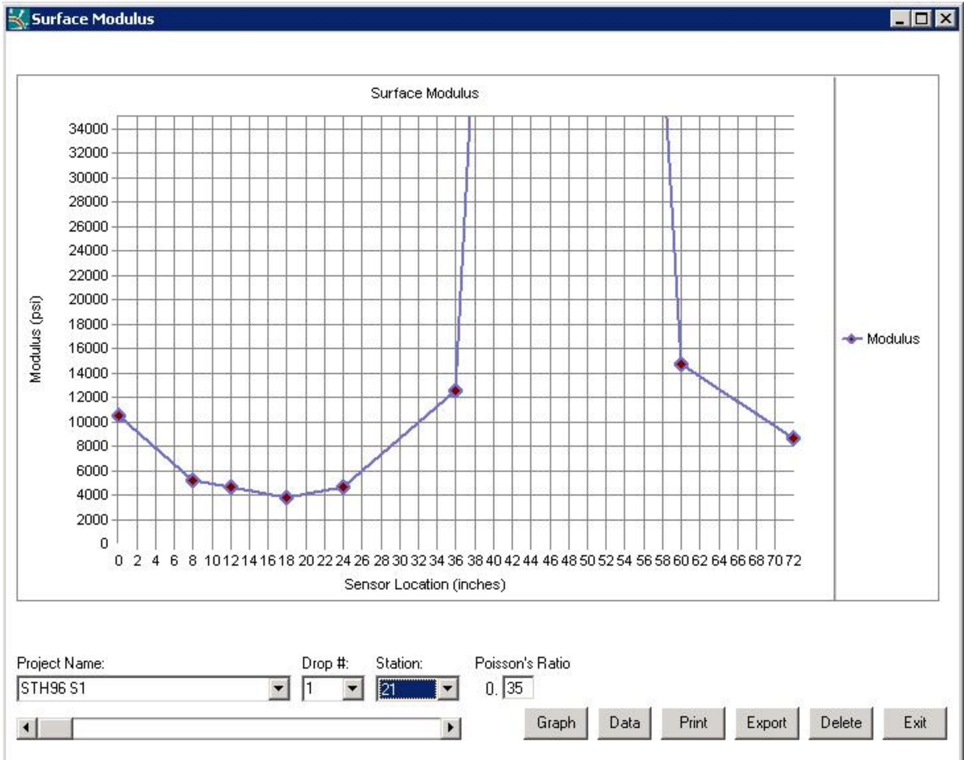
STH 29 S4 Station 956 Drop 1



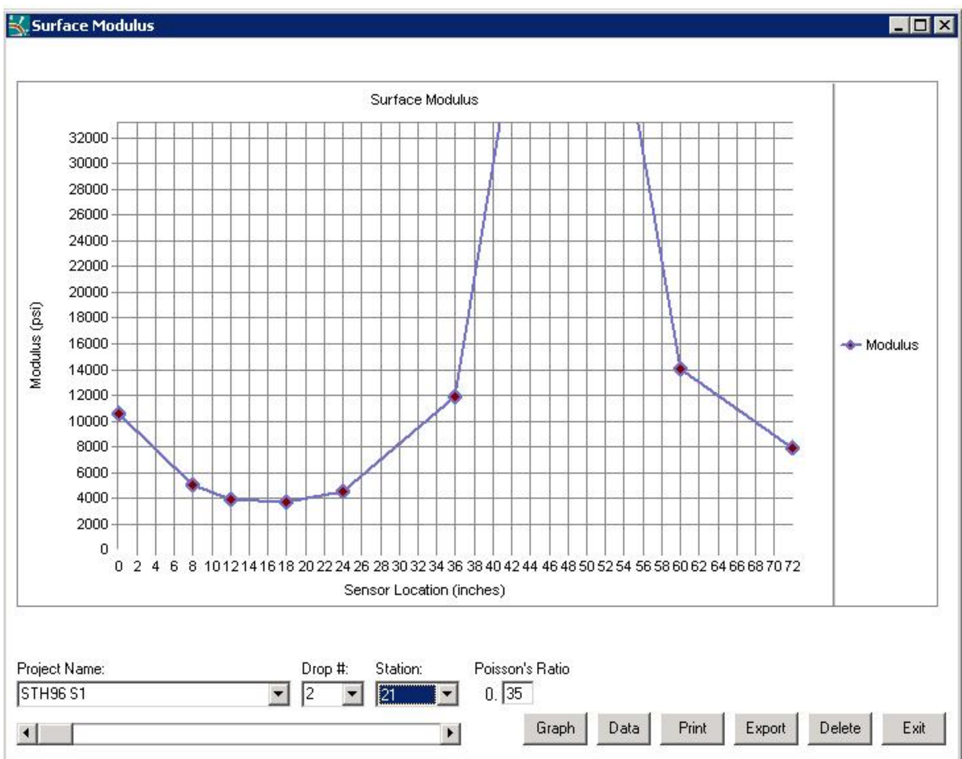
STH 29 S4 Station 956 Drop 2



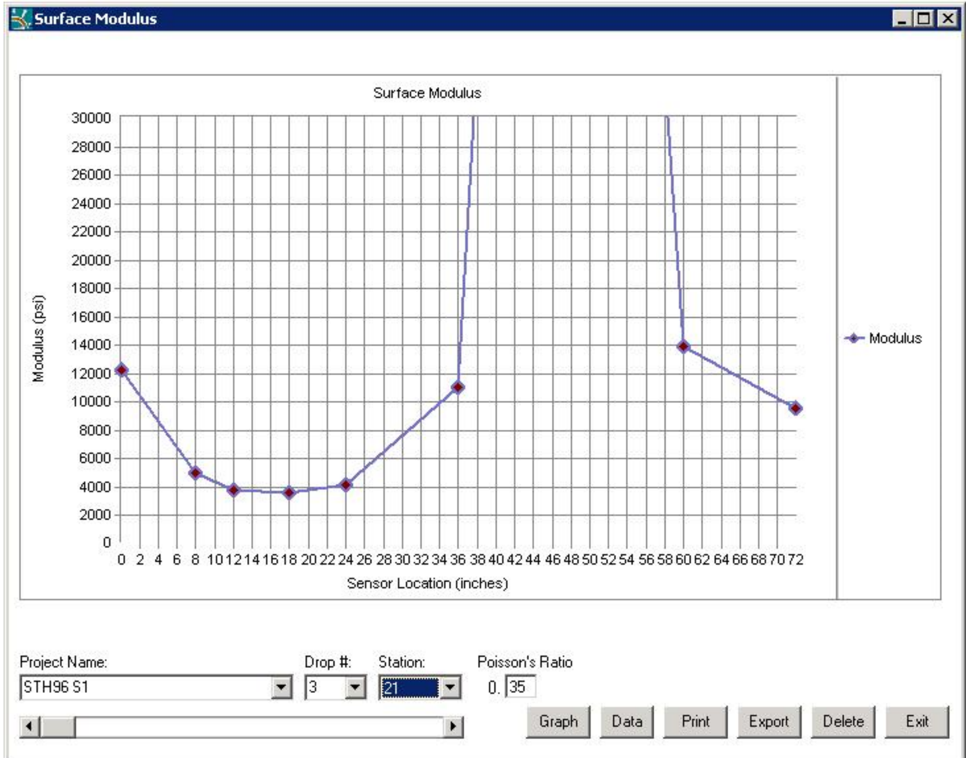
STH 29 S4 Station 956 Drop 3



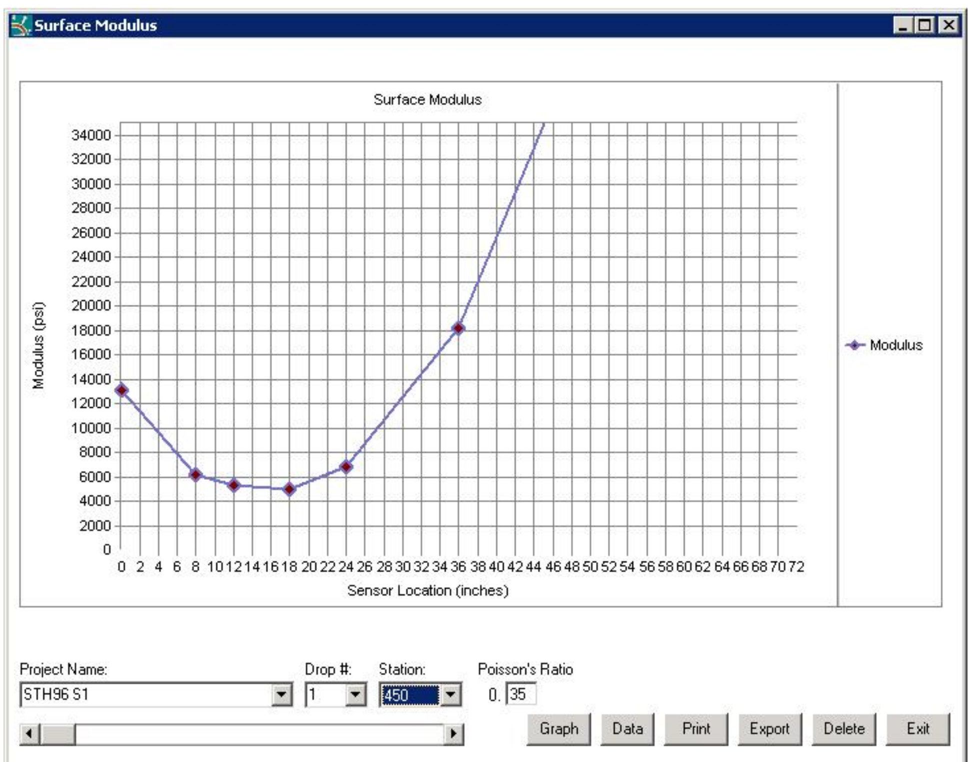
STH 96 S1 Station 21 Drop 1



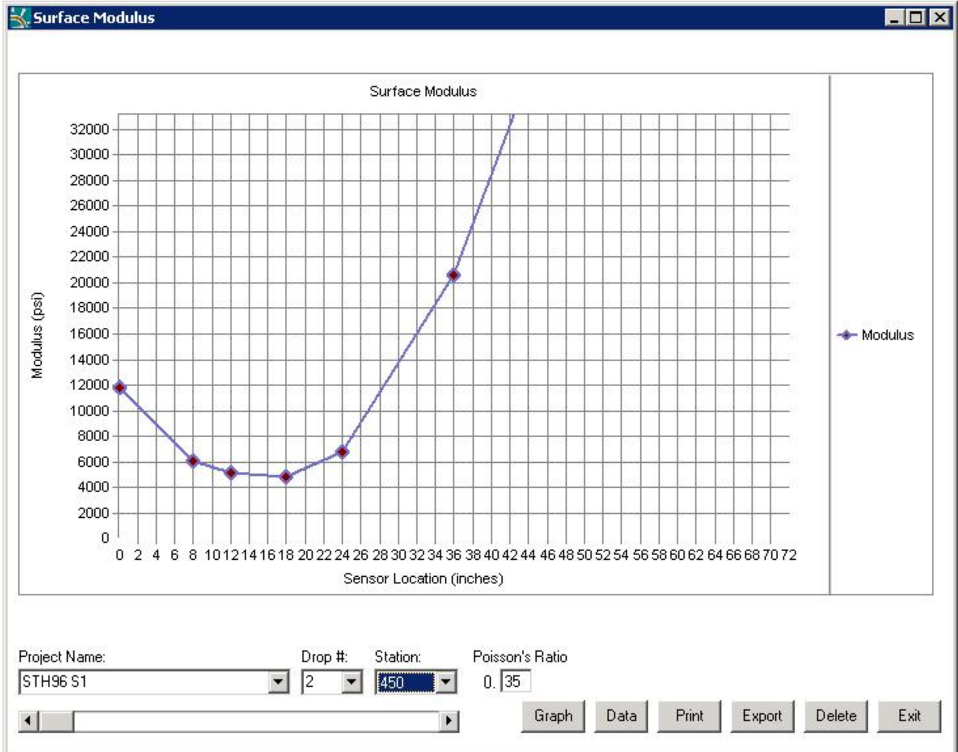
STH 96 S1 Station 21 Drop 2



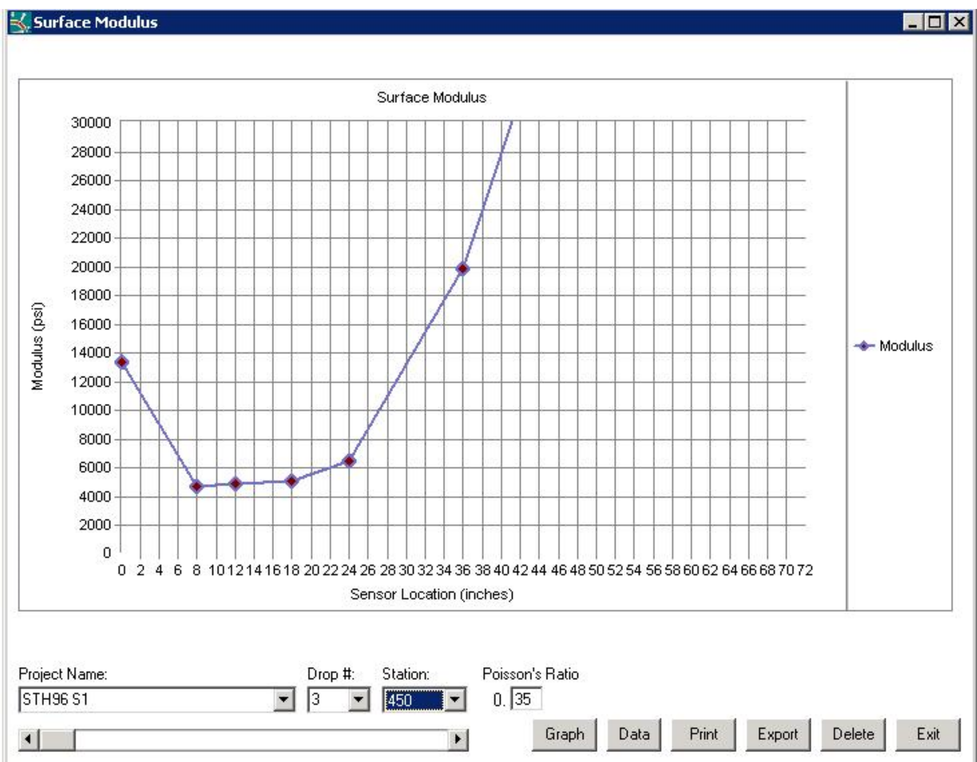
STH 96 S1 Station 21 Drop 3



STH 96 S1 Station 450 Drop 1



STH 96 S1 Station 450 Drop 2



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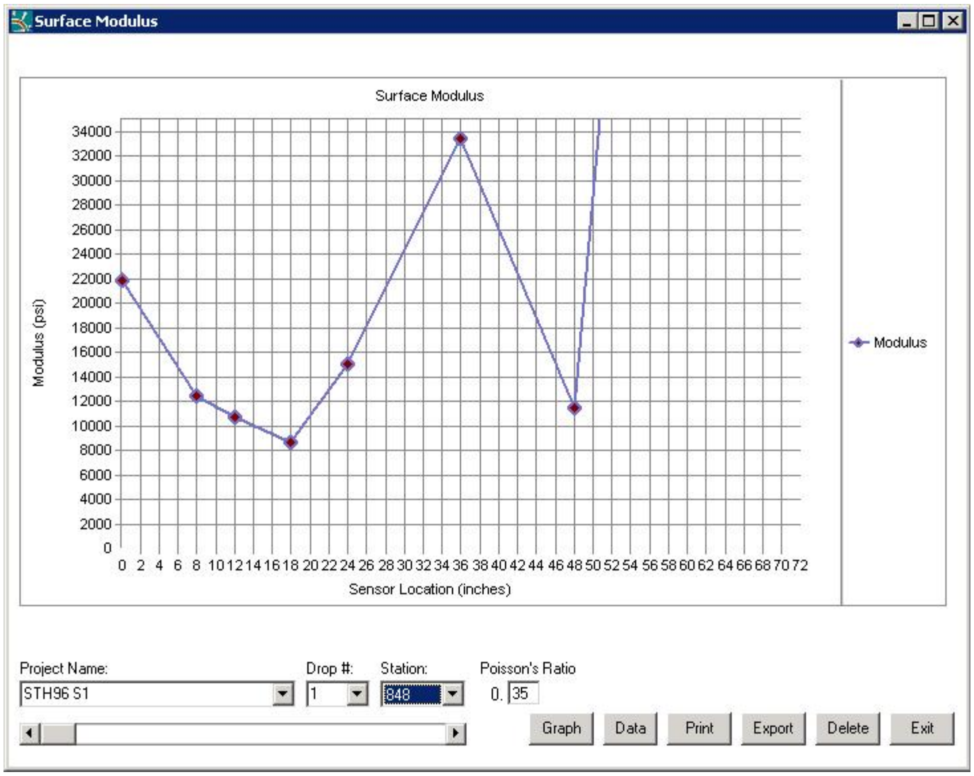
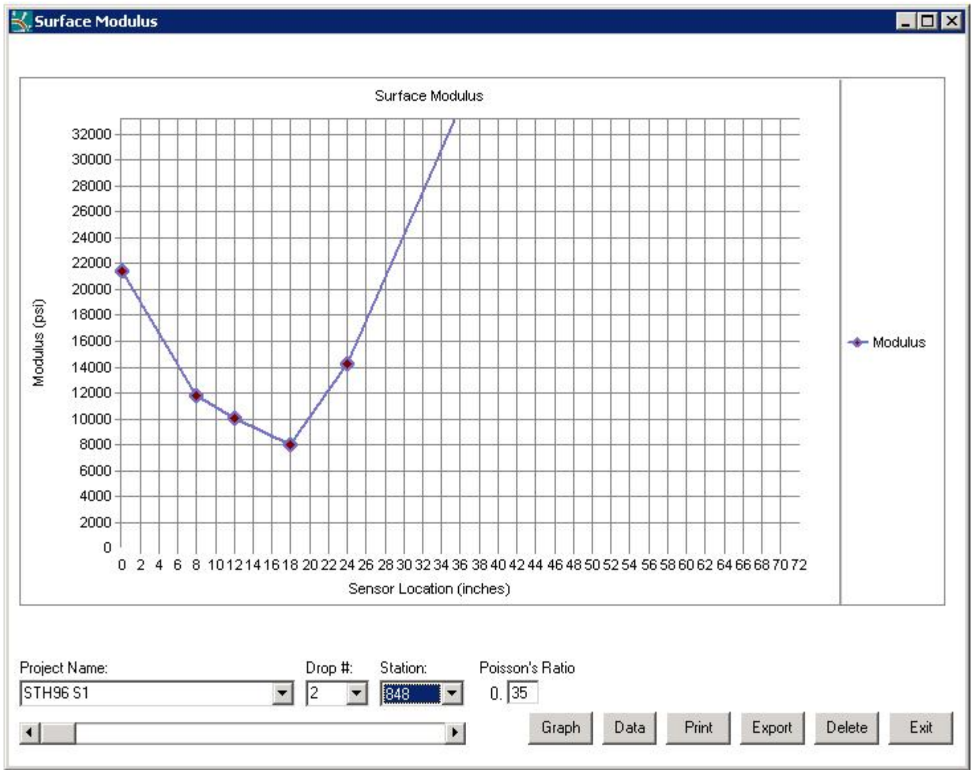


STH 96 S1 Station 848 Drop 1



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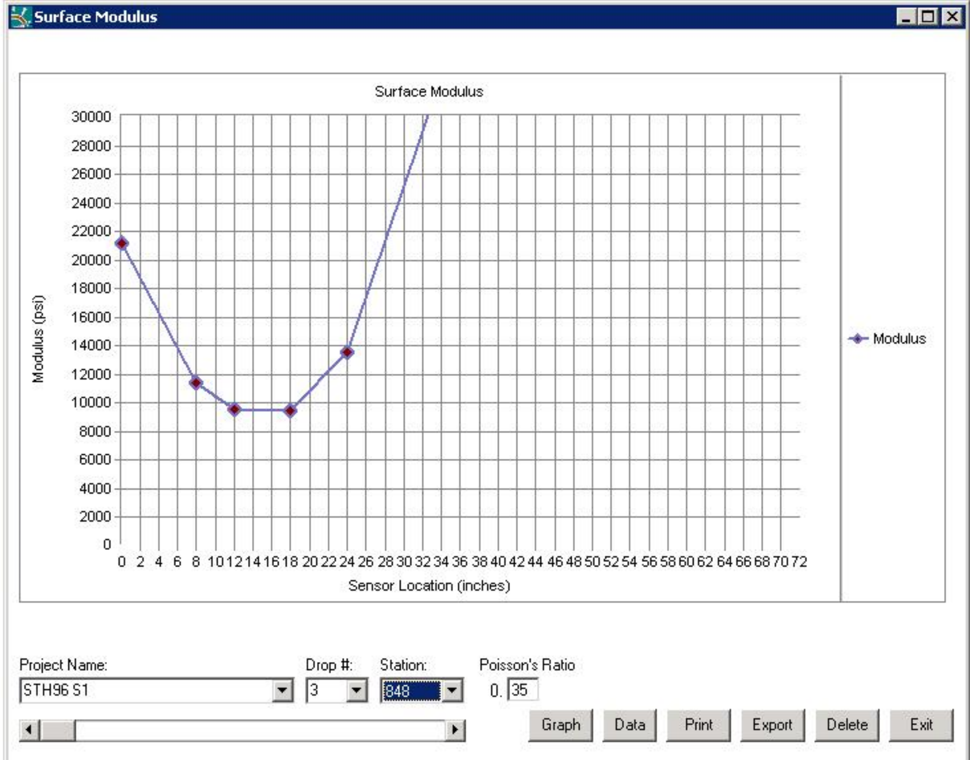

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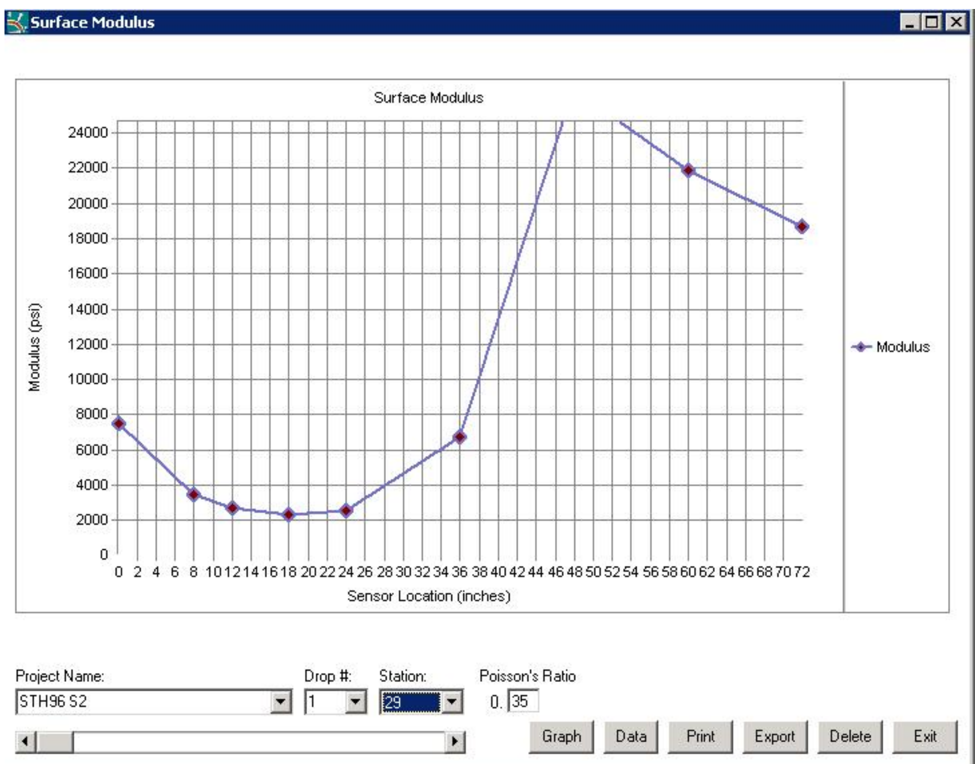
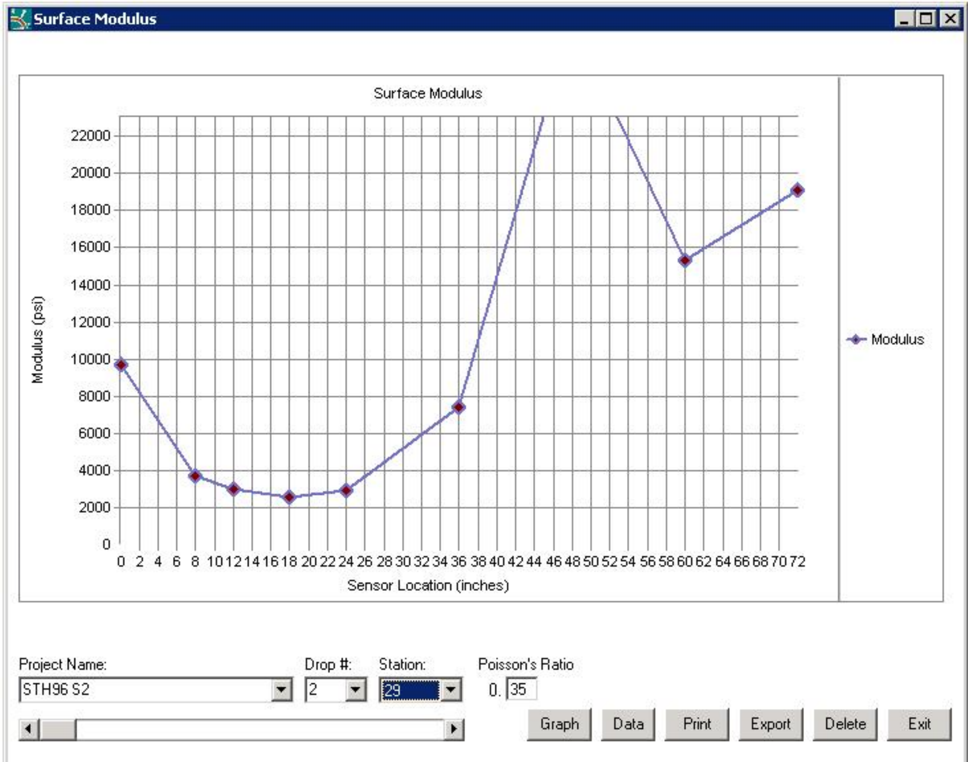


STH 96 S2 Station 29 Drop 1



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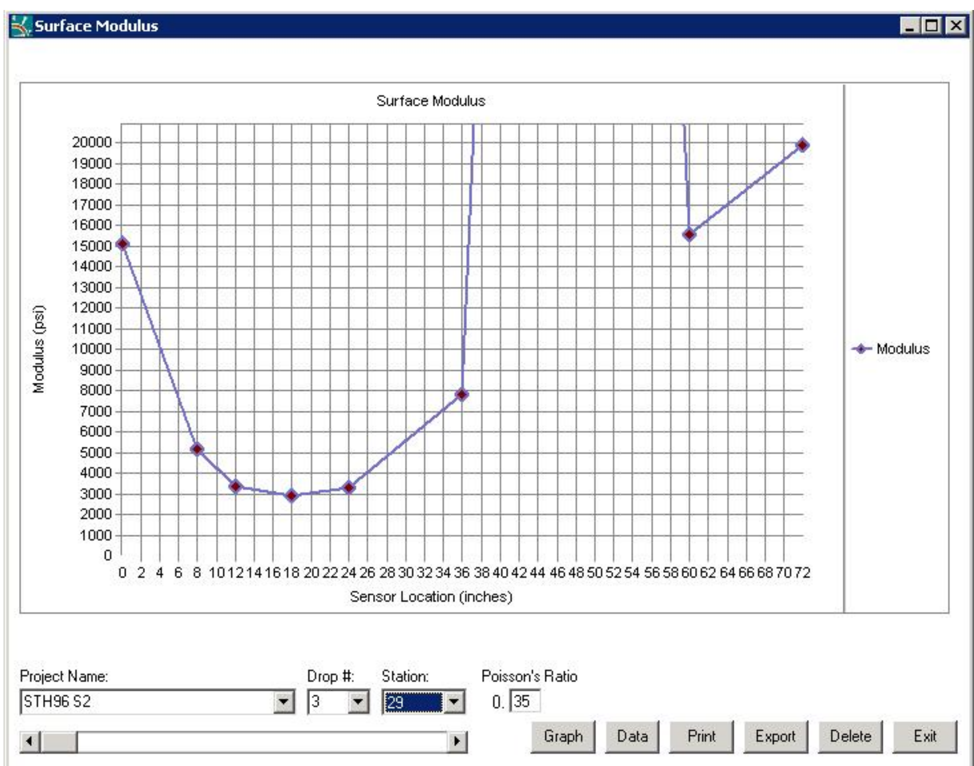

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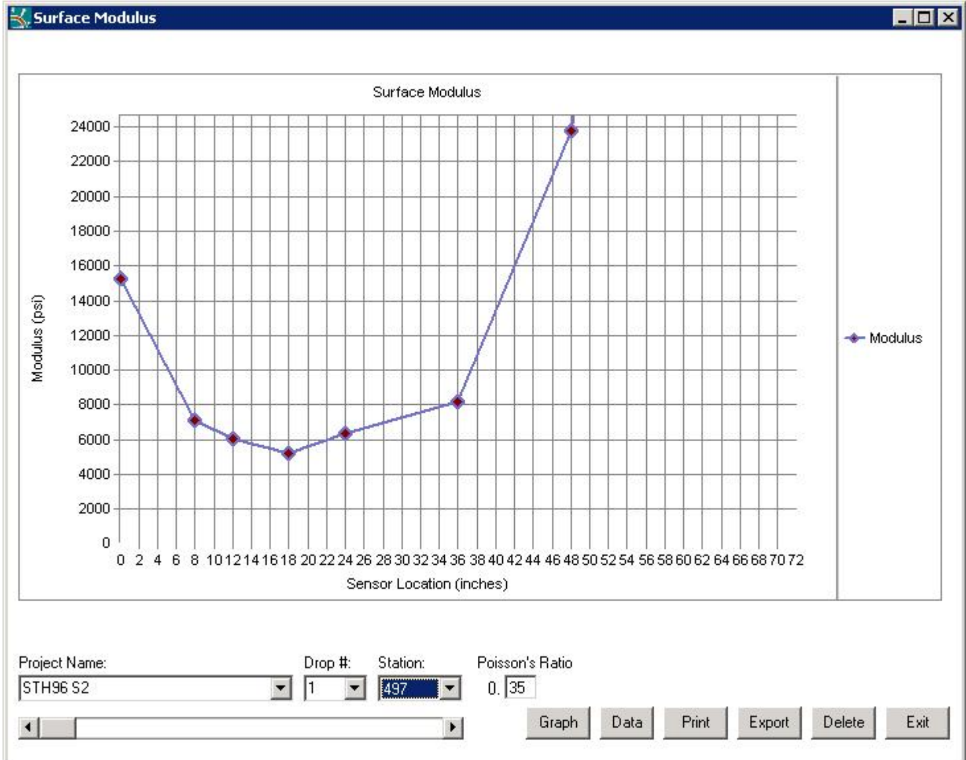
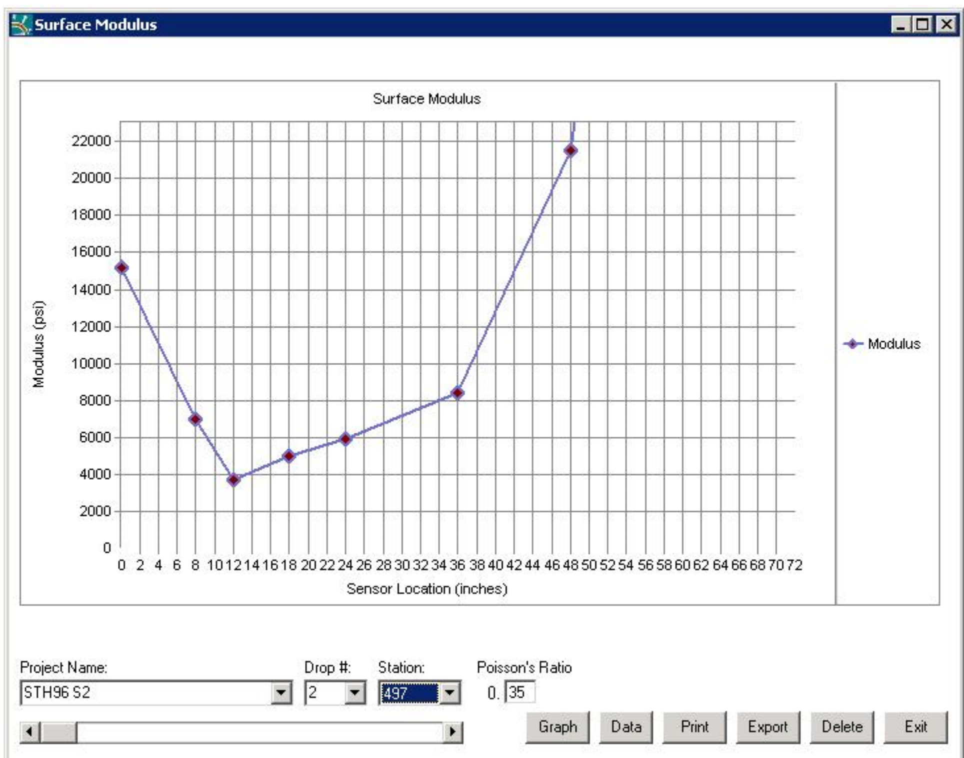
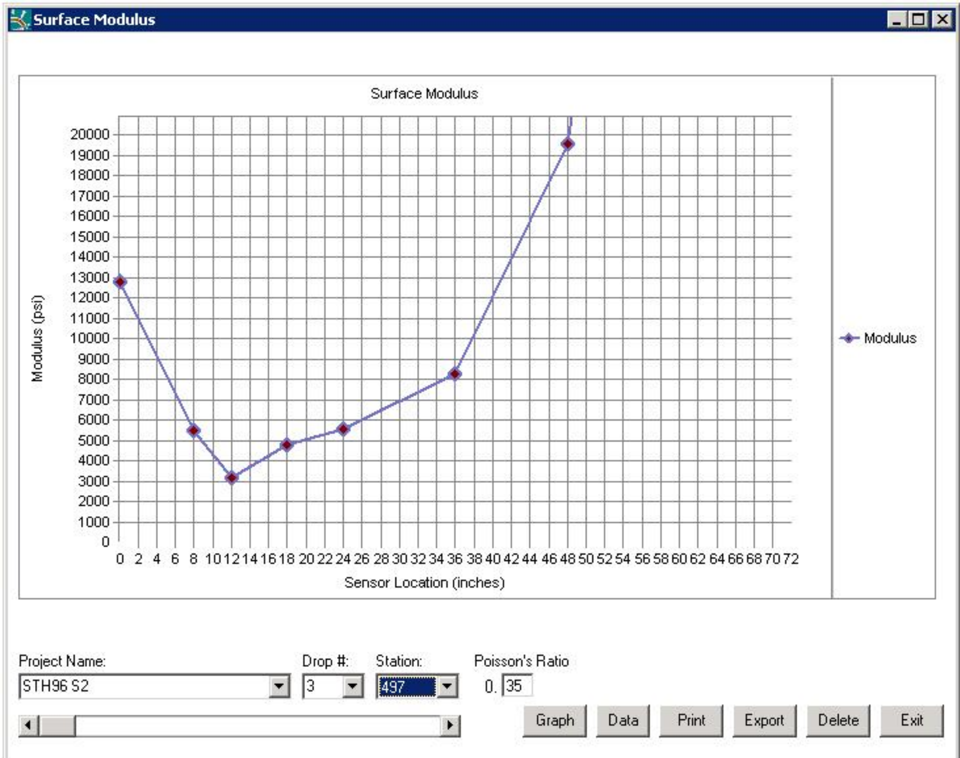


STH 96 S2 Station 497 Drop 1



STH 96 S2 Station 497 Drop 2



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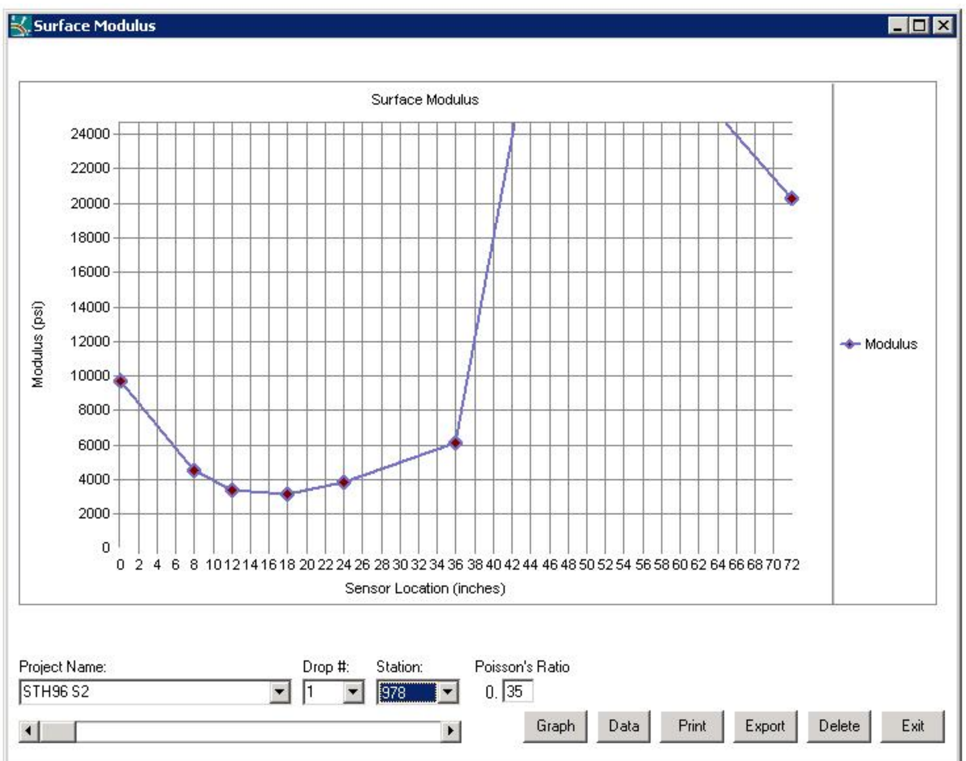
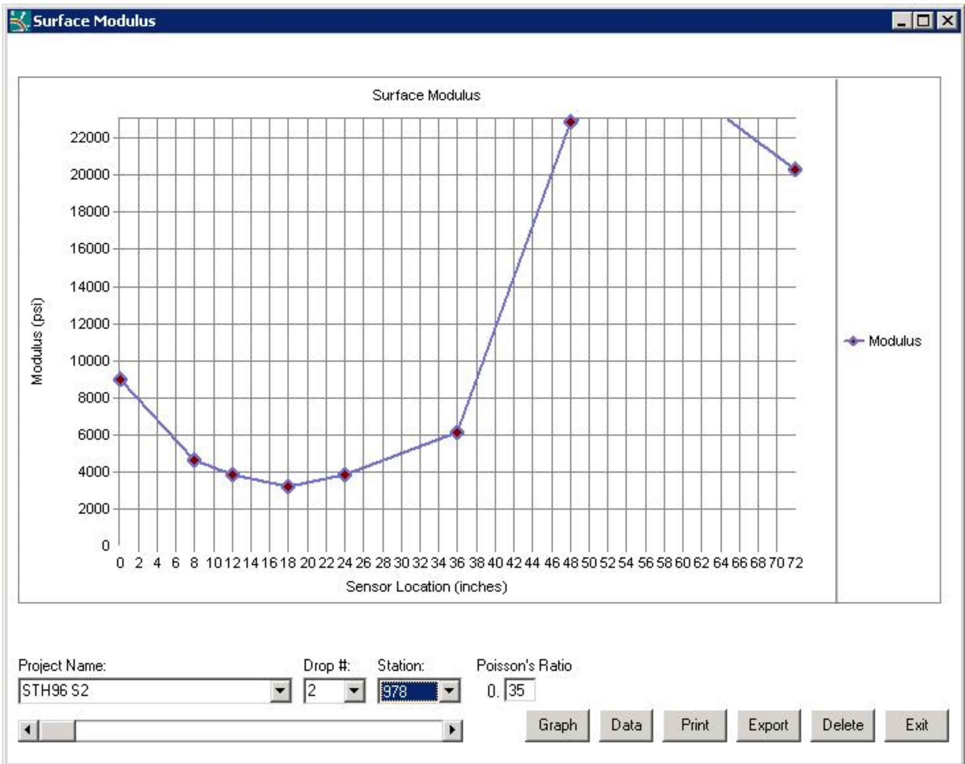


STH 96 S2 Station 978 Drop 1



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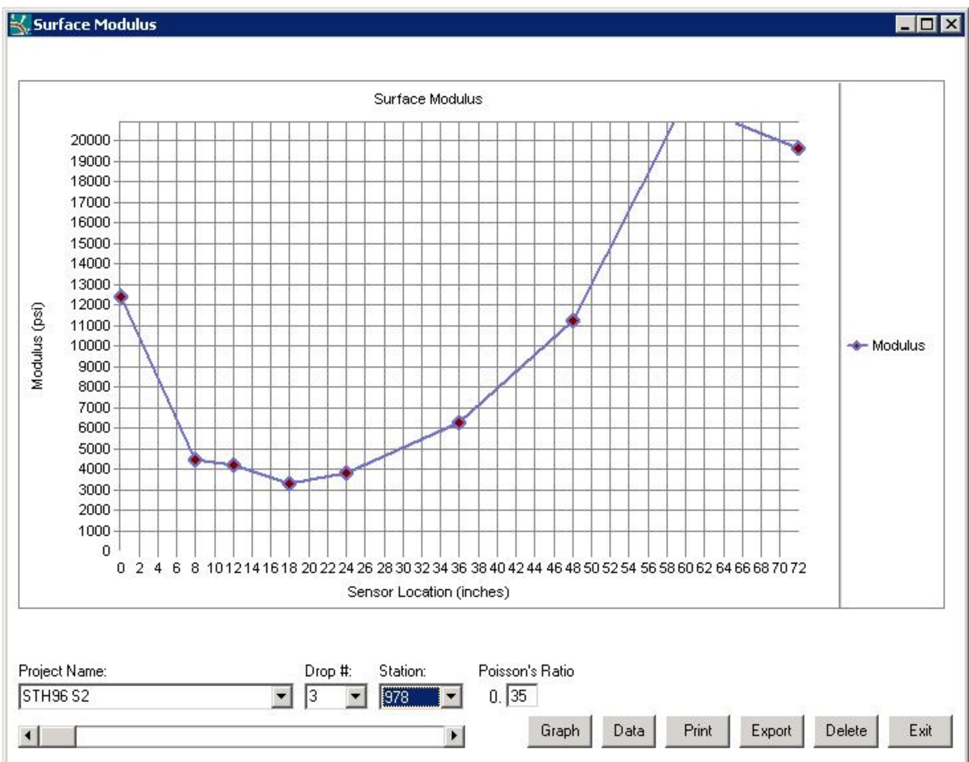

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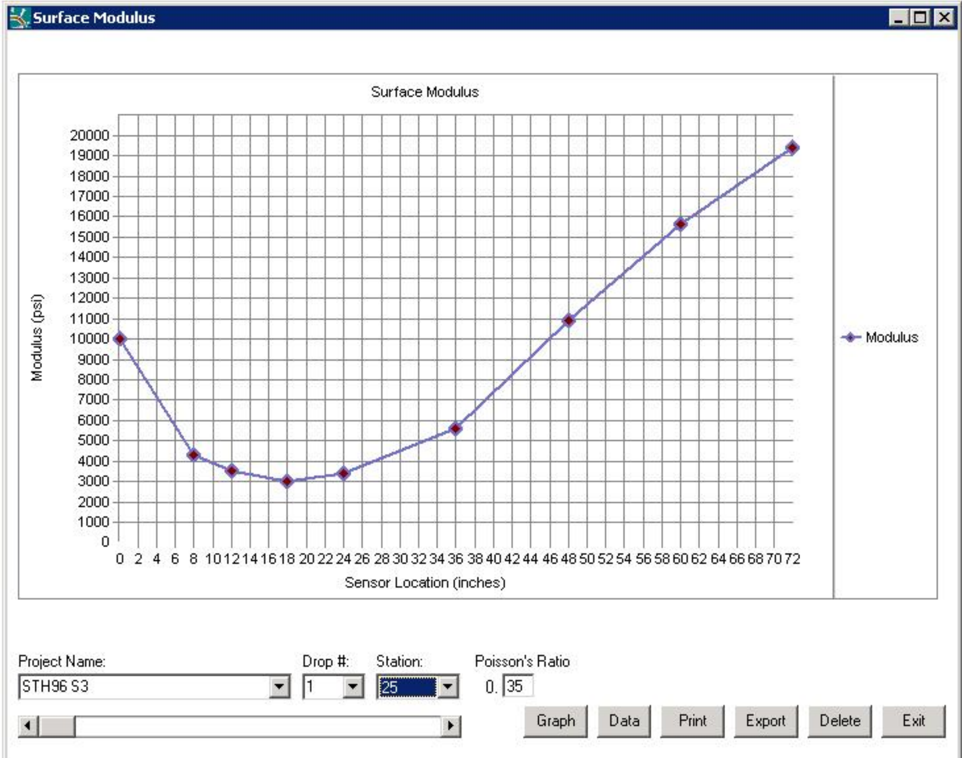
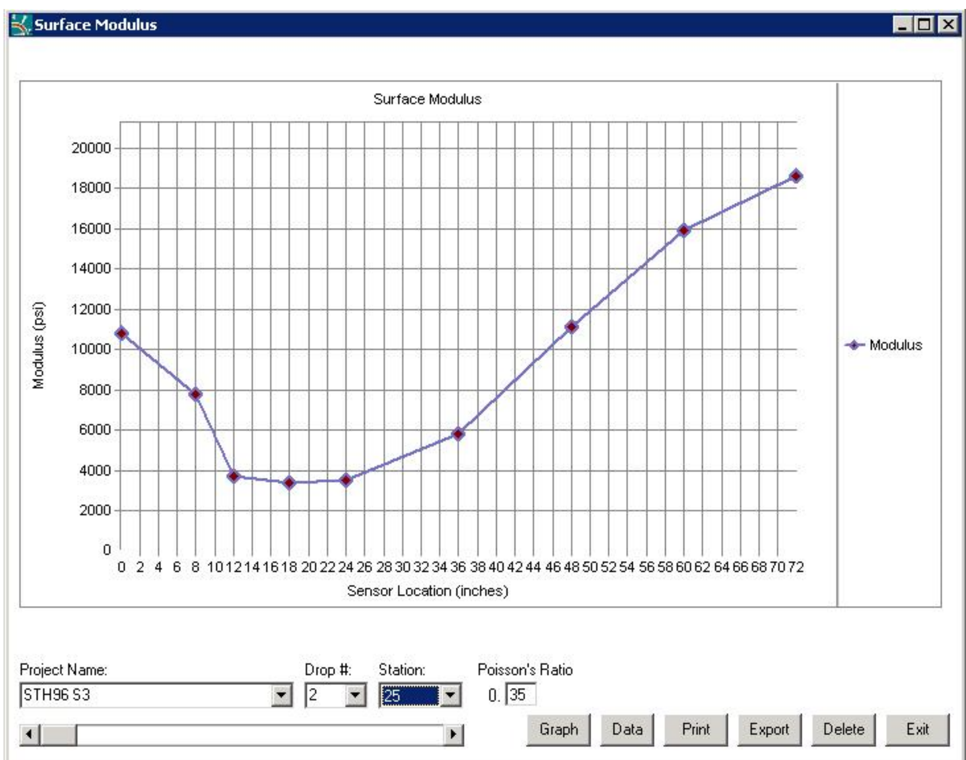
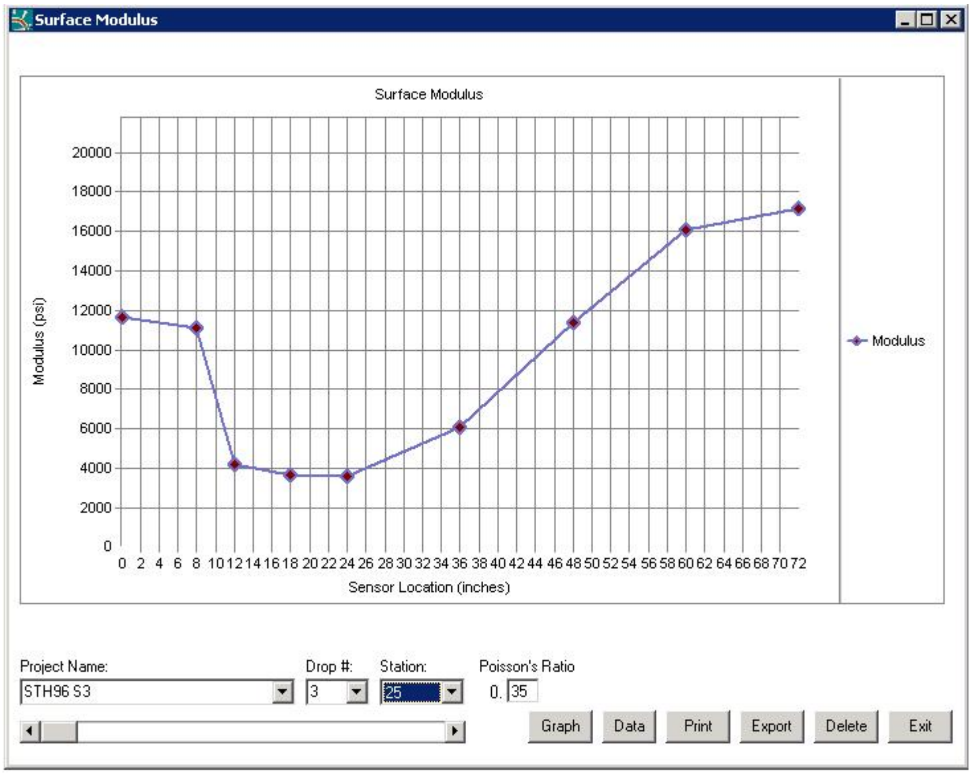


STH 96 S3 Station 25 Drop 1



STH 96 S3 Station 25 Drop 2



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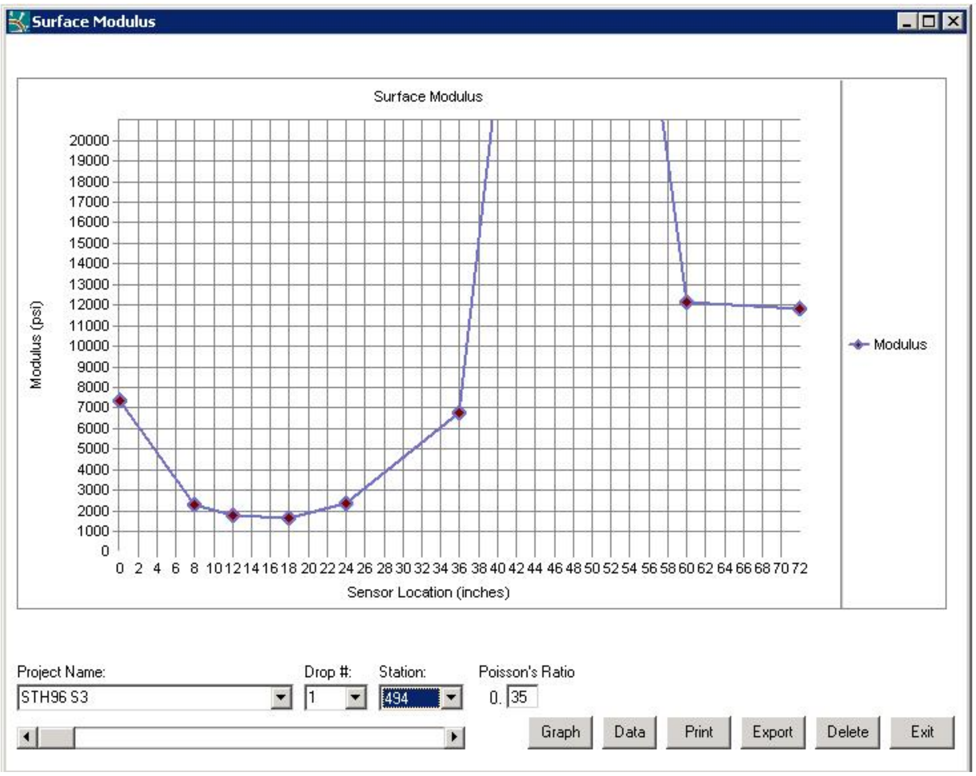
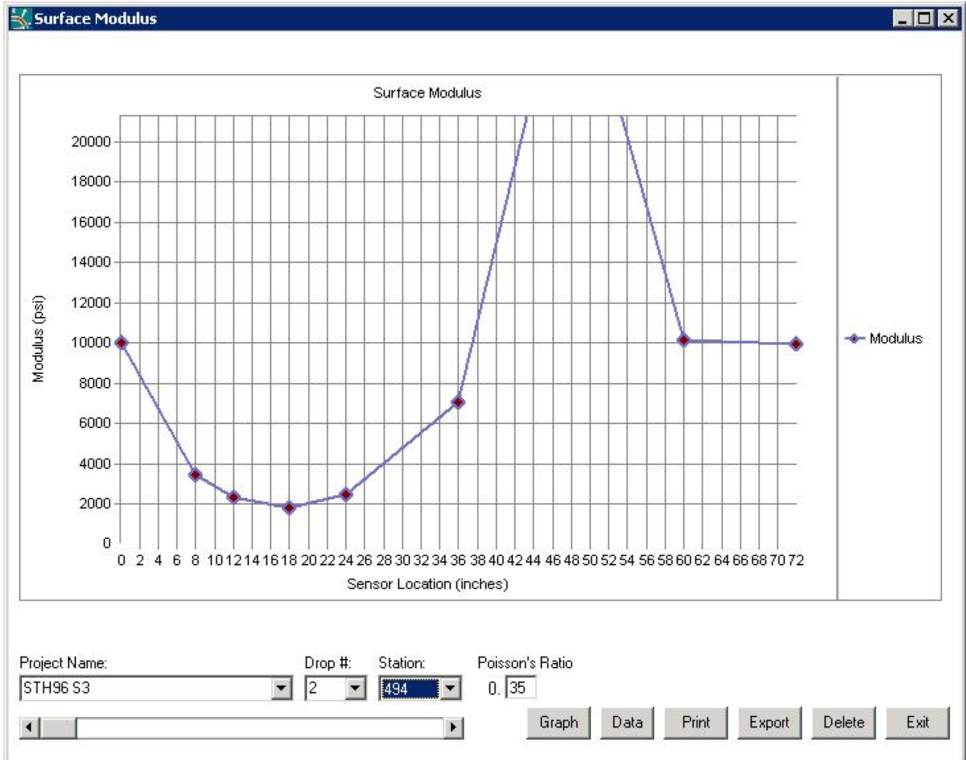


STH 96 S3 Station 494 Drop 1



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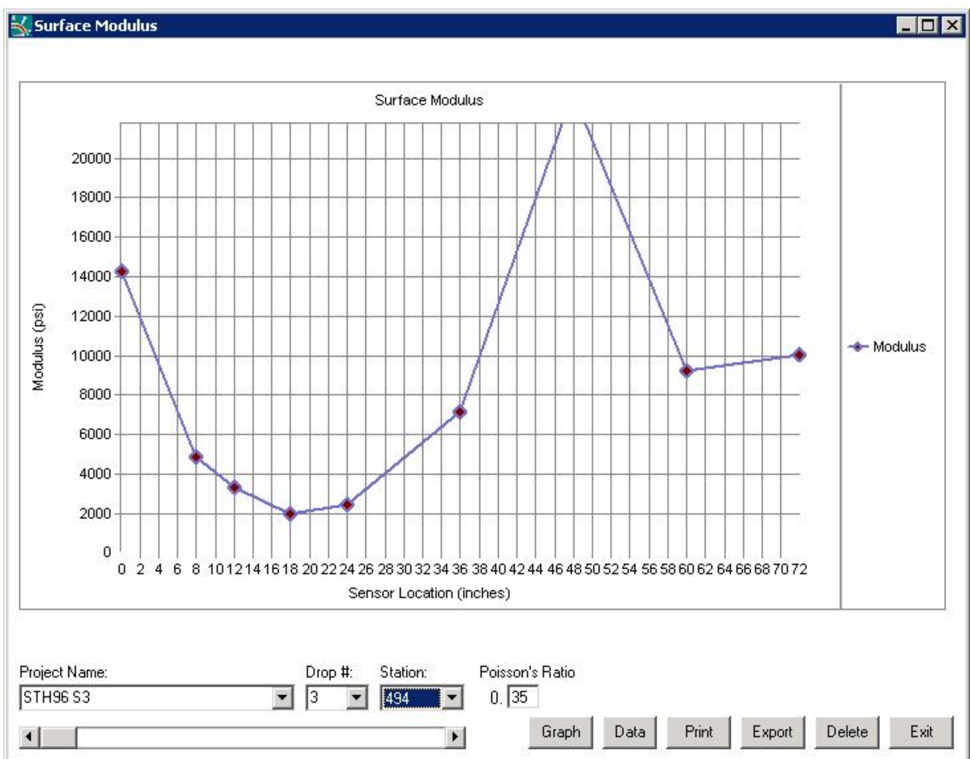
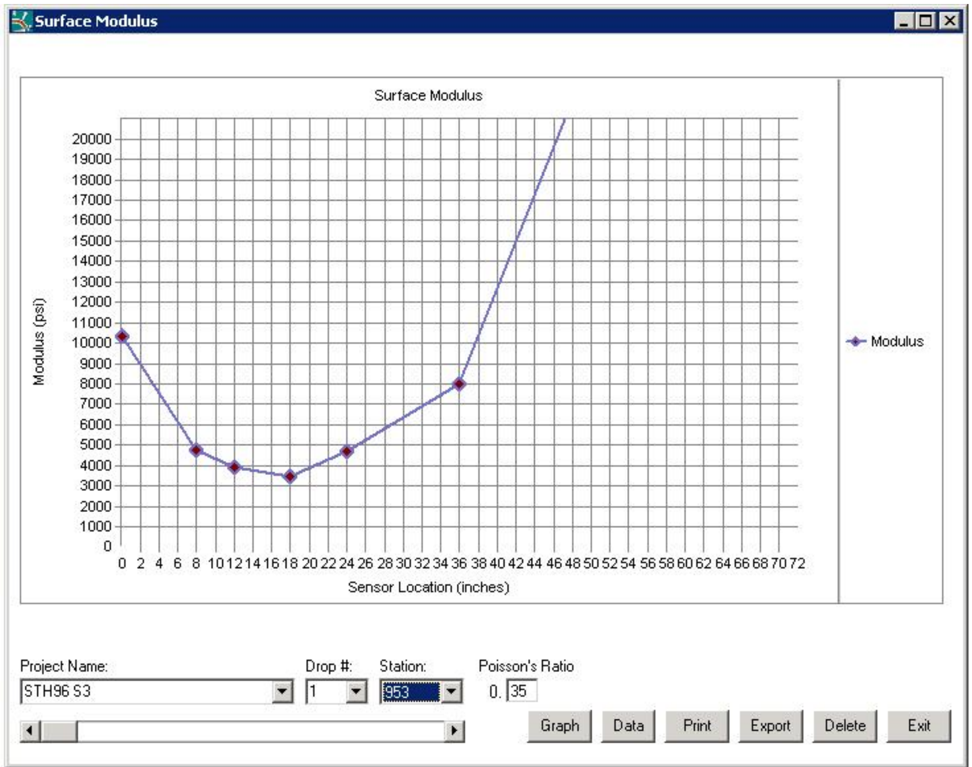
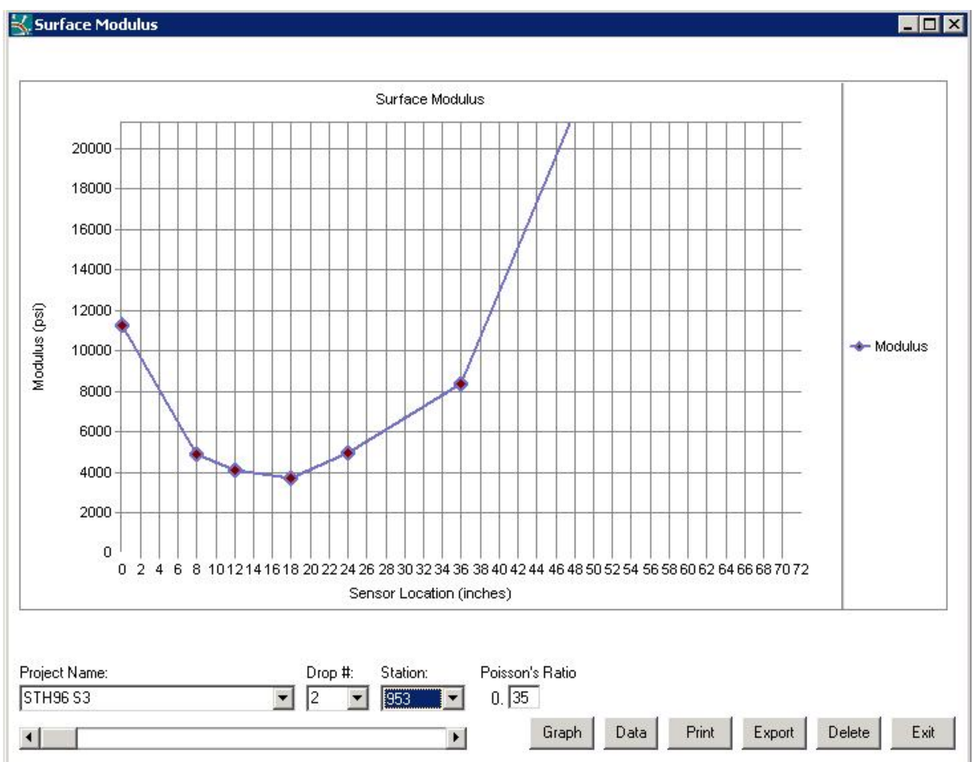


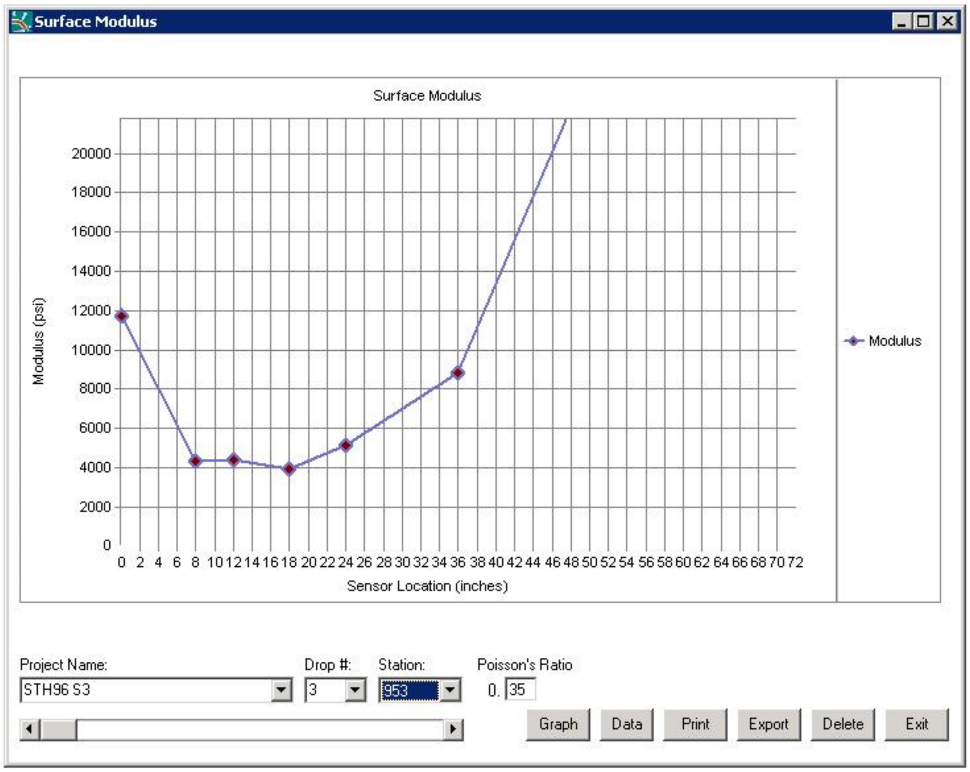
STH 96 S3 Station 494 Drop 3



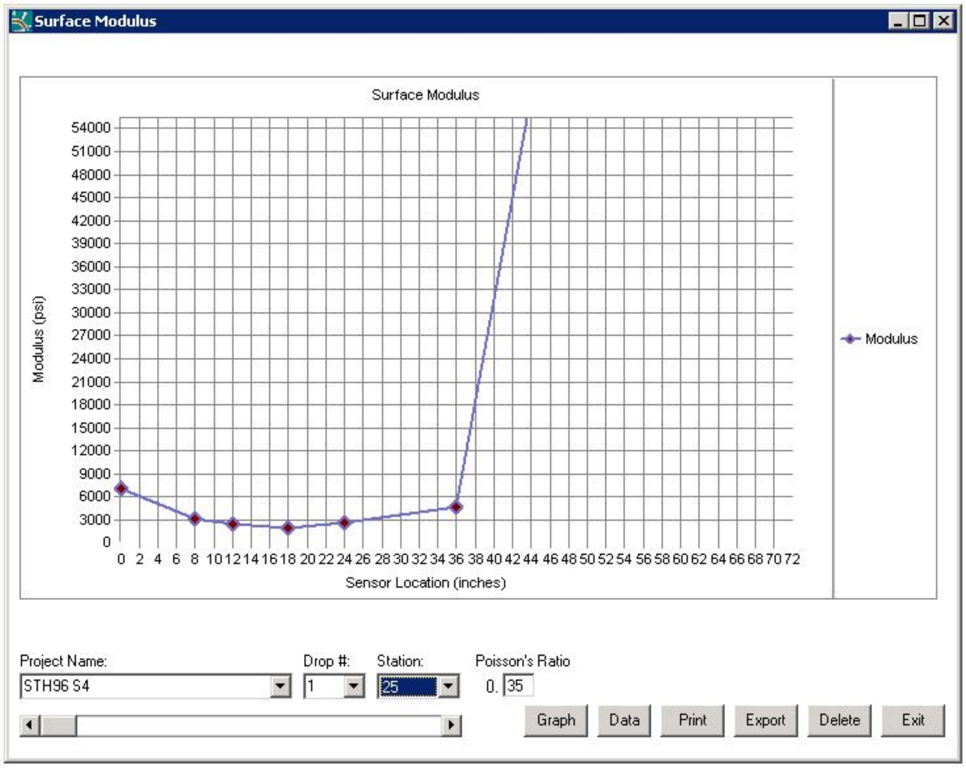
STH 96 S3 Station 953 Drop 1



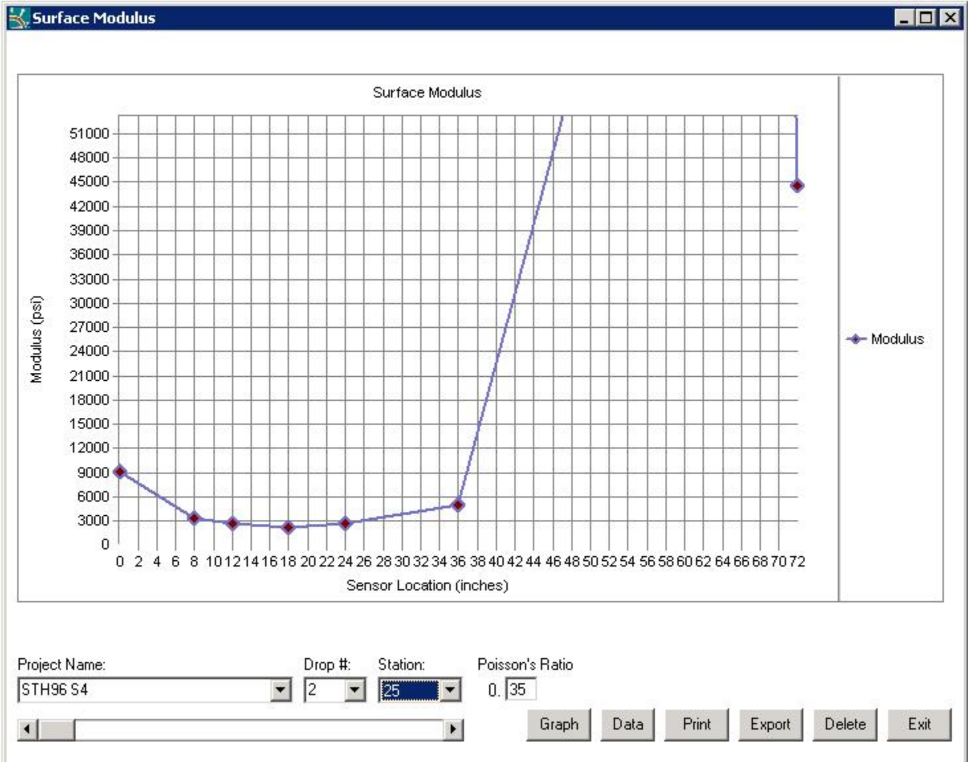
STH 96 S3 Station 953 Drop 2



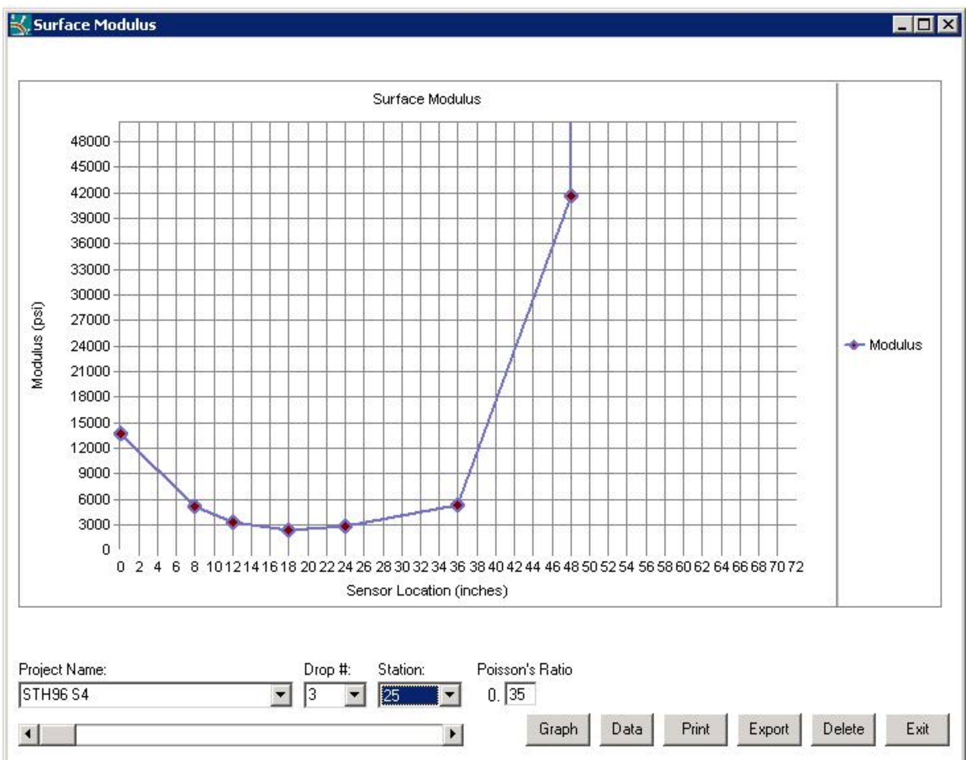
STH 96 S3 Station 953 Drop 3



STH 96 S4 Station 25 Drop 1



STH 96 S4 Station 25 Drop 2



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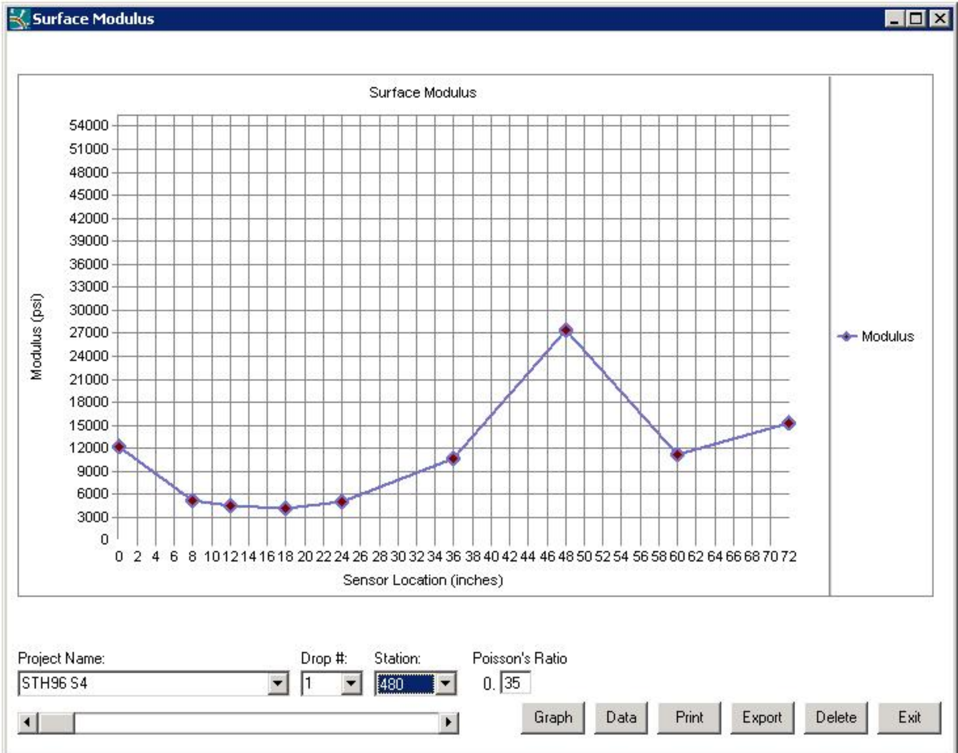

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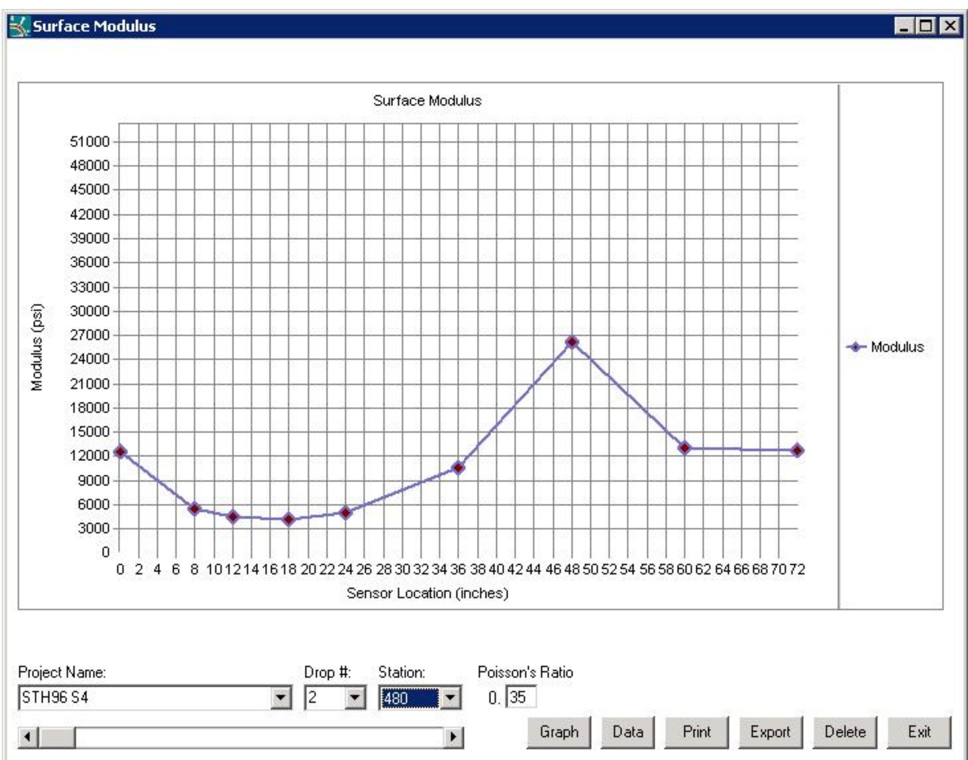
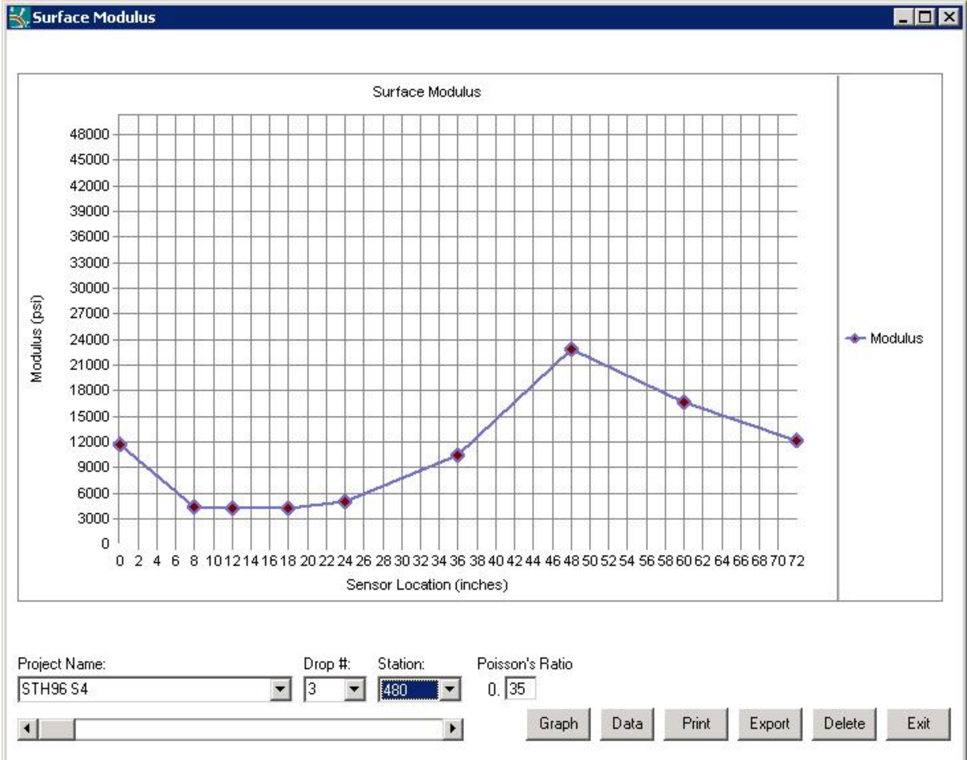
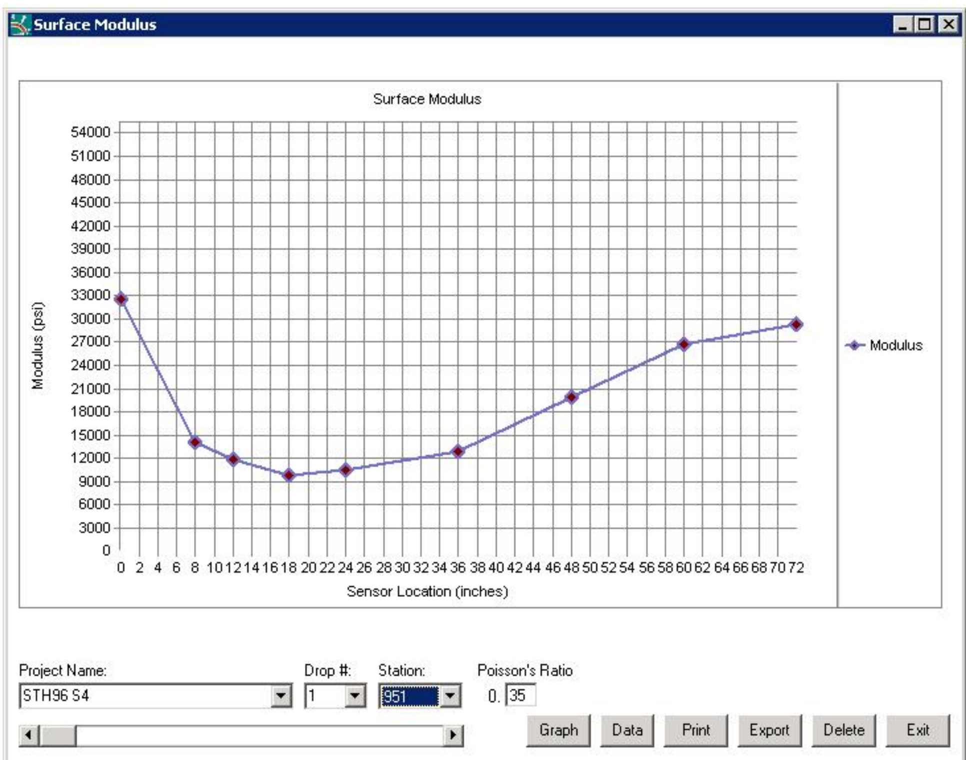


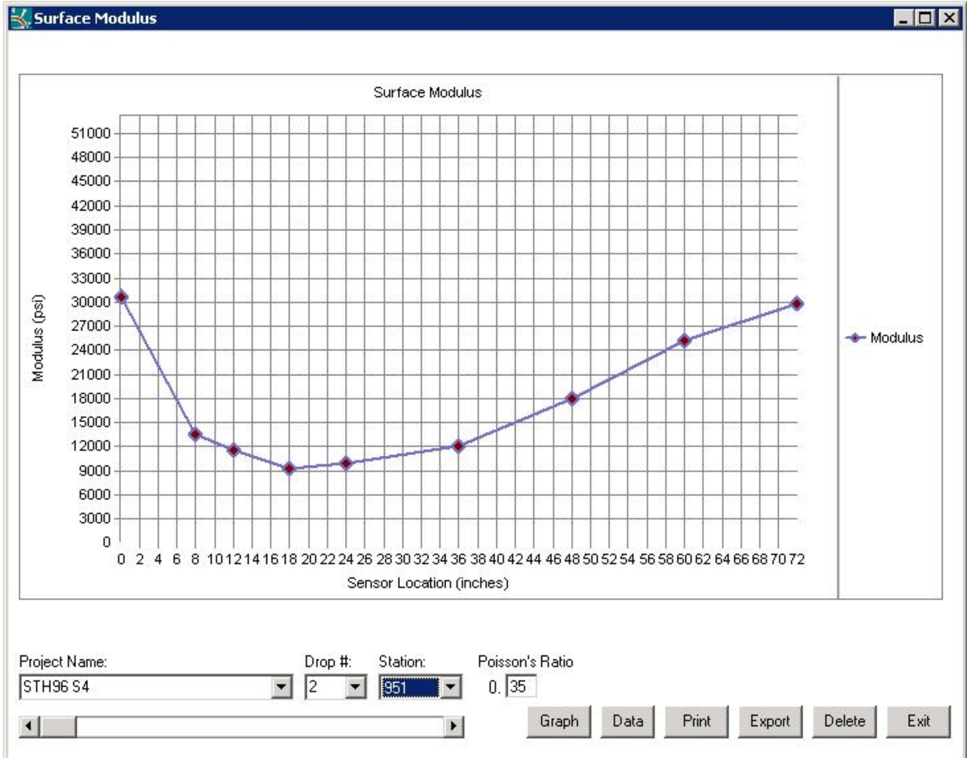
STH 96 S4 Station 480 Drop 2



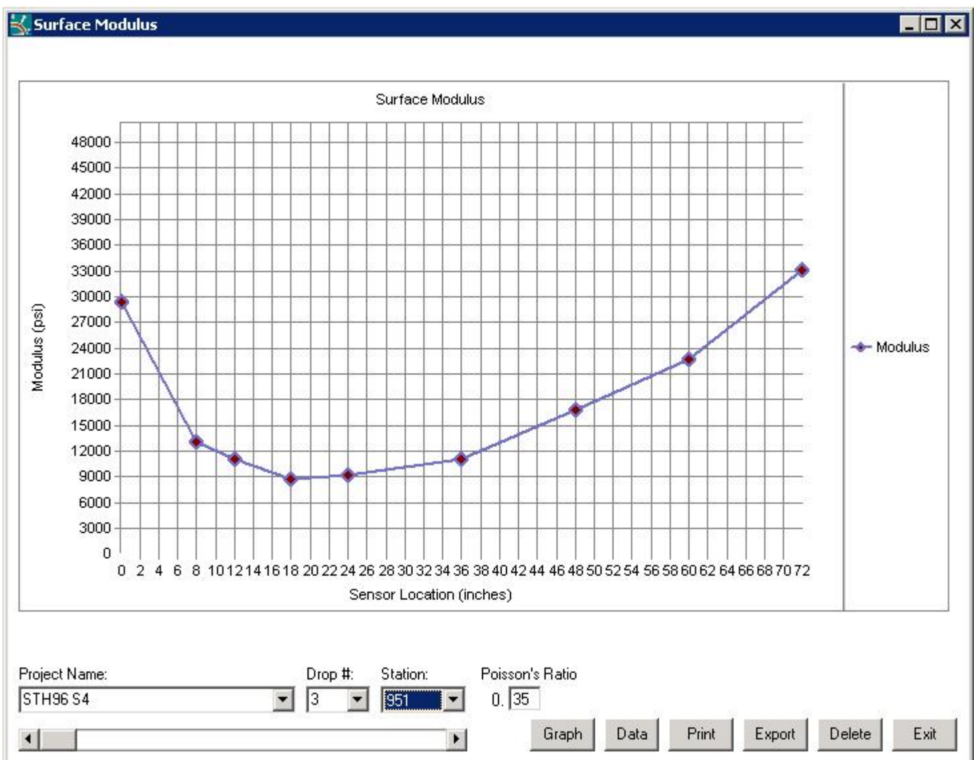
STH 96 S4 Station 480 Drop 3



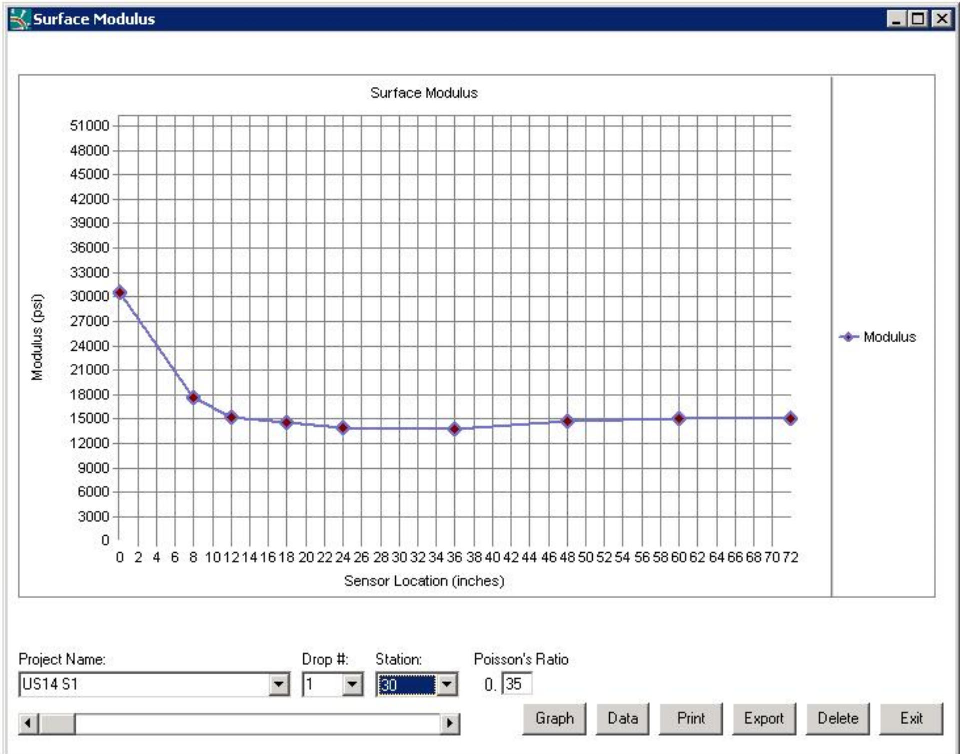
STH 96 S4 Station 951 Drop 1



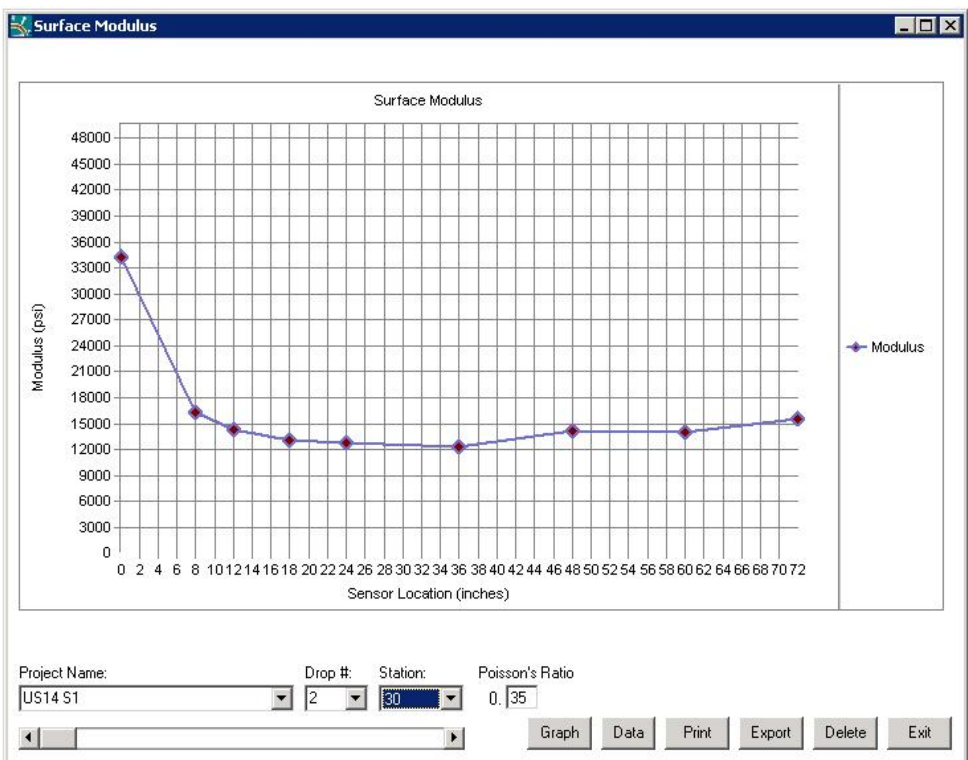
STH 96 S4 Station 951 Drop 1



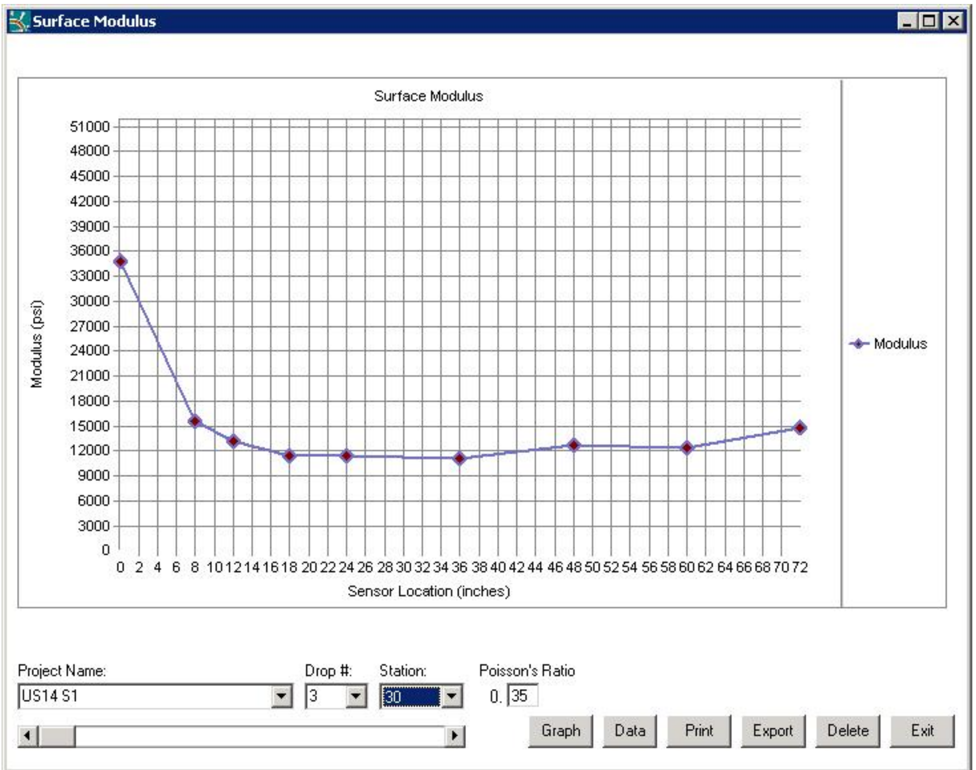
STH 96 S4 Station 951 Drop 1



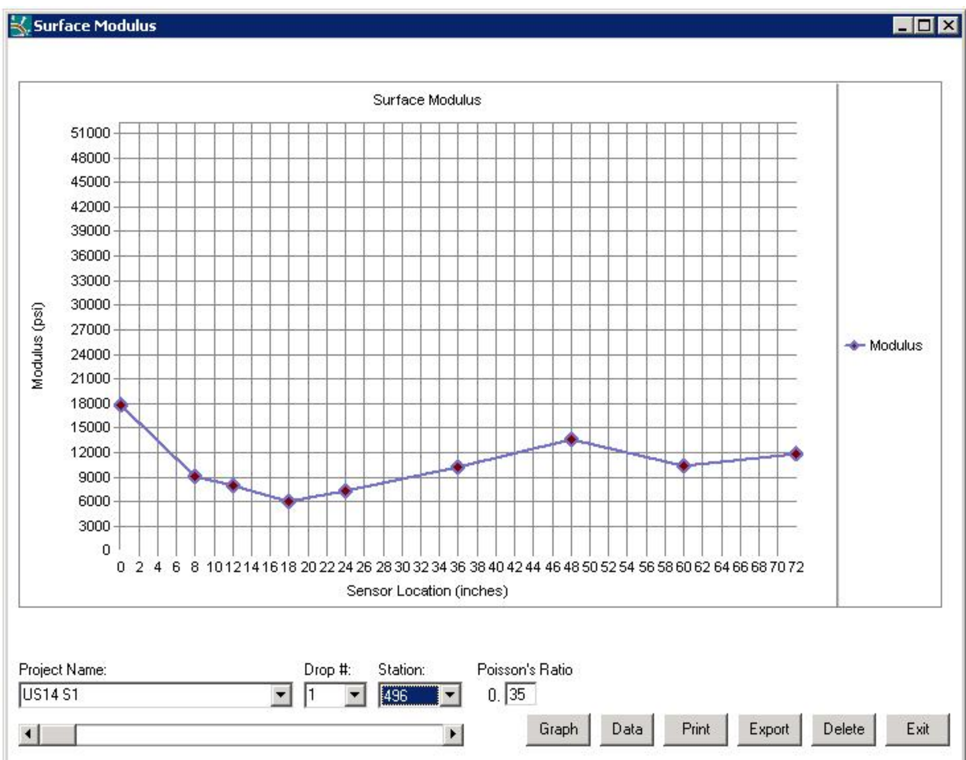
US14 S1 Station 30 Drop 1



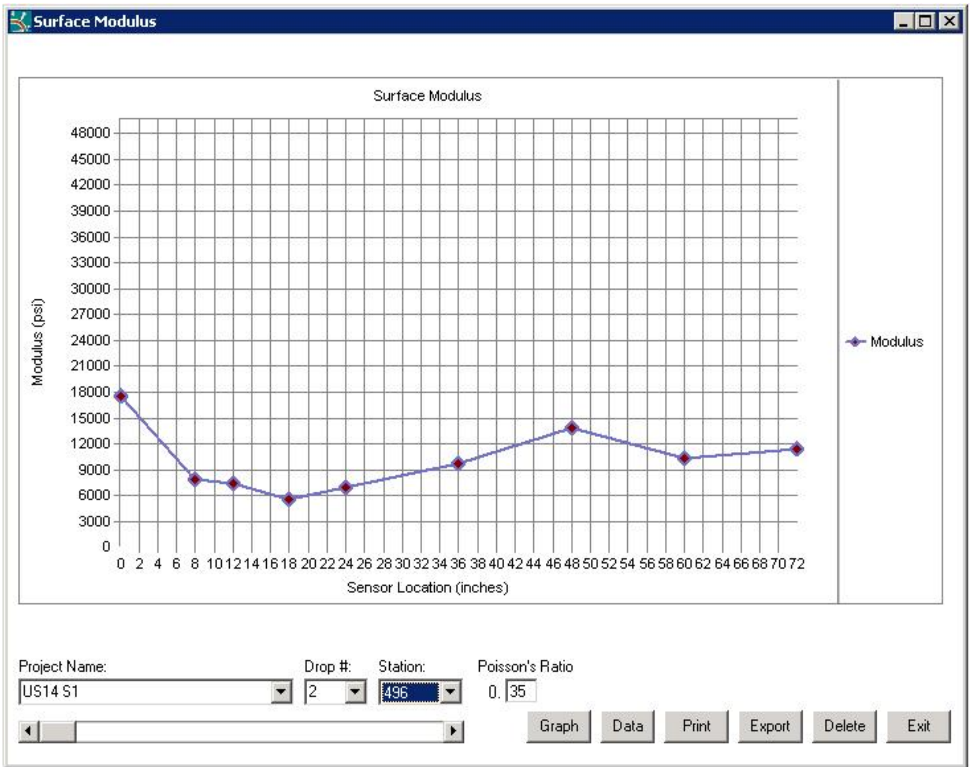
US14 S1 Station 30 Drop 2



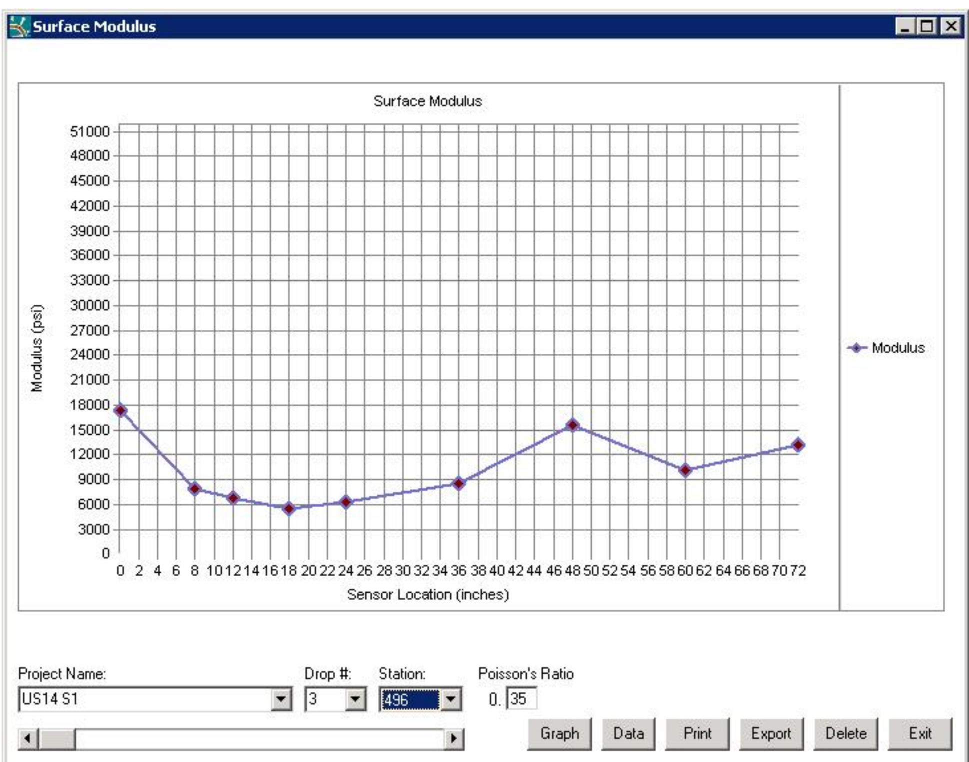
US14 S1 Station 30 Drop 3



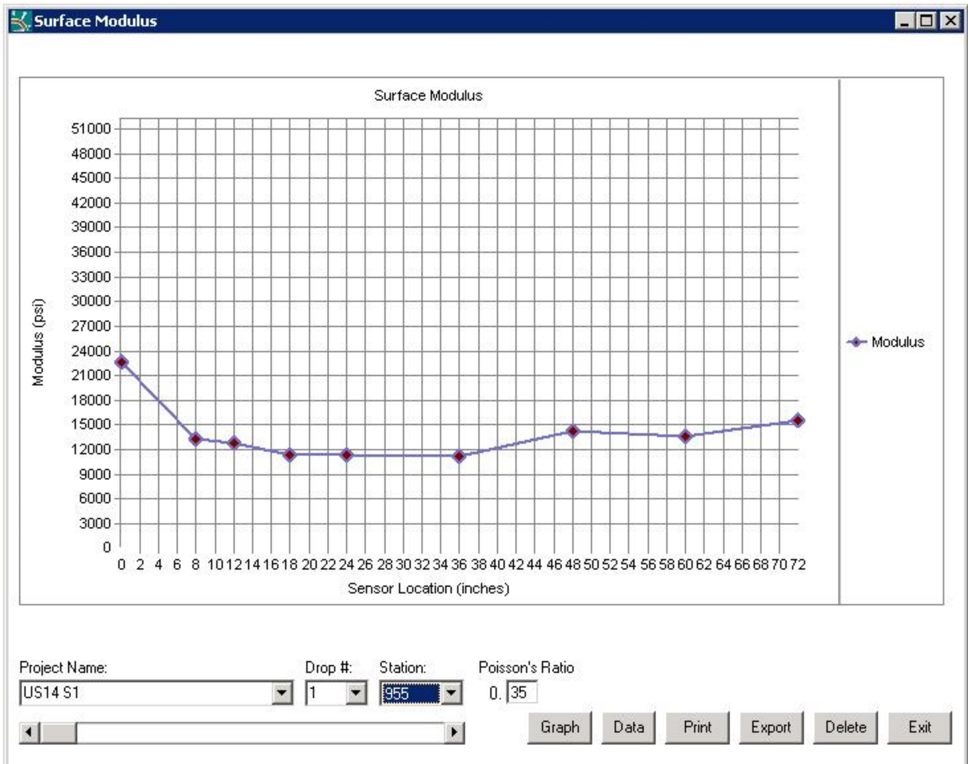
US14 S1 Station 496 Drop 1



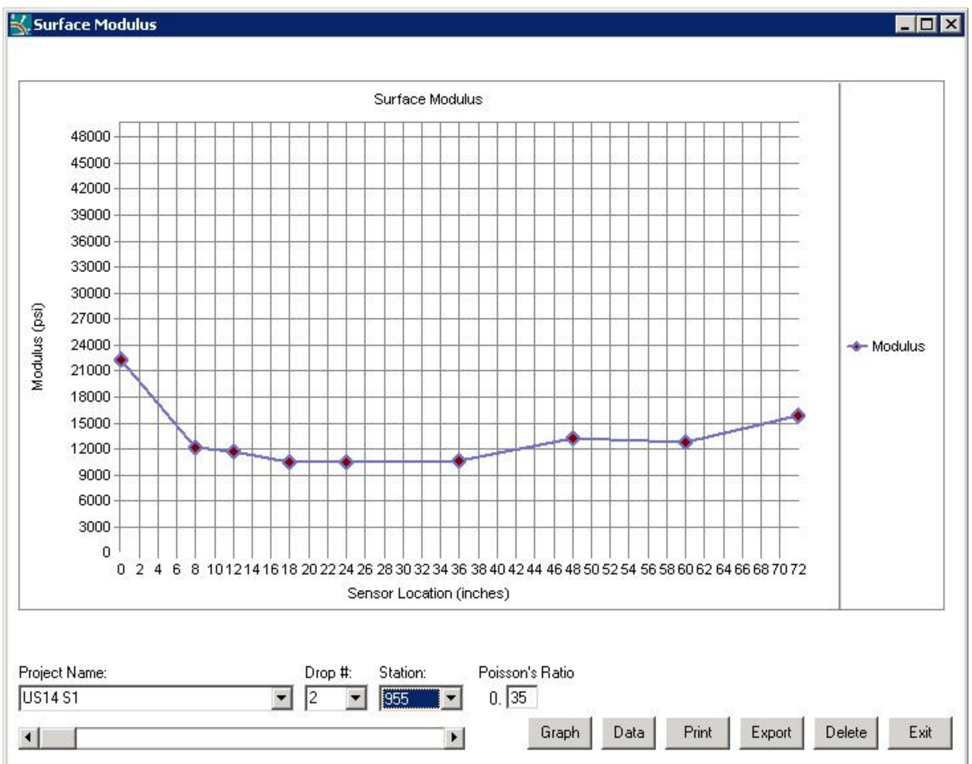
US14 S1 Station 496 Drop 2



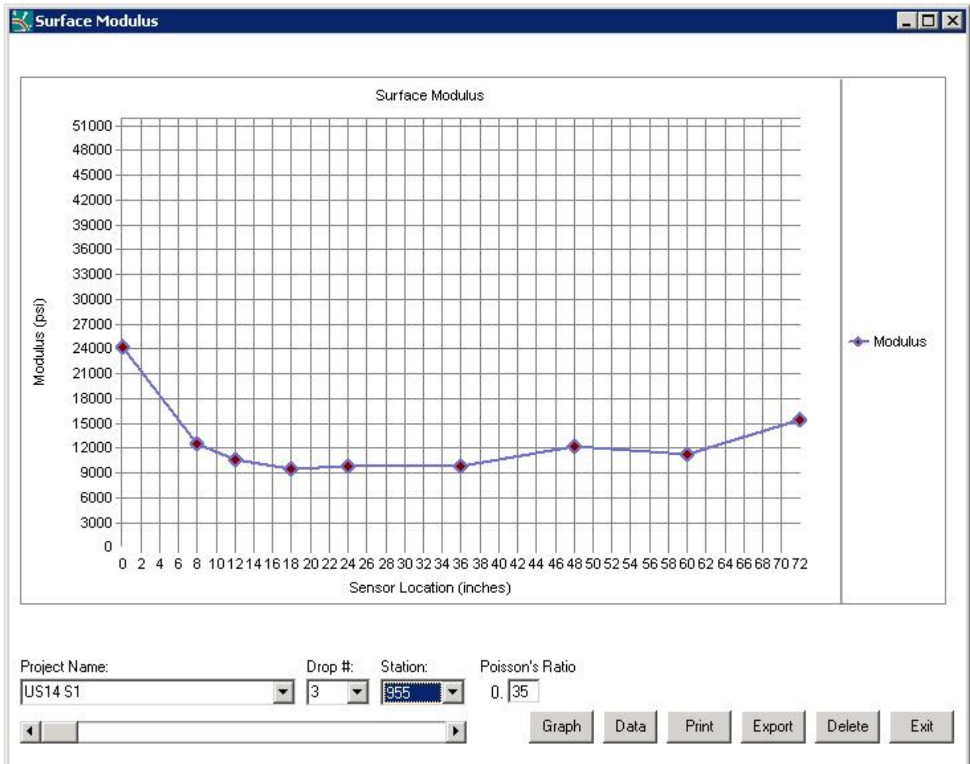
US14 S1 Station 496 Drop 3



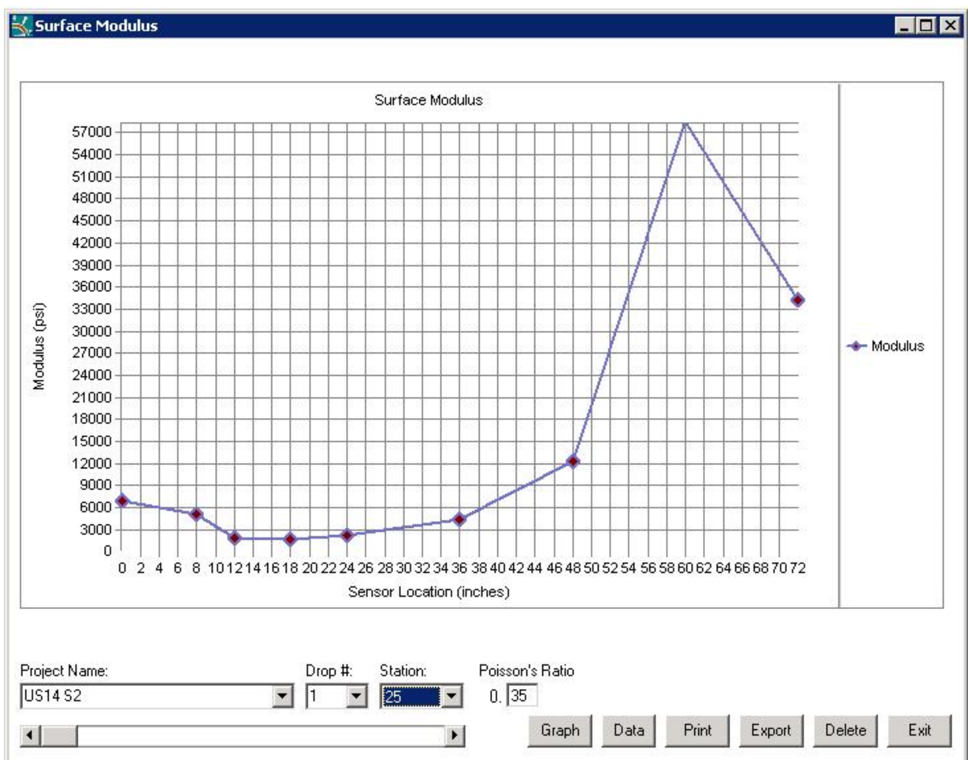
US14 S1 Station 955 Drop 1



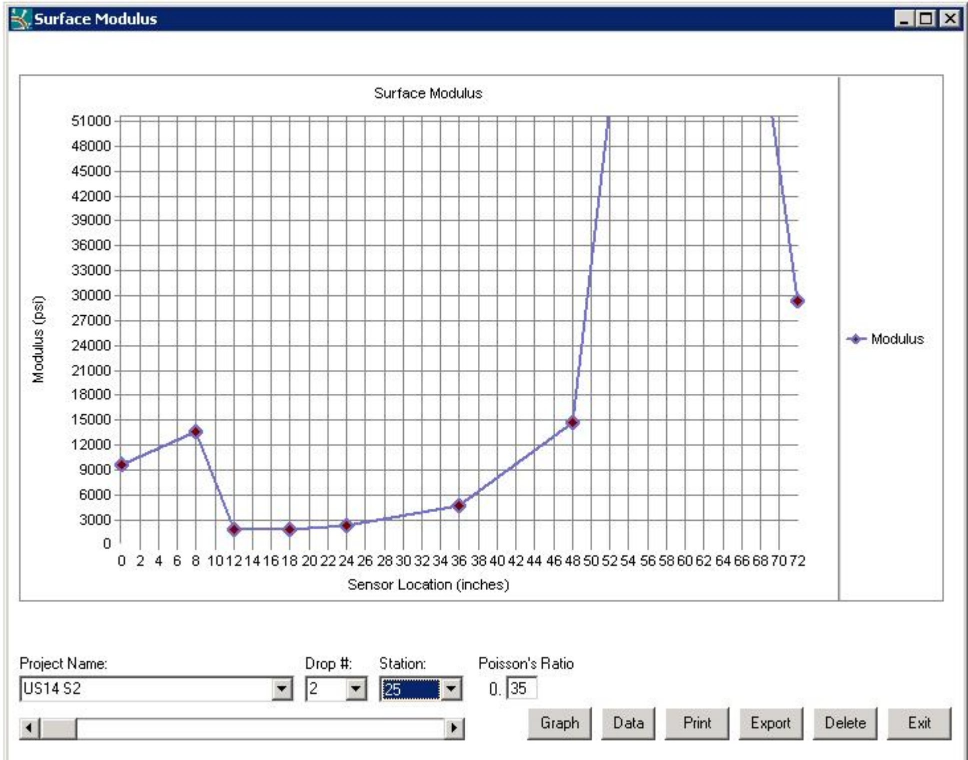
US14 S1 Station 955 Drop 2



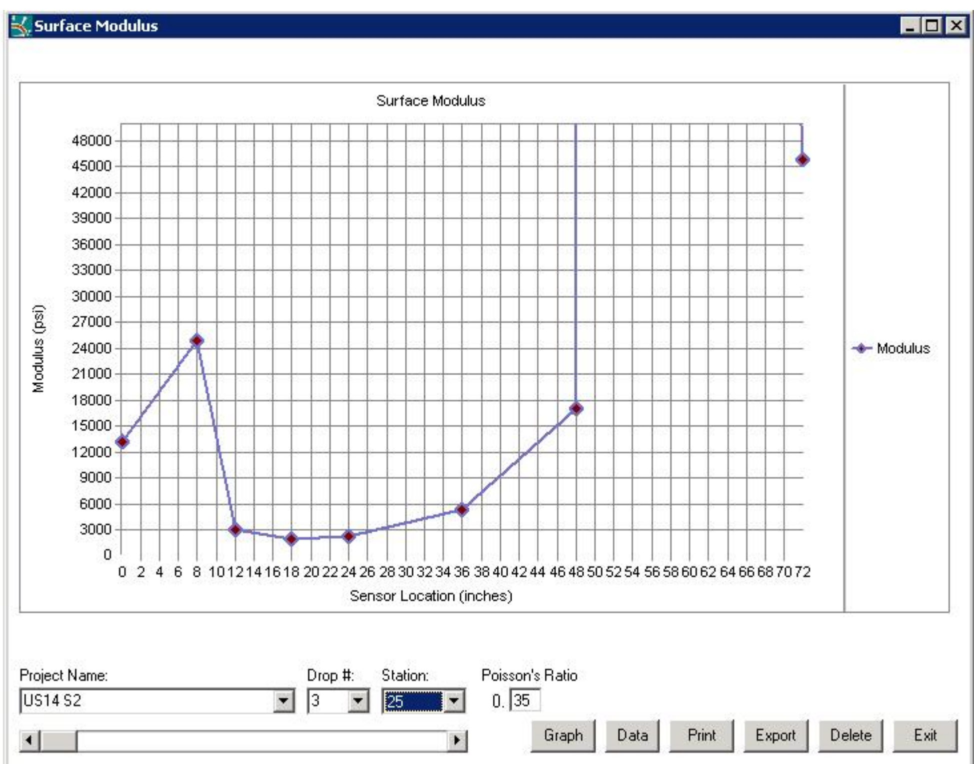
US14 S1 Station 955 Drop 3



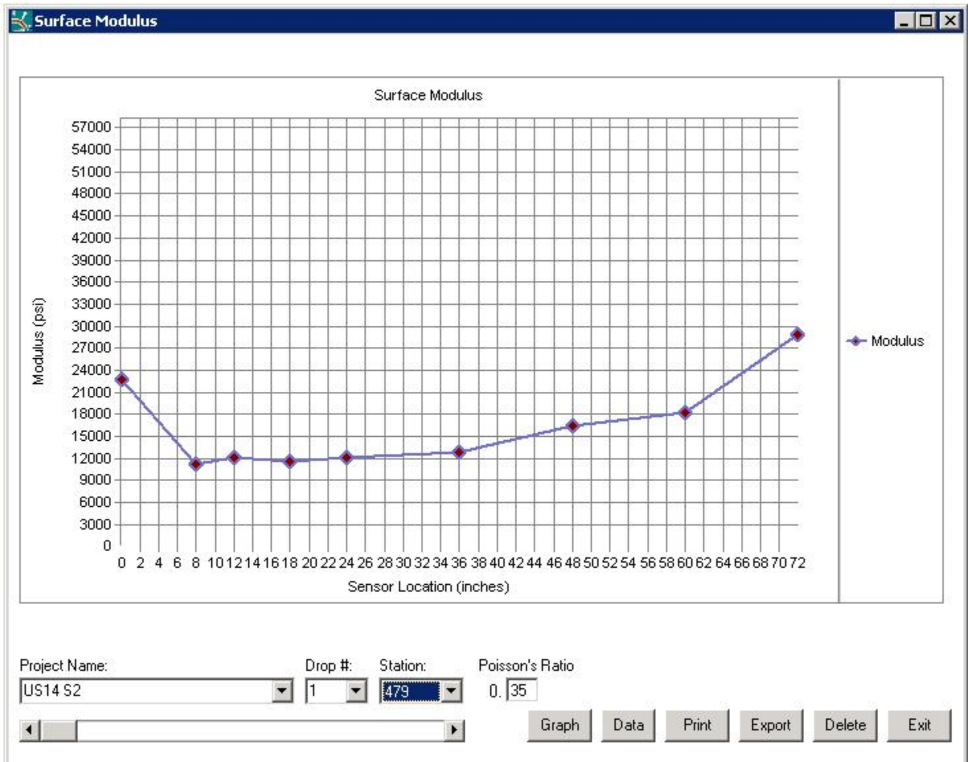
US14 S2 Station 25 Drop 1



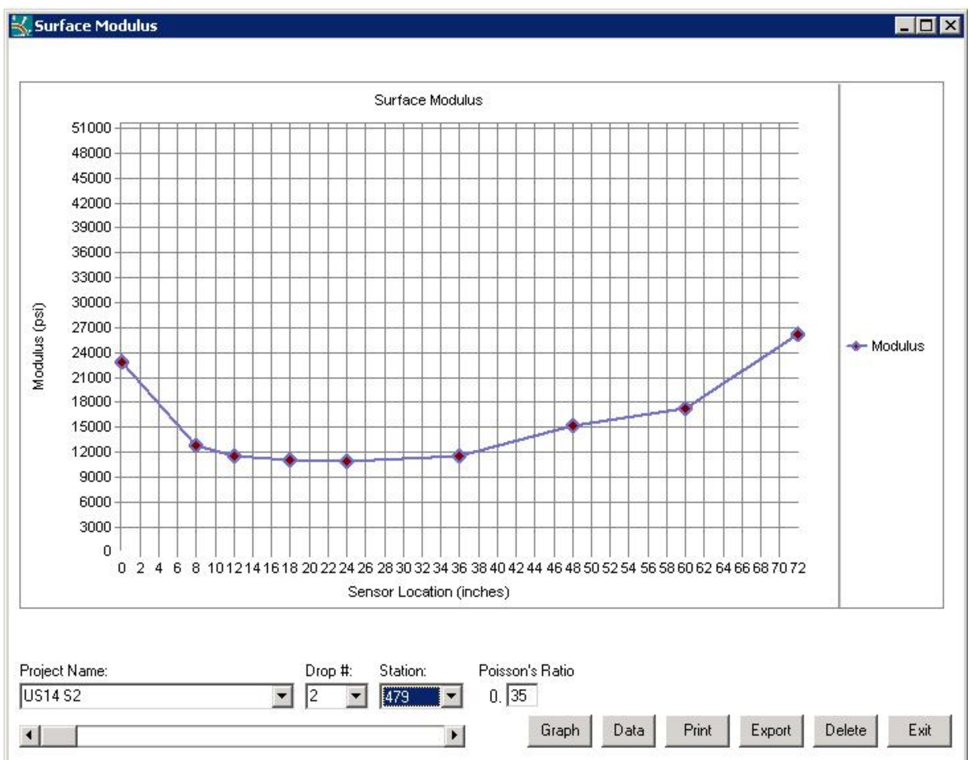
US14 S2 Station 25 Drop 2



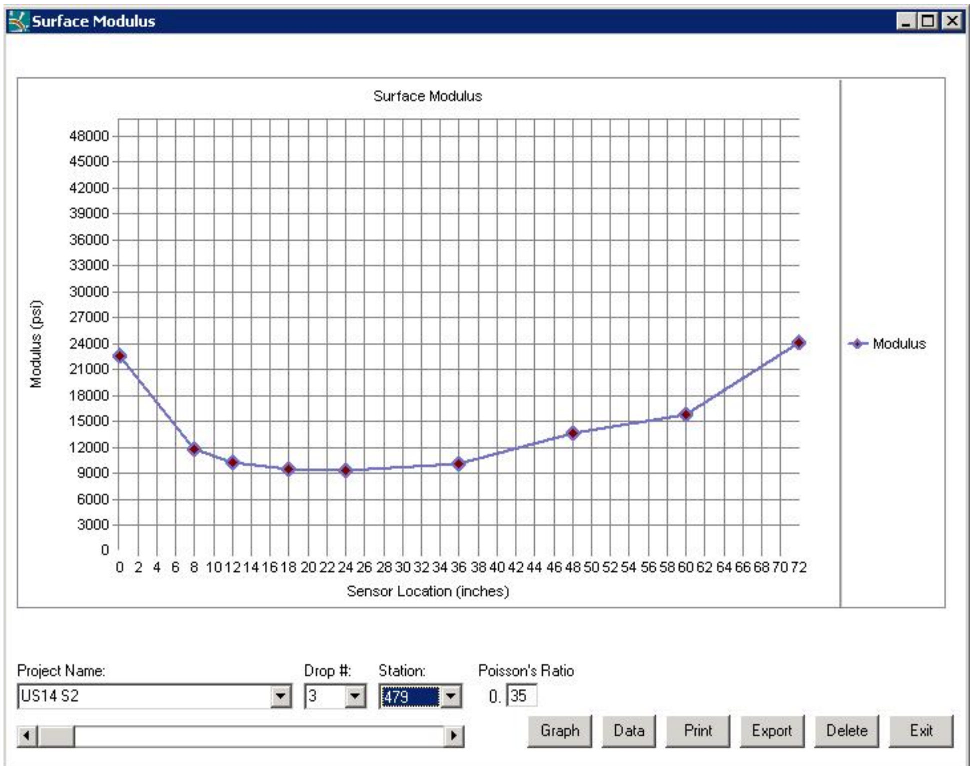
US14 S2 Station 25 Drop 3



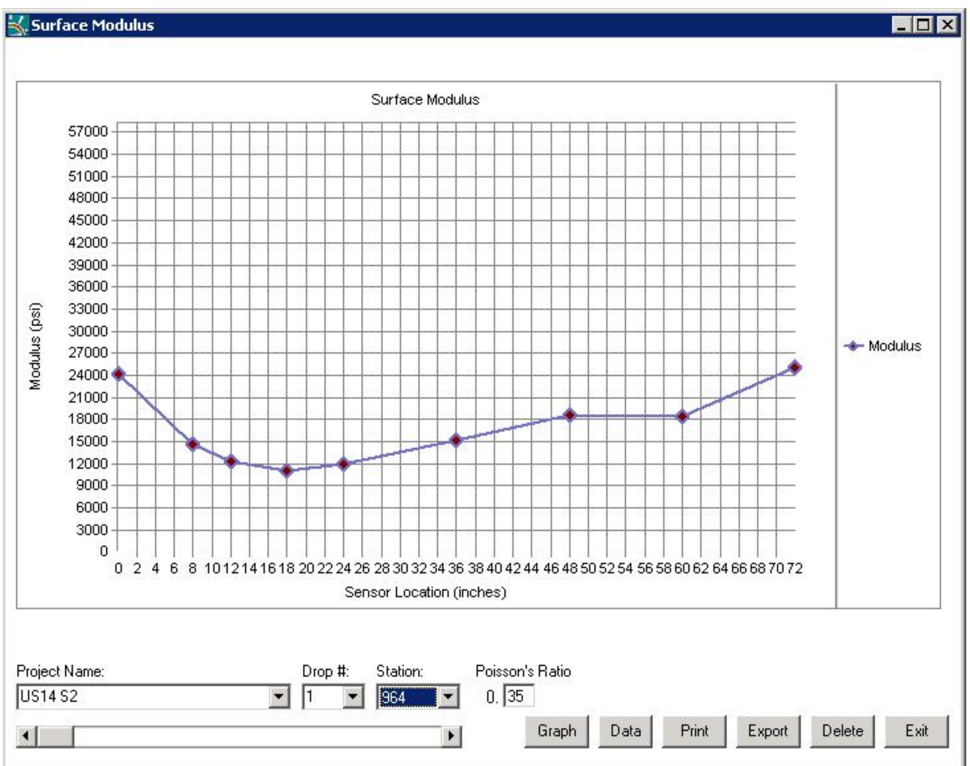
US14 S2 Station 479 Drop 1



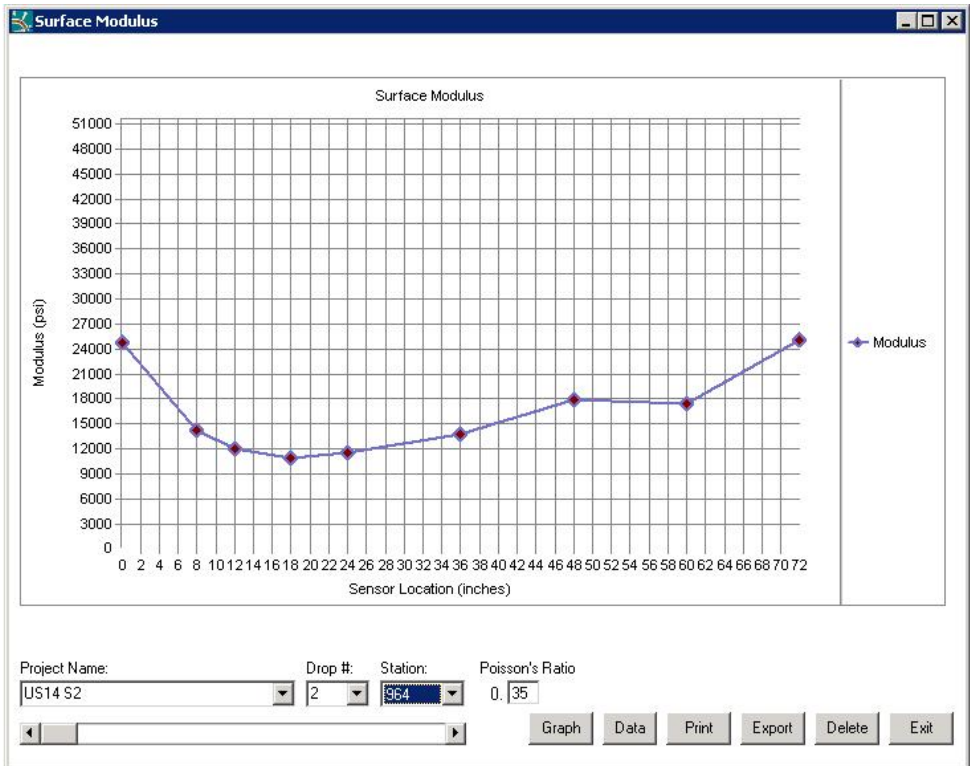
US14 S2 Station 479 Drop 2



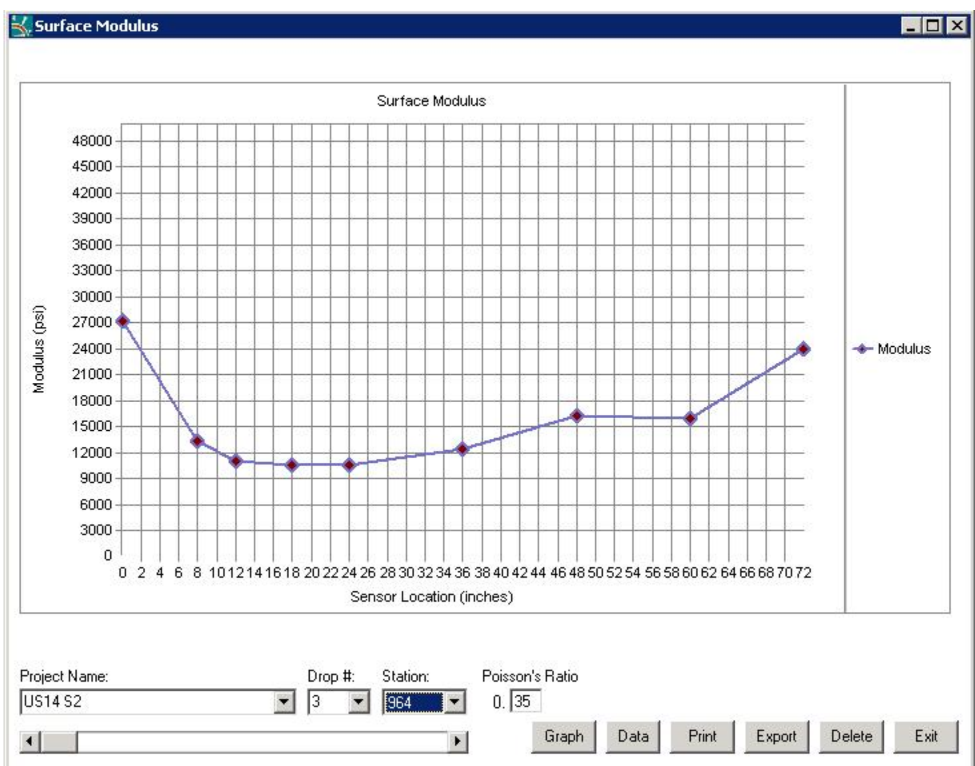
US14 S2 Station 479 Drop 3



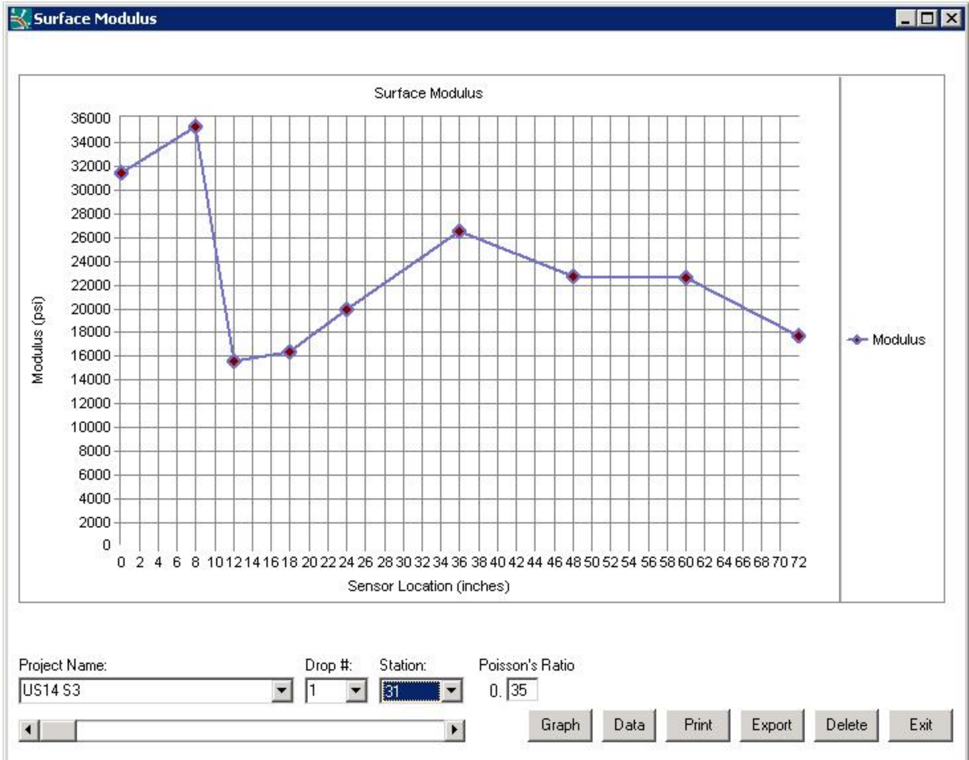
US14 S2 Station 964 Drop 1



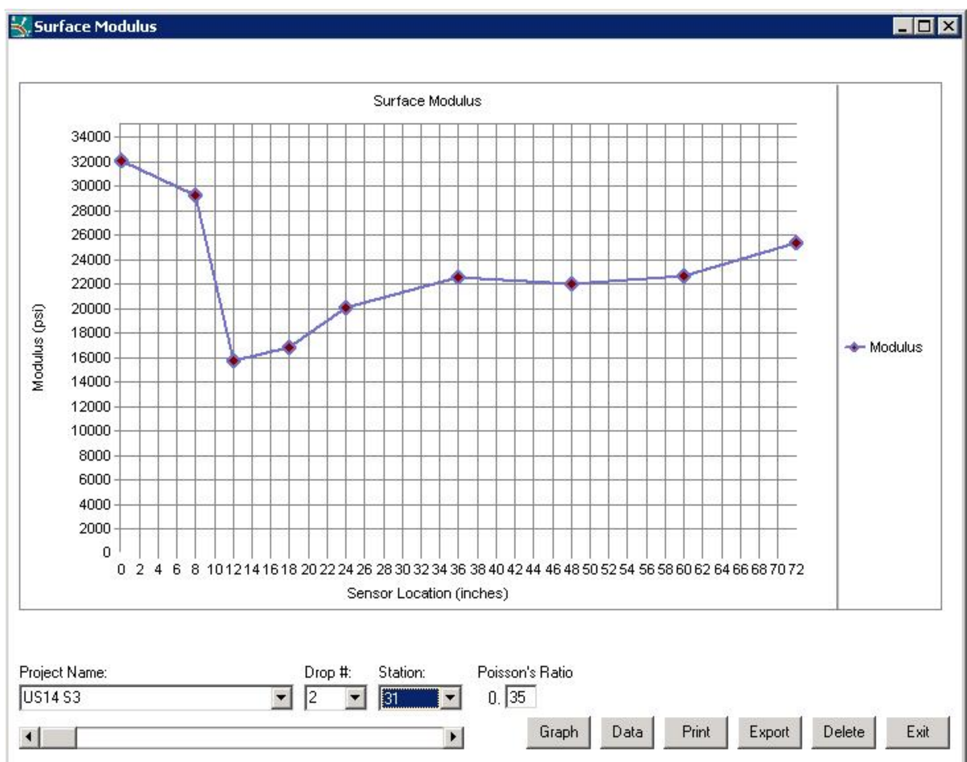
US14 S2 Station 964 Drop 2



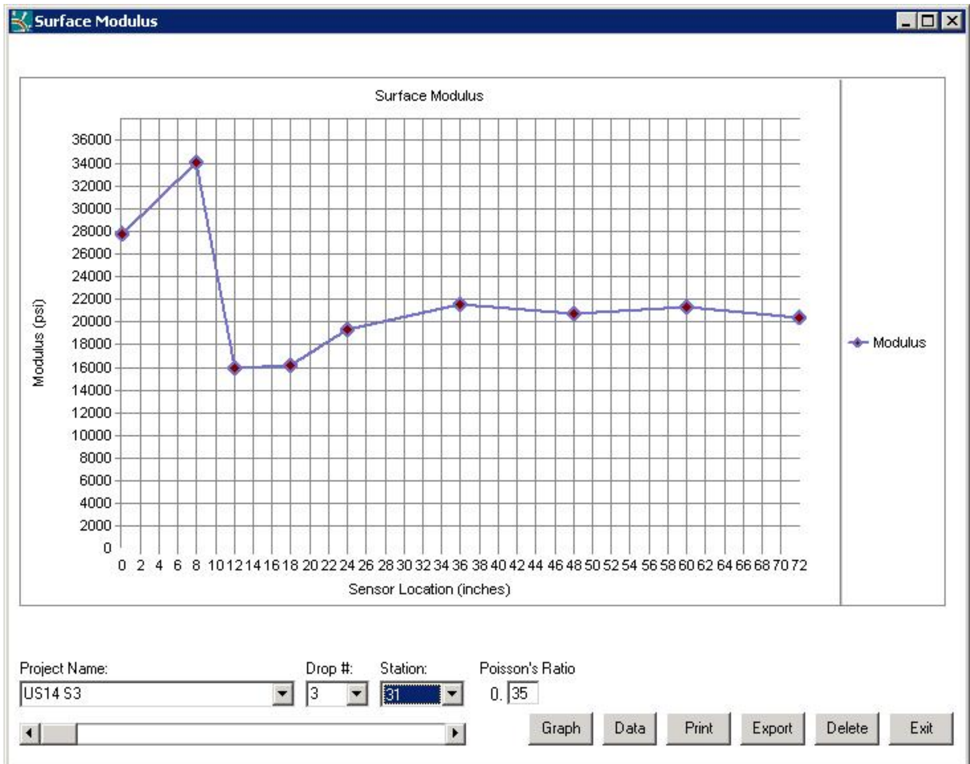
US14 S2 Station 964 Drop 3



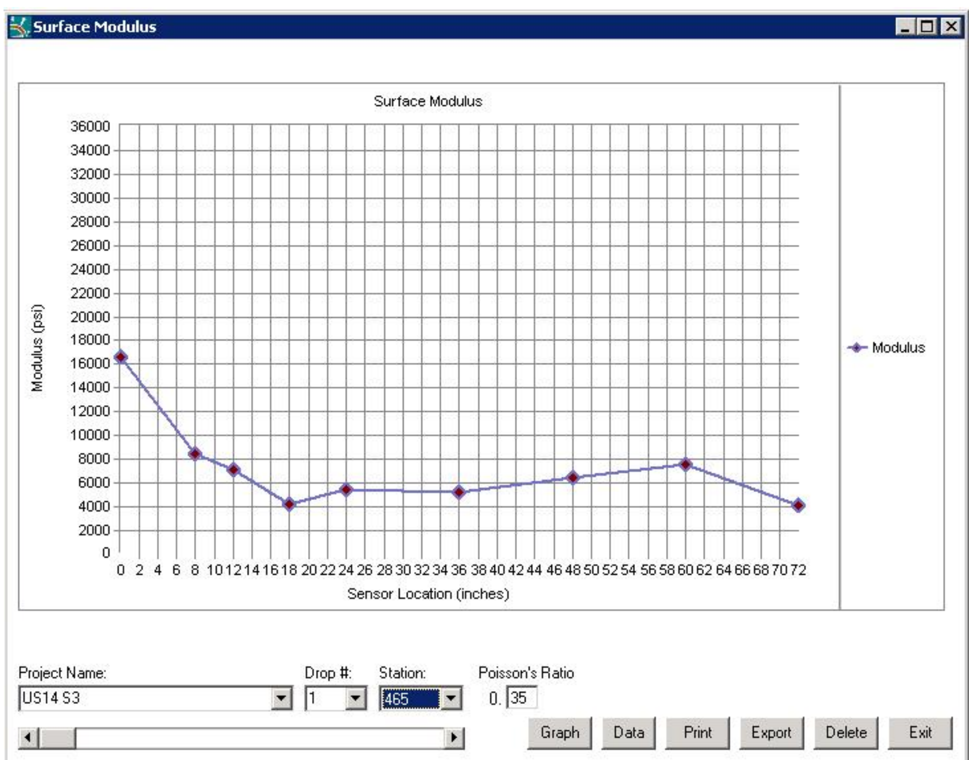
US14 S3 Station 31 Drop 1



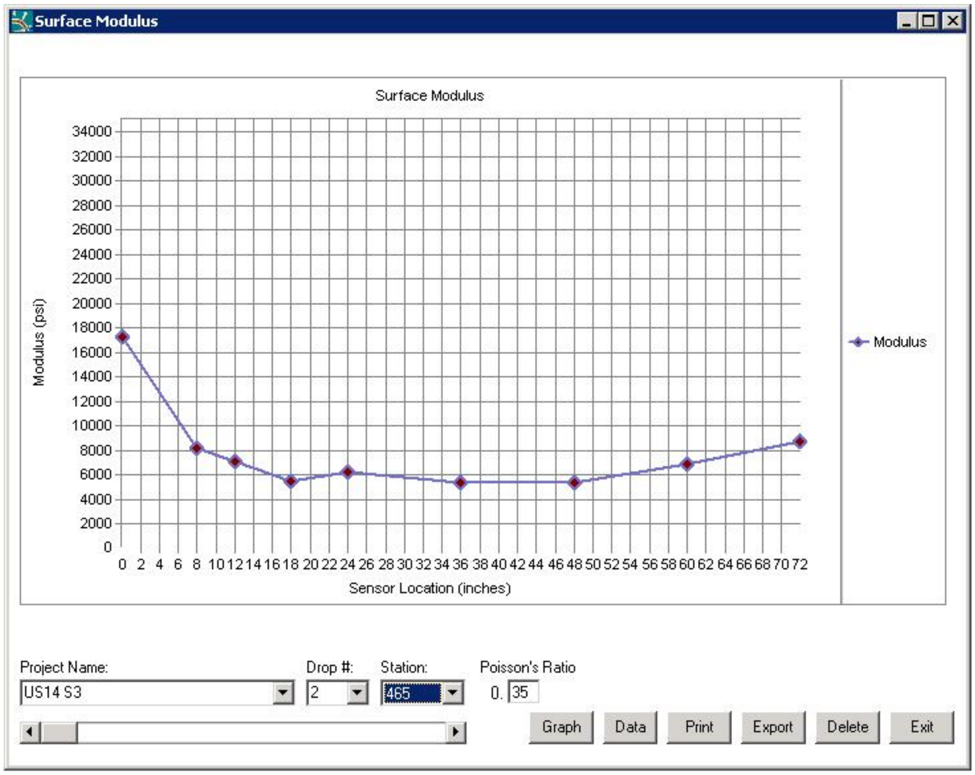
US14 S3 Station 31 Drop 2



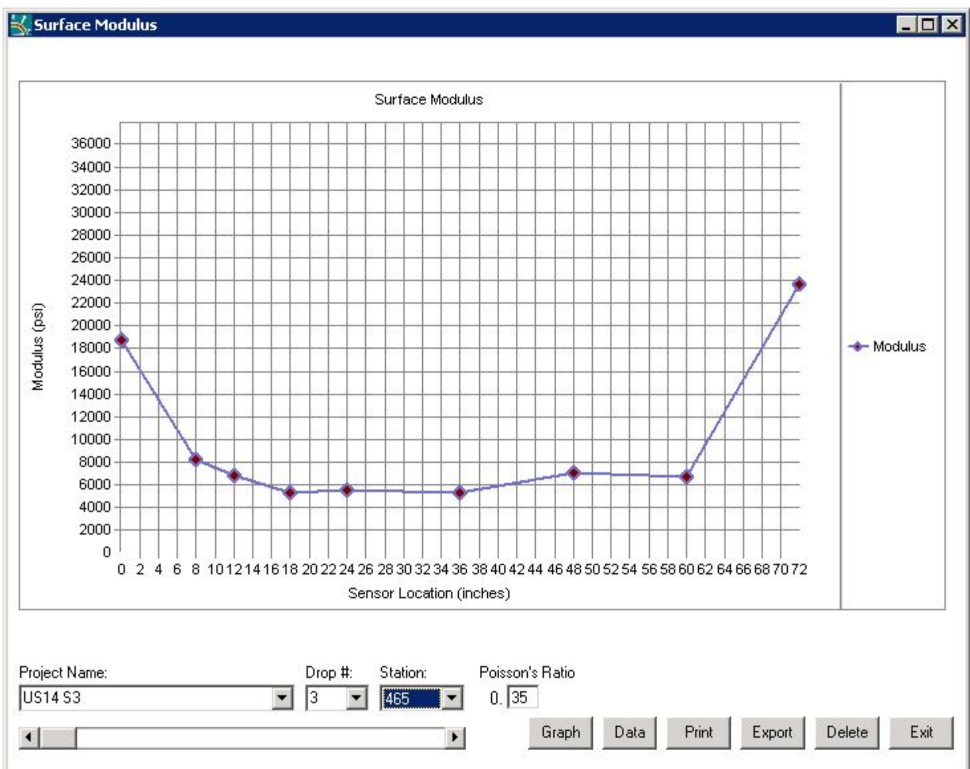
US14 S3 Station 31 Drop 3



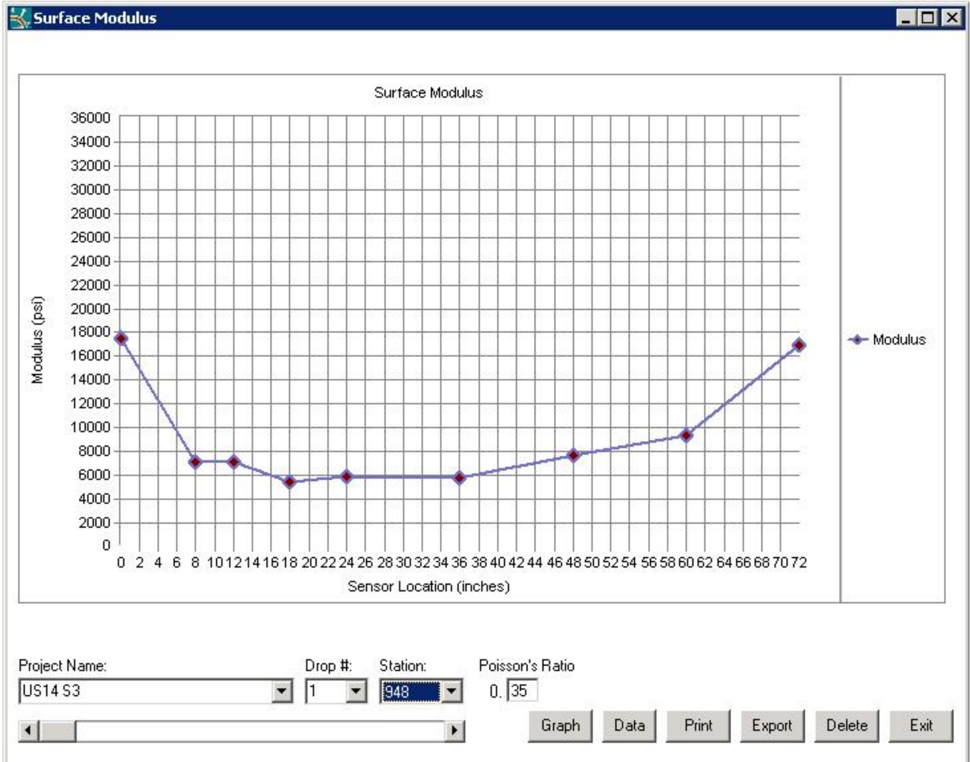
US14 S3 Station 465 Drop 1



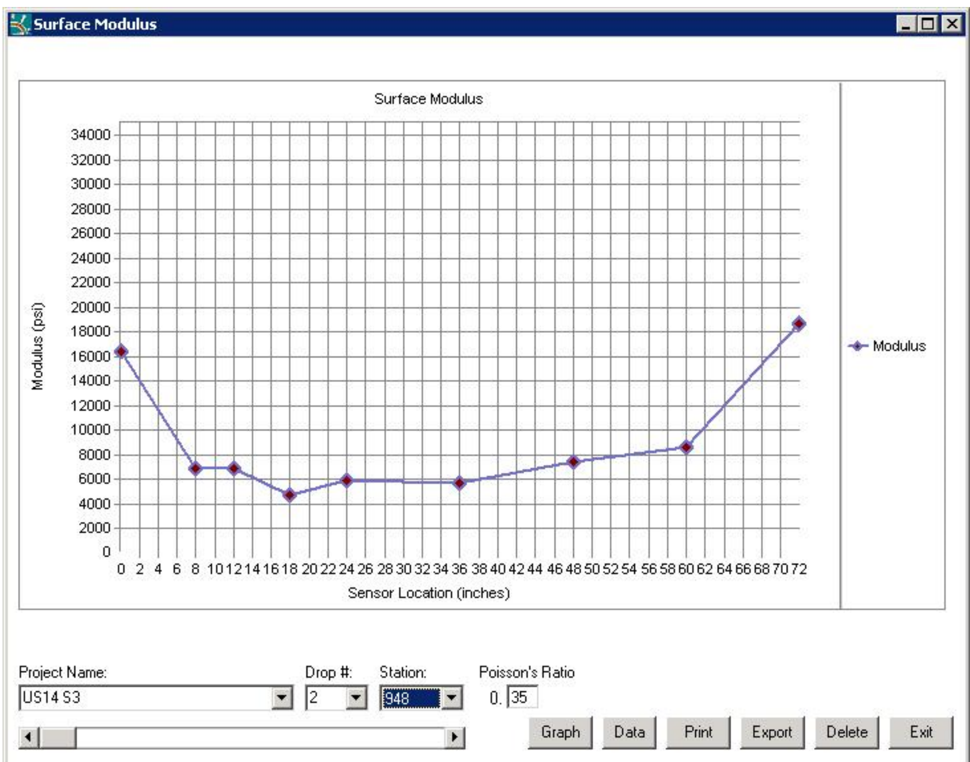
US14 S3 Station 465 Drop 2



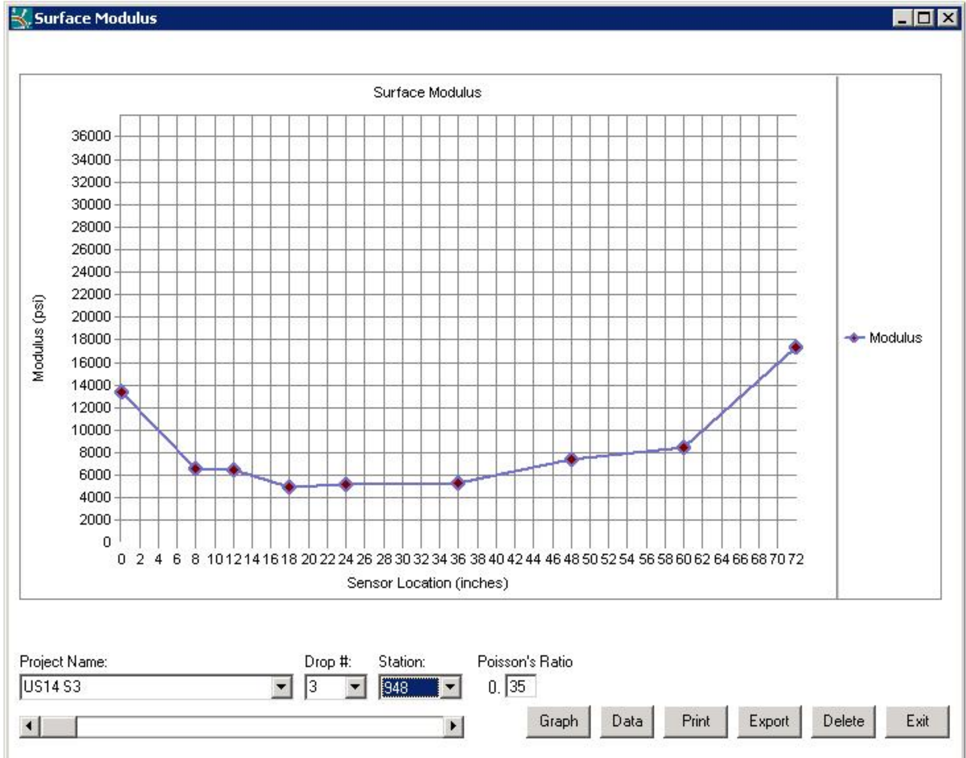
US14 S3 Station 465 Drop 3



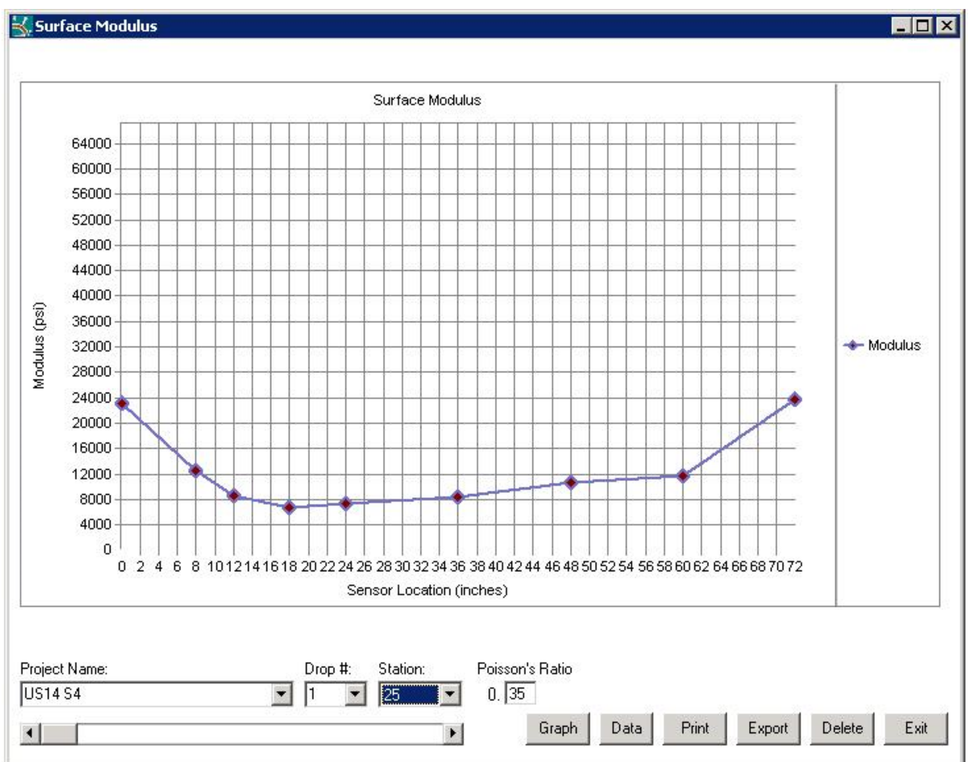
US14 S3 Station 948 Drop 1



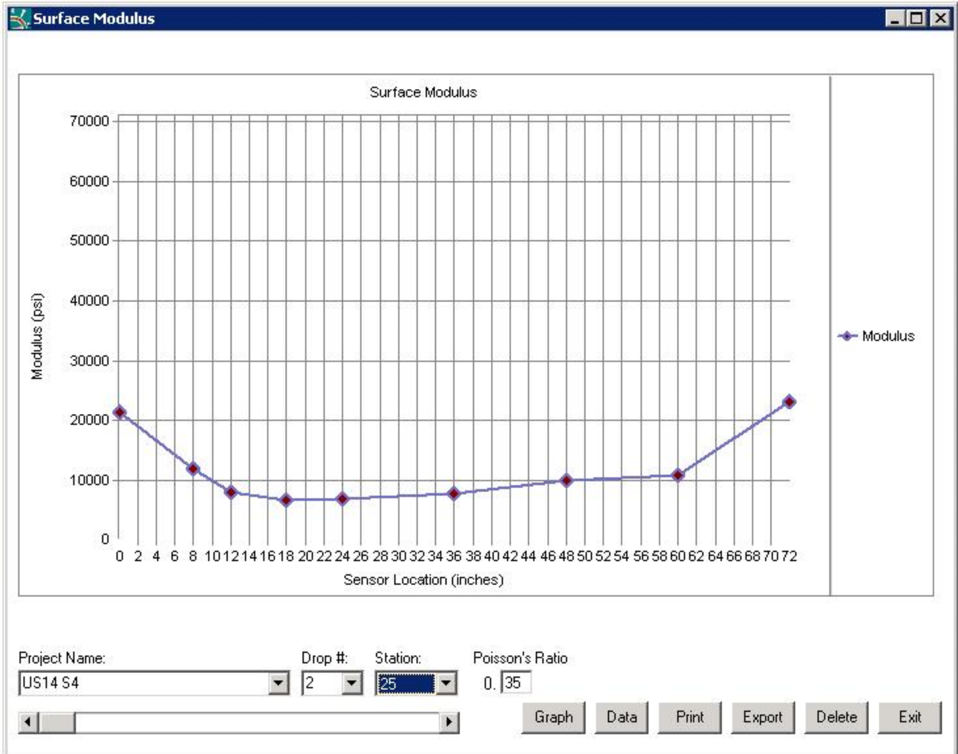
US14 S3 Station 948 Drop 2



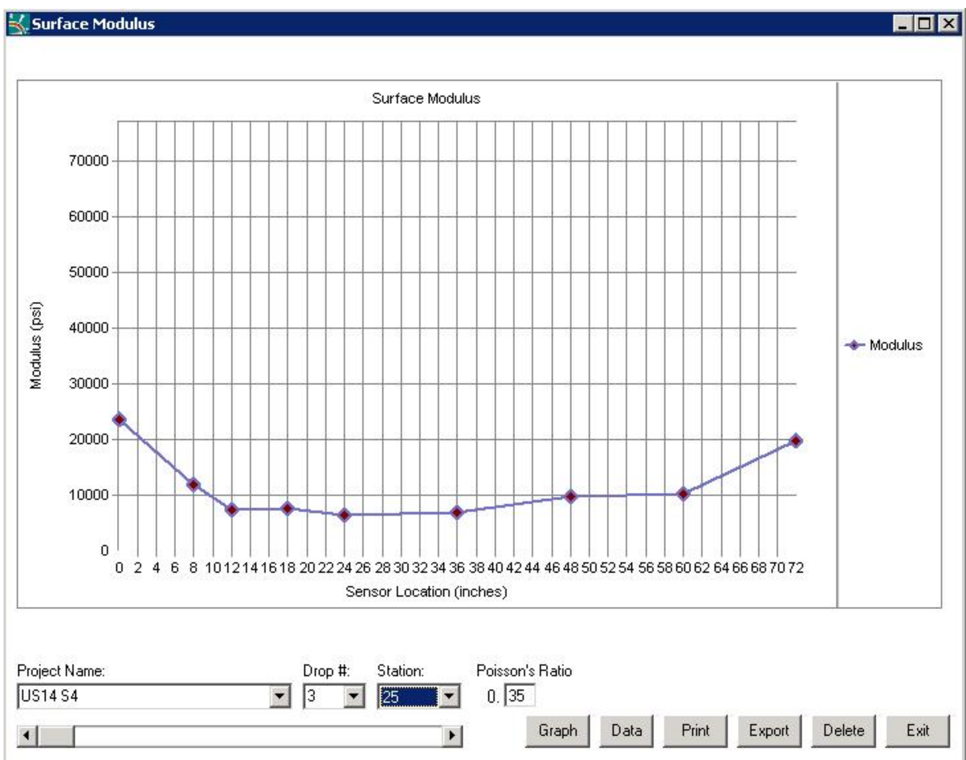
US14 S3 Station 948 Drop 3



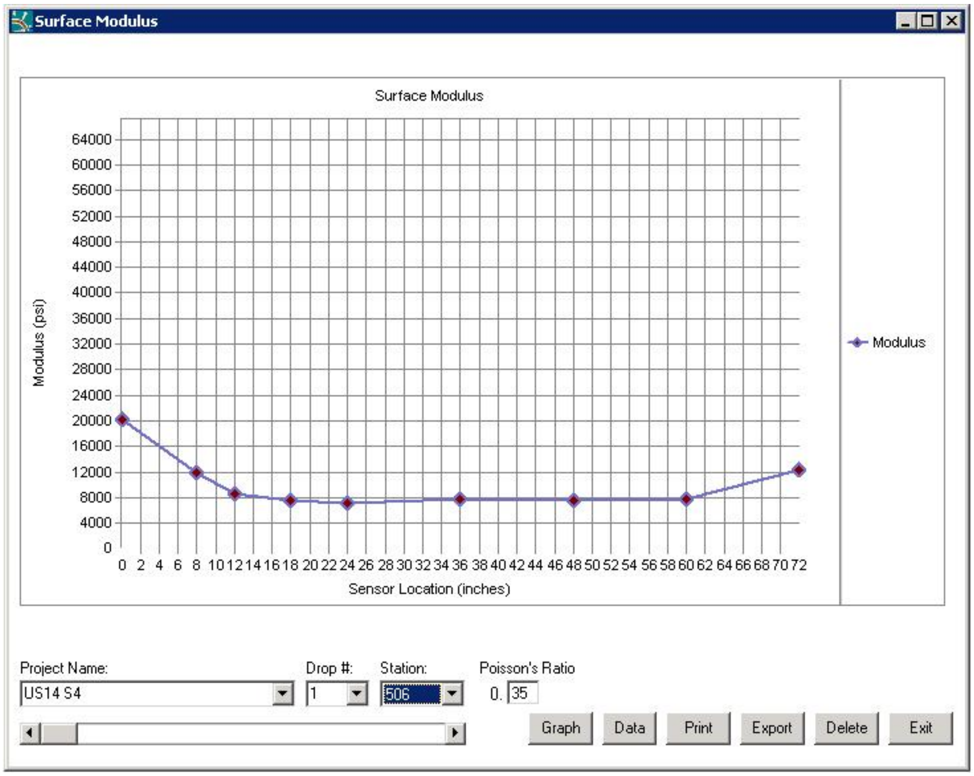
US14 S4 Station 25 Drop 1



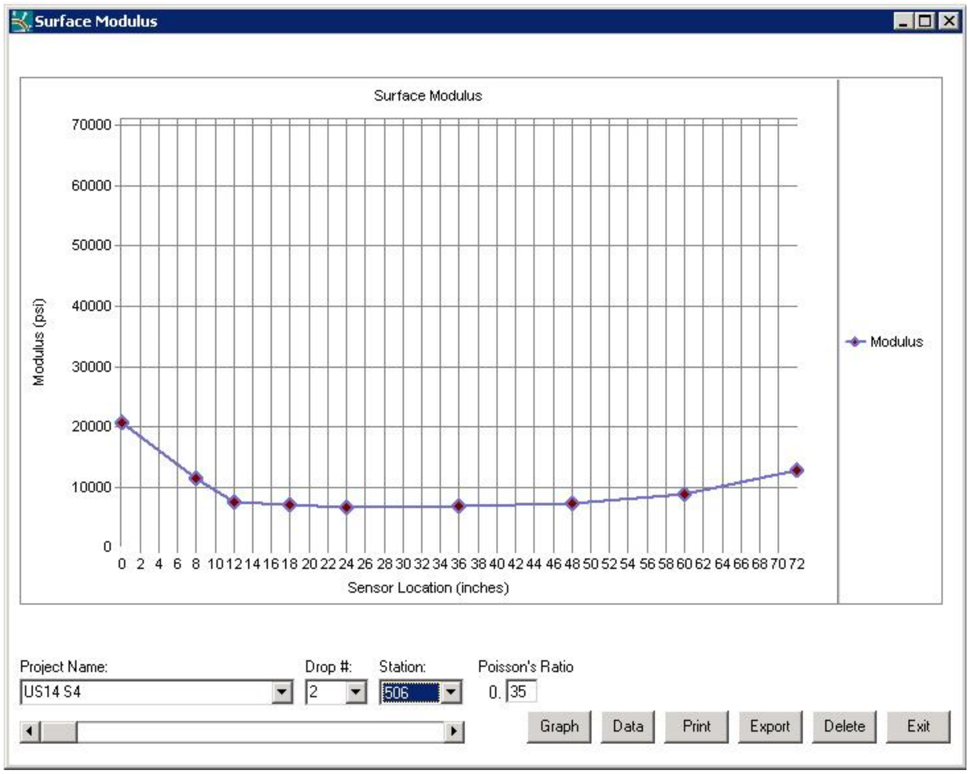
US14 S4 Station 25 Drop 2



US14 S4 Station 25 Drop 3



US14 S4 Station 506 Drop 1



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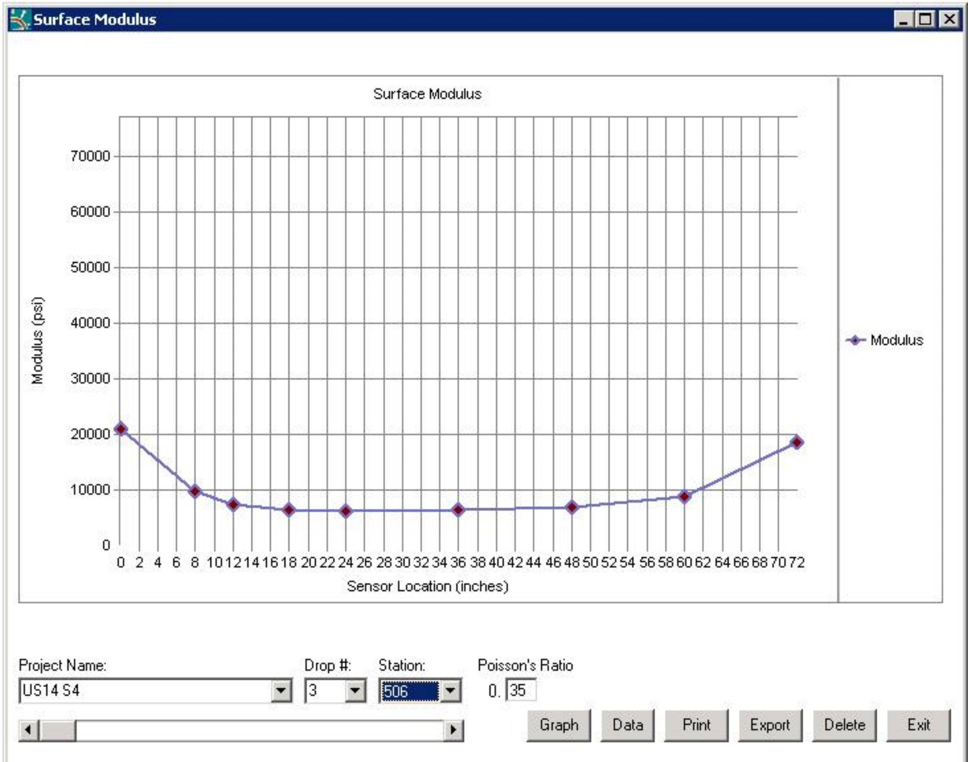
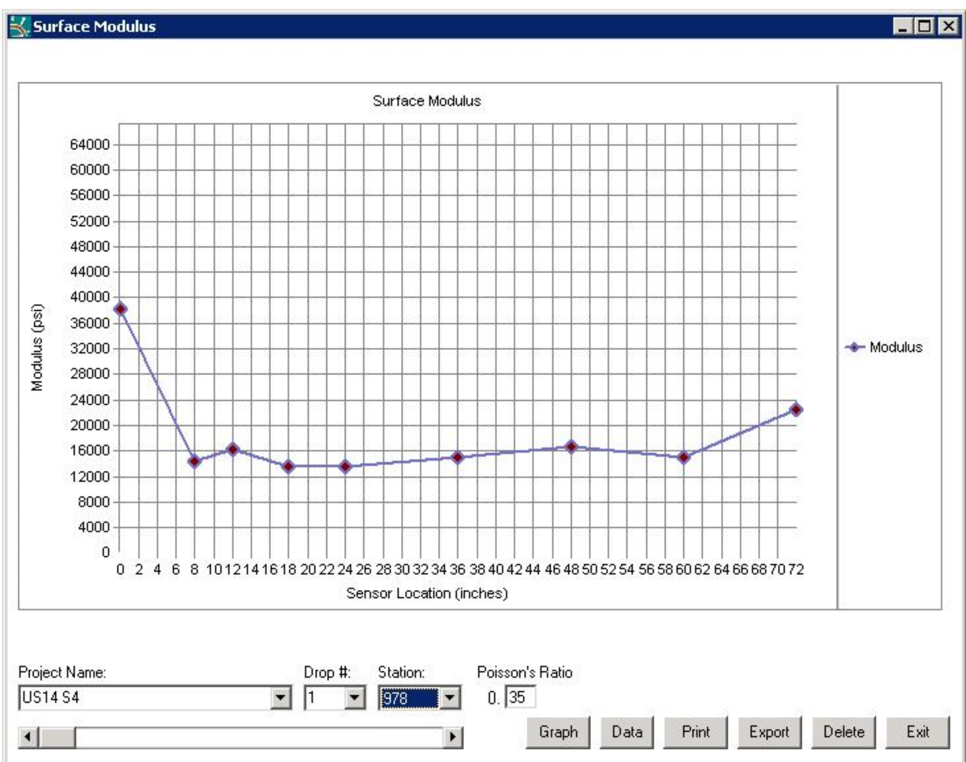
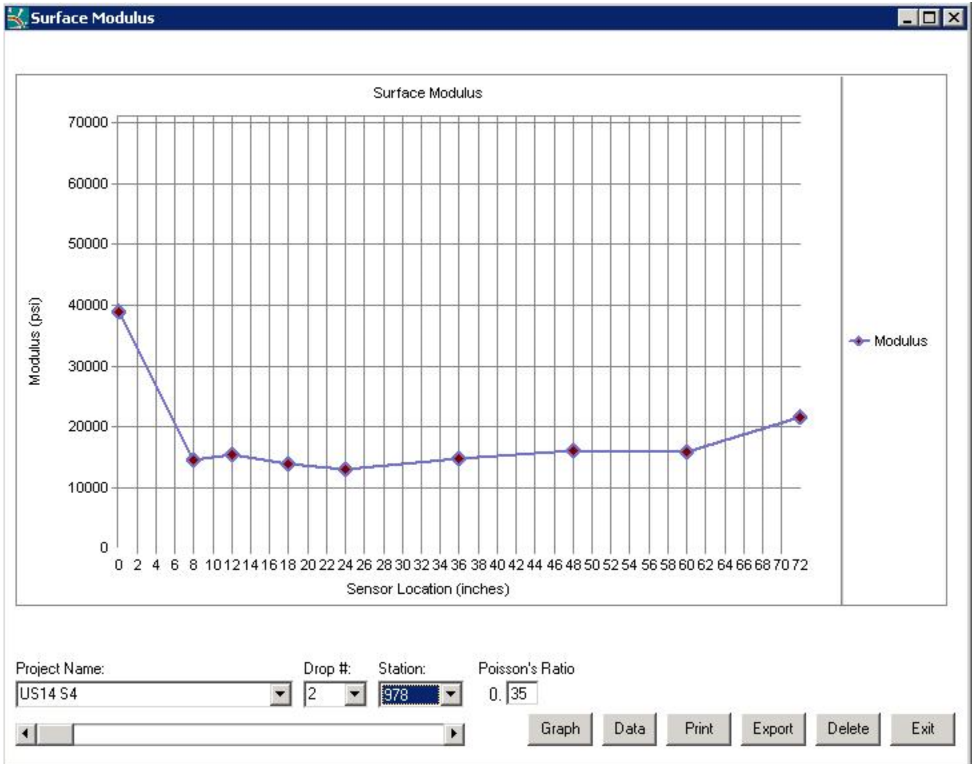


US14 S4 Station 506 Drop 3



US14 S4 Station 978 Drop 1



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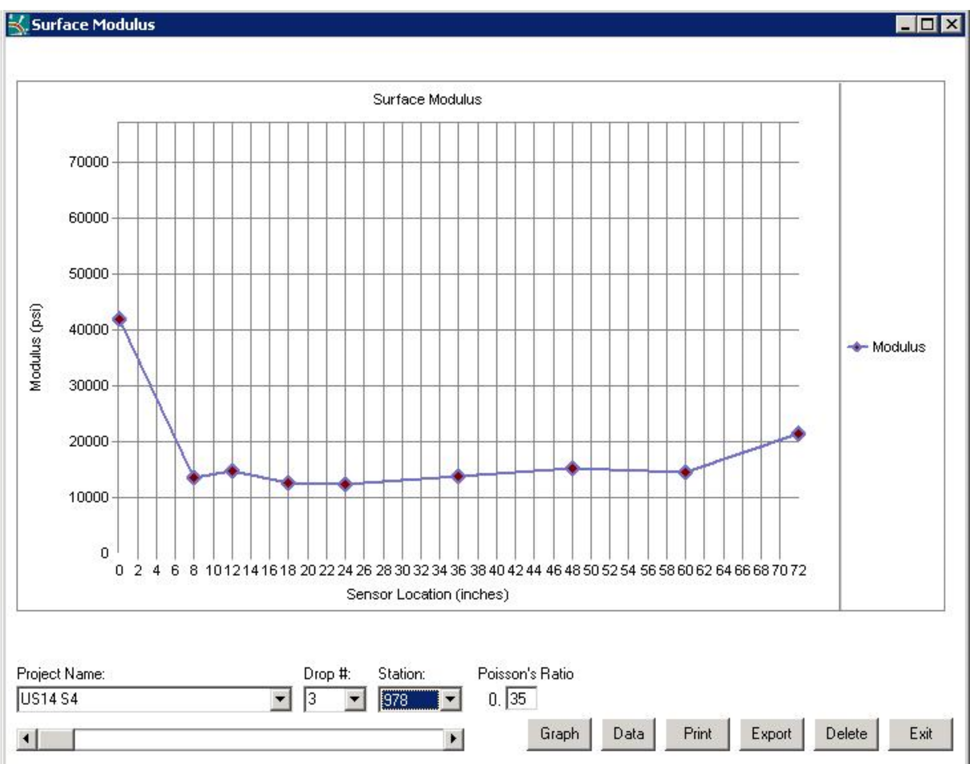

US14 S4 Station 978 Drop 3