Geotechnical Engineering Report and Site Specific Seismic Hazard Investigation

For the

Proposed New City Hall/Tsunami Evacuation Building
163 East Gower Street
Cannon Beach, Oregon

Prepared for

Mr. Mark See
Public Works Director
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Prepared by

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CGI Report No. 11-022-1

May 4, 2011

Chinook GeoServices, Inc.

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EXPIRES 12/31/11

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May 4, 2011

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Subject: **Geotechnical Engineering Report and**
Site-Specific Seismic Hazard Evaluation
Proposed New City Hall/Tsunami Evacuation Building
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Cannon Beach, Oregon
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Dear Mr. See:

Chinook GeoServices, Inc. (CGI) is pleased to submit our Geotechnical Engineering Report and Site-Specific Seismic Hazard Evaluation for the proposed new City Hall/Tsunami Evacuation Building (TEB) located at 163 East Gower Street in Cannon Beach, Oregon. This report includes the results of our field and laboratory testing, geotechnical engineering analysis, recommendations for site development, and results of our site-specific seismic hazard evaluation.

We appreciate the opportunity to perform this evaluation and look forward to continued participation during the remaining design and construction phases of this project. Please contact Marcy Boyer at (360) 695-8500 if you have any questions or if we may be of further service.

Respectfully submitted,

CHINOOK GEOSERVICES, INC.

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Principal Geotechnical Engineer

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1.0 EXECUTIVE SUMMARY

CGI has completed a geotechnical engineering study and seismic site hazard investigation to evaluate the feasibility of the proposed City of Cannon Beach, City Hall/Tsunami Evacuation Building (TEB) that is proposed at 163 East Gower Street in Cannon Beach, Oregon. The seismic site hazard investigation was conducted in general accordance with the Oregon Structural Specialty Code (OSSC) Chapter 1802.4.2.

The geotechnical subsurface exploration consisted of one 28-foot deep cone penetrometer test (CPT-1) and two mud rotary soil borings (B-1 and B-2) to depths of 115.5 feet and 121 feet using a subcontracted truck mounted drill rig. In general, the subsurface conditions consisted of medium stiff to soft silt and clay in the approximately upper 25 feet, which included abundant organic material below 15 feet. Below 25 feet, we encountered medium dense to dense gray sand. Multiple thin gravel layers were observed in the two borings at various depths. At an approximate depth of 100 feet below the ground surface we encountered siltstone bedrock. Static groundwater was encountered at about 21 feet below the ground surface based on interpretation of the pore-water pressure dissipation test conducted in CPT-1.

Based on the results of the field exploration and engineering analyses, it is our opinion that the proposed project is geotechnically feasible, based on the assumptions stated in this report.

In our opinion, the greatest geotechnical constraints at this site include the dynamic response of the subsurface conditions to earthquakes and the significant depth required for the foundations. Deep foundations that are embedded into the underlying siltstone bedrock are recommended for the proposed Tsunami Evacuation Building (TEB).

The owner and/or designer should not rely solely on this Executive Summary and must read and evaluate the entire contents of this report prior to using our engineering recommendations to prepare the design/construction documents.

2.0 PROJECT INFORMATION

2.1 Project Authorization

Chinook GeoServices, (CGI) has completed a geotechnical engineering evaluation and a site specific seismic hazard study to evaluate the feasibility of the proposed City Hall/Tsunami Evacuation Building (TEB) that may be located at 163 East Gower Street in Cannon Beach, Oregon. The site specific seismic hazard evaluation is included as Appendix A of this report. Our work was completed in general accordance with the March 7, 2011 Personal Services Contract with the City of Cannon Beach.

2.2 Project Description

Our understanding of the project is based on a September 2010 site visit with Mark See, our review of the RFP and our participation in the Ad-Hoc Committee for the Tsunami Evacuation Building at City Hall during 2009 and 2010. The proposed City Hall/TEB is proposed to be in the same location as the existing City Hall. The current conceptual design consists of the main city hall offices on the main floor with a flat roof for evacuation during a tsunami. The main offices would be elevated on robust concrete posts above the anticipated tsunami inundation elevation established by computer modeling. Stairs and a flat roof will be constructed for public access if a tsunami occurs. We anticipate that the new structure will be supported on concrete piers founded below the anticipated liquefaction depth and scour depth.

The geotechnical recommendations presented in this report are based on the available project information, and the subsurface conditions described in this report. If any of the project information is known to be incorrect, the client or authorized representatives should advise CGI in writing so that we may amend the recommendations as appropriate based on the corrected information. CGI will not be responsible for the applicability of its recommendations when not notified of changes in the project.

2.3 Purpose and Scope of Services

The purpose of our services was to provide geotechnical engineering design recommendations and conduct a site-specific seismic hazard study to evaluate the feasibility of development for the proposed new City Hall/TEB. Our general scope of work for this project was outlined in Exhibit A of the March 7, 2011 Personal Services Contract between the City of Cannon Beach and CGI.

Our scope of services included two mud rotary soil borings, one cone penetration test, soil laboratory testing, and engineering analyses to evaluate the soil properties for deep foundation support, seismic characteristics and hazards and other geotechnical engineering concerns for subsurface materials underlying the site. This geotechnical engineering report provides our recommendations for site earthwork, deep foundation design, subsurface drainage, slab support, pavement design, and other geotechnical engineering design and construction considerations. Appendix A includes the results of our Site-Specific Seismic Hazard Evaluation, which was prepared in general conformance with Exhibit A and the 2010 Oregon Structural Specialty Code (OSSC).

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Location and Description

The site location is shown on Figure 1, Site Location Plan, attached to the back of this report. The site address is 163 East Gower Street, Cannon Beach, Oregon. The site is comprised of Tax Lots 11100, 12000, and 11900, of T5N R10W Section 30-AD in Clatsop County. Lots 12000 and 11900 are adjacent and are bordered on the north by East Gower Street, on the west by Evergreen Avenue, on the east by the undeveloped Harding Avenue right-of-way, and on the south by developed residential properties. The combined lot dimensions are approximately 325 feet east to west and 100 feet north to south. Lot 11100 across the street to the west of the other lots is bordered on the north by East Gower Street, on the west by South Hemlock Avenue, on the east by Evergreen Avenue, and on the south by Coolidge Avenue. The approximate lot dimensions are 100 feet east to west and 200 feet north to south.

Lot 12000 is currently developed with a single story structure housing the City of Cannon Beach municipal offices. Lot 12000 also includes paved parking areas east and west of the developed structure. Lot 11900 is currently undeveloped. Lot 11100 is developed with a paved municipal parking lot. It is our understanding that the proposed structure will be located on Lot 12000, which is referred to in this report as the project site.

Based on an aerial topographic survey of The City of Cannon Beach dated December 28, 2004, the project site elevation is roughly 30 feet above mean sea level (MSL). The area of the project site is relatively level, with a minor descending slope toward the west. Site specific topographic mapping was not available at the time of this report.

3.2 Soil and Geologic Setting

Soils mapped in the project area by the United States Department of Agriculture (USDA), Natural Resource Conservation Service Web Soil Survey (http://websoilsurvey.nrcs.usda.gov) consist of Walluski silt loam, 0 to 7 percent slopes. This mapped unit consists of very deep, moderately well drained soils found on fluviomarine and stream terraces. The soil formed from mixed alluvium and/or fluviomarine deposits derived from sedimentary rock. A typical soil profile consists of medial silt loam to a depth of 13 inches, underlain by silty clay loam to a depth of 60 inches.

Geologic mapping for the project area is included in the 2009 Oregon Department of Geology and Mineral Industries (DOGAMI) open file report O-09-06 "Coastal Erosion Hazard Zones in Southern Clatsop County, Oregon: Seaside to Cape Falcon". This publication maps the geology in the project area as late Pleistocene age (126,000 years to 10,000 years ago) coastal terrace deposits (unit Qpt). This unit is described as unconsolidated to moderately consolidated gravel, beach, and dune sand; locally containing minor consolidated clay-rich paleosol, colluvium, debris flows, and alluvial sand, silt, and gravel deposited in channel and point bar environments. The 1985 Geologic Map of the Astoria Basin, Clatsop and Northernmost Tillamook Counties, Northwest Oregon, Oil and Gas Investigation 14 prepared by DOGAMI similarly maps the site as Pleistocene age (1.8 million years to 10,000 years ago) coastal marine-terrace deposits (Qmt). This unit is described as predominantly laminated to cross-bedded beach sand and crudely stratified rounded basalt gravels with some discontinuous paleosols, mud beds, and layers of partially carbonized tree trunks and limbs. The 1972 Environmental Geology of the Coastal Region of Tillamook and Clatsop Counties, Oregon, Bulletin 74 prepared by DOGAMI also maps the geology at the site as Pleistocene age Marine Terraces (Qmt).

The DOGAMI O-09-06 geologic map also shows undifferentiated Holocene age (10,000 years ago to present) alluvial deposits (Qha) directly west of the site. This unit is described as unconsolidated sand, silt, and gravel deposited in alluvial fan, stream terrace, or basin environments. The mapped geologic unit may represent an old stream channel in the vicinity of the project.

The uplands to the south of the subject site are mapped by Bulletin 81 as Oligocene to Miocene Sedimentary Rocks (unit Toms) and by Oil and Gas Investigation 14 as middle to lower Miocene Cannon Beach member of the Astoria Formation (unit Tac). The Toms unit consists of thin bedded to massive, medium to dark gray (orange to white where weathered), tuffaceous siltstone, with lesser amounts of sandstone and claystone. Unit Tac is described as well bedded, laminated to massive micaceous mudstone with subordinate rhythmically thin bedded feldspathic sandstone and mudstone in the lower part of the unit. Numerous outcrops of Intrusive Grande Ronde Basalt (unit Tgri) are mapped within unit Tac south of the site. Unit Tgri is described as a Tertiary middle

Miocene age, invasive sills, dikes, and irregular bodies of massive to columnar-jointed, aphyric to rarely phyric basalt and peperite or intrusive bodies related to Grande Ronde Basalt.

3.3 Subsurface Soil Conditions

Subsurface soil conditions were explored by CGI Geologic Associate Chuck Bolduc, G.I.T., who visited the site on March 29 and March 30, 2011. We observed advancement of two mud rotary soil borings (B-1 and B-2) to depths of 115.5 feet and 121 feet using a subcontracted truck mounted drill rig and one cone penetrometer test (CPT-1) to a depth of 28 feet using a subcontracted rig. The borings and CPT were located in the general vicinity of the proposed structure and were selected in the field by Mark See, the Public Works Director with the City of Cannon Beach, Oregon. The approximate boring and CPT locations are shown on Figure 2. Detailed boring and CPT logs are included in the attached Appendix B.

Boring B-1 was drilled on March 29, 2011 and with sample intervals between 0 feet and 5 feet and took more than 1 day to drill. Because we observed primarily sand that was similar in gradation between 25 feet and 100 feet and bedrock at 100 feet, we recommended to Mr. See that we expand the sample intervals to between 10 feet and 25 feet so that we could get better information for foundation design in the bedrock. Mr. See agreed with the recommendation and boring B-2 was drilled on March 30, 2011 using the expanded sample intervals.

In general, the subsurface conditions consisted of medium stiff to soft silt and clay in the approximately upper 25 feet, which included abundant organic material below 15 feet. Below 25 feet, we encountered medium dense to very dense gray sand. Multiple thin gravel layers were observed in the two borings at various depths. At approximately 100 feet below the ground surface, we encountered siltstone bedrock. A more detailed description of the soils encountered in the borings is included below:

Clay and Organic Debris - The clay was stiff in the near surface becoming softer with depth. Clay was tan with rust mottling with minor inclusions of rust concretions. Some sandy texture was observed but sand particles were not present. In boring B-2, the drill cuttings were observed to be significantly more orange in color than in boring B-1. Wood fiber was observed in the cuttings from boring B-2 at a depth of 10 feet and again at 15 feet. A sample in boring B-2 encountered a log or stump oriented vertically based on the vertical wood grain, which was relatively fresh to minimally decomposed. Other samples encountered gray clay with decomposed wood debris and gray clayey sand with decomposed wood debris. We interpret this sequence of sediments were deposited in an

alluvial environment. Based on the CPT data, the shear wave velocity was between 402 feet per second and 582 feet per second in this soil layer.

Beach and Dune Sand - Dense, wet, gray sand was encountered at a depth of 25 feet in boring B-1 and dense sand to silty sand was found in CPT-1 below 26 feet. The sand was fine-grained, poorly-sorted sand with abundant micaceous flakes at selected depths. The micaceous material may have been derived from weathering of local mica-bearing sandstones of the Astoria Formation and deposited as alluvial sands. Very dense basaltic gravel and sand was encountered in boring B-1 at 55 feet below the ground surface, and ended at 57.5 feet below the ground surface based on drilling characteristics. Thin layers of gravel were also interpreted at 61.5 feet in boring B-1 and 65 feet in boring B-2 based on drilling characteristics. Based on the limited thickness and variable depth, we interpret the gravel to be discontinuous. We interpret the sands and gravel deposits to be consistent with the geologic mapping of marine terrace deposits. The CPT met refusal near the top of the contact of the upper dense sand layer at 26 feet and shear wave velocities were not obtained below 25 feet. However, based on our blow count data, we estimate that the beach and dune sand has a shear wave velocity between 650 feet per second and 1,300 feet per second.

Siltstone Bedrock - Hard siltstone bedrock was encountered in boring B-1 at 100 feet below the ground surface and in boring B-2 at 101 feet below the ground surface. The siltstone observed in each boring differed in blow counts, drilling characteristics, and cutting return. The siltstone in boring B-1 had very high blow counts, variably hard and easy drilling and black fragments of basaltic rock returned in the drill cuttings. The siltstone in boring B-2 had relatively lower blow counts, consistent drilling characteristics, and no basaltic cuttings were observed. We interpret that the siltstone in boring B-1 also included a minor basalt intrusion, which is consistent with the abundantly mapped basaltic intrusives within the Astoria Formation in the area. In boring B-1, we drilled 15 feet into the formation and in boring B-2,we drilled 20 feet into the formation. According to a Madin and Wang 1999 paper, the shear wave velocity of the siltstone bedrock was estimated to be 1,870 feet per second.

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in Appendix B should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratifications, and test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. The samples that were not altered by laboratory testing will be retained for 60 days from the date of this report and then will be discarded.

3.4 Groundwater Information

The static groundwater elevation in the project area was interpreted to be approximately 25 feet to 30 feet below the ground surface based on our observation of soil samples recorded during mud rotary drilling. The cone penetrometer test conducted a pore-water dissipation test within the dense gray sand at a depth of approximately 27.5 feet. Results of the pore-water dissipation test indicated a static water level of approximately 21 feet below the ground surface. We have assumed a groundwater depth of 21 feet below the ground surface for the purpose of this report.

4.0 GEOTECHNICAL ENGINEERING EVALUATION

4.1 Geotechnical Engineering Discussion

Based on the results of the field exploration and engineering analyses, it is our opinion that the proposed project is geotechnically feasible based on assumptions and preliminary design criteria discussed below. However, this report may not include geotechnical analyses and design recommendations sufficient for final design.

In our opinion, the greatest geotechnical constraints at this site include the dynamic response of the subsurface conditions to earthquakes and the significant depth required for the foundations. Deep foundations that are embedded into the underlying siltstone bedrock are recommended for this development.

4.2 Site Preparation and Earthwork Recommendations

We anticipate that the proposed building footprint and related parking areas, sidewalks, and other site improvements will be located in areas that are currently developed with the existing city building and paved parking areas. We recommend that the existing pavement and foundations be completely removed from the site in areas that will be developed with structures or pavement. The existing base rock could remain in-place if it is below finished subgrade elevation. Based on our subsurface explorations, the thickness of the asphalt pavement was 1.5 inches in boring B-1. The depths of the existing foundations for the city building are unknown; therefore, the depth of removal in this area is unknown. In areas where there are trees, soft disturbed soil, or manmade fill, additional stripping may be necessary. A representative of the geotechnical engineer should determine the depth of removal at the time of construction.

The existing asphaltic pavement and stripped soils may not be suitable for re-use as structural fill and should be exported from the site. The base rock gravel could re-used as structural fill. Additionally, the removed concrete foundations could potentially be crushed for re-use as structural fill. A representative of the geotechnical engineer should be contacted to review and approve the onsite materials for re-use as structural fill at the time of construction. Our recommendations for structural fill and compaction are included below in section 4.6.

Wet weather and construction equipment could severely disturb the upper several feet of the clayey subgrade during initial phases of site clearing. We recommend dry weather construction to protect the subgrade from disturbance. If the subgrade becomes wet or is exposed to significant construction traffic, the subgrade may soften and require additional stripping prior to construction. After stripping, a granular working pad consisting of crushed rock should be placed over the subgrade to protect it from disturbance and provide access for construction equipment. The thickness of the working pad would depend on the use of the stripped area (haul road, material storage, etc.) We can provide thickness recommendations prior to construction when construction sequencing and staging is known.

Alternately, the site could be stripped in phases. The proposed building area could be prepared for placement of foundations and the existing pavement could be used for construction access and staging during construction. The paved areas could then be stripped for construction of the new parking areas and other related improvements outside the building area. We are providing these considerations solely for your use in developing a plan for your project. It is the ultimate responsibility of the contractor to determine the construction methods that are most appropriate for the site.

Following subgrade preparation, and prior to placement of structural fill or base course, we recommend that the site be proof rolled with a fully loaded 10 yard to 12 yard dump truck or other suitably loaded rubber-tired construction vehicle. Any areas that pump, weave, or appear exceptionally soft or muddy should be overexcavated to a depth determined by the geotechnical engineer and backfilled with compacted granular fill. If significant time passes between completion of subgrade preparation and commencement of other construction activities, or if significant traffic has been routed across the site, we recommend that the site be similarly proof rolled before placement of base rock or paving. A representative of our firm should observe this operation.

4.3 Temporary Excavations

Stability of temporary excavations is the responsibility of the contractor, who must maintain safe excavation slopes and/or shoring. Excavations must comply with the current requirements of OSHA

and the State of Oregon. We are providing the information below solely as a service to our client. Under no circumstances should the information provided be interpreted to mean that CGI is assuming responsibility for construction site safety or the contractor's compliance with local, state, and federal safety or other regulations.

The contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, and/or federal safety regulations (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations). Such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

We recommend that the temporary excavations not encroach below a 2H:1V line extended downward from the existing utilities to reduce the risk of settlement and/or collapse of existing features, such as the sidewalk and street pavement. If this setback cannot be maintained, we recommend installing temporary shoring. We should be contracted to review the final documents for construction.

The near surface soils generally consist of medium stiff fine-grained cohesive soils, which are considered a Type B soil when applying the OSHA regulations. For Type B soils, the maximum recommended temporary slope inclination is 1 Horizontal to 1 Vertical (1H:1V). Flatter slopes and/or trench shields may be required if loose soils, debris, voids, and/or water are encountered along the slope face. The recommended maximum inclination for temporary slopes is based on the assumption that the ground surface behind the cut slope is level, that surface loads from equipment and materials are kept a sufficient distance away from the top of the slope (typically at least half the slope height), and that utility trench excavations are completed and backfilled prior to the construction of structures adjacent to the excavations. If these assumptions are not valid, we should be contacted for additional recommendations.

4.4 Construction Dewatering

Groundwater was estimated to be approximately 21 feet below the ground surface during our explorations, which were conducted in March, when groundwater is typically at higher levels in response to the wet season. However, it is possible that shallow perched water within the fine-grained soils may be encountered during construction. If shallow water is encountered during construction, for most excavations, pumping from a sump inside or outside the limits of the excavation should adequately control seepage and surface water ponding. As an alternative, dewatering wells may be installed outside of the excavation is water seepage is significant. During

wet weather, earthen berms or other methods should be used to prevent runoff water from entering excavations. All runoff water and groundwater encountered within the excavation(s) should be collected and disposed of outside the construction limits.

4.5 Permanent Cut and Fill Slopes

We do not expect significant cut or fill slopes will be associated with this project based on the relatively level topography in the area. If any are planned, we recommend that permanent slopes in native soils or engineered fill be graded no steeper than 2H:1V and be protected from erosion by civil engineer designed and approved methods.

4.6 Structural Fill Materials

Imported structural fill should only be installed on a subgrade that has been prepared in accordance with the preceding recommendations. Fill materials should be free of organic or other deleterious materials have a maximum particle size less than 3 inches, be relatively well graded, and have a liquid limit less than 45 and plasticity index less than 25. The suitability of soil for use as compacted structural fill will depend on the gradation and moisture content of the soil when it is placed. As the amount of fines (that portion finer than the US Standard No. 200 sieve) increases, soil becomes increasingly sensitive to small changes in moisture content and compaction becomes more difficult to achieve. Soils containing more than about 5 percent fines cannot consistently be compacted to a dense, non-yielding condition when the water content is significantly greater (or significantly less) than optimum. The onsite clay soil will not be acceptable for re-use as structural fill. The existing base rock will likely be acceptable for re-use as structural fill provided it meets the specifications above, is free of organic material, and is separated from the asphalt pavement. The demolished concrete foundations can potentially be processed to create a crushed rock product meeting the above specifications for use as structural fill.

On-site base rock and imported granular material that are used for engineered fill should be uniformly moisture conditioned to within ±2 percent of the optimum moisture content and compacted in thin lifts using suitable mechanical compaction equipment. We recommend that fill intended to support foundations, slabs or pavements be placed in horizontal lifts in thickness from 8 inches to 12 inches, and be compacted to at least 95 percent of the maximum dry density as determined by the modified Proctor compaction test method (AASHTO T-180 or ASTM D1557).

4.7 Deep Foundation Recommendations

Deep foundations and a structural slab are recommended for this development. At this time, 2-foot diameter concrete auger cast-in-place piles would be generally compatible with the site subsurface conditions and earthquake performance criteria for this project. No structural load information was available at the time of this evaluation and our foundation analysis is intended for a feasibility evaluation only.

The results of our liquefaction analysis (included in Appendix A) indicate the presence of up to 75 feet of unconsolidated clayey silt, sand and gravel that may liquefy and/or strain soften during the modeled earthquakes. Based on the thickness of liquefiable soils we anticipate that deep foundations will need to be embedded in the bedrock. For feasibility evaluation purposes we have calculated the axial capacity of 2-foot diameter concrete auger cast-in-place piles embedded 10 feet into the underlying siltstone bedrock at an approximate depth of 100 feet below the ground surface. Other pile sizes and types could be used, subject to structural design and constructability criteria.

We assumed a cohesion value of 2,500 pounds per square foot (psf) for the blue-gray siltstone. A friction angle is not appropriate for the siltstone bedrock material.

Estimated Axial Pile Capacity – We expect that the static and transient compressive loads on the piles will be achieved through a combination of end bearing and skin friction. Our estimated allowable compressive capacities are based on a static factor of safety of 3.0 for end bearing, side friction and uplift. The capacities can be increased by 1/3 for transient loads. Axial pile capacities were determined using the computer program AllPile 7. The pile has an axial downward capacity of approximately 975 kips and an allowable uplift capacity of 230 kips under static conditions. The results of the analysis are included in Appendix D.

Estimated Downdrag – Downdrag is the additional load caused by adhesion or friction between the pile and the surrounding settling soil. Downdrag loads are caused by negative skin friction. Some negative skin friction would occur during settlement of the clay with organics layer between 15 feet and 25 feet below the ground surface. In addition, we expect that the pile will be subjected to negative skin friction from liquefaction during the modeled earthquakes. The earthquake ground motions will strain soften the clayey soils and liquefy the saturated sand. The structural capacity of piles is affected by downdrag loads. Downdrag increases the stresses in the pile and pile cap and has the potential for creating settlement. For a single pile, the downward load transferred to a pile is equal to the shearing resistance along the pile. This may be calculated using the formula on the following page.

$Q_{nf} = s * L * P^1$ Where Q_{nf} = Average downward load transferred to the pile
s = Shear resistance of the soil
L = Length of embedment above the bottom of the compressible layer
P^1 = Perimeter of the Pile

Then, the average downward load, Q_{nf} is then added to the total live load and dead load, Q, applied to the pile, according to the following equation:

$Q_T = Q + Q_{nf}$ Where Q_T = Total applied load
Q = Live load plus dead load
Q_{nf} = Average downward load transferred to the pile

For this site, we estimate that the load transferred to the pile (Q_{nf}) for consolidating organics would be approximately 46 kips. The downward load transferred to the pile (Q_{nf}) from liquefaction during the modeled earthquake is estimated to be 450 kips, assuming the upper 75 feet contributes to the downdrag load.

Estimated Lateral Pile Capacities – Lateral loads on piles could be imposed by wind and seismic events and by liquefied soil. These loads are resisted primarily by horizontal bearing support of the soils adjacent to the pile shafts. The lateral capacity of a pile depends on its length, stiffness in the direction of loading, proximity to other piles and degree of zero moment, as well as the engineering properties of the soil. Lateral pile capacities were estimated using the computer program LPILE Plus V5.0. The results are included in Appendix D.

Our model included liquefied sand that could be present during the modeled earthquakes.

We have presented our estimated lateral pile top capacities for free and fixed head conditions in Table 1 on the following page. These include a factor of safety of 3 applied to the lateral load.

Table 1 – Lateral Load Information

Lateral Load Information for ½-inch Deflection				
Pile Length (feet)	Pile Head Condition	Allowable Lateral Load (kips)	Maximum Bending Moment (feet-kips)	Depth of Zero Moment (feet)
110	Free	12.0	253	0, 50
	Fixed	21.2	663	17
Lateral Load Information for 1-inch Deflection				
110	Free	16.4	408	0, 54
	Fixed	31.2	1,153	18

Pile Spacing and Group Effects – The above mentioned values for compressive, uplift and lateral capacity refer to single piles unaffected by group interactions. To reduce or eliminate group effects, we recommend that the pile spacing not be less than three pile diameters measured center to center. If piles are at least three diameters apart, group effects can be neglected for compressive, uplift and perpendicularly applied lateral loads. For in-line lateral loads, however, group effects reduce the lateral load capacity of the pile at a pile spacing less than eight diameters. The following reduction factors should be applied to in-line laterally loaded piles with a center-to-center spacing between three and eight diameters as shown in the following table.

Table 2 – Reduction Factors for In-Line Laterally Loaded Piles

Pile Spacing Center to Center	In-line Load Reduction Factor
3 pile widths	.25
4 pile widths	.4
6 pile widths	.7
8 pile widths	1.0

Estimated Settlements – We estimate that total post-construction static settlements of pile-supported elements will not exceed 1 inch. Differential settlements could approach ½ of the actual total settlement amount.

Installation Monitoring – CGI should be retained to continuously monitor installation of the piles. CGI will verify that the suitable tip depths are reached. The monitoring program would include

observation and documentation of installation procedures, construction equipment, pile materials, drilling conditions and sequencing and load testing.

4.8 Seismic Design

The seismic analysis for the feasibility study was conducted using historic earthquakes with shorter duration than the 5 minutes to 6 minutes of shaking that the scientific community believes may be possible. In our opinion, the selected ground motions were adequate for this feasibility study and showed that seismic hazards do exist at the site. Longer duration ground motions may need to be considered during the final design phase of this project.

According to the site specific seismic hazard feasibility summary, we recommend using the site specific values of S_{DS} and S_{D1}, which are recommended to be 0.52g and 1.41g, respectively. Both values exceed the IBC response spectrum. The analysis was conducted for shorter duration earthquakes and these values could change.

4.9 Drainage

All roof, landscape, and other upland surface water should be directed to approved discharge points away from foundations and retaining walls. In our opinion, underslab and perimeter drains are not needed for this project. We do not expect that infiltration of stormwater into the underlying clay soils will be feasible for this site. A professional civil engineer should be consulted to provide grading plans for drainage, stormwater management options, and utility design.

4.10 Floor Slabs

Because of the intended function of the proposed building as an essential facility, we do not recommend conventional floor slab on grade. We have concern that a conventional floor slab would provide performance liabilities during an earthquake and/or subsequent tsunami event. Liquefaction under a concrete floor slab may cause it to heave or tilt and become more susceptible to tsunami shear forces or scour. A non structural slab could potentially damage foundation components during an earthquake and tsunami.

We recommend that any required floor slabs be designed as structural slabs that would not rely on near surface soil for support and would be engineered to remain intact during the design seismic event.

4.11 Pavement Design

Our scope of services did not include extensive sampling and CBR testing for the existing subgrade, or testing of potential sources of imported fill, for the specific purpose of detailed pavement analysis. Instead, we have assumed pavement related design parameters that are considered to be typical for the area soil types. The pavement recommendations presented in this report are limited to the on-site parking areas and driveways. A more detailed analysis of the subgrade and traffic conditions should be made for street improvements to the existing right-of-way or where pavements are subject to significant traffic loading conditions. The results of such a study would provide information necessary to design an economical and serviceable pavement.

We anticipate that stiff to medium stiff clay will remain underlying proposed driveway and parking areas. We recommend that the subgrade be prepared in accordance with Section 4.2, Site Preparation and Earthwork Recommendations, of this report. Pavement may be placed after the subgrade has been properly prepared, fine-graded and proof rolled.

The thickness recommendations presented below are considered minimum for the assumed parameters. We understand that budgetary considerations sometimes warrant thinner pavement sections than those presented. However, the project team should be aware that thinner pavement sections might result in increased maintenance costs and lower than anticipated pavement life.

We have estimated the near surface subgrade soils will be have a CBR of at least 4. Our recommended pavement sections are outlined in Table 3. The pavement materials and installation procedures should be completed in accordance with Oregon Department of Transportation guidelines.

Table 3 – Pavement Section Recommendations

	Car Parking and Driveways
Asphalt Surface Course	2.5
Granular Base Course	8

Rigid concrete pavements are not recommended for this site because of potentially poor performance during an earthquake event.

5.0 REPORT LIMITATIONS

The recommendations submitted in this report are based on the available subsurface information obtained by CGI and project information provided by Mark See of the City of Cannon Beach,

Oregon for the feasibility study for the proposed City Hall/Tsunami Evacuation Building. We will be available to provide further geotechnical analysis and design services as the project progresses.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed. This report has been prepared for the exclusive use of the client or their authorized agents for the specific application to the proposed project.

APPENDIX A:

SITE-SPECIFIC SEISMIC HAZARD EVALUATION

APPENDIX A

SITE-SPECIFIC SEISMIC HAZARD EVALUATION

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SITE-SPECIFIC SEISMIC HAZARD EVALUATION

Chinook GeoServices, (CGI) has completed this site specific seismic hazard evaluation for the proposed City Hall/Tsunami Evacuation Building (TEB) located at 163 East Gower Street in Cannon Beach, Oregon to determine the feasibility of the project. This study is an attachment to our geotechnical engineering report titled "Proposed New City Hall/Tsunami Evacuation Building, 163 East Gower Street, Cannon Beach, Oregon", CGI Report No. 11-022-1 dated May 4, 2011. Our work was completed in general accordance with the March 7, 2011 Personal Services Contract with the City of Cannon Beach.

Site Location and Description

The site location is shown on Figure A-1, Site Location Plan, attached to the back of this report. The site address is 163 East Gower Street, Cannon Beach, Oregon. The site is comprised of Tax Lots 11100, 12000, and 11900, of T5N R10W Section 30-AD in Clatsop County. Lots 12000 and 11900 are adjacent and are bordered on the north by East Gower Street, on the west by Evergreen Avenue, on the east by the undeveloped Harding Avenue right-of-way, and on the south by developed residential properties. The combined lot dimensions are approximately 325 feet east to west and 100 feet north to south. Lot 11100 lies across the street to the west of the other lots is bordered on the north by East Gower Street, on the west by South Hemlock Avenue, on the east by Evergreen Avenue, and on the south by Coolidge Avenue. The approximate lot dimensions are 100 feet east to west and 200 feet north to south. The approximate site layout is included in Figure A-2.

Lot 12000 is currently developed with a single story structure housing the City of Cannon Beach municipal offices. Lot 12000 also includes paved parking areas east and west of the developed structure. Lot 11900 is currently undeveloped. Lot 11100 is developed with a paved municipal parking lot. It is our understanding that the proposed structure will be located on Lot 12000, which is referred to in this report as the project site.

Based on an aerial topographic survey of The City of Cannon Beach dated December 28, 2004, the project site elevation is roughly 30 feet above mean sea level (MSL). The area of the project site is relatively level, with a minor descending slope toward the west. Site specific topographic mapping was not available at the time of this report.

Regional Geology

Much of Oregon's geologic history is defined by its location on a convergent plate tectonic boundary (subduction zone). The oceanic crust west of Oregon has collided with and subducted beneath the continental crust, a process which continues to the present day. As the oceanic crust moved toward the continent, material that could not be subducted was accreted onto the continent. The

subducting oceanic plate melted as it plunged deeper into the earth and magma migrated to the surface, creating a volcanic arc; known today as the Cascade Range. Other local and massive volcanic episodes, large earthquakes, tectonic shifting, continued erosion and sedimentation, catastrophic flooding and other geologic processes further defined Oregon's landscape. Oregon can be generally divided into geologic provinces, which share similar geologic histories, landforms, and composition. The subject site is generally located in the geologic province known as the Coast Range.

Marine sedimentary formations make up the primary bedrock in the Coast Range, which began forming approximately 65 million years ago (early Paleocene) when forearc sedimentation built a thick wedge of marine sediments off the coast. Silt, sand, and mud were deposited on the Pacific Ocean floor off the coast of Oregon and were compressed into thick layers of sedimentary rocks. As the ocean sediments were steadily accumulating, the two tectonic plates continued to collide. Uplift, folding, and faulting associated with the plate convergence continued to push the marine sedimentary rock upward to form much of the Coast Range. Accumulation of marine sediments and convergence of the plates continues to the present day.

Approximately 45 million years to 36 million years ago (middle Eocene age), the North American continental plate drifted west over a hot spot. The hot spot fed magma through the submarine Coast Range sediments and erupted lava that built up along the coast. These volcanic and intrusive rocks make up the Tillamook Highlands. Hot spot volcanism again influenced the Coast Range province between 17 million years and 15 million years ago (middle Miocene age). This period of highly active volcanism produced a series of gigantic lava floods originating from great fissures near the current Oregon-Idaho-Washington border. The thick and widespread deposits are collectively known as the Columbia River Basalts. Some basalt flows travelled all the way to the Oregon coast.

Marine sediment accumulation, lithification, and uplift were taking place before, during, and after the intermittent volcanic episodes. Where the marine sedimentary formations are older, intrusive sills and dykes, and flows of younger volcanics are sometimes present within and overlying the sedimentary rock. Basalt flows were also deposited along with the marine sediments in shallow marine environments, creating intermittent layers of marine sedimentary rock and submarine basalt formations. Large flows of basalt, such as the Columbia River Basalt, also created injection sills and dikes in the underlying sedimentary formations, which are abundant in the northwest Coast Range.

Soil and Geologic Setting

Soils mapped in the project area by the United States Department of Agriculture (USDA), Natural Resource Conservation Service Web Soil Survey (http://websoilsurvey.nrcs.usda.gov) consist of

Walluski silt loam, 0 to 7 percent slopes. This mapped unit consists of very deep, moderately well drained soils found on fluviomarine and stream terraces. The soil formed from mixed alluvium and/or fluviomarine deposits derived from sedimentary rock. A typical soil profile consists of medial silt loam to a depth of 13 inches, underlain by silty clay loam to a depth of 60 inches.

Geologic mapping for the project area is included in the 2009 Oregon Department of Geology and Mineral Industries (DOGAMI) open file report O-09-06 "Coastal Erosion Hazard Zones in Southern Clatsop County, Oregon: Seaside to Cape Falcon". This publication maps the geology in the project area as late Pleistocene age (126,000 years to 10,000 years ago) coastal terrace deposits (unit Qpt). This unit is described as unconsolidated to moderately consolidated gravel, beach, and dune sand; locally containing minor consolidated clay-rich paleosol, colluvium, debris flows, and alluvial sand, silt, and gravel deposited in channel and point bar environments. The 1985 Geologic Map of the Astoria Basin, Clatsop and Northernmost Tillamook Counties, Northwest Oregon, Oil and Gas Investigation 14 prepared by DOGAMI similarly maps the site as Pleistocene age (1.8 million years to 10,000 years ago) coastal marine-terrace deposits (Qmt). This unit is described as predominantly laminated to cross-bedded beach sand and crudely stratified rounded basalt gravels with some discontinuous paleosols, mud beds, and layers of partially carbonized tree trunks and limbs. The 1972 Environmental Geology of the Coastal Region of Tillamook and Clatsop Counties, Oregon, Bulletin 74 prepared by DOGAMI also maps the geology at the site as Pleistocene age Marine Terraces (Qmt).

The DOGAMI O-09-06 geologic map also shows undifferentiated Holocene age (10,000 years ago to present) alluvial deposits (Qha) directly west of the site. This unit is described as unconsolidated sand, silt, and gravel deposited in alluvial fan, stream terrace, or basin environments. The mapped geologic unit may represent an old stream channel in the vicinity of the project.

The uplands to the south of the subject site are mapped by Bulletin 81 as Oligocene to Miocene Sedimentary Rocks (unit Toms) and by Oil and Gas Investigation 14 as middle to lower Miocene Cannon Beach member of the Astoria Formation (unit Tac). The Toms unit consists of thin bedded to massive, medium to dark gray (orange to white where weathered), tuffaceous siltstone, with lesser amounts of sandstone and claystone. Unit Tac is described as well bedded, laminated to massive micaceous mudstone with subordinate rhythmically thin bedded feldspathic sandstone and mudstone in the lower part of the unit. Numerous outcrops of Intrusive Grande Ronde Basalt (unit Tgri) are mapped within unit Tac south of the site. Unit Tgri is described as a Tertiary middle Miocene age, invasive sills, dikes, and irregular bodies of massive to columnar-jointed, aphyric to rarely phyric basalt and peperite or intrusive bodies related to Grande Ronde Basalt. A figure illustrating the geologic maps is included in Figure A-3.

Subsurface Soil Conditions

Subsurface soil conditions were explored by CGI Geologic Associate Chuck Bolduc, G.I.T., who visited the site on March 29 and March 30, 2011. We observed advancement of two mud rotary soil borings (B-1 and B-2) to depths of 115.5 feet and 121 feet using a subcontracted truck mounted drill rig and one cone penetrometer test (CPT-1) to a depth of 28 feet using a subcontracted rig. The borings and CPT were located in the general vicinity of the proposed structure and were selected in the field by Mark See, the Public Works Director with the City of Cannon Beach, Oregon. The approximate boring and CPT locations are shown on Figure A-2. Detailed boring and CPT logs are included in the attached Appendix B.

Boring B-1 was drilled on March 29, 2011 and with sample intervals between 0 feet and 5 feet and took more than 1 day to drill. Because we observed primarily sand that was similar in gradation between 25 feet and 100 feet and bedrock at 100 feet, we recommended to Mr. See that we extend the sample intervals to between 10 feet and 25 feet so that we could get better information for foundation design in the bedrock. Mr. See agreed with the recommendation and boring B-2 was drilled on March 30, 2011 using the extended sample intervals.

In general, the subsurface conditions consisted of medium stiff to soft silt and clay in the approximately upper 25 feet, which included abundant organic material below 15 feet. Below 25 feet, we encountered medium dense to very dense gray sand. Multiple thin gravel layers were observed in the two borings at various depths. At approximately 100 feet below the ground surface, we encountered siltstone bedrock. A more detailed description of the soils encountered in the borings is included below:

Clay and Organic Debris
The clay was stiff in the near surface becoming softer with depth. Clay was tan with rust mottling with minor inclusions of rust concretions. Some sandy texture was observed but sand particles were not present. In boring B-2, the drill cuttings were observed to be significantly more orange in color than in boring B-1. Wood fiber was observed in the cuttings from boring B-2 at a depth of 10 feet and again at 15 feet. A sample in boring B-2 encountered a relatively fresh to minimally decomposed log or stump oriented vertically based on the vertical wood grain recovered in the sampler. Other samples encountered gray clay with decomposed wood debris and gray clayey sand with decomposed wood debris. We interpret this sequence of sediments were deposited in an alluvial environment. Based on the CPT data, the shear wave velocity was between 402 feet per second and 582 feet per second in this soil layer.

Beach and Dune Sand

Dense, wet, gray sand was encountered at a depth of 25 feet in boring B-1 and dense sand to silty sand was interpreted in CPT-1 below 26 feet. The sand was generally fine-grained poorly-sorted with abundant micaceous flakes in select samples. The micaceous material may have been derived from weathering of local mica-bearing sandstones of the Astoria Formation and deposited as alluvial sands. Very dense basaltic gravel and sand was encountered in boring B-1 at 55 feet below the ground surface, and ended at 57.5 feet below the ground surface based on drilling characteristics. Thin layers of gravel were also interpreted at 61.5 feet in boring B-1 and 65 feet in boring B-2 based on drilling characteristics. Based on the limited thickness and variable depth, we interpret the gravel to be discontinuous. We interpret the sands and gravel deposits to be consistent with the geologic mapping of marine terrace deposits. The CPT met refusal near the top of the contact of the upper dense sand layer at 26 feet and shear wave velocities were not obtained below 25 feet. However, based on our blow count data, we estimate that the beach and dune sand has a shear wave velocity between 650 feet per second and 1,300 feet per second.

Siltstone Bedrock

Hard siltstone bedrock was encountered in boring B-1 at 100 feet below the ground surface and in boring B-2 at 101 feet below the ground surface. The siltstone observed in each boring differed in blow counts, drilling characteristics, and cutting return. The siltstone in boring B-1 had very high blow counts, variably hard and easy drilling and black fragments of basaltic rock returned in the drill cuttings. The siltstone in boring B-2 had relatively lower blow counts, consistent drilling characteristics, and no basaltic cuttings were observed. We interpret that the siltstone in boring B-1 also included a minor basalt intrusion, which is consistent with the abundantly mapped basaltic intrusives within the Astoria Formation in the area. In boring B-1, we drilled 15 feet into the formation and in boring B-2, we drilled 20 feet into the formation. According to a Madin and Wang 1999 paper, the shear wave velocity of the siltstone bedrock was estimated to be 1,870 feet per second.

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in Appendix B should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratifications, and test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. The samples that were not altered by laboratory testing will be retained for 60 days from the date of this report and then will be discarded.

Groundwater Information

The static groundwater elevation in the project area was interpreted to be approximately 25 feet to 30 feet below the ground surface based on our observation of soil samples recorded during mud rotary drilling. The cone penetrometer test conducted a pore-water dissipation test within the dense gray sand at a depth of approximately 27.5 feet. Results of the pore-water dissipation test indicated a static water level of approximately 21 feet below the ground surface. We have assumed a groundwater depth of 21 feet below the ground surface for the purpose of this report.

Seismic Setting

The Oregon Coast is located near the western margin of the North American tectonic plate. The Pacific and Juan de Fuca tectonic plates that form the ocean floor are converging upon, and being subducted beneath, the North American Plate off the Oregon coastline. This zone of tectonic plate convergence, called the Cascadia Subduction Zone, has created a complex set of stress regimes that influence the tectonic and volcanic activity of the Pacific Northwest.

The moment magnitude (M_w) scale, rather than the Richter magnitude (M_L) scale, is now being used by seismologists to provide more accurate information. Moment magnitude measures an earthquake in terms of energy released and takes into account the rigidity of the earth, the average amount of slip on the fault and the size of the area that slipped. Richter magnitude is a base-10 logarithmic scale where the magnitude is calculated based on the combined shaking amplitude and the largest displacement from zero on a particular type of seismometer. The effective limit of measurement on the Richter scale is about M_L equal to 6.8. The size of an earthquake measured by moment magnitude and Richter magnitude are similar up to about 6.8.

The following paragraphs describe the distinct seismic sources that could potentially generate earthquakes affecting the subject site.

Cascadia Subduction Zone

The Cascadia Subduction Zone, located approximately 50 miles to 60 miles off the Oregon and Washington coastlines, is an immense thrust fault and a potential source of earthquakes large enough to cause significant ground shaking at the subject site and potentially throughout western Oregon and Washington. Research over the last several years has shown that this offshore fault zone has repeatedly produced large earthquakes every 300 years to 700 years. Geologic research of ancient Japanese tsunami records along with dendrochronology (tree ring dating techniques) has established that the last large Cascadia Subduction Zone earthquake occurred in January of 1700 AD. Although researchers do not fully agree on the likely magnitude of the next Cascadia Subduction Zone thrust fault earthquake, it is widely believed that earthquakes of moment

magnitude (M_w) 8.0 to 9.0 are possible. The scientific community believes that the duration of strong ground shaking may be as long as 5 minutes to 6 minutes, with minor shaking lasting on the order of several minutes longer. Subduction zone earthquake aftershocks could continue to occur for hours or days after the initial rupture.

Intra-Slab Seismic Sources

Additional earthquake sources in this region include fault ruptures within the subducting oceanic plates. Earthquakes occurring within the subducting oceanic plates are called intraplate earthquakes. Originating at depths on the order of 20 miles to 30 miles within the remains of the subducting Juan de Fuca Plate, these large earthquakes have occurred with historical frequency in western Washington and to a lesser extent in western Oregon. These earthquakes range up to about Mw 7.5 and have caused widespread damage in the southern Puget Sound and northwest Oregon region in 1949, 1965, and 2001.

Crustal Seismic Sources

Crustal earthquakes are relatively shallow, occurring within approximately 6 miles to 12 miles of the earth's surface as a result of localized tectonic stresses. Oregon has experienced at least two significant crustal earthquakes in the past 18 years—the Scotts Mills (Mt. Angel) earthquake (Mw 5.6) on March 25, 1993 and the Klamath Falls earthquake (Mw 6.0) on September 21, 1993. Although there are no mapped crustal faults in the immediate vicinity of the project site that pose a surface rupture hazard, there may be yet undiscovered faults capable of generating significant ground motion and capable of influencing local relative seismic hazards. Based on limited data available in Oregon, it would be reasonable to assume Mw 6.0 to 6.6 crustal earthquakes may occur in Oregon.

Ground Shaking

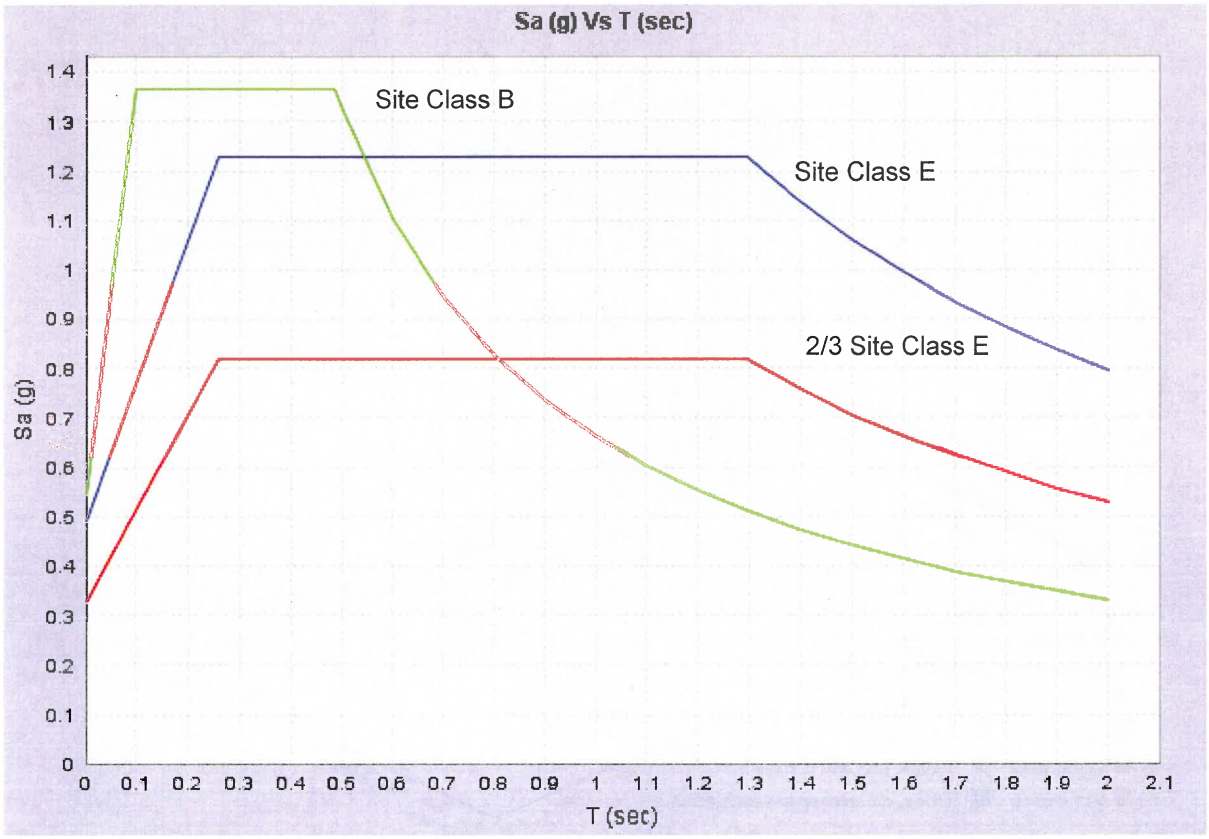
The peak horizontal ground acceleration (PGA) is the standard quantitative method of describing ground motion associated with propagating seismic waves in bedrock. The PGA is based on empirical attenuation relationships of seismic wave energy with distance from the seismic source. PGA's are expressed as a fraction of the acceleration due to gravity (g). Both Probabilistic Seismic Site Hazard (PSHA) and Deterministic Seismic Site Hazard (DSHA) were used to determine the PGA's for the site. The results are summarized in the following sections.

Probabilistic Seismic Hazard Analysis (PSHA)

The PSHA uses a response spectrum that is based on the chance that a particular ground motion will be exceeded in a defined recurrence interval (typically the lifetime of the planned development) due to earthquakes on numerous nearby and distant sources. We used the USGS National Seismic Hazard Mapping Program to obtain the ground motions evaluated for this study. Based on

the exploration logs, we classified this site as a Site Class E in accordance with the 2010 Oregon Structural Specialty Code (OSSC) Table 1613.5.6(1) and (2). The probabilistic response is based on a return interval of 2 percent probability of exceedance within 50 years as described by ASCE 7-10 Section 21.2.1. The values determined in the PSHA assessment are shown and discussed on the below.

General Response Spectra



In accordance with Table 1613.5.2 of the 2010 OSSC, which is an amendment to the 2009 International Building Code (IBC), we recommend a Site Class E (stiff soil profile) for this site. According to the USGS Java Ground Motion Parameter Calculator using the ASCE 7-05, the maximum considered earthquake (MCE) ground motions for the site are S_S=1.379g and S_1=0.676g (for Site Class B and 5 percent critical damping). The USGS values are a more accurate interpolation of the values presented in Figure 1613.5(1) and 1613.5(2) of the OSSC. Site Coefficients F_a and F_v are 0.9 and 2.4, respectively for Site Class E. Therefore the adjusted MCE

ground motions are S_{MS}=1.241g and S_{M1}=1.623g (for Site Class E). The return interval for these ground motions is 2 percent probability of exceedance in 50 years.

In addition, we performed a seismic deaggregation for the site. The estimated ground surface PGA is approximately 0.5778g for a Site Class B based on that evaluation. The seismic deaggragation is included on the following page.

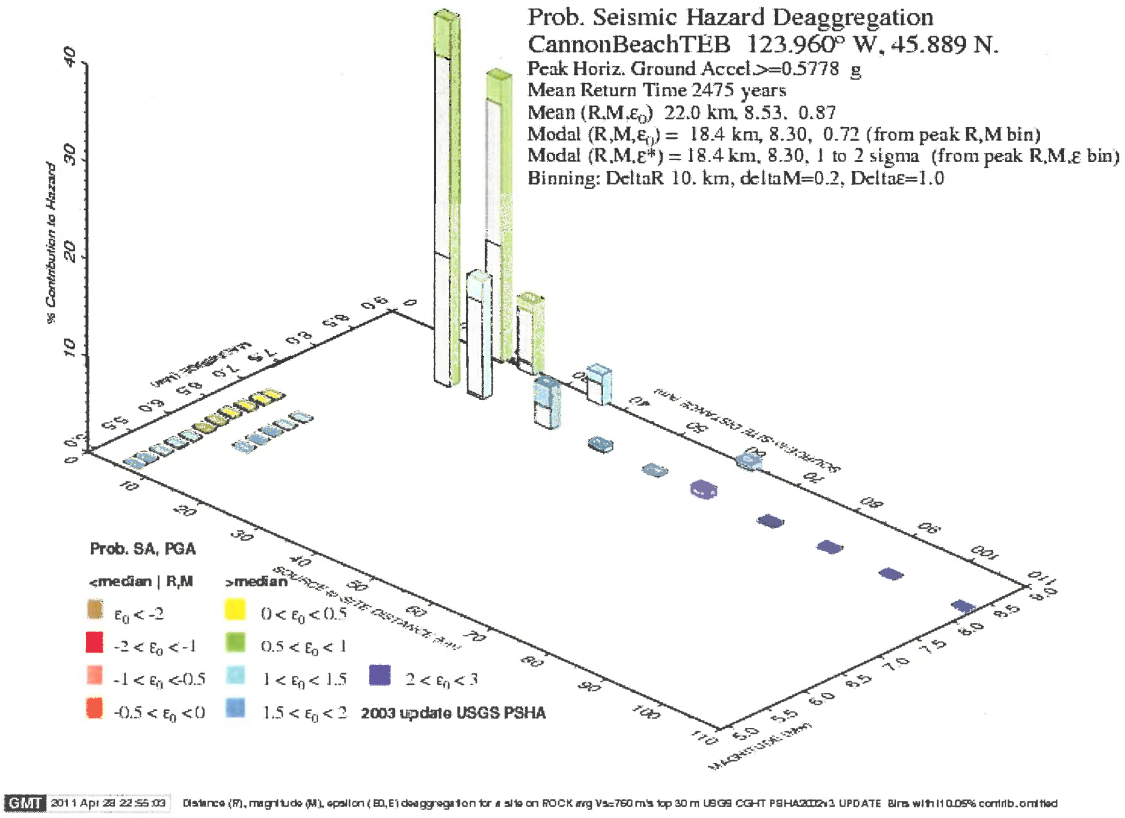


Table A-1: Principal Seismic Sources with Greater than 10 Percent Contribution to the Probabilistic Hazard at the Site

Earthquake Source	Percent Contribution	Probabilistic Magnitude
Cascadia M8.3	57 percent	8.3
Cascadia Megathrust	41 percent	9.0

Deterministic Seismic Hazard Analysis (DSHA)

A DSHA calculates the ground motions due to a specific maximum characteristic earthquake magnitude that is defined as the largest earthquake that could be expected to occur for a particular seismic source, regardless of the frequency of occurrence. The maximum characteristic earthquake is defined as the maximum earthquake that appears capable of occurring under the known tectonic framework (Kramer 1996). The size of the maximum characteristic earthquakes are discussed above in the Seismic Setting section of this appendix and are M_W 6.0 to 6.6 for shallow crustal earthquakes, M_W 7.5 for intraplate earthquakes and M_W 8.0 to 9.0 for the interface (subduction) zone earthquakes. These magnitudes are also reflected in the probabilistic analysis used by the USGS.

For the DSHA, we only conducted seismic analysis for the interface zone earthquake because that is the controlling earthquake at this site. The results of the DSHA are summarized in the following paragraphs.

Historical Seismicity
For historical seismicity within a 20 kilometer (12 mile) radius of the site, we reviewed the DOGAMI 2002 open-file report O-03-02, Map of Selected Earthquakes for Oregon, 1841 through 2002. The publication shows the location of earthquakes greater than magnitude 2.0 between 1841 and 2002. Based on our review, no earthquakes have been recorded within a 12 mile radius. No earthquakes greater than 5.9 were shown on the map. A copy of the pertinent section of the DOGAMI O-03-02 map is included in Figure A-4.

Local and Regional Potentially Active Faults
Based on review of the USGS 2006 (updated November 3, 2010) Quaternary Fault and Fold Database of the United States website, there are both on-shore and off-shore potentially active fault zones present in northwestern Oregon. The nearest potentially active fault, Fault "H", is mapped by the USGS offshore of Cannon Beach. Fault "H" consists of multiple fault strands, the eastern most of which is approximately 5.6 kilometers (3.5 miles) east of the site, although the reliability of the location is poor. The USGS describes Fault "H" as a 30 mile long northwest-striking, normal and/or left-lateral fault, which offsets accretionary wedge sediment of unknown age that underlies the continental shelf in the forearc of the Cascadia Subduction Zone. Similarities with other faults suggest most recent movement in the late Pleistocene and Holocene (<15,000 years ago). As with other folds and faults located in the Cascadia forearc, it is unknown if coseismic displacements on these faults are always related to great megathrust earthquakes on the subduction zone, or whether some displacements are related to smaller earthquakes in the North American Plate.

The known faults within 100 kilometers (62 miles) of the site have been listed in Table A-2 on the following page.

Table A-2: Class A Seismic Sources within 100-km (62 mile) Radius of the Site

Fault Name or Zone	USGS ID No.	Approximate Distance from Site (km)	Slip Rate (mm/yr)	Fault Length (km)	Most Recent Deformation
Fault "H" (offshore)	790	5.6	>5.0	49	<15Ka
Nehalem Bank Fault	789	19.0	1.0 to 5.0	101	<15Ka
Unnamed Offshore Faults	785	20.7	1.0 to 5.0	300	<15Ka
Gales Creek Fault Zone	718	22.5	<0.2	73	<1.6Ma
Tillamook Bay Fault Zone	881	35.0	<0.2	32	<1.6Ma
Cascadia Fold and Fault Belt	784	46.0	1.0 to 5.0	484	<15Ka
Fault "G" (offshore)	791	46.0	>5.0	56	<15Ka
Fault "J" (offshore)	788	48.6	1.0 to 5.0	8	<15Ka
Happy Camp Fault	882	49.5	<0.2	3	<1.6Ma
Willapa Bay fault zone	592	57.5	0.2 to 1.0	37	<15Ka
Portland Hills Fault	877	82.1	<0.2	49	<1.6Ma
Helvetia Fault	714	84.0	<0.2	7	<1.6Ma
Beaverton Fault Zone	715	88.9	<0.2	15	<750Ka
Unnamed fault set offshore of mouth of Willapa Bay	590	92.1	<0.2	26	<130Ka
Stonewall Anticline	786	92.3	1.0 to 5.0	80	<15Ka
East Bank Fault	876	94.9	<0.2	29	<15Ka
Oatfield Fault	875	95.1	<0.2	29	<1.6Ma
Unnamed fault zone offshore of Cape Shoalwater	591	95.8	<0.2	6	<1.6Ma
Newberg Fault	717	98.0	<0.2	5	<1.6Ma

USGS 2006 (updated November 3, 2010) Quaternary Fault and Fold Database of the United States.

Site Response Model

CGI used the computer program SHAKE2000 version 8.1.0 to perform dynamic analysis of a model soil profile created from subsurface information obtained in our field exploration and sol laboratory testing. Troy Hull, P.E., G.E. of Earth Engineers, Inc. provided technical expertise with the SHAKE2000 modeling. We modeled subsurface conditions represented by boring B-1 with 5 foot thick layers that extended to the bedrock. The dynamic model consisted of five different types of soil.

The following dynamic properties were selected for the model; shear modulus/maximum shear modulus (G/Gmax) and damping curves. We used soil with PI=15 (Vucetic and Dobry, JGE, 1/91)

for the upper clay layer; soil with PI=50 (Vucetic and Dobry, JGE, 1/91) for the clay with organics; average sand (Seed and Idriss, 1970) for the dense to very dense sand; G/Gmax curves for sand CP>3.0ksc 3/11 1988 and damping curves for deep cohesionless soil 21 to 50 feet for the medium dense sand; G/Gmax curves for sand CP>3.0ksc 3/11 1988 and damping curves for deep cohesionless soil 21 to 50 feet for the lower dense sand layer between 60 feet and 65 feet below the ground surface; and EPRI, 1993 for rock 51 to 120 feet for the siltstone bedrock. Shear wave velocities were determined in the field in the CPT or correlated with the N_{60} value calculated from the corrected blow counts in the boring log for B-1. The shear wave velocity of the bedrock was estimated to be 1,870 feet per second (Madin and Wang 1999).

The horizontal PGAs were calculated using three attenuation relationships for a M_W of either 8.5 or 9 because the some of the models are reliable only to that magnitude. The source to site distance was 80 kilometers (50 miles) and a depth of 20 kilometers (13 miles) was assumed for this site. The calculated PGAs are summarized in Table A-3 below.

Table A-3: Calculated PGA at Bedrock, g

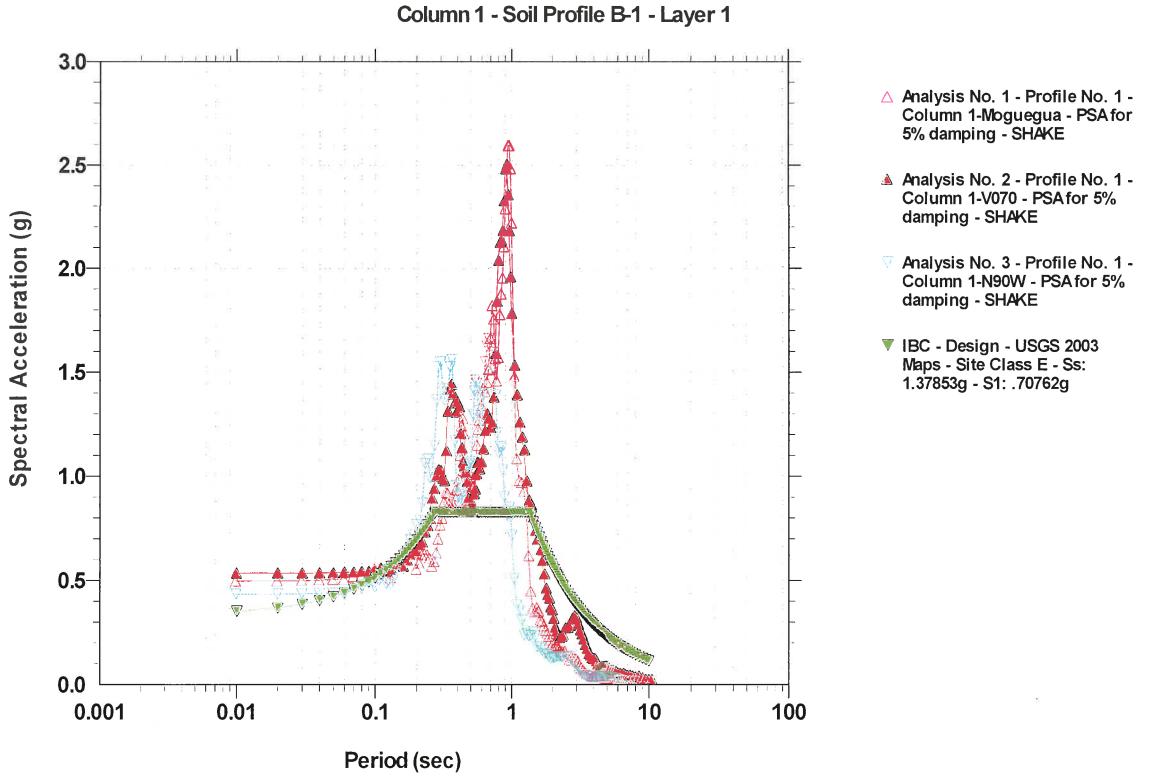
Relationship	Calculated PGA
Gregor, et.al (2002)	0.349
Youngs, et.al (1997)	0.437
Atkinson and Boore (2003)	0.165

We modeled only the interface or subduction zone earthquake because that is the principal seismic source for this site based on the research obtained during the PSHA analysis. We selected three historic earthquakes to complete the analysis. The length of recorded shaking for these earthquakes varied from 1 minute to over 3 minutes. Longer records were not available to us. However, the analysis showed that liquefaction and lateral spreading would occur at the site during the shorter duration ground motions. In our opinion, the selected ground motions were adequate for this feasibility study. Longer duration ground motions may need to be considered during the final design phase of this project. The earthquakes were scaled so that their response spectrum is, on average, approximately at the level of the targeted base spectrum over the anticipated range of significance to the structure. The details of the earthquake records are listed in Table A-4 on the next page.

Table A-4: Earthquake Motions Used In Analysis

Earthquake	Earthquake Type	Station	Magnitude	Source to Site Distance	Recorded PGA	Scaling Factor
2001 Peru	Subduction Zone, Interface	Moquegua	8.4	--	0.30	1.2
1985 Valparaiso (Chili)	Subduction Zone, Interface	Valparaiso (VALU) 70	7.8	109 km (80 miles)	0.23	1.4
1985 Michoacan (Mexico)	Subduction Zone, Interface	Caleta de Campos, N90W	8.1	38 km (23 miles)	0.14	1.6

The response spectrum for the earthquake motions and the IBC code values for reference are provided in the figure included below.



Site Specific Acceleration Parameters for Design

As specified in ASCE 7-10, the design spectral response acceleration parameter at short periods (S_{DS}) obtained from a site specific procedure should be taken at the 0.2 second spectral acceleration, but should not be less than 80 percent of the peak spectral acceleration at any period larger than 0.2 seconds. ASCE 7-10 requires that the parameter S_{D1}, the design spectral response acceleration at a period of 1 second, shall be taken as the greater of the spectral acceleration values at 1 second or two times the spectral acceleration value at 2 seconds. Based on these procedures, the site specific values of S_{DS} and S_{D1} are recommended to be 0.52g and 1.41g, respectively. These values were obtained from the average of the three earthquake response spectrums shown above. Both values exceed the IBC response spectrum. The analysis was conducted for 1 to 3 minute duration earthquakes and these values could change under longer duration earthquakes.

Site Specific Seismic Hazard Summary

The following section of this report presents out evaluation of the site-specific seismic hazards including:

- Liquefaction and Lateral Spread
- Fault Rupture Hazard
- Tsunami Hazard
- Co-Seismic Ground Subsidence
- Earthquake-Induced Landslide Hazard
- Settlement Mitigation and Scour Protection

Liquefaction and Lateral Spread Hazard

Liquefaction occurs when saturated deposits of loose to medium dense, cohesionless, fine-grained soils, generally sands and sand-silt mixtures, are subjected to strong earthquake shaking. If these deposits are saturated and cannot drain rapidly, there will be an increase in pore water pressure. With increasing seismic shaking, the pore water pressure can increase to the value of the overburden pressure. The shear strength of a cohesionless soil is directly proportional to the effective stress, which is equal to the difference between the overburden pressure and the pore water pressure. Therefore, when the pore water pressure increases to the value of the overburden pressure, the shear strength of the soil reduces to zero, and the soil deposits turn to a liquefied state. Liquefaction typically occurs when very loose to loose, saturated sediments are subjected to large earthquake motions. Ground surface response to seismic liquefaction could include softening or settlement of soil grades, loss of foundation support, tipping or tilting of taller structures founded on shallow footings, and a form of slope stability failure called lateral spreading.

Simplified empirical field methods were used to assess liquefaction. These methods are effective to depths of 75 feet. Cyclic laboratory testing and additional ground response analysis would need to be completed to assess the liquefaction potential below depths of 75 feet.

For our liquefaction analysis, we assumed that groundwater would be at a depth of 21 feet below the ground surface. We found that the clay layer will strain soften in the upper 25 feet of boring B-1 and underlying sand could liquefy at all depths except for the between 35 feet and 40 feet and below 75 feet. Based on our soil explorations, laboratory testing and analysis, we estimated that 9 to 15 inches of liquefaction induced settlement in the sand layers and strain softening in the upper clay layers could occur within the upper 75 feet of the site soil profile during the earthquakes modeled. Liquefaction could result in softening or deformation of surface grades or expulsion of water and sediment from the subsurface. Liquefaction can also reduce soil support and pile foundation capacity during an earthquake. Between 1 foot and 4 feet of lateral spreading could occur at the site during the earthquakes modeled with the anticipated direction of movement toward the Pacific Ocean beaches.

Fault Rupture Hazard

There are no mapped crustal faults in the immediate vicinity of the project site. We also reviewed available LIDAR imagery and bathymetry for the project area and did not observe significant signs or trends of any unmapped fault traces, such as lineaments, off-set topographic features, or off-set drainages. However, there may be yet undiscovered faults capable of generating significant ground motion and capable of influencing local relative seismic hazards.

Tsunami Hazards

Due to the relatively low elevation of the site above sea level, tsunami inundation and scour are considered likely seismic hazards at this site. A tsunami, or seismic sea wave, is produced when a fault under the ocean floor shifts vertically, displacing the seawater above it. Based on the DOGAMI Special Paper 41, 2009, the City Hall site lies within in a zone predicted to be inundated by between 50 percent and 70 percent of possible Cascadia Tsunami scenarios as shown on Figure A-5. The site is also subject to inundation by the maximum distant tsunami scenario modeled from Gulf of Alaska seismic source. Lines of 50 percent, 70 percent, 90 percent, and 99 percent lines on Figure A-5 correspond to inundation depths of 9 meters (29 feet), 11meters (36 feet), 16 meters (52 meters), and 30 meters (100 feet), where tsunamis were amplified by local topography. Scour from a tsunami could remove several feet of surface soil from the site, potentially eroding parking and street grades, damaging shallow underground utilities and undermining shallow foundations.

Co-Seismic Ground Subsidence

Co-seismic ground subsidence occurs when large areas of the coastline release built up strain during a large earthquake. The historical and geologic evidence suggest that 2 meters (6 feet) or

more of rapid co-seismic subsidence could occur in this area during a strong Cascadia Suduction zone earthquake. Site affects could include immediate flooding of low lying or coastal areas and relatively higher tsunami inundation levels.

Earthquake Induced Landslide Hazard
The risk of earthquake induced landslides on the site is negligible because the site slopes are mild to level.

Settlement Mitigation and Scour Protection
A building supported on concrete piles with a structural slab would not be affected by dynamic settlement and lateral spreading. However, the ground surface, surrounding structures and utilities will be affected by the dynamic settlement and lateral spreading. Ground improvement techniques, such as deep soil mixing and installation of vertical drains could reduce the risk of liquefaction and lateral spreading.

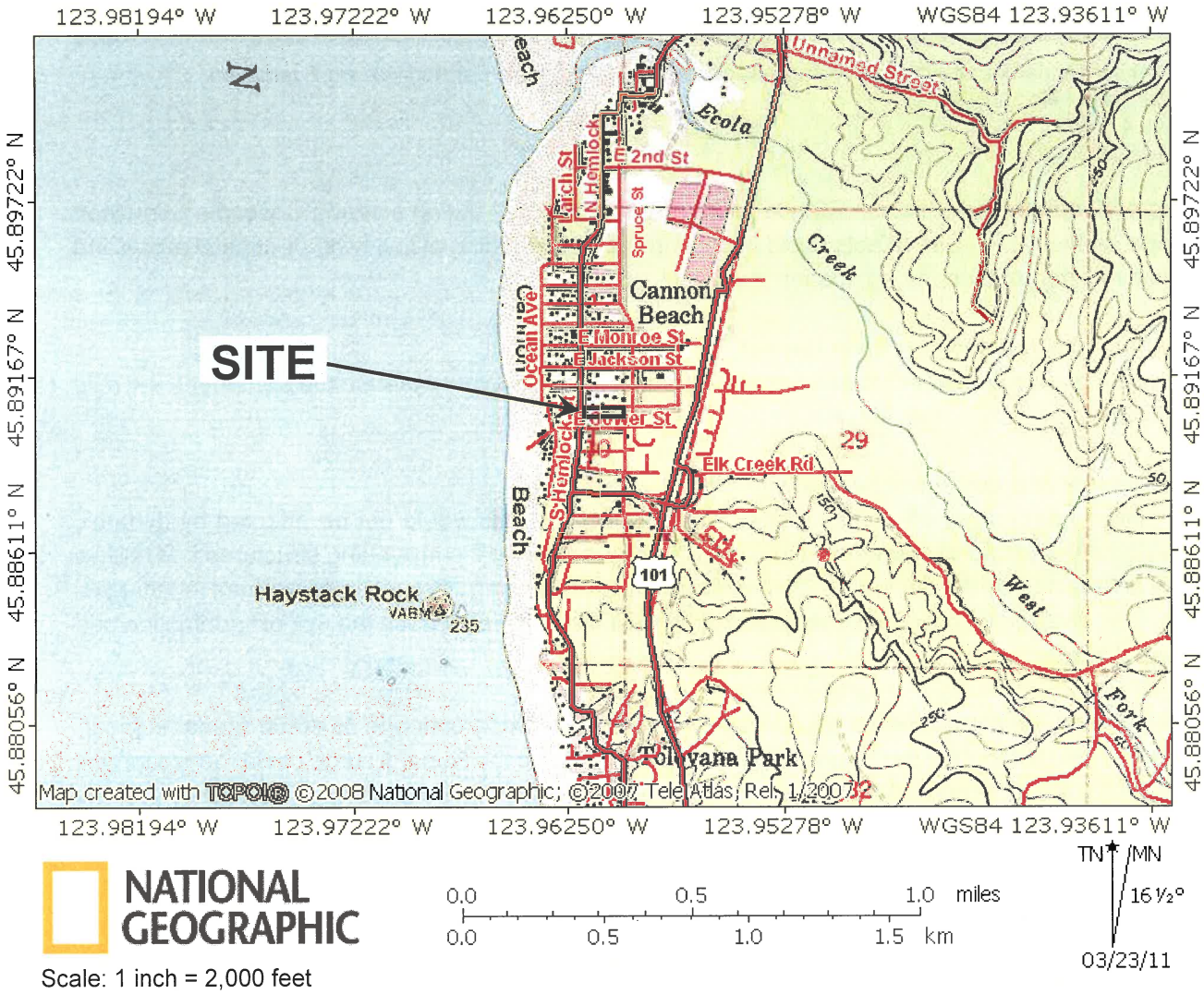
Foundation elements should be constructed of cast-in-place concrete to resist tsunami scour. Placing the rectangular building with the long axis parallel to the tsunami surge could reduce forces. Bearing walls or structural walls should be placed perpendicular to the water flow. Tsunami forces could be reduced by allowing non-structural elements at lower levels to break away

Limitations

This feasibility study showed that seismic hazards do exist at the site. Final design may need to consider different earthquake scenarios for longer duration ground motions than were considered for this analysis.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed. This report has been prepared for the exclusive use of the client or their authorized agents for the specific application to the proposed project.

FIGURE A-1: SITE LOCATION PLAN



Scale: 1 inch = 2,000 feet

Approximate Scale: 1 inch = 2,000 feet

Chinook GeoServices Inc.	**Proposed New City Hall Tsunami Evacuation Building 163 East Gower Street Cannon Beach, Oregon**	**Report No. 11-022-1** **Date: May 4, 2011**

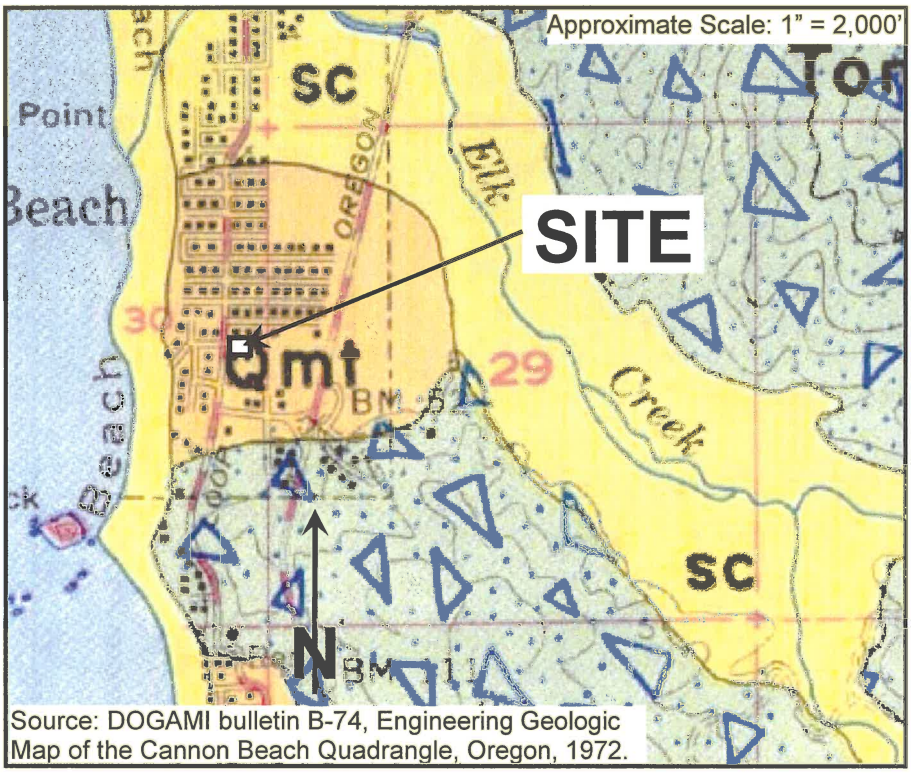
FIGURE A-2: SITE PLAN WITH EXPLORATION LOCATIONS

Approximate Scale: 1 inch = 80 feet

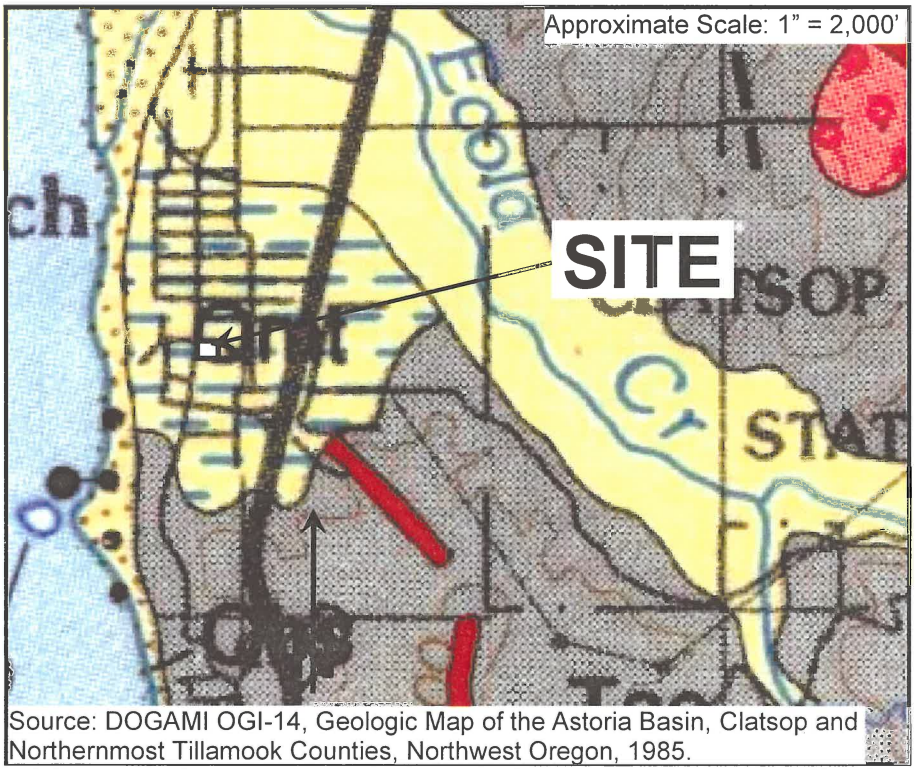
Source: City of Cannon Beach GIS Website (http://www.ci.cannon-beach.or.us/docs/Planning/GIS_2010/MASTER/index4.htm)

Chinook GeoServices Inc.	**Proposed New City Hall Tsunami Evacuation Building 163 East Gower Street Cannon Beach, Oregon**	**Report No. 11-022-1** **Date: May 4, 2011**

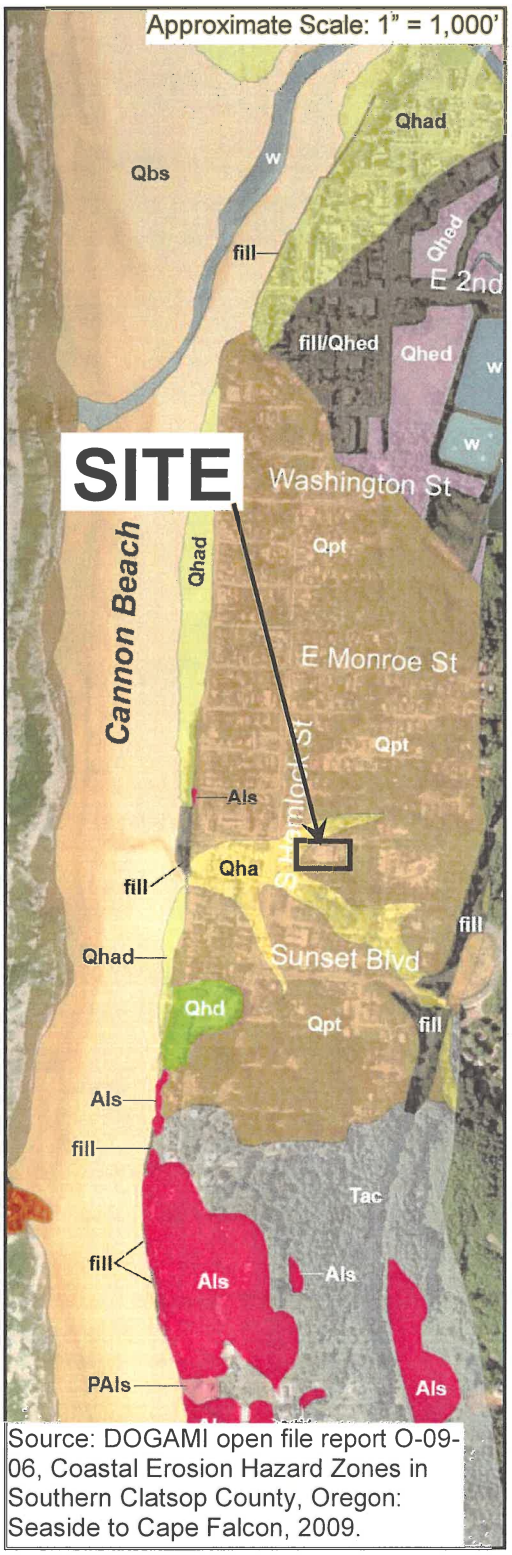
FIGURE A-3: GEOLOGIC MAPS



Source: DOGAMI bulletin B-74, Engineering Geologic Map of the Cannon Beach Quadrangle, Oregon, 1972.



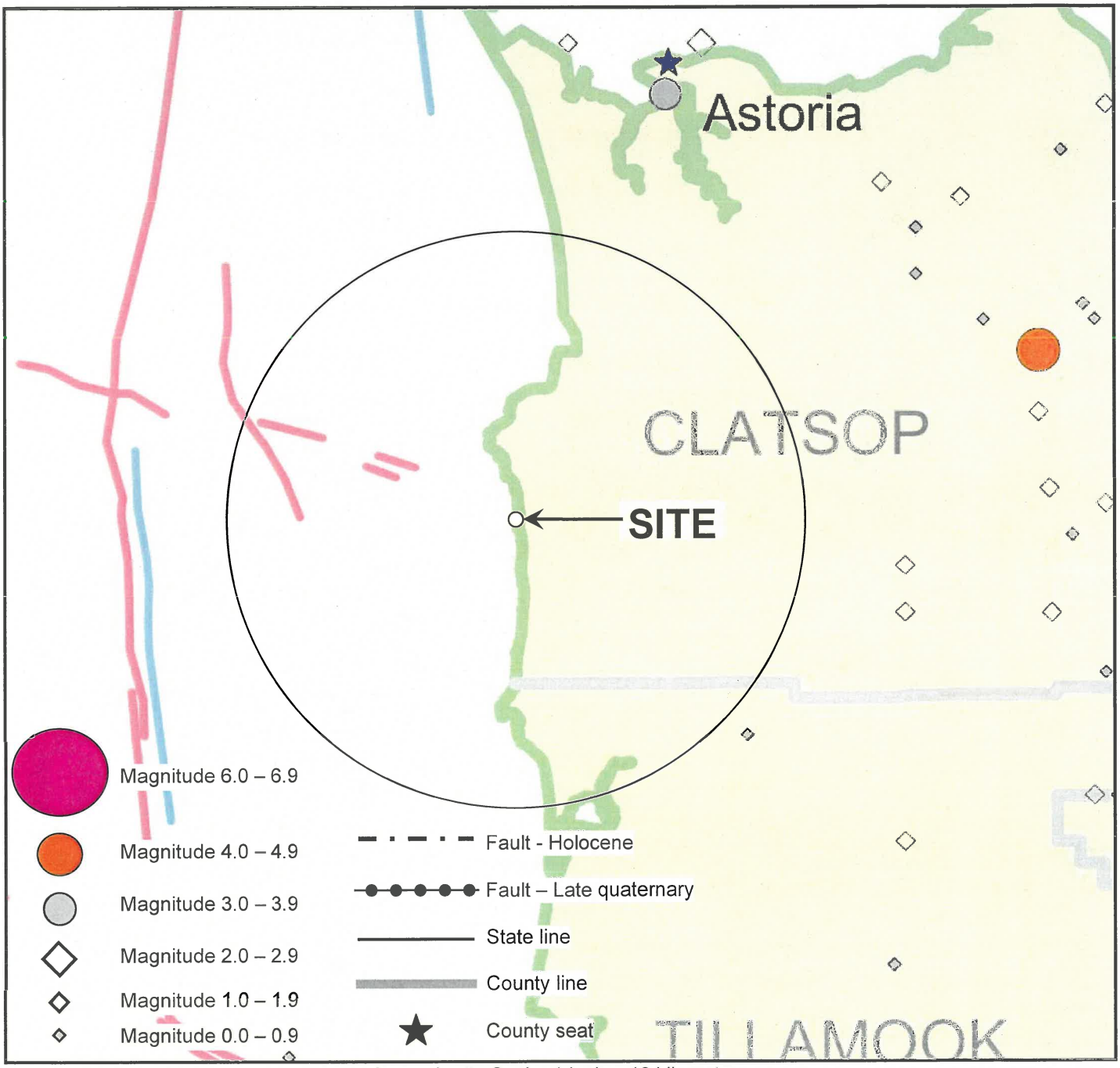
Source: DOGAMI OGI-14, Geologic Map of the Astoria Basin, Clatsop and Northernmost Tillamook Counties, Northwest Oregon, 1985.



Source: DOGAMI open file report O-09-06, Coastal Erosion Hazard Zones in Southern Clatsop County, Oregon: Seaside to Cape Falcon, 2009.

Chinook GeoServices Inc.	Proposed New City Hall Tsunami Evacuation Building 163 East Gower Street Cannon Beach, Oregon	Report No. 11-022-1 Date: May 4, 2011

FIGURE A-4: HISTORIC EARTHQUAKES AND FAULT MAP

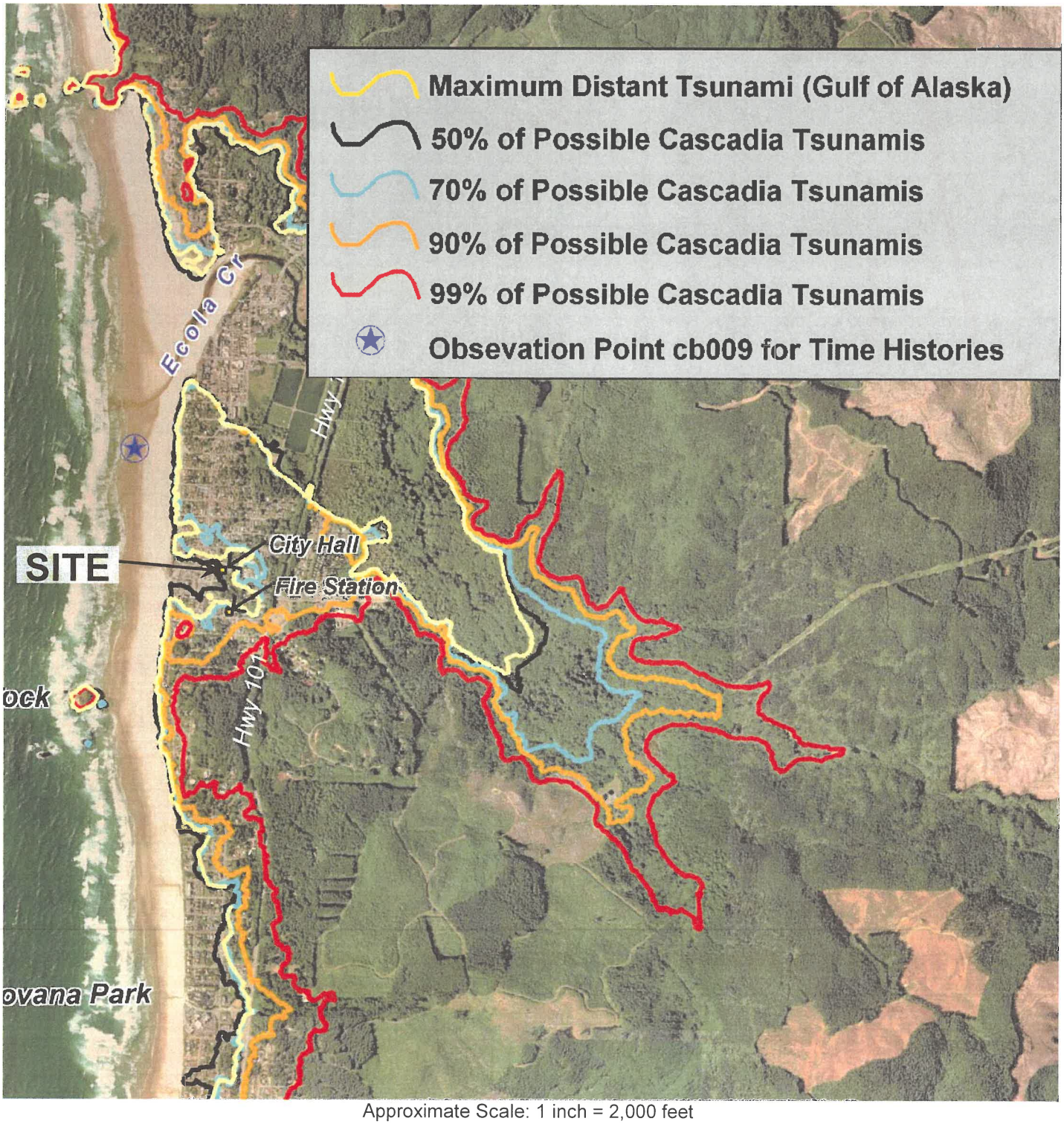


Approximate Scale: 1 inch = 10 kilometers

Source: DOGAMI 0-03-02 Map of Selected Earthquakes for Oregon 1841 through 2002

Chinook GeoServices Inc.	**Proposed New City Hall Tsunami Evacuation Building 163 East Gower Street Cannon Beach, Oregon**	**Report No. 11-022-1**
		Date: May 4, 2011

FIGURE A-5: TSUNAMI INUNDATION MAP



Approximate Scale: 1 inch = 2,000 feet

Source: DOGAMI SP-41, Tsunami hazard assessment of the northern Oregon coast: a multi-deterministic approach tested at Cannon Beach, Clatsop County, Oregon, Figure 50 page 73.

Chinook GeoServices Inc.	Proposed New City Hall Tsunami Evacuation Building 163 East Gower Street Cannon Beach, Oregon	Report No. 11-022-1 Date: May 4, 2011

APPENDIX B:

FIELD EXPLORATION PROCEDURES AND LOGS

APPENDIX B

FIELD EXPLORATION PROCEDURES AND LOGS

Chinook GeoServices, Inc. (CGI) explored subsurface conditions on March 29 and 30, 2011, during which time two soil borings (B-1 and B-2) were drilled and one cone penetrometer (CPT-1) was advanced.

Drilled Borings

Our two soil borings (B-1 and B-2) were drilled and sampled using mud rotary drilling equipment. The drill rig was operated by Subsurface Technologies of North Plains, Oregon under contract to CGI. Boring locations were selected in the field by the Client in the general vicinity of proposed structure. Field measurements from site features were used to locate the borings on the site plan. A qualified representative from CGI continuously observed the borings, logged the subsurface conditions and collected representative soil samples. All samples were stored in watertight containers and later transported to a subcontracted laboratory for further testing. After each boring was completed, the borehole was backfilled with bentonite chips and patched with asphalt cold patch.

Throughout the drilling operation, soil samples were generally obtained at 5-foot intervals in boring B-1 and 25-foot to 10-foot intervals in boring B-2 using a Standard Penetration Test (SPT) in accordance with ASTM D1586 using an automatic hammer. The testing and sampling procedure consists of driving a 2-inch diameter steel split spoon sampler 18 inches into the soil with a 140 pound hammer free-falling a distance of 30 inches. The number of blows required to drive the sampler through each 6-inch interval are counted, and the total number of blows struck during the final 12 inches is recorded as the SPT blow count (N-value). If the total blow count of 50 blows is recorded for any 6-inch interval, the driving is stopped and the blow count is recorded as 50 blows for the actual penetration distance. The resulting SPT resistance values indicate the relative density of granular soils and the relative consistency of cohesive soils.

The automatic hammer produces lower blow counts and SPT N-values than the traditional safety hammer. Studies have generally shown that penetration resistances may vary by a factor of 1.5 to 2 between the two methods. We have not adjusted the numbers recorded on the boring logs, and therefore the SPT values should be considered conservative.

The enclosed Boring Logs describe the vertical sequence of soils and materials encountered in each boring, based primarily on field classifications and supported by our subsequent laboratory examination and testing. Where a soil contact was observed to

be gradational, our logs indicate the average contact depth. Where the soil type changed between sample intervals, we inferred the contact depth. Our logs graphically present the blow count per 6-inch interval, the sample number, and approximate depth of each soil sample obtained from the borings, as well as any laboratory tests performed on these samples. If any ground water was encountered in a boring, the approximate ground water depth is shown in the boring log. Ground water depth estimates were determined by visual examination of the samples.

Cone Penetrometer Test Probe

One cone penetrometer test probe (CPT) (CPT-1) was advanced using electronic cone equipment. The CPT rig was a Hogentogler Seismic/Pore Pressure 10 ton Subtraction Electronic Cone Penetrometer operated by Subsurface Technologies of North Plains, Oregon under contract to CGI. The exploration location was selected in the field by the Client in the general vicinity of proposed structure. Field measurements from site features were used to locate the CPT probe on the site plan. The exploration was advanced in general conformance with ASTM D3441. The test method consists of pushing an instrumented cone, with the tip facing down, into the ground at a controlled rate.

Seismic shear wave velocity testing was obtained at 2 meter intervals. The seismic shear wave testing equipment consists of hammer, a static load and a field computer all connected with a trigger that serves as the seismic source. The time for the shear wave to arrive at the seismic cone is measured. The shear wave velocity is calculated based on the information obtained in the field.

Pore pressure dissipation was also measured within the sand material present at a depth of 27.5 feet. The testing is conducted by allowing the excess pore water pressure to dissipate from the test depth. Pore pressure dissipation testing allows for calculation of the static water table. Results of the pore-water dissipation test indicated a static water level of approximately 21 feet below the ground surface.

Boring Log B-1

Chinook GeoServices Inc.

CLIENT: Mark See, Public Works Director, City of Cannon Beach	CGI PROJECT NO.: 11-022
PROJECT: Proposed New City Hall / Tsunami Evacuation Building	BORING TYPE: Mud rotary using truck mounted rig equipped with automatic SPT hammer
LOCATION: 163 East Gower Street, Cannon Beach, Oregon	ELEVATION: Approximately 30 feet above mean sea level
DATE DRILLED: March 29, 2011	LOGGED BY: Chuck Bolduc, G.I.T.

DEPTH (ft)	SAMPLE NO.	SAMPLE	SOIL DESCRIPTION	BLOWS PER 6 INCHES	SPT "N" Value	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT (%)	UNIT DRY WT. (p.c.f.)	REMARKS
			1.5 inches asphalt underlain by approximately 7.5 inches base rock							
	S-1		Stiff, moist, gray-brown with rust mottling, clay with sand texture	3 4 5	9					
	S-2		Becomes medium stiff.	2 3 4	7	53	35	61.5		
5	S-3		Becomes light tan.	2 2 3	5					
10	S-4		Becomes soft.	1 1 1	2	62	36	63.1		
15	S-5		Tree or stump in upright position. Wood core had grains orientec vertically. Fresh to partially decomposed.	3 5 6	11					
20	S-6		Soft, moist to wet, gray clay with sand texture and decomposec wood debris and organics.	0 2 1	3					
25	S-7		Dense, wet, gray fine-grained sand.	10 15 20	35					▼ Estimated Static Groundwater
30	S-8		Becomes tan.	16 20 19	39					
35	S-9			18 22 27	49					
40	S-10			14 18 17	35					
45	S-11		Becomes medium dense, wet, gray and tan sand with abundan micaceous grains.	7 8 9	17					
50										

Boring Log B-1 Continued

Chinook GeoServices Inc.

CLIENT: Mark See, Public Works Director, City of Cannon Beach	CGI PROJECT NO.: 11-022
PROJECT: Proposed New City Hall / Tsunami Evacuation Building	BORING TYPE: Mud rotary using truck mounted rig equipped with automatic SPT hammer
LOCATION: 163 East Gower Street, Cannon Beach, Oregon	ELEVATION: Approximately 30 feet above mean sea level
DATE DRILLED: March 29, 2011	LOGGED BY: Chuck Bolduc, G.I.T.

DEPTH (ft)	SAMPLE NO.	SAMPLE	SOIL DESCRIPTION	BLOWS PER 6 INCHES	SPT "N" Value	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT (%)	UNIT DRY WT. (p.c.f.)	REMARKS
	S-12		Becomes dense.	10 14 20	34					
55	S-13		Very dense, wet, gray sand and basaltic gravel.	45 50 for 3"	>50					
			Base of gravel layer, based on driling characteristics.							
60	S-14		Dense, wet, gray fine-grained sand with micaceous flakes and trace rounded black gravel.	8 20 15	35					
			Layer of gravel infered from drilling characteristics.							
65	S-15		Very dense, wet, gray fine-grained sand with no micaceous flakes	16 47 42	89					
70	S-16			20 31 31	62					
75	S-17			20 26 33	59					
80	S-18		Becomes dense with some micaceous flakes.	15 17 25	42					
85	S-19		More abundant micaceous flakes.	22 24 18	42					
90	S-20			16 23 25	48					
95	S-21		Becomes very dense.	22 27 26	53					
100										

Boring Log B-1 Continued

Chinook GeoServices Inc.

CLIENT: Mark See, Public Works Director, City of Cannon Beach	CGI PROJECT NO.: 11-022
PROJECT: Proposed New City Hall / Tsunami Evacuation Building	BORING TYPE: Mud rotary using truck mounted rig equipped with automatic SPT hammer
LOCATION: 163 East Gower Street, Cannon Beach, Oregon	ELEVATION: Approximately 30 feet above mean sea level
DATE DRILLED: March 29, 2011	LOGGED BY: Chuck Bolduc, G.I.T.

DEPTH (ft)	SAMPLE NO.	SAMPLE	SOIL DESCRIPTION	BLOWS PER 6 INCHES	SPT "N" Value	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT (%)	UNIT DRY WT. (p.c.f.)	REMARKS
	S-22		Hard, moist, purplish-brown siltstone.	36 50 for 3"	>50					
	S-23		No sample recovery.	30 for 0"	>50					
			Fragments of black basalt observed in the drill cuttings.							
105	S-24		No sample recovery.	30 for 0"	>50					
			Drilling indicated contact between harder and softer material							
110	S-25		Hard, moist, purplish-brown siltstone.	50 for 4"	>50					
			Drill cuttings continue to bring up black basalt fragments							
115	S-26			50 for 6"	>50					
			Boring terminated at 115.5 feet below the ground surface and backfilled with bentonite/cement grout and bentonite chip hole-plug							
120										
125										
130										
135										
140										
145										
150										

Boring Log B-2

Chinook GeoServices Inc.

CLIENT: Mark See, Public Works Director, City of Cannon Beach	CGI PROJECT NO.: 11-022
PROJECT: Proposed New City Hall / Tsunami Evacuation Building	BORING TYPE: Mud rotary using truck mounted rig equipped with automatic SPT hammer
LOCATION: 163 East Gower Street, Cannon Beach, Oregon	ELEVATION: Approximately 30 feet above mean sea level
DATE DRILLED: March 30, 2011	LOGGED BY: Chuck Bolduc, G.I.T.

DEPTH (ft)	SAMPLE NO.	SAMPLE	SOIL DESCRIPTION	BLOWS PER 6 INCHES	SPT "N" Value	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT (%)	UNIT DRY WT. (p.c.f.)	REMARKS
10			Woody debris observed in cuttings.							
15			Woody debris observed in cuttings.							
25	S-1		Stiff, moist, gray clayey sand with wood and organic debris	4 6 8	14					

Boring Log B-2 Continued

Chinook GeoServices Inc.

CLIENT: Mark See, Public Works Director, City of Cannon Beach	CGI PROJECT NO.: 11-022
PROJECT: Proposed New City Hall / Tsunami Evacuation Building	BORING TYPE: Mud rotary using truck mounted rig equipped with automatic SPT hammer
LOCATION: 163 East Gower Street, Cannon Beach, Oregon	ELEVATION: Approximately 30 feet above mean sea level
DATE DRILLED: March 30, 2011	LOGGED BY: Chuck Bolduc, G.I.T.

DEPTH (ft)	SAMPLE NO.	SAMPLE	SOIL DESCRIPTION	BLOWS PER 6 INCHES	SPT "N" Value	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT (%)	UNIT DRY WT. (p.c.f.)	REMARKS
	S-2		Medium dense, wet gray sand with layers of mica and micaceous sand.	4 8 15	23					
55										
60										
65			Layer of gravelly material based on drilling characteristics							
70										
75	S-3		Medium dense, wet, tan and gray fine-grained sand with no mica	8 12 15	27					
80										
85	S-4		Becomes dense with layers of concetrated micaceious flakes.	12 16 20	36					
90			Alternately hard and easier drilling between 90 and 95 feet							
95	S-5			13 19 24	43					
100										

Boring Log B-2 Continued

Chinook GeoServices Inc.

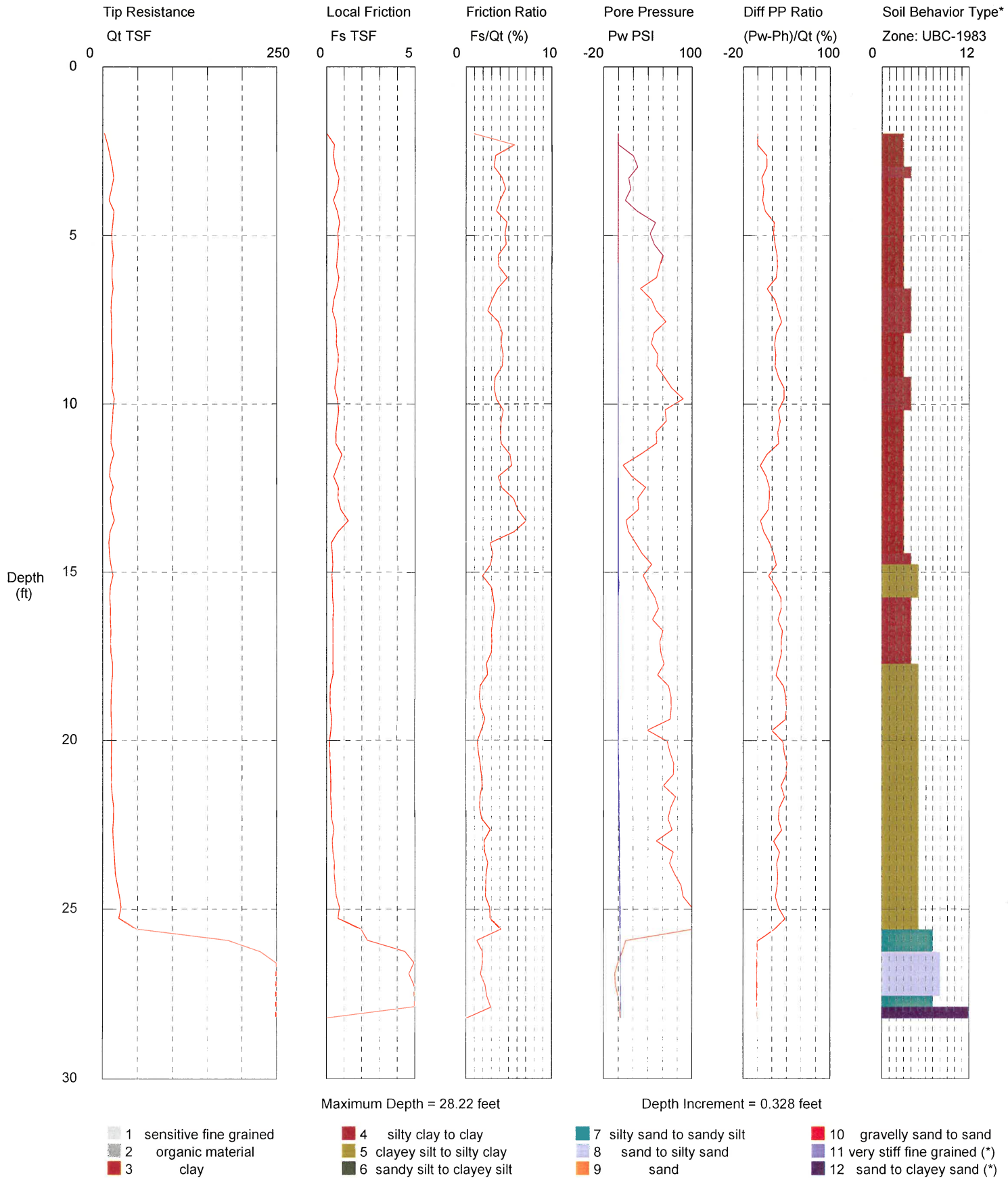
CLIENT: Mark See, Public Works Director, City of Cannon Beach	CGI PROJECT NO.: 11-022
PROJECT: Proposed New City Hall / Tsunami Evacuation Building	BORING TYPE: Mud rotary using truck mounted rig equipped with automatic SPT hammer
LOCATION: 163 East Gower Street, Cannon Beach, Oregon	ELEVATION: Approximately 30 feet above mean sea level
DATE DRILLED: March 30, 2011	LOGGED BY: Chuck Bolduc, G.I.T.

DEPTH (ft)	SAMPLE NO.	SAMPLE	SOIL DESCRIPTION	BLOWS PER 6 INCHES	SPT "N" Value	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT (%)	UNIT DRY WT. (p.c.f.)	REMARKS
			Contact with bedrock based on drilling characteristics.							
	S-6		Hard, moist, grayish brown siltstone.	50 for 4"	>50					
105										
110	S-7			32 43 50 for 5"	>50					
115										
120	S-8			48 50 for 5"						
			Boring terminated at 121 feet below the ground surface and backfilled with bentonite/cement grout and bentonite chip hole-plug							
125										
130										
135										
140										
145										
150										

Subsurface Technologies

Operator: SAM
Sounding: P-1
Cone Used: DSG1021

CPT Date/Time: 3/29/2011 9:24:20 AM
Location: CANNON-CITY HALL
Job Number: 11-022



Maximum Depth = 28.22 feet

Depth Increment = 0.328 feet

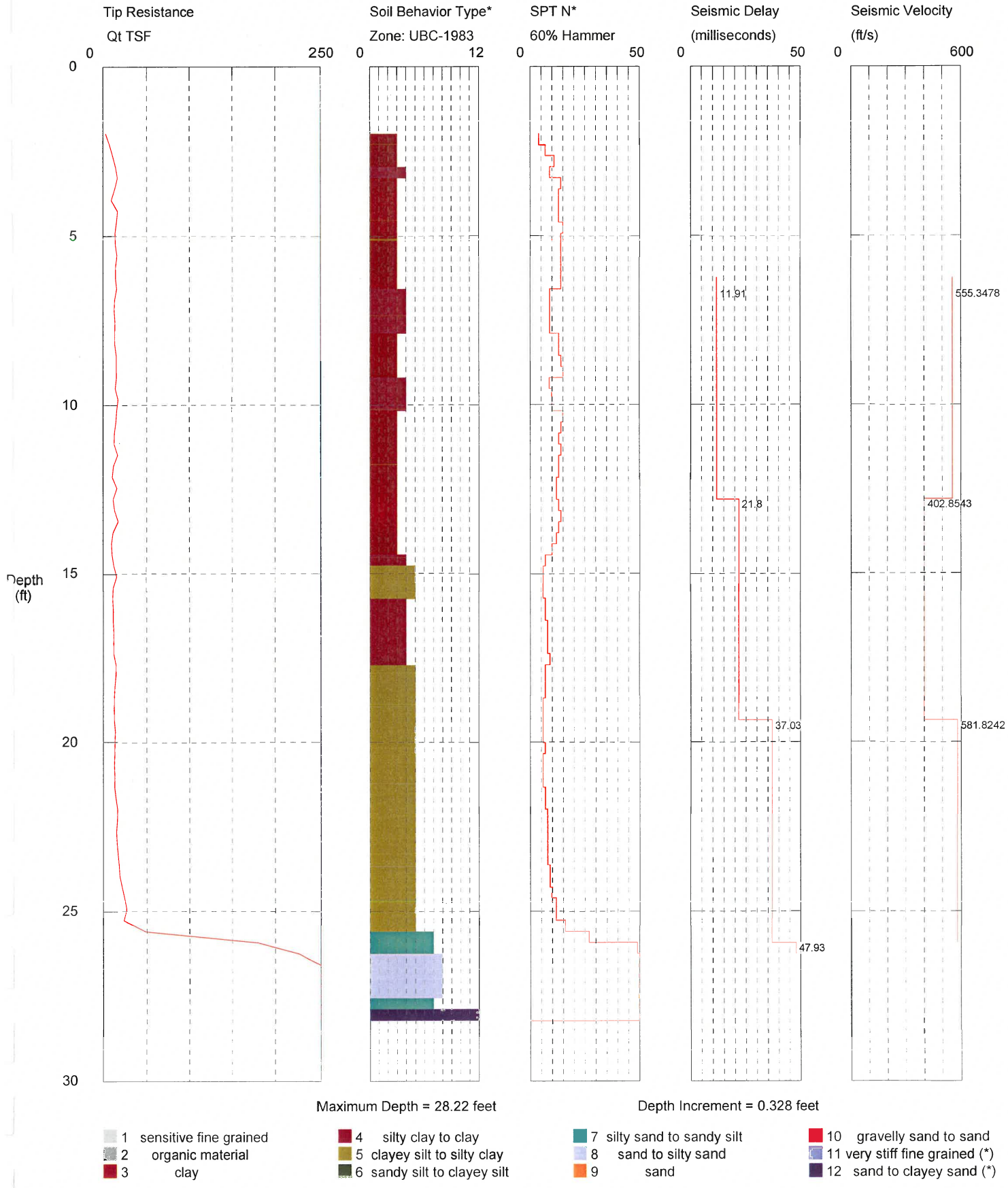
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Subsurface Technologies

Operator: SAM
Sounding: P-1
Cone Used: DSG1021

CPT Date/Time: 3/29/2011 9:24:20 AM
Location: CANNON-CITY HALL
Job Number: 11-022



Maximum Depth = 28.22 feet

Depth Increment = 0.328 feet

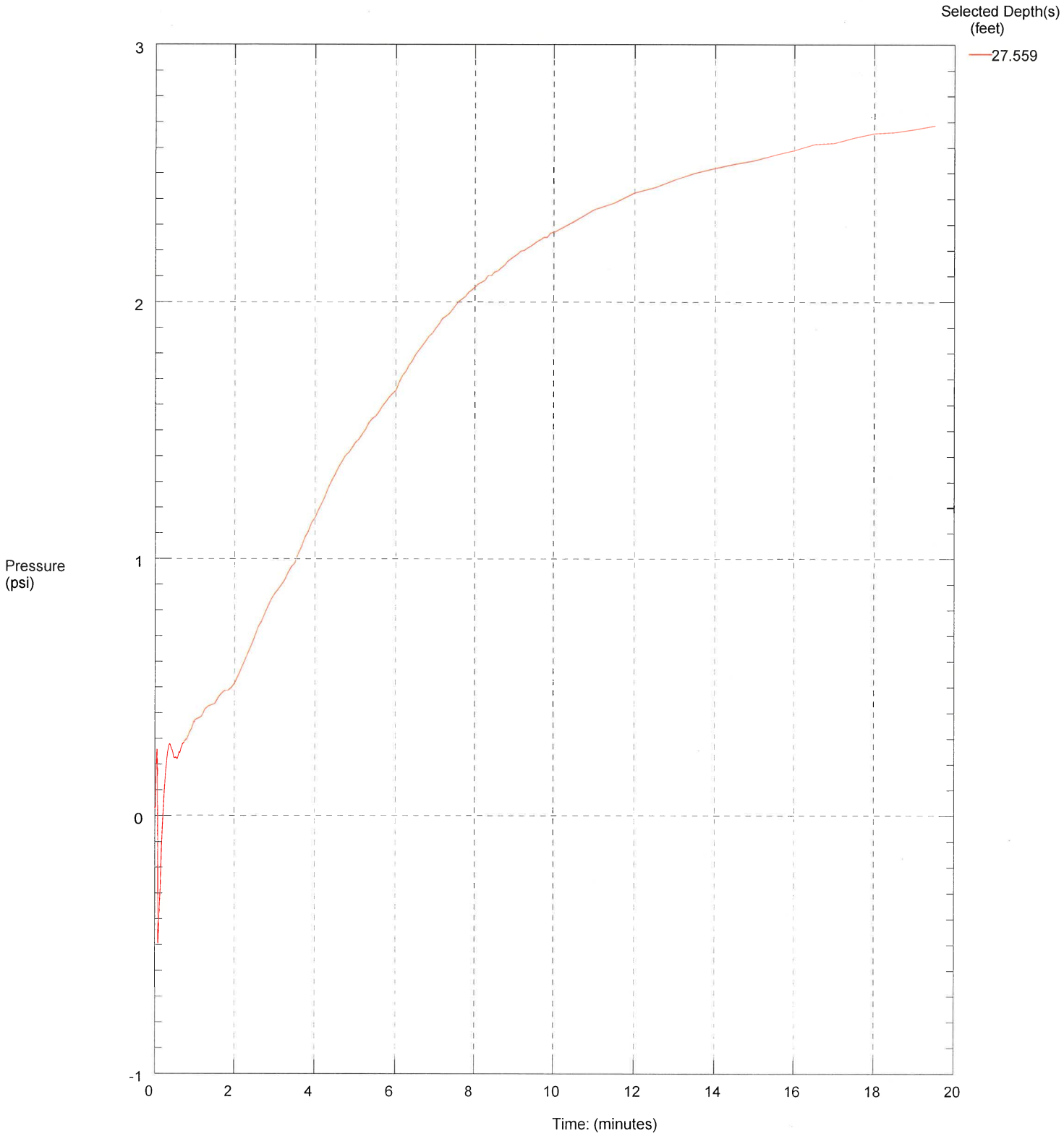
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

Soil behavior type and SPT based on data from UBC-1983

Subsurface Technologies

Operator SAM
Sounding: P-1
Cone Used: DSG1021

CPT Date/Time: 3/29/2011 9:24:20 AM
Location: CANNON-CITY HALL
Job Number: 11-022



Maximum Pressure = 2.686 psi
Hydrostatic Pressure = 3.417 psi

APPENDIX C:

LABORATORY TEST PROCEDURES AND RESULTS

APPENDIX C

LABORATORY TEST PROCEDURES AND RESULTS

The following paragraphs describe the procedures associated with the laboratory testing that we conducted for this project. Graphic results of certain laboratory tests are enclosed with this appendix.

Visual Classification Procedures

Visual soil classifications were conducted on all samples in the field and on selected samples in the laboratory. All soils were classified in general accordance with ASTM D2488 and the Unified Soil Classification System. The resulting classifications are included in our boring logs included in Appendix B.

Moisture Content Determination Procedures

Moisture content determinations were performed on representative samples to aid in identification and correlation with soil types. All determinations were made in general accordance with ASTM D2216. The results of these tests are shown on the boring logs included in Appendix B.

Atterberg Limits Testing

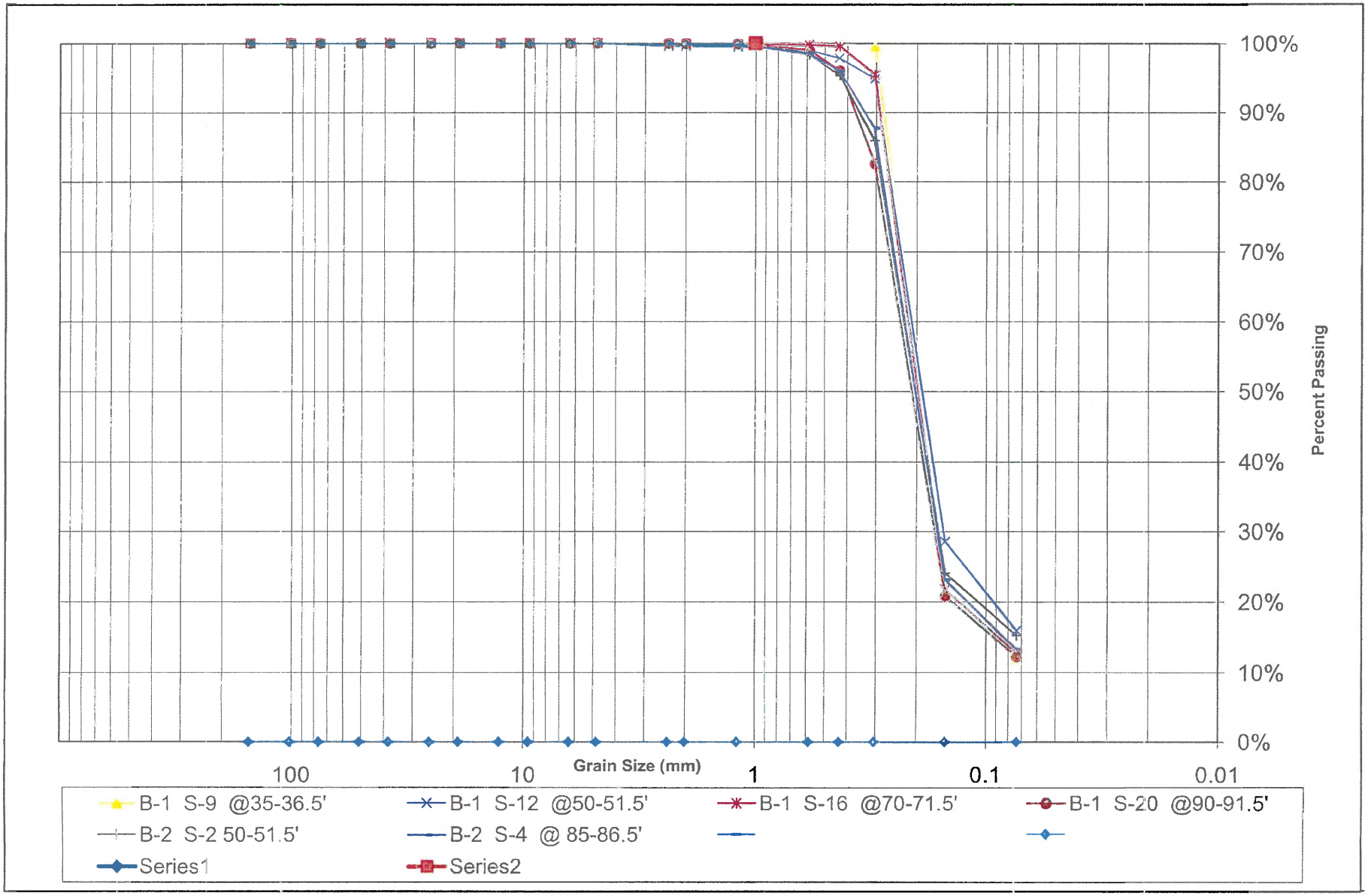
The plastic limit, liquid limit and plasticity index were determined on selected soil samples in general accordance with ASTM D4318. The results are shown on the boring logs included in Appendix B.

Grain Size Analysis Procedure

A grain size analysis indicates the range of soil particle diameters included in a particular sample. Grain size analyses were performed on representative samples in general accordance with ASTM D422. The results are included with this appendix and were used to classify the soils described in the boring logs.

PROJECT:	CANNON BEACH TEB		**JOB NO:**	11-3303-000
LOCATION:	CANNON BEACH		**WORK ORDER NO:**	
SAMPLE SOURCE:	SEE BELOW	REVISED CHART TO ADD IN SERIES	**DATE SAMPLED:**	3/29/11 & 3/30/11

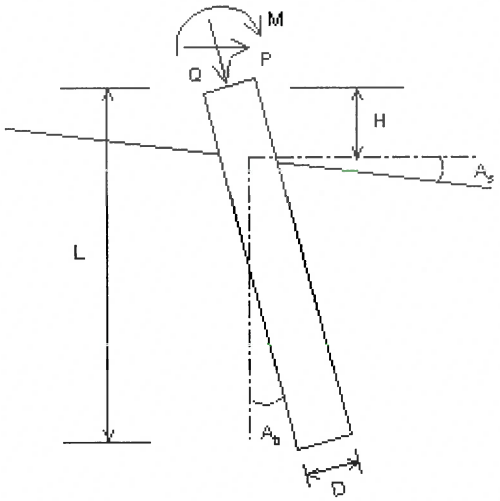
MECHANICAL SIEVE ANALYSIS



APPENDIX D:

PILE DESIGN COMPUTER OUTPUT

VERTICAL ANALYSIS



Drilled Pile (dia <=24 in. or 61 cm)

Loads:
Load Factor for Vertical Loads= 1.0
Load Factor for Lateral Loads= 1.0
Loads Supported by Pile Cap= 0 %
Shear Condition: Static

Vertical Load, Q= 975.0 -kp
Shear Load, P= 0.0 -kp
Moment, M= 0.0 -kp-f

Profile:
Pile Length, L= 110.0 -ft
Top Height, H= 0 -ft
Slope Angle, As= 0
Batter Angle, Ab= 0

Soil Data:

Depth -ft	Gamma -lb/f3	Phi	C -kp/f2	K -lb/i3	e50 or Dr %	Nspt
0	105	0	1.0	0	0	
7.5	105	0	1.00	0	0	
15	100	0	0.25	0	0	
21	37.6	0	.25	0	0	
25	42.6	38	0.00	0	0	
45	42.6	35	0.00	0	0	
50	42.6	38	0.00	0	0	
100	77.6	0	2.5	0	0	
150	77.6	0	2.5	0	0	

Pile Data:

Depth -ft	Width -in	Area -in2	Per. -in	I -in4	E -kp/i2	Weight -kp/f
0.0	24	452.4	75.4	16286.0	3000	0.471
110.0	24	452.4	75.4	16286.0	3000	0.471

Vertical capacity:
Weight above Ground= 0.00 Total Weight= 34.39-kp *Soil Weight is not included
Side Resistance (Down)= 908.260-kp Side Resistance (Up)= 587.619-kp
Tip Resistance (Down)= 70.688-kp Tip Resistance (Up)= 0.000-kp
Total Ultimate Capacity (Down)= 978.948-kp Total Ultimate Capacity (Up)= 622.013-kp
Total Allowable Capacity (Down)= 326.316-kp Total Allowable Capacity (Up)= 230.267-kp
N/G! Qallow < Q

Settlement Calculation:
At Q= 975.00-kp Settlement= 0.83467-in
At Xallow= 1.00-in Qallow= 976.87335-kp

Note: If the program cannot find a result or the result exceeds the upper limit. The result will be displayed as 99999.

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                    ALLPILE 7
        VERTICAL ANALYSIS DETAILED OUTPUT
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Licensed to   Marcella M Boyer      Chinook GeoServices, Inc.
Date: 4/29/2011  File: P:\2011 Projects\11-022 (Cannon Beach TEB)\Pile
Analysis\Allpile\TEB24.alp                  1.0

Title 1: TEB/City Hall Cannon Beach, OR
Title 2: 2 ft diameter piles


Pile Profile and Loading:
        Piletype: Drilled Pile (dia <=24 in. or 61 cm)
        Pile Length, L= 110.0 -ft
        Top Height, H= 0 -ft
        Slope Angle, As= 0
        Batter Angle, Ab= 0.00

Single Pile, Vertical Analysis:
        Vertical Load, Qt 975.0 -kp
          Load Factor for Vertical Loads: 1.0

Bearing stratum from pile tip extending to 10 Diameter of pile, which
is=20.0-ft Starting from Pile Tip= 110.0-ft
From Ztip=110.0 to 130.0-ft  Average Properties: Es= 937.50-kp/f2
C=2.50-kp/f2  Friction=0.00 Cp=0.14  Ksand=1.00
Limits of Max. tip resistance, q_lim= N/A
Batter Angle, Ab= 0.00    Batter Factor, Kbat= 1.00
Qtip_dw=70.7-kp  based on qult=22.5-kp/f2  and Base Area=3.1-ft2
Qtip_up=0.0-kp  and Base Area=0.0-ft2


TIP RESISTANCE (Down) CALCULATION:
Tip Depth= 110.0-ft Critical Depth Ratio Z/D= 20 Critical Depth= 40.0-ft
Effective Width of Tip= 2.00-ft,   Tip Area= 3.14-ft2
Bearing stratum from pile tip extending to 10 Diameter of pile. Bearing
stratum= 20.00-ft
Btip: width at pile tip= 2.00-ft
Phi & C are average value in bearing stratum
Batter Angle= 0.00,    Batter Factor for Tip and Side= 1.00

Ztip     Z/D      Z_lim   q_lim    Width    Area     Phi      C        Nq       Nc
Sv       qult     Qtip_dw
-ft               -ft     -kp/f2   -ft      -ft2     - o      -kp/f2
-kp/f2   -kp/f2   -kp
-------------------------------------------------------------------------------
-------------------------
110.0    20.0     40.0    N/A      2.0      3.14     0.0      2.50     0.0      9.0
3.0      22.5     70.7

 Ztip - Depth of pile tip from ground surface
 D - Pile average diameter (below ground) for calculation of critical depth.
D=2.00-ft
 Z/D - Critical depth (for tip resistances) as ratio of depth/diameter.
Vertical stress will be constant below critical depth
 Z_lim - Critical depth (for tip resistances)
 q_lim -  Limit of Max. tip resistance
 Btip: width or diameter at pile tip
 Bearing stratum: A stratum from pile tip extending to some depth. Average
soil properties in the stratum are used for bearing calclation


SIDE RESISTANCE (Up & Down) CALCULATION:
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D -ft	Z/D	Z_lim -ft	Sf_lim -kp/f2	K_dw	K_up	dz -ft
2.00	20.0	40.00	N/A	0.8	0.4	0.220

D - Pile average diameter for calculation of critical depth
Z/D - Critical depth (for side resistances) as ratio of depth/diameter.
Vertical stress will be constant below critical depth
Z_lim - Critical depth (for side resistances)
Sf_lim - Limit of Max. side resistance

Users Setting: Ka=1, which is constant. Ca=KcKaC=KcC

SIDE RESISTANCE (Up & Down) CALCULATION vs DEPTH:
Calculation is based on segment dZ= 0.22

Zs -ft	Prem Ca_dw -ft	Sv Ca_up -kp/f2	Phi Sf_dw - o	Kf(<2) Sf_up Delta -kp/f2	Delta Weight - o -kp	f_dw Qneg -kp/f2 -kp	f_up Q_dw -kp/f2 -kp	C Q_up -kp/f2 -kp	Ka
Kc(<2) Ca		-kp/f2	-kp/f2	-kp/f2					
110.00	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	0.00	0.00	0.00	0.00	70.7	0.0	
109.78	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.06	0.00	74.2	3.5	
109.56	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.12	0.00	77.6	7.0	
109.34	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.18	0.00	81.1	10.6	
109.12	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.24	0.00	84.5	14.1	
108.90	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.30	0.00	88.0	17.6	
108.68	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.36	0.00	91.5	21.1	
108.46	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.42	0.00	94.9	24.7	
108.24	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.48	0.00	98.4	28.2	
108.02	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.55	0.00	101.9	31.7	
107.80	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.61	0.00	105.3	35.2	
107.58	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.67	0.00	108.8	38.8	
107.35	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.73	0.00	112.2	42.3	
107.13	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.79	0.00	115.7	45.8	
106.91	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.85	0.00	119.2	49.3	
106.69	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.91	0.00	122.6	52.9	
106.47	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	0.97	0.00	126.1	56.4	
106.25	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.03	0.00	129.6	59.9	
106.03	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.09	0.00	133.0	63.4	
105.81	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.15	0.00	136.5	66.9	
105.59	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.21	0.00	139.9	70.5	
105.37	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.27	0.00	143.4	74.0	

105.15	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.33	0.00	146.9	77.5	
104.93	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.39	0.00	150.3	81.0	
104.71	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.45	0.00	153.8	84.6	
104.49	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.52	0.00	157.3	88.1	
104.27	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.58	0.00	160.7	91.6	
104.05	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.64	0.00	164.2	95.1	
103.83	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.70	0.00	167.6	98.7	
103.61	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.76	0.00	171.1	102.2	
103.39	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.82	0.00	174.6	105.7	
103.17	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.88	0.00	178.0	109.2	
102.95	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	1.94	0.00	181.5	112.7	
102.73	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.00	0.00	185.0	116.3	
102.51	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.06	0.00	188.4	119.8	
102.28	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.12	0.00	191.9	123.3	
102.06	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.18	0.00	195.3	126.8	
101.84	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.24	0.00	198.8	130.4	
101.62	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.30	0.00	202.3	133.9	
101.40	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.36	0.00	205.7	137.4	
101.18	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.42	0.00	209.2	140.9	
100.96	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.49	0.00	212.7	144.5	
100.74	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.55	0.00	216.1	148.0	
100.52	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.61	0.00	219.6	151.5	
100.30	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.67	0.00	223.0	155.0	
100.08	6.28	2.98	0.0	0.80	0.00	0.00	0.00	2.5	1.00
1.0	2.50	2.50	2.50	2.50	2.73	0.00	226.5	158.6	
99.86	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	2.79	0.00	228.5	159.6	
99.64	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	2.85	0.00	230.4	160.6	
99.42	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	2.91	0.00	232.3	161.6	
99.20	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	2.97	0.00	234.3	162.7	
98.98	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.03	0.00	236.2	163.7	
98.76	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.09	0.00	238.1	164.7	
98.54	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.15	0.00	240.1	165.8	
98.32	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.21	0.00	242.0	166.8	
98.10	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.27	0.00	244.0	167.8	

97.88	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.33	0.00	245.9	168.9	
97.66	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.39	0.00	247.8	169.9	
97.43	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.45	0.00	249.8	170.9	
97.21	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.52	0.00	251.7	171.9	
96.99	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.58	0.00	253.7	173.0	
96.77	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.64	0.00	255.6	174.0	
96.55	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.70	0.00	257.5	175.0	
96.33	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.76	0.00	259.5	176.1	
96.11	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.82	0.00	261.4	177.1	
95.89	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.88	0.00	263.3	178.1	
95.67	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	3.94	0.00	265.3	179.2	
95.45	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.00	0.00	267.2	180.2	
95.23	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.06	0.00	269.2	181.2	
95.01	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.12	0.00	271.1	182.2	
94.79	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.18	0.00	273.0	183.3	
94.57	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.24	0.00	275.0	184.3	
94.35	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.30	0.00	276.9	185.3	
94.13	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.36	0.00	278.9	186.4	
93.91	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.42	0.00	280.8	187.4	
93.69	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.49	0.00	282.7	188.4	
93.47	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.55	0.00	284.7	189.5	
93.25	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.61	0.00	286.6	190.5	
93.03	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.67	0.00	288.6	191.5	
92.81	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.73	0.00	290.5	192.5	
92.59	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.79	0.00	292.4	193.6	
92.36	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.85	0.00	294.4	194.6	
92.14	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.91	0.00	296.3	195.6	
91.92	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	4.97	0.00	298.2	196.7	
91.70	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.03	0.00	300.2	197.7	
91.48	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.09	0.00	302.1	198.7	
91.26	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.15	0.00	304.1	199.8	
91.04	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.21	0.00	306.0	200.8	
90.82	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.27	0.00	307.9	201.8	

90.60	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.33	0.00	309.9	202.8	
90.38	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.39	0.00	311.8	203.9	
90.16	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.46	0.00	313.8	204.9	
89.94	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.52	0.00	315.7	205.9	
89.72	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.58	0.00	317.6	207.0	
89.50	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.64	0.00	319.6	208.0	
89.28	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.70	0.00	321.5	209.0	
89.06	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.76	0.00	323.5	210.1	
88.84	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.82	0.00	325.4	211.1	
88.62	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.88	0.00	327.3	212.1	
88.40	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	5.94	0.00	329.3	213.1	
88.18	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.00	0.00	331.2	214.2	
87.96	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.06	0.00	333.1	215.2	
87.74	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.12	0.00	335.1	216.2	
87.52	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.18	0.00	337.0	217.3	
87.29	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.24	0.00	339.0	218.3	
87.07	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.30	0.00	340.9	219.3	
86.85	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.36	0.00	342.8	220.4	
86.63	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.42	0.00	344.8	221.4	
86.41	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.49	0.00	346.7	222.4	
86.19	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.55	0.00	348.7	223.4	
85.97	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.61	0.00	350.6	224.5	
85.75	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.67	0.00	352.5	225.5	
85.53	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.73	0.00	354.5	226.5	
85.31	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.79	0.00	356.4	227.6	
85.09	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.85	0.00	358.3	228.6	
84.87	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.91	0.00	360.3	229.6	
84.65	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	6.97	0.00	362.2	230.7	
84.43	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.03	0.00	364.2	231.7	
84.21	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.09	0.00	366.1	232.7	
83.99	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.15	0.00	368.0	233.7	
83.77	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.21	0.00	370.0	234.8	
83.55	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.27	0.00	371.9	235.8	

83.33	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.33	0.00	373.9	236.8	
83.11	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.39	0.00	375.8	237.9	
82.89	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.46	0.00	377.7	238.9	
82.67	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.52	0.00	379.7	239.9	
82.44	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.58	0.00	381.6	241.0	
82.22	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.64	0.00	383.6	242.0	
82.00	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.70	0.00	385.5	243.0	
81.78	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.76	0.00	387.4	244.0	
81.56	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.82	0.00	389.4	245.1	
81.34	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.88	0.00	391.3	246.1	
81.12	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	7.94	0.00	393.2	247.1	
80.90	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.00	0.00	395.2	248.2	
80.68	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.06	0.00	397.1	249.2	
80.46	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.12	0.00	399.1	250.2	
80.24	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.18	0.00	401.0	251.3	
80.02	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.24	0.00	402.9	252.3	
79.80	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.30	0.00	404.9	253.3	
79.58	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.36	0.00	406.8	254.3	
79.36	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.43	0.00	408.8	255.4	
79.14	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.49	0.00	410.7	256.4	
78.92	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.55	0.00	412.6	257.4	
78.70	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.61	0.00	414.6	258.5	
78.48	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.67	0.00	416.5	259.5	
78.26	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.73	0.00	418.5	260.5	
78.04	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.79	0.00	420.4	261.6	
77.82	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.85	0.00	422.3	262.6	
77.60	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.91	0.00	424.3	263.6	
77.37	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	8.97	0.00	426.2	264.6	
77.15	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.03	0.00	428.1	265.7	
76.93	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.09	0.00	430.1	266.7	
76.71	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.15	0.00	432.0	267.7	
76.49	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.21	0.00	434.0	268.8	
76.27	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.27	0.00	435.9	269.8	

76.05	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.33	0.00	437.8	270.8	
75.83	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.39	0.00	439.8	271.9	
75.61	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.46	0.00	441.7	272.9	
75.39	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.52	0.00	443.7	273.9	
75.17	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.58	0.00	445.6	274.9	
74.95	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.64	0.00	447.5	276.0	
74.73	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.70	0.00	449.5	277.0	
74.51	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.76	0.00	451.4	278.0	
74.29	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.82	0.00	453.3	279.1	
74.07	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.88	0.00	455.3	280.1	
73.85	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	9.94	0.00	457.2	281.1	
73.63	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.00	0.00	459.2	282.2	
73.41	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.06	0.00	461.1	283.2	
73.19	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.12	0.00	463.0	284.2	
72.97	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.18	0.00	465.0	285.2	
72.75	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.24	0.00	466.9	286.3	
72.53	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.30	0.00	468.9	287.3	
72.30	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.36	0.00	470.8	288.3	
72.08	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.43	0.00	472.7	289.4	
71.86	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.49	0.00	474.7	290.4	
71.64	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.55	0.00	476.6	291.4	
71.42	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.61	0.00	478.6	292.5	
71.20	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.67	0.00	480.5	293.5	
70.98	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.73	0.00	482.4	294.5	
70.76	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.79	0.00	484.4	295.5	
70.54	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.85	0.00	486.3	296.6	
70.32	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.91	0.00	488.2	297.6	
70.10	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	10.97	0.00	490.2	298.6	
69.88	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.03	0.00	492.1	299.7	
69.66	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.09	0.00	494.1	300.7	
69.44	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.15	0.00	496.0	301.7	
69.22	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.21	0.00	497.9	302.8	
69.00	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.27	0.00	499.9	303.8	

68.78	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.33	0.00	501.8	304.8	
68.56	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.40	0.00	503.8	305.8	
68.34	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.46	0.00	505.7	306.9	
68.12	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.52	0.00	507.6	307.9	
67.90	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.58	0.00	509.6	308.9	
67.68	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.64	0.00	511.5	310.0	
67.45	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.70	0.00	513.5	311.0	
67.23	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.76	0.00	515.4	312.0	
67.01	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.82	0.00	517.3	313.1	
66.79	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.88	0.00	519.3	314.1	
66.57	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	11.94	0.00	521.2	315.1	
66.35	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.00	0.00	523.1	316.1	
66.13	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.06	0.00	525.1	317.2	
65.91	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.12	0.00	527.0	318.2	
65.69	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.18	0.00	529.0	319.2	
65.47	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.24	0.00	530.9	320.3	
65.25	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.30	0.00	532.8	321.3	
65.03	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.36	0.00	534.8	322.3	
64.81	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.43	0.00	536.7	323.4	
64.59	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.49	0.00	538.7	324.4	
64.37	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.55	0.00	540.6	325.4	
64.15	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.61	0.00	542.5	326.4	
63.93	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.67	0.00	544.5	327.5	
63.71	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.73	0.00	546.4	328.5	
63.49	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.79	0.00	548.3	329.5	
63.27	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.85	0.00	550.3	330.6	
63.05	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.91	0.00	552.2	331.6	
62.83	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	12.97	0.00	554.2	332.6	
62.61	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.03	0.00	556.1	333.7	
62.38	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.09	0.00	558.0	334.7	
62.16	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.15	0.00	560.0	335.7	
61.94	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.21	0.00	561.9	336.7	
61.72	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.27	0.00	563.9	337.8	

61.50	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.33	0.00	565.8	338.8	
61.28	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.40	0.00	567.7	339.8	
61.06	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.46	0.00	569.7	340.9	
60.84	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.52	0.00	571.6	341.9	
60.62	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.58	0.00	573.6	342.9	
60.40	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.64	0.00	575.5	344.0	
60.18	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.70	0.00	577.4	345.0	
59.96	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.76	0.00	579.4	346.0	
59.74	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.82	0.00	581.3	347.0	
59.52	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.88	0.00	583.2	348.1	
59.30	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	13.94	0.00	585.2	349.1	
59.08	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.00	0.00	587.1	350.1	
58.86	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.06	0.00	589.1	351.2	
58.64	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.12	0.00	591.0	352.2	
58.42	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.18	0.00	592.9	353.2	
58.20	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.24	0.00	594.9	354.3	
57.98	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.30	0.00	596.8	355.3	
57.76	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.37	0.00	598.8	356.3	
57.54	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.43	0.00	600.7	357.3	
57.31	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.49	0.00	602.6	358.4	
57.09	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.55	0.00	604.6	359.4	
56.87	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.61	0.00	606.5	360.4	
56.65	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.67	0.00	608.5	361.5	
56.43	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.73	0.00	610.4	362.5	
56.21	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.79	0.00	612.3	363.5	
55.99	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.85	0.00	614.3	364.6	
55.77	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.91	0.00	616.2	365.6	
55.55	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	14.97	0.00	618.1	366.6	
55.33	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.03	0.00	620.1	367.6	
55.11	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.09	0.00	622.0	368.7	
54.89	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.15	0.00	624.0	369.7	
54.67	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.21	0.00	625.9	370.7	
54.45	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.27	0.00	627.8	371.8	

54.23	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.33	0.00	629.8	372.8	
54.01	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.40	0.00	631.7	373.8	
53.79	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.46	0.00	633.7	374.9	
53.57	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.52	0.00	635.6	375.9	
53.35	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.58	0.00	637.5	376.9	
53.13	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.64	0.00	639.5	377.9	
52.91	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.70	0.00	641.4	379.0	
52.69	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.76	0.00	643.3	380.0	
52.46	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.82	0.00	645.3	381.0	
52.24	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.88	0.00	647.2	382.1	
52.02	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	15.94	0.00	649.2	383.1	
51.80	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	16.00	0.00	651.1	384.1	
51.58	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	16.06	0.00	653.0	385.2	
51.36	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	16.12	0.00	655.0	386.2	
51.14	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	16.18	0.00	656.9	387.2	
50.92	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	16.24	0.00	658.9	388.2	
50.70	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	16.30	0.00	660.8	389.3	
50.48	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	16.37	0.00	662.7	390.3	
50.26	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	16.43	0.00	664.7	391.3	
50.04	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	16.49	0.00	666.6	392.4	
49.82	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	16.55	0.00	668.4	393.3	
49.60	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	16.61	0.00	670.1	394.2	
49.38	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	16.67	0.00	671.9	395.2	
49.16	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	16.73	0.00	673.6	396.1	
48.94	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	16.79	0.00	675.4	397.1	
48.72	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	16.85	0.00	677.2	398.0	
48.50	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	16.91	0.00	678.9	398.9	
48.28	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	16.97	0.00	680.7	399.9	
48.06	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.03	0.00	682.4	400.8	
47.84	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.09	0.00	684.2	401.8	
47.62	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.15	0.00	685.9	402.7	
47.39	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.21	0.00	687.7	403.6	
47.17	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.27	0.00	689.5	404.6	

46.95	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.34	0.00	691.2	405.5	
46.73	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.40	0.00	693.0	406.4	
46.51	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.46	0.00	694.7	407.4	
46.29	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.52	0.00	696.5	408.3	
46.07	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.58	0.00	698.2	409.3	
45.85	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.64	0.00	700.0	410.2	
45.63	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.70	0.00	701.8	411.1	
45.41	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.76	0.00	703.5	412.1	
45.19	6.28	2.98	35.0	0.80	28.00	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	17.82	0.00	705.3	413.0	
44.97	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	17.88	0.00	707.2	414.1	
44.75	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	17.94	0.00	709.1	415.1	
44.53	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.00	0.00	711.1	416.1	
44.31	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.06	0.00	713.0	417.1	
44.09	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.12	0.00	715.0	418.2	
43.87	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.18	0.00	716.9	419.2	
43.65	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.24	0.00	718.8	420.2	
43.43	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.30	0.00	720.8	421.3	
43.21	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.37	0.00	722.7	422.3	
42.99	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.43	0.00	724.7	423.3	
42.77	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.49	0.00	726.6	424.4	
42.55	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.55	0.00	728.5	425.4	
42.32	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.61	0.00	730.5	426.4	
42.10	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.67	0.00	732.4	427.4	
41.88	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.73	0.00	734.4	428.5	
41.66	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.79	0.00	736.3	429.5	
41.44	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.85	0.00	738.2	430.5	
41.22	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.91	0.00	740.2	431.6	
41.00	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	18.97	0.00	742.1	432.6	
40.78	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	19.03	0.00	744.0	433.6	
40.56	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	19.09	0.00	746.0	434.7	
40.34	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	19.15	0.00	747.9	435.7	
40.12	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	19.21	0.00	749.9	436.7	
39.90	6.28	2.98	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	19.27	0.00	751.8	437.7	

39.68	6.28	2.97	38.0	0.80	30.40	1.40	0.70	0.0	1.00
1.0	0.00	0.00	1.40	0.70	19.34	0.00	753.7	438.8	
39.46	6.28	2.96	38.0	0.80	30.40	1.39	0.70	0.0	1.00
1.0	0.00	0.00	1.39	0.70	19.40	0.00	755.7	439.8	
39.24	6.28	2.95	38.0	0.80	30.40	1.39	0.69	0.0	1.00
1.0	0.00	0.00	1.39	0.69	19.46	0.00	757.6	440.8	
39.02	6.28	2.94	38.0	0.80	30.40	1.38	0.69	0.0	1.00
1.0	0.00	0.00	1.38	0.69	19.52	0.00	759.5	441.8	
38.80	6.28	2.94	38.0	0.80	30.40	1.38	0.69	0.0	1.00
1.0	0.00	0.00	1.38	0.69	19.58	0.00	761.4	442.8	
38.58	6.28	2.93	38.0	0.80	30.40	1.37	0.69	0.0	1.00
1.0	0.00	0.00	1.37	0.69	19.64	0.00	763.3	443.9	
38.36	6.28	2.92	38.0	0.80	30.40	1.37	0.68	0.0	1.00
1.0	0.00	0.00	1.37	0.68	19.70	0.00	765.2	444.9	
38.14	6.28	2.91	38.0	0.80	30.40	1.36	0.68	0.0	1.00
1.0	0.00	0.00	1.36	0.68	19.76	0.00	767.1	445.9	
37.92	6.28	2.90	38.0	0.80	30.40	1.36	0.68	0.0	1.00
1.0	0.00	0.00	1.36	0.68	19.82	0.00	769.0	446.9	
37.70	6.28	2.89	38.0	0.80	30.40	1.36	0.68	0.0	1.00
1.0	0.00	0.00	1.36	0.68	19.88	0.00	770.9	447.9	
37.47	6.28	2.88	38.0	0.80	30.40	1.35	0.68	0.0	1.00
1.0	0.00	0.00	1.35	0.68	19.94	0.00	772.7	448.9	
37.25	6.28	2.87	38.0	0.80	30.40	1.35	0.67	0.0	1.00
1.0	0.00	0.00	1.35	0.67	20.00	0.00	774.6	449.9	
37.03	6.28	2.86	38.0	0.80	30.40	1.34	0.67	0.0	1.00
1.0	0.00	0.00	1.34	0.67	20.06	0.00	776.5	450.9	
36.81	6.28	2.85	38.0	0.80	30.40	1.34	0.67	0.0	1.00
1.0	0.00	0.00	1.34	0.67	20.12	0.00	778.3	451.8	
36.59	6.28	2.84	38.0	0.80	30.40	1.33	0.67	0.0	1.00
1.0	0.00	0.00	1.33	0.67	20.18	0.00	780.2	452.8	
36.37	6.28	2.83	38.0	0.80	30.40	1.33	0.66	0.0	1.00
1.0	0.00	0.00	1.33	0.66	20.24	0.00	782.0	453.8	
36.15	6.28	2.82	38.0	0.80	30.40	1.32	0.66	0.0	1.00
1.0	0.00	0.00	1.32	0.66	20.31	0.00	783.8	454.8	
35.93	6.28	2.81	38.0	0.80	30.40	1.32	0.66	0.0	1.00
1.0	0.00	0.00	1.32	0.66	20.37	0.00	785.7	455.8	
35.71	6.28	2.80	38.0	0.80	30.40	1.32	0.66	0.0	1.00
1.0	0.00	0.00	1.32	0.66	20.43	0.00	787.5	456.7	
35.49	6.28	2.79	38.0	0.80	30.40	1.31	0.66	0.0	1.00
1.0	0.00	0.00	1.31	0.66	20.49	0.00	789.3	457.7	
35.27	6.28	2.79	38.0	0.80	30.40	1.31	0.65	0.0	1.00
1.0	0.00	0.00	1.31	0.65	20.55	0.00	791.1	458.7	
35.05	6.28	2.78	38.0	0.80	30.40	1.30	0.65	0.0	1.00
1.0	0.00	0.00	1.30	0.65	20.61	0.00	792.9	459.6	
34.83	6.28	2.77	38.0	0.80	30.40	1.30	0.65	0.0	1.00
1.0	0.00	0.00	1.30	0.65	20.67	0.00	794.7	460.6	
34.61	6.28	2.76	38.0	0.80	30.40	1.29	0.65	0.0	1.00
1.0	0.00	0.00	1.29	0.65	20.73	0.00	796.5	461.5	
34.39	6.28	2.75	38.0	0.80	30.40	1.29	0.64	0.0	1.00
1.0	0.00	0.00	1.29	0.64	20.79	0.00	798.3	462.5	
34.17	6.28	2.74	38.0	0.80	30.40	1.29	0.64	0.0	1.00
1.0	0.00	0.00	1.29	0.64	20.85	0.00	800.1	463.5	
33.95	6.28	2.73	38.0	0.80	30.40	1.28	0.64	0.0	1.00
1.0	0.00	0.00	1.28	0.64	20.91	0.00	801.8	464.4	
33.73	6.28	2.72	38.0	0.80	30.40	1.28	0.64	0.0	1.00
1.0	0.00	0.00	1.28	0.64	20.97	0.00	803.6	465.3	
33.51	6.28	2.71	38.0	0.80	30.40	1.27	0.64	0.0	1.00
1.0	0.00	0.00	1.27	0.64	21.03	0.00	805.4	466.3	
33.29	6.28	2.70	38.0	0.80	30.40	1.27	0.63	0.0	1.00
1.0	0.00	0.00	1.27	0.63	21.09	0.00	807.1	467.2	
33.07	6.28	2.69	38.0	0.80	30.40	1.26	0.63	0.0	1.00
1.0	0.00	0.00	1.26	0.63	21.15	0.00	808.9	468.2	
32.85	6.28	2.68	38.0	0.80	30.40	1.26	0.63	0.0	1.00
1.0	0.00	0.00	1.26	0.63	21.21	0.00	810.6	469.1	
32.63	6.28	2.67	38.0	0.80	30.40	1.25	0.63	0.0	1.00
1.0	0.00	0.00	1.25	0.63	21.27	0.00	812.4	470.0	

32.40	6.28	2.66	38.0	0.80	30.40	1.25	0.62	0.0	1.00
1.0	0.00	0.00	1.25	0.62	21.34	0.00	814.1	470.9	
32.18	6.28	2.65	38.0	0.80	30.40	1.25	0.62	0.0	1.00
1.0	0.00	0.00	1.25	0.62	21.40	0.00	815.8	471.9	
31.96	6.28	2.64	38.0	0.80	30.40	1.24	0.62	0.0	1.00
1.0	0.00	0.00	1.24	0.62	21.46	0.00	817.5	472.8	
31.74	6.28	2.63	38.0	0.80	30.40	1.24	0.62	0.0	1.00
1.0	0.00	0.00	1.24	0.62	21.52	0.00	819.2	473.7	
31.52	6.28	2.63	38.0	0.80	30.40	1.23	0.62	0.0	1.00
1.0	0.00	0.00	1.23	0.62	21.58	0.00	821.0	474.6	
31.30	6.28	2.62	38.0	0.80	30.40	1.23	0.61	0.0	1.00
1.0	0.00	0.00	1.23	0.61	21.64	0.00	822.7	475.5	
31.08	6.28	2.61	38.0	0.80	30.40	1.22	0.61	0.0	1.00
1.0	0.00	0.00	1.22	0.61	21.70	0.00	824.3	476.4	
30.86	6.28	2.60	38.0	0.80	30.40	1.22	0.61	0.0	1.00
1.0	0.00	0.00	1.22	0.61	21.76	0.00	826.0	477.3	
30.64	6.28	2.59	38.0	0.80	30.40	1.21	0.61	0.0	1.00
1.0	0.00	0.00	1.21	0.61	21.82	0.00	827.7	478.2	
30.42	6.28	2.58	38.0	0.80	30.40	1.21	0.61	0.0	1.00
1.0	0.00	0.00	1.21	0.61	21.88	0.00	829.4	479.1	
30.20	6.28	2.57	38.0	0.80	30.40	1.21	0.60	0.0	1.00
1.0	0.00	0.00	1.21	0.60	21.94	0.00	831.1	480.0	
29.98	6.28	2.56	38.0	0.80	30.40	1.20	0.60	0.0	1.00
1.0	0.00	0.00	1.20	0.60	22.00	0.00	832.7	480.9	
29.76	6.28	2.55	38.0	0.80	30.40	1.20	0.60	0.0	1.00
1.0	0.00	0.00	1.20	0.60	22.06	0.00	834.4	481.8	
29.54	6.28	2.54	38.0	0.80	30.40	1.19	0.60	0.0	1.00
1.0	0.00	0.00	1.19	0.60	22.12	0.00	836.0	482.7	
29.32	6.28	2.53	38.0	0.80	30.40	1.19	0.59	0.0	1.00
1.0	0.00	0.00	1.19	0.59	22.18	0.00	837.7	483.6	
29.10	6.28	2.52	38.0	0.80	30.40	1.18	0.59	0.0	1.00
1.0	0.00	0.00	1.18	0.59	22.24	0.00	839.3	484.5	
28.88	6.28	2.51	38.0	0.80	30.40	1.18	0.59	0.0	1.00
1.0	0.00	0.00	1.18	0.59	22.31	0.00	841.0	485.4	
28.66	6.28	2.50	38.0	0.80	30.40	1.17	0.59	0.0	1.00
1.0	0.00	0.00	1.17	0.59	22.37	0.00	842.6	486.2	
28.44	6.28	2.49	38.0	0.80	30.40	1.17	0.59	0.0	1.00
1.0	0.00	0.00	1.17	0.59	22.43	0.00	844.2	487.1	
28.22	6.28	2.48	38.0	0.80	30.40	1.17	0.58	0.0	1.00
1.0	0.00	0.00	1.17	0.58	22.49	0.00	845.8	488.0	
28.00	6.28	2.48	38.0	0.80	30.40	1.16	0.58	0.0	1.00
1.0	0.00	0.00	1.16	0.58	22.55	0.00	847.4	488.8	
27.78	6.28	2.47	38.0	0.80	30.40	1.16	0.58	0.0	1.00
1.0	0.00	0.00	1.16	0.58	22.61	0.00	849.0	489.7	
27.56	6.28	2.46	38.0	0.80	30.40	1.15	0.58	0.0	1.00
1.0	0.00	0.00	1.15	0.58	22.67	0.00	850.6	490.6	
27.33	6.28	2.45	38.0	0.80	30.40	1.15	0.57	0.0	1.00
1.0	0.00	0.00	1.15	0.57	22.73	0.00	852.2	491.4	
27.11	6.28	2.44	38.0	0.80	30.40	1.14	0.57	0.0	1.00
1.0	0.00	0.00	1.14	0.57	22.79	0.00	853.8	492.3	
26.89	6.28	2.43	38.0	0.80	30.40	1.14	0.57	0.0	1.00
1.0	0.00	0.00	1.14	0.57	22.85	0.00	855.4	493.1	
26.67	6.28	2.42	38.0	0.80	30.40	1.14	0.57	0.0	1.00
1.0	0.00	0.00	1.14	0.57	22.91	0.00	857.0	494.0	
26.45	6.28	2.41	38.0	0.80	30.40	1.13	0.57	0.0	1.00
1.0	0.00	0.00	1.13	0.57	22.97	0.00	858.5	494.8	
26.23	6.28	2.40	38.0	0.80	30.40	1.13	0.56	0.0	1.00
1.0	0.00	0.00	1.13	0.56	23.03	0.00	860.1	495.6	
26.01	6.28	2.39	38.0	0.80	30.40	1.12	0.56	0.0	1.00
1.0	0.00	0.00	1.12	0.56	23.09	0.00	861.6	496.5	
25.79	6.28	2.38	38.0	0.80	30.40	1.12	0.56	0.0	1.00
1.0	0.00	0.00	1.12	0.56	23.15	0.00	863.2	497.3	
25.57	6.28	2.37	38.0	0.80	30.40	1.11	0.56	0.0	1.00
1.0	0.00	0.00	1.11	0.56	23.21	0.00	864.7	498.1	
25.35	6.28	2.36	38.0	0.80	30.40	1.11	0.55	0.0	1.00
1.0	0.00	0.00	1.11	0.55	23.28	0.00	866.3	499.0	

25.13	6.28	2.35	38.0	0.80	30.40	1.10	0.55	0.0	1.00
1.0	0.00	0.00	1.10	0.55	23.34	0.00	867.8	499.8	
24.91	6.28	2.34	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.40	0.00	868.1	500.2	
24.69	6.28	2.34	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.46	0.00	868.5	500.6	
24.47	6.28	2.33	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.52	0.00	868.8	501.0	
24.25	6.28	2.32	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.58	0.00	869.2	501.4	
24.03	6.28	2.31	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.64	0.00	869.5	501.8	
23.81	6.28	2.30	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.70	0.00	869.9	502.2	
23.59	6.28	2.30	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.76	0.00	870.2	502.6	
23.37	6.28	2.29	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.82	0.00	870.6	503.1	
23.15	6.28	2.28	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.88	0.00	870.9	503.5	
22.93	6.28	2.27	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	23.94	0.00	871.3	503.9	
22.71	6.28	2.26	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.00	0.00	871.6	504.3	
22.48	6.28	2.25	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.06	0.00	871.9	504.7	
22.26	6.28	2.25	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.12	0.00	872.3	505.1	
22.04	6.28	2.24	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.18	0.00	872.6	505.5	
21.82	6.28	2.23	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.24	0.00	873.0	505.9	
21.60	6.28	2.22	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.31	0.00	873.3	506.3	
21.38	6.28	2.21	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.37	0.00	873.7	506.7	
21.16	6.28	2.20	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.43	0.00	874.0	507.1	
20.94	6.28	2.18	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.53	0.00	874.4	507.6	
20.72	6.28	2.16	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.63	0.00	874.7	508.0	
20.50	6.28	2.14	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.74	0.00	875.1	508.5	
20.28	6.28	2.12	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.84	0.00	875.4	508.9	
20.06	6.28	2.09	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	24.95	0.00	875.8	509.4	
19.84	6.28	2.07	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.05	0.00	876.1	509.8	
19.62	6.28	2.05	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.15	0.00	876.4	510.3	
19.40	6.28	2.03	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.26	0.00	876.8	510.7	
19.18	6.28	2.01	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.36	0.00	877.1	511.2	
18.96	6.28	1.98	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.47	0.00	877.5	511.6	
18.74	6.28	1.96	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.57	0.00	877.8	512.1	
18.52	6.28	1.94	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.67	0.00	878.2	512.5	
18.30	6.28	1.92	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.78	0.00	878.5	513.0	
18.08	6.28	1.90	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.88	0.00	878.9	513.4	

17.86	6.28	1.87	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	25.98	0.00	879.2	513.9	
17.64	6.28	1.85	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	26.09	0.00	879.6	514.3	
17.41	6.28	1.83	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	26.19	0.00	879.9	514.8	
17.19	6.28	1.81	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	26.30	0.00	880.3	515.2	
16.97	6.28	1.79	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	26.40	0.00	880.6	515.7	
16.75	6.28	1.76	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	26.50	0.00	880.9	516.1	
16.53	6.28	1.74	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	26.61	0.00	881.3	516.6	
16.31	6.28	1.72	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	26.71	0.00	881.6	517.0	
16.09	6.28	1.70	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	26.81	0.00	882.0	517.5	
15.87	6.28	1.67	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	26.92	0.00	882.3	517.9	
15.65	6.28	1.65	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	27.02	0.00	882.7	518.4	
15.43	6.28	1.63	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	27.13	0.00	883.0	518.8	
15.21	6.28	1.61	0.0	0.80	0.00	0.00	0.00	0.3	1.00
1.0	0.25	0.25	0.25	0.25	27.23	0.00	883.4	519.3	
14.99	6.28	1.59	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	27.33	0.00	884.8	520.8	
14.77	6.28	1.56	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	27.44	0.00	886.1	522.3	
14.55	6.28	1.54	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	27.54	0.00	887.5	523.7	
14.33	6.28	1.52	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	27.65	0.00	888.9	525.2	
14.11	6.28	1.49	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	27.75	0.00	890.3	526.7	
13.89	6.28	1.47	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	27.85	0.00	891.7	528.2	
13.67	6.28	1.45	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	27.96	0.00	893.1	529.7	
13.45	6.28	1.42	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	28.06	0.00	894.5	531.2	
13.23	6.28	1.40	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	28.16	0.00	895.8	532.7	
13.01	6.28	1.38	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	28.27	0.00	897.2	534.2	
12.79	6.28	1.35	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	28.37	0.00	898.6	535.7	
12.57	6.28	1.33	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	28.48	0.00	900.0	537.1	
12.34	6.28	1.31	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	28.58	0.00	901.4	538.6	
12.12	6.28	1.28	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	28.68	0.00	902.8	540.1	
11.90	6.28	1.26	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	28.79	0.00	904.2	541.6	
11.68	6.28	1.24	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	28.89	0.00	905.5	543.1	
11.46	6.28	1.22	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.00	0.00	906.9	544.6	
11.24	6.28	1.19	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.10	0.00	908.3	546.1	
11.02	6.28	1.17	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.20	0.00	909.7	547.6	
10.80	6.28	1.15	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.31	0.00	911.1	549.1	

10.58	6.28	1.12	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.41	0.00	912.5	550.5	
10.36	6.28	1.10	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.51	0.00	913.8	552.0	
10.14	6.28	1.08	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.62	0.00	915.2	553.5	
9.92	6.28	1.05	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.72	0.00	916.6	555.0	
9.70	6.28	1.03	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.83	0.00	918.0	556.5	
9.48	6.28	1.01	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	29.93	0.00	919.4	558.0	
9.26	6.28	0.98	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.03	0.00	920.8	559.5	
9.04	6.28	0.96	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.14	0.00	922.2	561.0	
8.82	6.28	0.94	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.24	0.00	923.5	562.5	
8.60	6.28	0.91	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.34	0.00	924.9	563.9	
8.38	6.28	0.89	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.45	0.00	926.3	565.4	
8.16	6.28	0.87	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.55	0.00	927.7	566.9	
7.94	6.28	0.84	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.66	0.00	929.1	568.4	
7.72	6.28	0.82	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.76	0.00	930.5	569.9	
7.49	6.28	0.80	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.86	0.00	931.9	571.4	
7.27	6.28	0.78	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	30.97	0.00	933.2	572.9	
7.05	6.28	0.75	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	31.07	0.00	934.6	574.4	
6.83	6.28	0.73	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	31.18	0.00	936.0	575.9	
6.61	6.28	0.71	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	31.28	0.00	937.4	577.3	
6.39	6.28	0.68	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	31.38	0.00	938.8	578.8	
6.17	6.28	0.66	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	31.49	0.00	940.2	580.3	
5.95	6.28	0.64	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	31.59	0.00	941.5	581.8	
5.73	6.28	0.61	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	31.69	0.00	942.9	583.3	
5.51	6.28	0.59	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	31.80	0.00	944.3	584.8	
5.29	6.28	0.57	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	31.90	0.00	945.7	586.3	
5.07	6.28	0.54	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.01	0.00	947.1	587.8	
4.85	6.28	0.52	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.11	0.00	948.5	589.3	
4.63	6.28	0.50	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.21	0.00	949.9	590.7	
4.41	6.28	0.47	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.32	0.00	951.2	592.2	
4.19	6.28	0.45	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.42	0.00	952.6	593.7	
3.97	6.28	0.43	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.53	0.00	954.0	595.2	
3.75	6.28	0.41	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.63	0.00	955.4	596.7	
3.53	6.28	0.38	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.73	0.00	956.8	598.2	

3.31	6.28	0.36	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.84	0.00	958.2	599.7	
3.09	6.28	0.34	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	32.94	0.00	959.6	601.2	
2.87	6.28	0.31	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.04	0.00	960.9	602.7	
2.65	6.28	0.29	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.15	0.00	962.3	604.1	
2.42	6.28	0.27	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.25	0.00	963.7	605.6	
2.20	6.28	0.24	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.36	0.00	965.1	607.1	
1.98	6.28	0.22	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.46	0.00	966.5	608.6	
1.76	6.28	0.20	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.56	0.00	967.9	610.1	
1.54	6.28	0.17	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.67	0.00	969.3	611.6	
1.32	6.28	0.15	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.77	0.00	970.6	613.1	
1.10	6.28	0.13	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.88	0.00	972.0	614.6	
0.88	6.28	0.10	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	33.98	0.00	973.4	616.1	
0.66	6.28	0.08	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	34.08	0.00	974.8	617.5	
0.44	6.28	0.06	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	34.19	0.00	976.2	619.0	
0.22	6.28	0.03	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	34.29	0.00	977.6	620.5	
0.00	6.28	0.01	0.0	0.80	0.00	0.00	0.00	1.0	1.00
1.0	1.00	1.00	1.00	1.00	34.39	0.00	978.9	622.0	

DEPTH - SETTLEMENT RELATION by Vesic Method (1977):
Ztip=110.00 Btip= 2.00 Cp= 0.135 Cs= 0.286
Xpp=2.545 Xps= 1.258
Cp & Cs are average value at bearing stratum from pile tip extend to 10 Btip

Zs -ft	Qdw -kp	Area' -ft2	E -kp/i2	dXs -in	Xall -in
110.00	70.7	3.142	3000.0	0.0000	3.803
109.78	74.2	3.142	3000.0	0.0001	3.803
109.56	77.6	3.142	3000.0	0.0002	3.803
109.34	81.1	3.142	3000.0	0.0002	3.804
109.12	84.5	3.142	3000.0	0.0002	3.804
108.90	88.0	3.142	3000.0	0.0002	3.804
108.68	91.5	3.142	3000.0	0.0002	3.804
108.46	94.9	3.142	3000.0	0.0002	3.804
108.24	98.4	3.142	3000.0	0.0002	3.804
108.02	101.9	3.142	3000.0	0.0002	3.805
107.80	105.3	3.142	3000.0	0.0002	3.805
107.58	108.8	3.142	3000.0	0.0002	3.805
107.35	112.2	3.142	3000.0	0.0002	3.805
107.13	115.7	3.142	3000.0	0.0002	3.805
106.91	119.2	3.142	3000.0	0.0002	3.806
106.69	122.6	3.142	3000.0	0.0002	3.806
106.47	126.1	3.142	3000.0	0.0002	3.806
106.25	129.6	3.142	3000.0	0.0003	3.806
106.03	133.0	3.142	3000.0	0.0003	3.807
105.81	136.5	3.142	3000.0	0.0003	3.807
105.59	139.9	3.142	3000.0	0.0003	3.807
105.37	143.4	3.142	3000.0	0.0003	3.808
105.15	146.9	3.142	3000.0	0.0003	3.808
104.93	150.3	3.142	3000.0	0.0003	3.808
104.71	153.8	3.142	3000.0	0.0003	3.808

104.49	157.3	3.142	3000.0	0.0003	3.809
104.27	160.7	3.142	3000.0	0.0003	3.809
104.05	164.2	3.142	3000.0	0.0003	3.809
103.83	167.6	3.142	3000.0	0.0003	3.810
103.61	171.1	3.142	3000.0	0.0003	3.810
103.39	174.6	3.142	3000.0	0.0003	3.810
103.17	178.0	3.142	3000.0	0.0003	3.811
102.95	181.5	3.142	3000.0	0.0004	3.811
102.73	185.0	3.142	3000.0	0.0004	3.811
102.51	188.4	3.142	3000.0	0.0004	3.812
102.28	191.9	3.142	3000.0	0.0004	3.812
102.06	195.3	3.142	3000.0	0.0004	3.813
101.84	198.8	3.142	3000.0	0.0004	3.813
101.62	202.3	3.142	3000.0	0.0004	3.813
101.40	205.7	3.142	3000.0	0.0004	3.814
101.18	209.2	3.142	3000.0	0.0004	3.814
100.96	212.7	3.142	3000.0	0.0004	3.815
100.74	216.1	3.142	3000.0	0.0004	3.815
100.52	219.6	3.142	3000.0	0.0004	3.815
100.30	223.0	3.142	3000.0	0.0004	3.816
100.08	226.5	3.142	3000.0	0.0004	3.816
99.86	228.5	3.142	3000.0	0.0004	3.817
99.64	230.4	3.142	3000.0	0.0004	3.817
99.42	232.3	3.142	3000.0	0.0005	3.818
99.20	234.3	3.142	3000.0	0.0005	3.818
98.98	236.2	3.142	3000.0	0.0005	3.819
98.76	238.1	3.142	3000.0	0.0005	3.819
98.54	240.1	3.142	3000.0	0.0005	3.819
98.32	242.0	3.142	3000.0	0.0005	3.820
98.10	244.0	3.142	3000.0	0.0005	3.820
97.88	245.9	3.142	3000.0	0.0005	3.821
97.66	247.8	3.142	3000.0	0.0005	3.821
97.43	249.8	3.142	3000.0	0.0005	3.822
97.21	251.7	3.142	3000.0	0.0005	3.822
96.99	253.7	3.142	3000.0	0.0005	3.823
96.77	255.6	3.142	3000.0	0.0005	3.823
96.55	257.5	3.142	3000.0	0.0005	3.824
96.33	259.5	3.142	3000.0	0.0005	3.824
96.11	261.4	3.142	3000.0	0.0005	3.825
95.89	263.3	3.142	3000.0	0.0005	3.825
95.67	265.3	3.142	3000.0	0.0005	3.826
95.45	267.2	3.142	3000.0	0.0005	3.826
95.23	269.2	3.142	3000.0	0.0005	3.827
95.01	271.1	3.142	3000.0	0.0005	3.827
94.79	273.0	3.142	3000.0	0.0005	3.828
94.57	275.0	3.142	3000.0	0.0005	3.829
94.35	276.9	3.142	3000.0	0.0005	3.829
94.13	278.9	3.142	3000.0	0.0005	3.830
93.91	280.8	3.142	3000.0	0.0005	3.830
93.69	282.7	3.142	3000.0	0.0006	3.831
93.47	284.7	3.142	3000.0	0.0006	3.831
93.25	286.6	3.142	3000.0	0.0006	3.832
93.03	288.6	3.142	3000.0	0.0006	3.832
92.81	290.5	3.142	3000.0	0.0006	3.833
92.59	292.4	3.142	3000.0	0.0006	3.834
92.36	294.4	3.142	3000.0	0.0006	3.834
92.14	296.3	3.142	3000.0	0.0006	3.835
91.92	298.2	3.142	3000.0	0.0006	3.835
91.70	300.2	3.142	3000.0	0.0006	3.836
91.48	302.1	3.142	3000.0	0.0006	3.836
91.26	304.1	3.142	3000.0	0.0006	3.837
91.04	306.0	3.142	3000.0	0.0006	3.838
90.82	307.9	3.142	3000.0	0.0006	3.838
90.60	309.9	3.142	3000.0	0.0006	3.839
90.38	311.8	3.142	3000.0	0.0006	3.839
90.16	313.8	3.142	3000.0	0.0006	3.840

89.94	315.7	3.142	3000.0	0.0006	3.841
89.72	317.6	3.142	3000.0	0.0006	3.841
89.50	319.6	3.142	3000.0	0.0006	3.842
89.28	321.5	3.142	3000.0	0.0006	3.843
89.06	323.5	3.142	3000.0	0.0006	3.843
88.84	325.4	3.142	3000.0	0.0006	3.844
88.62	327.3	3.142	3000.0	0.0006	3.844
88.40	329.3	3.142	3000.0	0.0006	3.845
88.18	331.2	3.142	3000.0	0.0006	3.846
87.96	333.1	3.142	3000.0	0.0006	3.846
87.74	335.1	3.142	3000.0	0.0007	3.847
87.52	337.0	3.142	3000.0	0.0007	3.848
87.29	339.0	3.142	3000.0	0.0007	3.848
87.07	340.9	3.142	3000.0	0.0007	3.849
86.85	342.8	3.142	3000.0	0.0007	3.850
86.63	344.8	3.142	3000.0	0.0007	3.850
86.41	346.7	3.142	3000.0	0.0007	3.851
86.19	348.7	3.142	3000.0	0.0007	3.852
85.97	350.6	3.142	3000.0	0.0007	3.852
85.75	352.5	3.142	3000.0	0.0007	3.853
85.53	354.5	3.142	3000.0	0.0007	3.854
85.31	356.4	3.142	3000.0	0.0007	3.854
85.09	358.3	3.142	3000.0	0.0007	3.855
84.87	360.3	3.142	3000.0	0.0007	3.856
84.65	362.2	3.142	3000.0	0.0007	3.857
84.43	364.2	3.142	3000.0	0.0007	3.857
84.21	366.1	3.142	3000.0	0.0007	3.858
83.99	368.0	3.142	3000.0	0.0007	3.859
83.77	370.0	3.142	3000.0	0.0007	3.859
83.55	371.9	3.142	3000.0	0.0007	3.860
83.33	373.9	3.142	3000.0	0.0007	3.861
83.11	375.8	3.142	3000.0	0.0007	3.862
82.89	377.7	3.142	3000.0	0.0007	3.862
82.67	379.7	3.142	3000.0	0.0007	3.863
82.44	381.6	3.142	3000.0	0.0007	3.864
82.22	383.6	3.142	3000.0	0.0007	3.865
82.00	385.5	3.142	3000.0	0.0008	3.865
81.78	387.4	3.142	3000.0	0.0008	3.866
81.56	389.4	3.142	3000.0	0.0008	3.867
81.34	391.3	3.142	3000.0	0.0008	3.868
81.12	393.2	3.142	3000.0	0.0008	3.868
80.90	395.2	3.142	3000.0	0.0008	3.869
80.68	397.1	3.142	3000.0	0.0008	3.870
80.46	399.1	3.142	3000.0	0.0008	3.871
80.24	401.0	3.142	3000.0	0.0008	3.871
80.02	402.9	3.142	3000.0	0.0008	3.872
79.80	404.9	3.142	3000.0	0.0008	3.873
79.58	406.8	3.142	3000.0	0.0008	3.874
79.36	408.8	3.142	3000.0	0.0008	3.875
79.14	410.7	3.142	3000.0	0.0008	3.875
78.92	412.6	3.142	3000.0	0.0008	3.876
78.70	414.6	3.142	3000.0	0.0008	3.877
78.48	416.5	3.142	3000.0	0.0008	3.878
78.26	418.5	3.142	3000.0	0.0008	3.879
78.04	420.4	3.142	3000.0	0.0008	3.879
77.82	422.3	3.142	3000.0	0.0008	3.880
77.60	424.3	3.142	3000.0	0.0008	3.881
77.37	426.2	3.142	3000.0	0.0008	3.882
77.15	428.1	3.142	3000.0	0.0008	3.883
76.93	430.1	3.142	3000.0	0.0008	3.884
76.71	432.0	3.142	3000.0	0.0008	3.884
76.49	434.0	3.142	3000.0	0.0008	3.885
76.27	435.9	3.142	3000.0	0.0008	3.886
76.05	437.8	3.142	3000.0	0.0009	3.887
75.83	439.8	3.142	3000.0	0.0009	3.888
75.61	441.7	3.142	3000.0	0.0009	3.889

75.39	443.7	3.142	3000.0	0.0009	3.890
75.17	445.6	3.142	3000.0	0.0009	3.890
74.95	447.5	3.142	3000.0	0.0009	3.891
74.73	449.5	3.142	3000.0	0.0009	3.892
74.51	451.4	3.142	3000.0	0.0009	3.893
74.29	453.3	3.142	3000.0	0.0009	3.894
74.07	455.3	3.142	3000.0	0.0009	3.895
73.85	457.2	3.142	3000.0	0.0009	3.896
73.63	459.2	3.142	3000.0	0.0009	3.897
73.41	461.1	3.142	3000.0	0.0009	3.898
73.19	463.0	3.142	3000.0	0.0009	3.898
72.97	465.0	3.142	3000.0	0.0009	3.899
72.75	466.9	3.142	3000.0	0.0009	3.900
72.53	468.9	3.142	3000.0	0.0009	3.901
72.30	470.8	3.142	3000.0	0.0009	3.902
72.08	472.7	3.142	3000.0	0.0009	3.903
71.86	474.7	3.142	3000.0	0.0009	3.904
71.64	476.6	3.142	3000.0	0.0009	3.905
71.42	478.6	3.142	3000.0	0.0009	3.906
71.20	480.5	3.142	3000.0	0.0009	3.907
70.98	482.4	3.142	3000.0	0.0009	3.908
70.76	484.4	3.142	3000.0	0.0009	3.909
70.54	486.3	3.142	3000.0	0.0009	3.910
70.32	488.2	3.142	3000.0	0.0010	3.911
70.10	490.2	3.142	3000.0	0.0010	3.911
69.88	492.1	3.142	3000.0	0.0010	3.912
69.66	494.1	3.142	3000.0	0.0010	3.913
69.44	496.0	3.142	3000.0	0.0010	3.914
69.22	497.9	3.142	3000.0	0.0010	3.915
69.00	499.9	3.142	3000.0	0.0010	3.916
68.78	501.8	3.142	3000.0	0.0010	3.917
68.56	503.8	3.142	3000.0	0.0010	3.918
68.34	505.7	3.142	3000.0	0.0010	3.919
68.12	507.6	3.142	3000.0	0.0010	3.920
67.90	509.6	3.142	3000.0	0.0010	3.921
67.68	511.5	3.142	3000.0	0.0010	3.922
67.45	513.5	3.142	3000.0	0.0010	3.923
67.23	515.4	3.142	3000.0	0.0010	3.924
67.01	517.3	3.142	3000.0	0.0010	3.925
66.79	519.3	3.142	3000.0	0.0010	3.926
66.57	521.2	3.142	3000.0	0.0010	3.927
66.35	523.1	3.142	3000.0	0.0010	3.928
66.13	525.1	3.142	3000.0	0.0010	3.929
65.91	527.0	3.142	3000.0	0.0010	3.930
65.69	529.0	3.142	3000.0	0.0010	3.931
65.47	530.9	3.142	3000.0	0.0010	3.932
65.25	532.8	3.142	3000.0	0.0010	3.933
65.03	534.8	3.142	3000.0	0.0010	3.935
64.81	536.7	3.142	3000.0	0.0010	3.936
64.59	538.7	3.142	3000.0	0.0010	3.937
64.37	540.6	3.142	3000.0	0.0011	3.938
64.15	542.5	3.142	3000.0	0.0011	3.939
63.93	544.5	3.142	3000.0	0.0011	3.940
63.71	546.4	3.142	3000.0	0.0011	3.941
63.49	548.3	3.142	3000.0	0.0011	3.942
63.27	550.3	3.142	3000.0	0.0011	3.943
63.05	552.2	3.142	3000.0	0.0011	3.944
62.83	554.2	3.142	3000.0	0.0011	3.945
62.61	556.1	3.142	3000.0	0.0011	3.946
62.38	558.0	3.142	3000.0	0.0011	3.947
62.16	560.0	3.142	3000.0	0.0011	3.948
61.94	561.9	3.142	3000.0	0.0011	3.949
61.72	563.9	3.142	3000.0	0.0011	3.951
61.50	565.8	3.142	3000.0	0.0011	3.952
61.28	567.7	3.142	3000.0	0.0011	3.953
61.06	569.7	3.142	3000.0	0.0011	3.954

60.84	571.6	3.142	3000.0	0.0011	3.955
60.62	573.6	3.142	3000.0	0.0011	3.956
60.40	575.5	3.142	3000.0	0.0011	3.957
60.18	577.4	3.142	3000.0	0.0011	3.958
59.96	579.4	3.142	3000.0	0.0011	3.960
59.74	581.3	3.142	3000.0	0.0011	3.961
59.52	583.2	3.142	3000.0	0.0011	3.962
59.30	585.2	3.142	3000.0	0.0011	3.963
59.08	587.1	3.142	3000.0	0.0011	3.964
58.86	589.1	3.142	3000.0	0.0011	3.965
58.64	591.0	3.142	3000.0	0.0012	3.966
58.42	592.9	3.142	3000.0	0.0012	3.968
58.20	594.9	3.142	3000.0	0.0012	3.969
57.98	596.8	3.142	3000.0	0.0012	3.970
57.76	598.8	3.142	3000.0	0.0012	3.971
57.54	600.7	3.142	3000.0	0.0012	3.972
57.31	602.6	3.142	3000.0	0.0012	3.973
57.09	604.6	3.142	3000.0	0.0012	3.975
56.87	606.5	3.142	3000.0	0.0012	3.976
56.65	608.5	3.142	3000.0	0.0012	3.977
56.43	610.4	3.142	3000.0	0.0012	3.978
56.21	612.3	3.142	3000.0	0.0012	3.979
55.99	614.3	3.142	3000.0	0.0012	3.980
55.77	616.2	3.142	3000.0	0.0012	3.982
55.55	618.1	3.142	3000.0	0.0012	3.983
55.33	620.1	3.142	3000.0	0.0012	3.984
55.11	622.0	3.142	3000.0	0.0012	3.985
54.89	624.0	3.142	3000.0	0.0012	3.987
54.67	625.9	3.142	3000.0	0.0012	3.988
54.45	627.8	3.142	3000.0	0.0012	3.989
54.23	629.8	3.142	3000.0	0.0012	3.990
54.01	631.7	3.142	3000.0	0.0012	3.991
53.79	633.7	3.142	3000.0	0.0012	3.993
53.57	635.6	3.142	3000.0	0.0012	3.994
53.35	637.5	3.142	3000.0	0.0012	3.995
53.13	639.5	3.142	3000.0	0.0012	3.996
52.91	641.4	3.142	3000.0	0.0013	3.998
52.69	643.3	3.142	3000.0	0.0013	3.999
52.46	645.3	3.142	3000.0	0.0013	4.000
52.24	647.2	3.142	3000.0	0.0013	4.001
52.02	649.2	3.142	3000.0	0.0013	4.003
51.80	651.1	3.142	3000.0	0.0013	4.004
51.58	653.0	3.142	3000.0	0.0013	4.005
51.36	655.0	3.142	3000.0	0.0013	4.007
51.14	656.9	3.142	3000.0	0.0013	4.008
50.92	658.9	3.142	3000.0	0.0013	4.009
50.70	660.8	3.142	3000.0	0.0013	4.010
50.48	662.7	3.142	3000.0	0.0013	4.012
50.26	664.7	3.142	3000.0	0.0013	4.013
50.04	666.6	3.142	3000.0	0.0013	4.014
49.82	668.4	3.142	3000.0	0.0013	4.016
49.60	670.1	3.142	3000.0	0.0013	4.017
49.38	671.9	3.142	3000.0	0.0013	4.018
49.16	673.6	3.142	3000.0	0.0013	4.019
48.94	675.4	3.142	3000.0	0.0013	4.021
48.72	677.2	3.142	3000.0	0.0013	4.022
48.50	678.9	3.142	3000.0	0.0013	4.023
48.28	680.7	3.142	3000.0	0.0013	4.025
48.06	682.4	3.142	3000.0	0.0013	4.026
47.84	684.2	3.142	3000.0	0.0013	4.027
47.62	685.9	3.142	3000.0	0.0013	4.029
47.39	687.7	3.142	3000.0	0.0013	4.030
47.17	689.5	3.142	3000.0	0.0013	4.031
46.95	691.2	3.142	3000.0	0.0013	4.033
46.73	693.0	3.142	3000.0	0.0014	4.034
46.51	694.7	3.142	3000.0	0.0014	4.036

46.29	696.5	3.142	3000.0	0.0014	4.037
46.07	698.2	3.142	3000.0	0.0014	4.038
45.85	700.0	3.142	3000.0	0.0014	4.040
45.63	701.8	3.142	3000.0	0.0014	4.041
45.41	703.5	3.142	3000.0	0.0014	4.042
45.19	705.3	3.142	3000.0	0.0014	4.044
44.97	707.2	3.142	3000.0	0.0014	4.045
44.75	709.1	3.142	3000.0	0.0014	4.046
44.53	711.1	3.142	3000.0	0.0014	4.048
44.31	713.0	3.142	3000.0	0.0014	4.049
44.09	715.0	3.142	3000.0	0.0014	4.051
43.87	716.9	3.142	3000.0	0.0014	4.052
43.65	718.8	3.142	3000.0	0.0014	4.053
43.43	720.8	3.142	3000.0	0.0014	4.055
43.21	722.7	3.142	3000.0	0.0014	4.056
42.99	724.7	3.142	3000.0	0.0014	4.058
42.77	726.6	3.142	3000.0	0.0014	4.059
42.55	728.5	3.142	3000.0	0.0014	4.060
42.32	730.5	3.142	3000.0	0.0014	4.062
42.10	732.4	3.142	3000.0	0.0014	4.063
41.88	734.4	3.142	3000.0	0.0014	4.065
41.66	736.3	3.142	3000.0	0.0014	4.066
41.44	738.2	3.142	3000.0	0.0014	4.068
41.22	740.2	3.142	3000.0	0.0014	4.069
41.00	742.1	3.142	3000.0	0.0014	4.071
40.78	744.0	3.142	3000.0	0.0015	4.072
40.56	746.0	3.142	3000.0	0.0015	4.073
40.34	747.9	3.142	3000.0	0.0015	4.075
40.12	749.9	3.142	3000.0	0.0015	4.076
39.90	751.8	3.142	3000.0	0.0015	4.078
39.68	753.7	3.142	3000.0	0.0015	4.079
39.46	755.7	3.142	3000.0	0.0015	4.081
39.24	757.6	3.142	3000.0	0.0015	4.082
39.02	759.5	3.142	3000.0	0.0015	4.084
38.80	761.4	3.142	3000.0	0.0015	4.085
38.58	763.3	3.142	3000.0	0.0015	4.087
38.36	765.2	3.142	3000.0	0.0015	4.088
38.14	767.1	3.142	3000.0	0.0015	4.090
37.92	769.0	3.142	3000.0	0.0015	4.091
37.70	770.9	3.142	3000.0	0.0015	4.093
37.47	772.7	3.142	3000.0	0.0015	4.094
37.25	774.6	3.142	3000.0	0.0015	4.096
37.03	776.5	3.142	3000.0	0.0015	4.097
36.81	778.3	3.142	3000.0	0.0015	4.099
36.59	780.2	3.142	3000.0	0.0015	4.100
36.37	782.0	3.142	3000.0	0.0015	4.102
36.15	783.8	3.142	3000.0	0.0015	4.103
35.93	785.7	3.142	3000.0	0.0015	4.105
35.71	787.5	3.142	3000.0	0.0015	4.106
35.49	789.3	3.142	3000.0	0.0015	4.108
35.27	791.1	3.142	3000.0	0.0015	4.109
35.05	792.9	3.142	3000.0	0.0015	4.111
34.83	794.7	3.142	3000.0	0.0015	4.113
34.61	796.5	3.142	3000.0	0.0016	4.114
34.39	798.3	3.142	3000.0	0.0016	4.116
34.17	800.1	3.142	3000.0	0.0016	4.117
33.95	801.8	3.142	3000.0	0.0016	4.119
33.73	803.6	3.142	3000.0	0.0016	4.120
33.51	805.4	3.142	3000.0	0.0016	4.122
33.29	807.1	3.142	3000.0	0.0016	4.123
33.07	808.9	3.142	3000.0	0.0016	4.125
32.85	810.6	3.142	3000.0	0.0016	4.127
32.63	812.4	3.142	3000.0	0.0016	4.128
32.40	814.1	3.142	3000.0	0.0016	4.130
32.18	815.8	3.142	3000.0	0.0016	4.131
31.96	817.5	3.142	3000.0	0.0016	4.133

31.74	819.2	3.142	3000.0	0.0016	4.135
31.52	821.0	3.142	3000.0	0.0016	4.136
31.30	822.7	3.142	3000.0	0.0016	4.138
31.08	824.3	3.142	3000.0	0.0016	4.139
30.86	826.0	3.142	3000.0	0.0016	4.141
30.64	827.7	3.142	3000.0	0.0016	4.143
30.42	829.4	3.142	3000.0	0.0016	4.144
30.20	831.1	3.142	3000.0	0.0016	4.146
29.98	832.7	3.142	3000.0	0.0016	4.147
29.76	834.4	3.142	3000.0	0.0016	4.149
29.54	836.0	3.142	3000.0	0.0016	4.151
29.32	837.7	3.142	3000.0	0.0016	4.152
29.10	839.3	3.142	3000.0	0.0016	4.154
28.88	841.0	3.142	3000.0	0.0016	4.156
28.66	842.6	3.142	3000.0	0.0016	4.157
28.44	844.2	3.142	3000.0	0.0016	4.159
28.22	845.8	3.142	3000.0	0.0016	4.161
28.00	847.4	3.142	3000.0	0.0017	4.162
27.78	849.0	3.142	3000.0	0.0017	4.164
27.56	850.6	3.142	3000.0	0.0017	4.166
27.33	852.2	3.142	3000.0	0.0017	4.167
27.11	853.8	3.142	3000.0	0.0017	4.169
26.89	855.4	3.142	3000.0	0.0017	4.171
26.67	857.0	3.142	3000.0	0.0017	4.172
26.45	858.5	3.142	3000.0	0.0017	4.174
26.23	860.1	3.142	3000.0	0.0017	4.176
26.01	861.6	3.142	3000.0	0.0017	4.177
25.79	863.2	3.142	3000.0	0.0017	4.179
25.57	864.7	3.142	3000.0	0.0017	4.181
25.35	866.3	3.142	3000.0	0.0017	4.182
25.13	867.8	3.142	3000.0	0.0017	4.184
24.91	868.1	3.142	3000.0	0.0017	4.186
24.69	868.5	3.142	3000.0	0.0017	4.187
24.47	868.8	3.142	3000.0	0.0017	4.189
24.25	869.2	3.142	3000.0	0.0017	4.191
24.03	869.5	3.142	3000.0	0.0017	4.192
23.81	869.9	3.142	3000.0	0.0017	4.194
23.59	870.2	3.142	3000.0	0.0017	4.196
23.37	870.6	3.142	3000.0	0.0017	4.198
23.15	870.9	3.142	3000.0	0.0017	4.199
22.93	871.3	3.142	3000.0	0.0017	4.201
22.71	871.6	3.142	3000.0	0.0017	4.203
22.48	871.9	3.142	3000.0	0.0017	4.204
22.26	872.3	3.142	3000.0	0.0017	4.206
22.04	872.6	3.142	3000.0	0.0017	4.208
21.82	873.0	3.142	3000.0	0.0017	4.209
21.60	873.3	3.142	3000.0	0.0017	4.211
21.38	873.7	3.142	3000.0	0.0017	4.213
21.16	874.0	3.142	3000.0	0.0017	4.215
20.94	874.4	3.142	3000.0	0.0017	4.216
20.72	874.7	3.142	3000.0	0.0017	4.218
20.50	875.1	3.142	3000.0	0.0017	4.220
20.28	875.4	3.142	3000.0	0.0017	4.221
20.06	875.8	3.142	3000.0	0.0017	4.223
19.84	876.1	3.142	3000.0	0.0017	4.225
19.62	876.4	3.142	3000.0	0.0017	4.226
19.40	876.8	3.142	3000.0	0.0017	4.228
19.18	877.1	3.142	3000.0	0.0017	4.230
18.96	877.5	3.142	3000.0	0.0017	4.232
18.74	877.8	3.142	3000.0	0.0017	4.233
18.52	878.2	3.142	3000.0	0.0017	4.235
18.30	878.5	3.142	3000.0	0.0017	4.237
18.08	878.9	3.142	3000.0	0.0017	4.238
17.86	879.2	3.142	3000.0	0.0017	4.240
17.64	879.6	3.142	3000.0	0.0017	4.242
17.41	879.9	3.142	3000.0	0.0017	4.244

17.19	880.3	3.142	3000.0	0.0017	4.245
16.97	880.6	3.142	3000.0	0.0017	4.247
16.75	880.9	3.142	3000.0	0.0017	4.249
16.53	881.3	3.142	3000.0	0.0017	4.250
16.31	881.6	3.142	3000.0	0.0017	4.252
16.09	882.0	3.142	3000.0	0.0017	4.254
15.87	882.3	3.142	3000.0	0.0017	4.256
15.65	882.7	3.142	3000.0	0.0017	4.257
15.43	883.0	3.142	3000.0	0.0017	4.259
15.21	883.4	3.142	3000.0	0.0017	4.261
14.99	884.8	3.142	3000.0	0.0017	4.263
14.77	886.1	3.142	3000.0	0.0017	4.264
14.55	887.5	3.142	3000.0	0.0017	4.266
14.33	888.9	3.142	3000.0	0.0017	4.268
14.11	890.3	3.142	3000.0	0.0017	4.269
13.89	891.7	3.142	3000.0	0.0017	4.271
13.67	893.1	3.142	3000.0	0.0017	4.273
13.45	894.5	3.142	3000.0	0.0017	4.275
13.23	895.8	3.142	3000.0	0.0017	4.276
13.01	897.2	3.142	3000.0	0.0017	4.278
12.79	898.6	3.142	3000.0	0.0018	4.280
12.57	900.0	3.142	3000.0	0.0018	4.282
12.34	901.4	3.142	3000.0	0.0018	4.283
12.12	902.8	3.142	3000.0	0.0018	4.285
11.90	904.2	3.142	3000.0	0.0018	4.287
11.68	905.5	3.142	3000.0	0.0018	4.289
11.46	906.9	3.142	3000.0	0.0018	4.290
11.24	908.3	3.142	3000.0	0.0018	4.292
11.02	909.7	3.142	3000.0	0.0018	4.294
10.80	911.1	3.142	3000.0	0.0018	4.296
10.58	912.5	3.142	3000.0	0.0018	4.298
10.36	913.8	3.142	3000.0	0.0018	4.299
10.14	915.2	3.142	3000.0	0.0018	4.301
9.92	916.6	3.142	3000.0	0.0018	4.303
9.70	918.0	3.142	3000.0	0.0018	4.305
9.48	919.4	3.142	3000.0	0.0018	4.307
9.26	920.8	3.142	3000.0	0.0018	4.308
9.04	922.2	3.142	3000.0	0.0018	4.310
8.82	923.5	3.142	3000.0	0.0018	4.312
8.60	924.9	3.142	3000.0	0.0018	4.314
8.38	926.3	3.142	3000.0	0.0018	4.316
8.16	927.7	3.142	3000.0	0.0018	4.317
7.94	929.1	3.142	3000.0	0.0018	4.319
7.72	930.5	3.142	3000.0	0.0018	4.321
7.49	931.9	3.142	3000.0	0.0018	4.323
7.27	933.2	3.142	3000.0	0.0018	4.325
7.05	934.6	3.142	3000.0	0.0018	4.326
6.83	936.0	3.142	3000.0	0.0018	4.328
6.61	937.4	3.142	3000.0	0.0018	4.330
6.39	938.8	3.142	3000.0	0.0018	4.332
6.17	940.2	3.142	3000.0	0.0018	4.334
5.95	941.5	3.142	3000.0	0.0018	4.336
5.73	942.9	3.142	3000.0	0.0018	4.337
5.51	944.3	3.142	3000.0	0.0018	4.339
5.29	945.7	3.142	3000.0	0.0018	4.341
5.07	947.1	3.142	3000.0	0.0018	4.343
4.85	948.5	3.142	3000.0	0.0018	4.345
4.63	949.9	3.142	3000.0	0.0019	4.347
4.41	951.2	3.142	3000.0	0.0019	4.348
4.19	952.6	3.142	3000.0	0.0019	4.350
3.97	954.0	3.142	3000.0	0.0019	4.352
3.75	955.4	3.142	3000.0	0.0019	4.354
3.53	956.8	3.142	3000.0	0.0019	4.356
3.31	958.2	3.142	3000.0	0.0019	4.358
3.09	959.6	3.142	3000.0	0.0019	4.360
2.87	960.9	3.142	3000.0	0.0019	4.362

2.65	962.3	3.142	3000.0	0.0019	4.363
2.42	963.7	3.142	3000.0	0.0019	4.365
2.20	965.1	3.142	3000.0	0.0019	4.367
1.98	966.5	3.142	3000.0	0.0019	4.369
1.76	967.9	3.142	3000.0	0.0019	4.371
1.54	969.3	3.142	3000.0	0.0019	4.373
1.32	970.6	3.142	3000.0	0.0019	4.375
1.10	972.0	3.142	3000.0	0.0019	4.377
0.88	973.4	3.142	3000.0	0.0019	4.379
0.66	974.8	3.142	3000.0	0.0019	4.380
0.44	976.2	3.142	3000.0	0.0019	4.382
0.22	977.6	3.142	3000.0	0.0019	4.384
0.00	978.9	3.142	3000.0	0.0019	4.386

LOAD - SETTLEMENT RELATION (from t-z, and q-w curves):
Based on Vesic Method (1977)

Xall-in	Qtip-kp	Qside-kp	Qtotal-kp
0.006099	0.1	16.2	16.4
0.293557	2.5	566.8	569.3
0.383112	3.6	685.1	688.7
0.454502	4.8	764.0	768.8
0.513476	6.0	819.3	825.3
0.563530	7.2	859.1	866.3
0.606961	8.3	888.2	896.6
0.645368	9.5	909.6	919.1
0.679915	10.7	925.3	936.0
0.711477	11.8	936.8	948.6
0.740729	13.0	945.0	958.0
0.768197	14.2	950.7	964.9
0.794294	15.3	954.6	969.9
0.819346	16.4	957.0	973.4
0.843609	17.6	958.3	975.9
0.867278	18.7	958.8	977.5
0.890503	19.8	958.7	978.5
0.913391	20.9	958.0	978.9
0.936017	22.0	956.9	978.9
0.958429	23.1	955.5	978.6
0.980657	24.2	953.6	977.8
1.002710	25.2	951.5	976.7
1.024592	26.3	949.1	975.4
1.046300	27.3	946.4	973.7
1.067839	28.4	943.4	971.8
1.089218	29.4	940.4	969.7
1.110424	30.4	937.1	967.5
1.131452	31.4	933.7	965.1
1.152316	32.4	930.2	962.6
1.173033	33.3	926.6	959.9
1.193618	34.3	922.8	957.1
1.214123	35.2	919.1	954.3
1.234598	36.2	915.4	951.6
1.255109	37.1	911.8	948.9
1.275730	38.0	908.5	946.5
1.296541	38.9	905.5	944.4
1.317638	39.8	902.9	942.7
1.339099	40.7	900.8	941.5
1.361022	41.5	899.3	940.8
1.383932	42.3	898.9	941.3
1.406152	43.2	897.8	940.9
1.428362	44.0	896.6	940.6
1.450562	44.8	895.5	940.3
1.472752	45.6	894.4	940.0
1.494934	46.4	893.4	939.7
1.517105	47.1	892.4	939.5
1.539268	47.9	891.4	939.2

1.561422	48.6	890.4	939.0
1.583568	49.3	889.5	938.8
1.605704	50.1	888.5	938.6
1.627829	50.8	887.6	938.4
1.649945	51.5	886.7	938.2
1.672052	52.1	885.8	937.9
1.694145	52.8	884.8	937.6
1.716225	53.5	883.7	937.2
1.738290	54.1	882.5	936.6
1.760338	54.7	881.3	936.0
1.782370	55.3	880.2	935.6
1.804396	56.0	879.2	935.1
1.826415	56.6	878.2	934.7
1.848434	57.1	877.3	934.4
1.870454	57.7	876.5	934.2
1.892463	58.3	875.6	933.9
1.914466	58.8	874.8	933.6
1.936466	59.4	874.0	933.4
1.958451	59.9	873.2	933.1
1.980430	60.5	872.3	932.8
2.002402	61.0	871.5	932.5
2.024363	61.5	870.7	932.2
2.046318	62.0	869.9	931.9
2.068265	62.5	869.0	931.5
2.090204	63.0	868.2	931.2
2.112136	63.4	867.4	930.8
2.134058	63.9	866.6	930.5
2.155979	64.4	865.7	930.1
2.177890	64.8	864.9	929.7
2.199789	65.3	864.1	929.4
2.221689	65.7	863.3	929.0
2.243581	66.1	862.4	928.6
2.265468	66.6	861.6	928.2
2.287346	67.0	860.8	927.8
2.309220	67.4	860.0	927.4
2.331088	67.8	859.1	926.9
2.352950	68.2	858.3	926.5
2.374807	68.6	857.5	926.1
2.396659	69.0	856.7	925.7
2.418506	69.4	855.8	925.2
2.440348	69.7	855.0	924.8
2.462187	70.1	854.2	924.3
2.484020	70.5	853.4	923.9
2.505852	70.8	852.5	923.4
2.527674	71.2	851.7	922.9
2.549495	71.5	850.9	922.5
2.571310	71.9	850.1	922.0
2.702132	73.9	845.1	919.0
3.137424	79.7	828.7	908.4
3.571583	84.2	812.3	896.5
4.004045	86.8	795.9	882.7
4.433840	86.5	779.5	866.0
4.860473	82.6	763.2	845.7

At Qwork= 975.00-kp Settlement= 0.83467-in
At Qwork= 975.00-kp Secant Stiffness Kqx= 1168.13-kp/-in
At Xallow= 1.00-in Qallow= 976.87-kp
Note: If the program cannot find a result or the result exceeds the upper limit. The result will be displayed as 99999.

SUMMARY:
Total Ultimate Capacity (Down)= 978.948-kp Total Ultimate Capacity (Up)= 622.013-kp
Total Allowable Capacity (Down)= 326.316-kp Total Allowable Capacity (Up)= 230.267-kp

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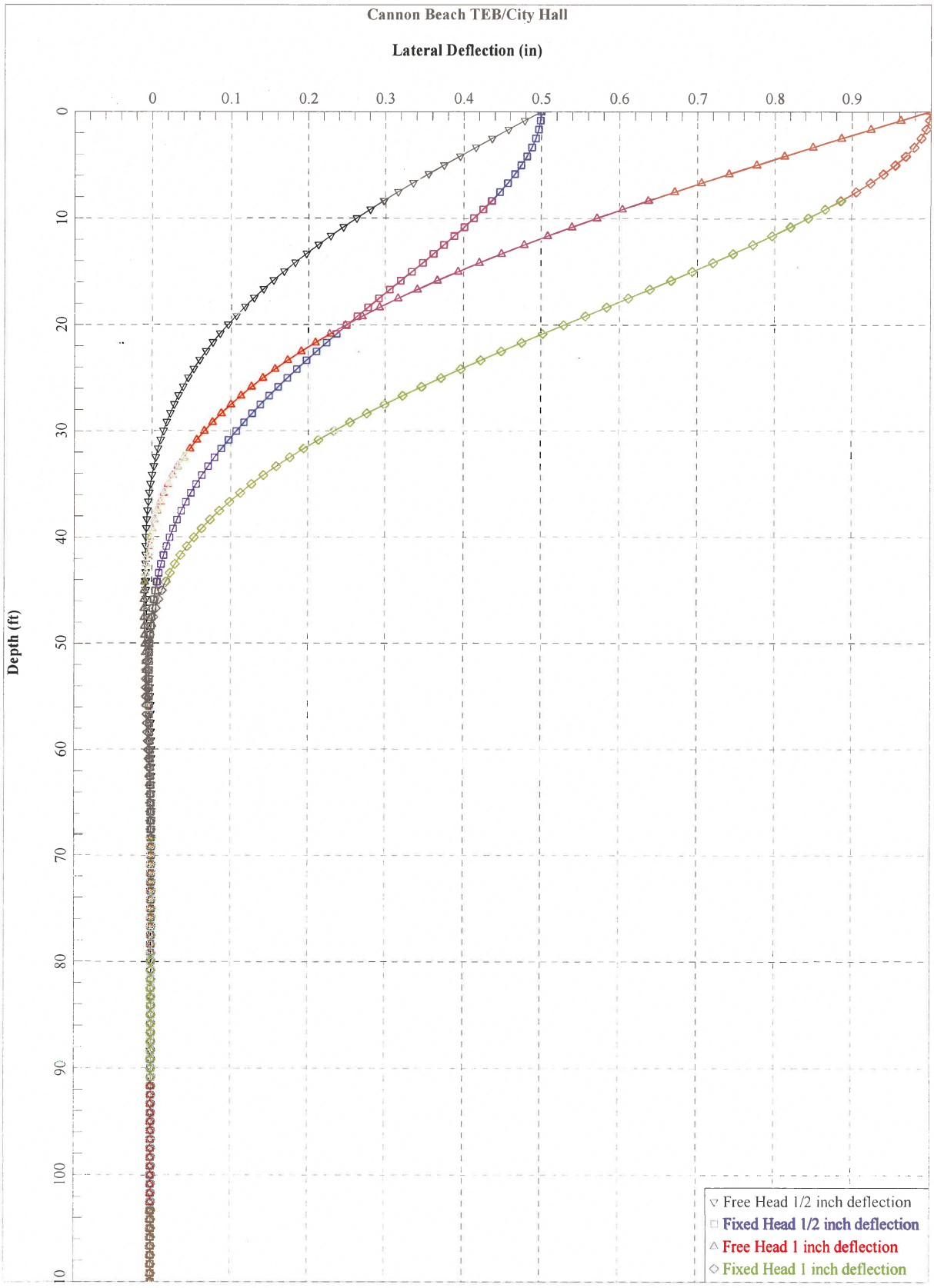
        Weight above Ground= 0.00          Total Pile Weight = 34.39-kp
*Soil Weight is not included
        Side Resistance (Down) = 908.260-kp  Side Resistance (Up) = 587.619-kp
        Tip Resistance (Down) = 70.688-kp  Tip Resistance (Up) = 0.000-kp
        Negative Friction, Qneg= 0.000-kp, which has been subtracted from
Total Ultimate Capacity (Down)
        Negative friction does not affect Total Uplift Ultimate Capacity (Up)

        N/G!  Qallow < Q        * Vertical Load, Q= 975.0 -kp

FACTOR OF SAFETY:
FSside  FStip   FSup    FSweight
_____________________________________
3.0     3.0     3.0     1.0

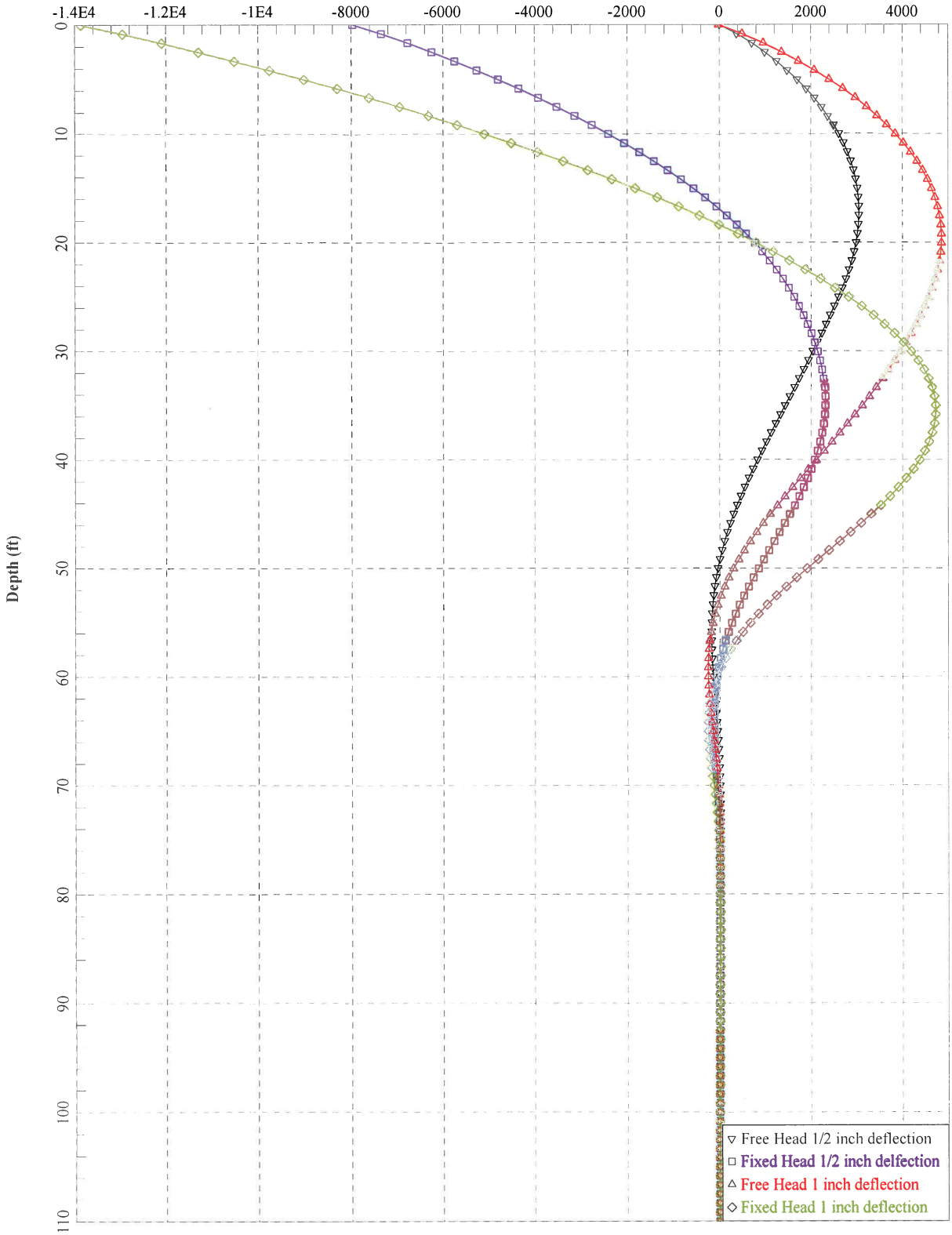
Notes:
* Settlement in the program is Elastic Settlement only. Consolidation
Settlement is not calculated!
 Length - Pile length, distance from pile top to tip (not from ground surface)

 Width or D - Width of pile shaft (pile diameter)
 Ds and Dl - Short Side and Long Side of Footing
 Area - Section area of pile shaft or tip area of pile
 Sv - Vertical stress in soils (It may be limited based on critical depth,
Z_lim or Z/D
 qult - Ultimate tip resistance (pressure)
 Qtip_dw - Ultimate downward tip resistance (Force or Capacity)
 Qtip_up - Ultimate uplift tip resistance for belled pile or uplift plate
(Force or Capacity)
 dz - Small Segment of Depth for Calculation
 Zs - Soil Depth, Depth from ground surface
 Zp - Pile Depth, Depth from pile top
 Prem - Primer of pile shaft
 Phi - Soil internal friction angle (between soils)
 Kf - Friction factor to convert Phi to Delta
 Delta - Ski friction between soil and pile (function of Phi. It is different
from Phi)
 f_dw - Resistance between soil and pile from Delta
 f_up - Resistance between soil and pile from Delta
 C - Soil cohesion (between soils)
 Ca - Adhesion between soil and pile (function of C. It is different from C)
Ca=KaKcC
 Ka - Adhesion ratio, C/Ca
 Kc - Adhesion factor defended by users
 Ca_dw - Downward adhesion between pile and soil
 Ca_up - Uplift adhesion between pile and soil
 Sf_dw  - Downward side resistance (sum of friction and adhesion, f_dw +
Ca_dw)
 Sf_up - Uplift side resistance (sum of friction and adhesion, f_up + Ca_up)
 Weight - Weight of Pile shaft
 Qneg - negative friction Resistance
 Qside - Ultimate side resistance (Qside_dw or Qside_up)
 Qtip - Ultimate tip resistance (Qtip_dw or Qtip_up for uplift plate)
 Q_dw - Ultimate downward capacity (Qtip + Qside_dw)
 Q_up - Ultimate uplift capacity (Weight + Qside_up)
 E - Elastic modules
 dXs - Axial deformation of pile shaft in each segment, dz
 Xs - Settlement due to axial deformation of pile shaft
 Xpp - Settlement due to point load from pile tip
 Xps- Settlement due to load from pile shaft
 Xall - Total Settlement, Xs + Xpp + Xps
 Xallow - Allowable settlement specified by users
 Qwork - Vertical working load applied to pile
 Qallow - Vertical allowable load, Qult/F.S.
```


Cannon Beach TEB/City Hall
Lateral Deflection (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Depth (ft)
0
10
20
30
40
50
60
70
80
90
100
110
Free Head 1/2 inch deflection
Fixed Head 1/2 inch deflection
Free Head 1 inch deflection
Fixed Head 1 inch deflection

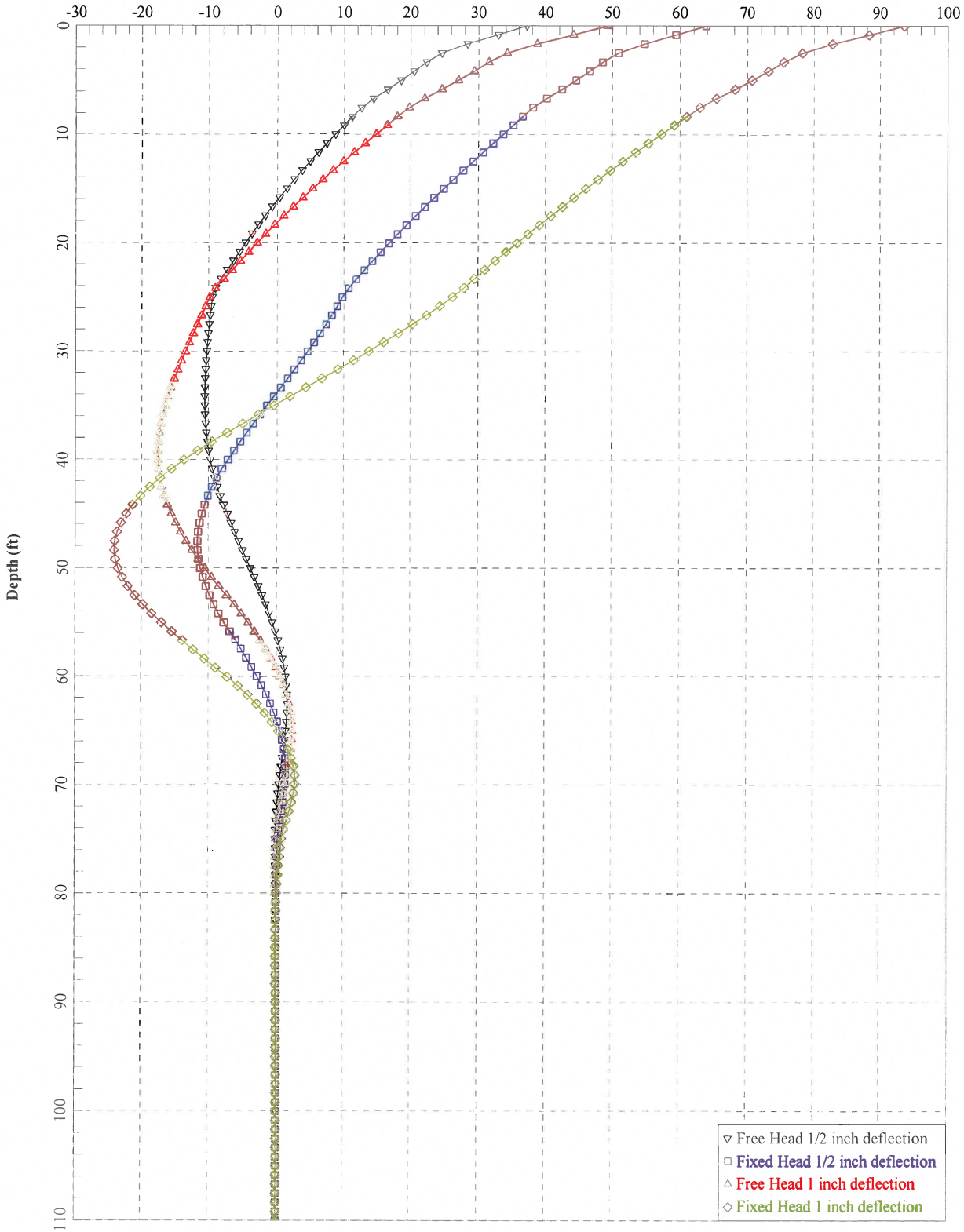
Cannon Beach TEB/City Hall

Bending Moment (in-kips)



Cannon Beach TEB/City Hall

Shear Force (kips)



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LPILE Plus for Windows, Version 5.0 (5.0.46)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

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This program is licensed to:

Marcella Boyer
Chinook GeoServices, Inc.

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Files Used for Analysis

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Path to file locations: P:\2011 Projects\11-022 (Cannon Beach TEB)\Pile Analysis\Lpile\
Name of input data file: Conc24.lpd
Name of output file: Conc24.lpo
Name of plot output file: Conc24.lpp
Name of runtime file: Conc24.lpr

Time and Date of Analysis

Date: April 28, 2011 Time: 15:47:47

Problem Title

TEB/City Hall, Cannon Beach 2 ft dia concrete

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 1:
- Computation of Lateral Pile Response Using User-specified Constant EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix elements
- Output pile response for full length of pile

- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:

- Number of pile increments	=	132
- Maximum number of iterations allowed	=	100
- Deflection tolerance for convergence	=	1.0000E-05 in
- Maximum allowable deflection	=	1.0000E+02 in

Printing Options:
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 1

Pile Structural Properties and Geometry

Pile Length = 1320.00 in

Depth of ground surface below top of pile = 0.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 2 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	24.00000000	16286.0000	452.0000	30000000.
2	1320.0000	24.00000000	16286.0000	452.0000	30000000.

Soil and Rock Layering Information

The soil profile is modelled using 8 layers

Layer 1 is stiff clay without free water
Distance from top of pile to top of layer = 0.000 in
Distance from top of pile to bottom of layer = 30.000 in

Layer 2 is stiff clay without free water
Distance from top of pile to top of layer = 30.000 in
Distance from top of pile to bottom of layer = 90.000 in

Layer 3 is soft clay, p-y criteria by Matlock, 1970
Distance from top of pile to top of layer = 90.000 in
Distance from top of pile to bottom of layer = 180.000 in

Layer 4 is soft clay, p-y criteria by Matlock, 1970
Distance from top of pile to top of layer = 180.000 in
Distance from top of pile to bottom of layer = 252.000 in

Layer 5 is soft clay, p-y criteria by Matlock, 1970
Distance from top of pile to top of layer = 252.000 in
Distance from top of pile to bottom of layer = 300.000 in

Layer 6 is liquefiable sand, by Rollins et al, 2004
Distance from top of pile to top of layer = 300.000 in
Distance from top of pile to bottom of layer = 900.000 in

Warning : The depth of this layer is deeper than the recommended depth limit

for using the p-y criteria for liquefied sand.
Please consult the LPile Technical Manual for additional background
information regarding limitations on the use of the liquefied sand criteria.

Layer 7 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 900.000 in
Distance from top of pile to bottom of layer = 1200.000 in
p-y subgrade modulus k for top of soil layer = 125.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 125.000 lbs/in**3

Layer 8 is stiff clay without free water
Distance from top of pile to top of layer = 1200.000 in
Distance from top of pile to bottom of layer = 1440.000 in

(Depth of lowest layer extends 120.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 16 points

Point No.	Depth X in	Eff. Unit Wei lbs/in**3
1	0.00	0.06076
2	30.00	0.06076
3	30.00	0.06076
4	90.00	0.06076
5	90.00	0.06076
6	180.00	0.06076
7	180.00	0.05787
8	252.00	0.05787
9	252.00	0.02176
10	300.00	0.02176
11	300.00	0.02465
12	900.00	0.02465
13	900.00	0.02465
14	1200.00	0.02465
15	1200.00	0.04491
16	1440.00	0.04491

Shear Strength of Soils

Shear strength parameters with depth defined using 16 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	0.000	10.00000	0.00	0.00500	0.0
2	30.000	10.00000	0.00	0.00500	0.0
3	30.000	5.00000	0.00	0.04000	0.0
4	90.000	5.00000	0.00	0.04000	0.0
5	90.000	2.00000	0.00	0.02000	0.0
6	180.000	2.00000	0.00	0.02000	0.0
7	180.000	2.00000	0.00	0.02000	0.0
8	252.000	2.00000	0.00	0.02000	0.0
9	252.000	2.00000	0.00	0.02000	0.0
10	300.000	2.00000	0.00	0.02000	0.0
11	300.000	0.00000	0.00	------	------

12	900.000	0.00000	0.00	------	------
13	900.000	0.00000	38.00	------	------
14	1200.000	0.00000	38.00	------	------
15	1200.000	15.00000	0.00	0.00500	0.0
16	1440.000	15.00000	0.00	0.00500	0.0

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 4

Load Case Number 1

Pile-head boundary conditions are Displacement and Moment (BC Type 4)
Deflection at pile head = 0.500 in
Bending moment at pile head = 0.000 in-lbs
Axial load at pile head = 1100000.000 lbs

Load Case Number 2

Pile-head boundary conditions are Displacement and Slope (BC Type 5)
Deflection at pile head = 0.500 in
Slope at pile head = 0.000 in/in
Axial load at pile head = 1100000.000 lbs

Load Case Number 3

Pile-head boundary conditions are Displacement and Moment (BC Type 4)
Deflection at pile head = 1.000 in
Bending moment at pile head = 0.000 in-lbs
Axial load at pile head = 1100000.000 lbs

Load Case Number 4

Pile-head boundary conditions are Displacement and Slope (BC Type 5)
Deflection at pile head = 1.000 in
Slope at pile head = 0.000 in/in
Axial load at pile head = 1100000.000 lbs

Computed Values of Load Distribution and Deflection for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Displacement and Moment (Pile-head Condition

Type 4)
Specified deflection at pile head = 0.500000 in
Specified moment at pile head = 0.000 in-lbs
Specified axial load at pile head = 1100000.000 lbs

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Soil Res. p lbs/in	Es*h F/L lbs/in
0.000	0.500000	0.0000	37185.2215	-0.0021226	2433.6283	-409.0390	4090.3897
10.000	0.478774	374749.	32935.4190	-0.0021187	2709.7540	-440.9215	9209.3825
20.000	0.457625	705321.	28371.5292	-0.0021077	2953.3292	-471.8564	10310.9802
30.000	0.436621	988548.	24622.3410	-0.0020904	3162.0195	-277.9812	6366.6548
40.000	0.415818	1243755.	22346.1725	-0.0020675	3350.0635	-177.2525	4262.7403
50.000	0.395270	1480957.	20521.7645	-0.0020396	3524.8406	-187.6291	4746.8549
60.000	0.375026	1699062.	18595.5057	-0.0020071	3685.5469	-197.6226	5269.5761
70.000	0.355129	1897023.	16571.2785	-0.0019703	3831.4100	-207.2228	5835.1451
80.000	0.335620	2073834.	14453.0676	-0.0019296	3961.6897	-216.4194	6448.3436
90.000	0.316536	2228536.	12613.5847	-0.0018856	4075.6788	-151.4772	4785.4659
100.000	0.297908	2367589.	11243.6883	-0.0018386	4178.1370	-122.5021	4112.0789
110.000	0.279764	2493859.	9993.5380	-0.0017888	4271.1762	-127.5280	4558.4064
120.000	0.262131	2606814.	8705.4553	-0.0017366	4354.4049	-130.0885	4962.7235
130.000	0.245032	2706174.	7419.0312	-0.0016823	4427.6160	-127.1963	5191.0097
140.000	0.228486	2792204.	6161.7167	-0.0016260	4491.0059	-124.2666	5438.6910
150.000	0.212512	2865180.	4933.8801	-0.0015681	4544.7763	-121.3007	5707.9424
160.000	0.197124	2925380.	3735.8785	-0.0015088	4589.1335	-118.2996	6001.2648
170.000	0.182336	2973091.	2568.0592	-0.0014485	4624.2889	-115.2643	6321.5476
180.000	0.168155	3008607.	1430.7602	-0.0013873	4650.4580	-112.1955	6672.1451
190.000	0.154590	3032226.	324.3123	-0.0013254	4667.8611	-109.0941	7056.9719
200.000	0.141646	3044253.	-750.9600	-0.0012632	4676.7228	-105.9604	7480.6248
210.000	0.129326	3044998.	-1794.7362	-0.0012009	4677.2720	-102.7949	7948.5358
220.000	0.117628	3034779.	-2806.6980	-0.0011387	4669.7419	-99.5975	8467.1717
230.000	0.106551	3013916.	-3786.5260	-0.0010768	4654.3697	-96.3681	9044.2928
240.000	0.096092	2982738.	-4733.8965	-0.0010154	4631.3968	-93.1060	9689.2975
250.000	0.086242	2941578.	-5648.4771	-0.0009548	4601.0688	-89.8101	10413.6841
260.000	0.076995	2890775.	-6529.9211	-0.0008951	4563.6354	-86.4787	

11231.6854						
270.000	0.068340	2830672.	-7377.8601	-0.0008366	4519.3504	-83.1091
12161.1542						
280.000	0.060264	2761622.	-8191.8946	-0.0007793	4468.4720	-79.6978
13224.8304						
290.000	0.052753	2683980.	-8971.5811	-0.0007236	4411.2632	-76.2395
14452.2001						
300.000	0.045791	2598110.	-9430.0334	-0.0006696	4347.9916	-15.4509
3374.1990						
310.000	0.039362	2510110.	-9583.2752	-0.0006173	4283.1505	-15.1974
3860.9742						
320.000	0.033446	2420025.	-9732.9913	-0.0005668	4216.7732	-14.7458
4408.8856						
330.000	0.028025	2327920.	-9877.1301	-0.0005182	4148.9080	-14.0820
5024.7852						
340.000	0.023081	2233884.	-10013.5061	-0.0004716	4079.6189	-13.1932
5716.1147						
350.000	0.018594	2138025.	-10139.8164	-0.0004268	4008.9872	-12.0688
6490.7802						
360.000	0.014544	2040477.	-10253.6606	-0.0003841	3937.1115	-10.7000
7356.7785						
370.000	0.010913	1941401.	-10352.5639	-0.0003433	3864.1089	-9.0806
8321.1880						
380.000	0.007678	1840979.	-10434.0062	-0.0003046	3790.1152	-7.2078
9387.3084						
390.000	0.004821	1739422.	-10495.4629	-0.0002680	3715.2849	-5.0835
10545.1442						
400.000	0.002319	1636965.	-10534.4774	-0.0002334	3639.7916	-2.7194
11726.0968						
410.000	0.000153	1533867.	-10548.9834	-0.0002010	3563.8263	-0.1817719
11912.6095						
420.000	-0.001700	1430406.	-10536.5534	-0.0001706	3487.5931	2.6678
15692.7726						
430.000	-0.003260	1326890.	-10492.8923	-0.0001424	3411.3193	6.0644
18603.6458						
440.000	-0.004548	1223681.	-10413.5145	-0.0001163	3335.2721	9.8111
21572.1538						
450.000	-0.005586	1121178.	-10295.3304	-9.2304E-05	3259.7449	13.8257
24751.3651						
460.000	-0.006394	1019805.	-10136.0115	-7.0394E-05	3185.0504	18.0381
28210.3809						
470.000	-0.006994	920006.	-9933.9202	-5.0542E-05	3111.5158	22.3802
32000.4314						
480.000	-0.007405	822239.	-9688.1042	-3.2713E-05	3039.4777	26.7830
36168.9707						
490.000	-0.007648	726964.	-9398.3057	-1.6859E-05	2969.2766	31.1767
40764.6603						
500.000	-0.007742	634643.	-9064.9728	-2.9242E-06	2901.2520	35.4899
45839.8845						
510.000	-0.007706	545729.	-8689.2653	9.1554E-06	2835.7372	39.6516
51452.4796						
520.000	-0.007559	460657.	-8273.0529	1.9455E-05	2773.0535	43.5909
57667.2481						
530.000	-0.007317	379840.	-7818.9033	2.8056E-05	2713.5053	47.2390
64557.5094						
540.000	-0.006998	303661.	-7330.0593	3.5051E-05	2657.3748	50.5298
72206.8300						
550.000	-0.006616	232467.	-6810.4046	4.0537E-05	2604.9171	53.4012
80711.0500						
560.000	-0.006187	166561.	-6264.4167	4.4621E-05	2556.3556	55.7964
90180.7234						
570.000	-0.005724	106197.	-5697.1089	4.7412E-05	2511.8777	57.6651
100744.						
580.000	-0.005239	51576.1302	-5113.9599	4.9027E-05	2471.6311	58.9647
112551.						
590.000	-0.004743	2839.6628	-4520.8325	4.9584E-05	2435.7207	59.6608

125777.						
600.000	-0.004247	-39931.3604	-3923.8822	4.9204E-05	2463.0509	59.7292
140630.						
610.000	-0.003759	-76720.4717	-3329.4574	4.8010E-05	2490.1582	59.1557
157358.						
620.000	-0.003287	-107577.	-2743.9916	4.6124E-05	2512.8940	57.9374
176260.						
630.000	-0.002837	-132615.	-2173.8905	4.3666E-05	2531.3429	56.0828
197696.						
640.000	-0.002414	-152015.	-1625.4162	4.0753E-05	2545.6376	53.6121
222113.						
650.000	-0.002022	-166020.	-1104.5698	3.7499E-05	2555.9567	50.5572
250066.						
660.000	-0.001664	-174932.	-616.9780	3.4009E-05	2562.5230	46.9612
282260.						
670.000	-0.001342	-179108.	-167.7839	3.0386E-05	2565.6001	42.8776
319610.						
680.000	-0.001056	-178956.	238.4507	2.6722E-05	2565.4881	38.3693
363336.						
690.000	-0.000807	-174927.	597.8268	2.3100E-05	2562.5193	33.5060
415129.						
700.000	-0.000594	-167507.	907.1659	1.9596E-05	2557.0527	28.3619
477458.						
710.000	-0.000415	-157214.	1164.0285	1.6273E-05	2549.4685	23.0106
554208.						
720.000	-0.000269	-144585.	1366.6649	1.3184E-05	2540.1627	17.5166
652248.						
730.000	-0.000152	-130171.	1513.8222	1.0373E-05	2529.5422	11.9148
786404.						
740.000	-6.11E-05	-114537.	1604.1009	7.8684E-06	2518.0222	6.1409
1004985.						
750.000	5.86E-06	-98262.2175	1630.0099	5.6907E-06	2506.0308	-0.9591394
1637411.						
760.000	5.27E-05	-82061.6110	1592.0588	3.8453E-06	2494.0937	-6.6311
1258070.						
770.000	8.28E-05	-66505.6372	1505.8067	2.3249E-06	2482.6316	-10.6193
1283102.						
780.000	9.92E-05	-51996.6245	1384.9328	1.1122E-06	2471.9409	-13.5554
1366396.						
790.000	0.000105	-38831.4494	1239.2139	1.8264E-07	2462.2405	-15.5883
1484516.						
800.000	0.000103	-27216.3640	1077.2550	-4.9328E-07	2453.6821	-16.8035
1633646.						
810.000	9.51E-05	-17275.4965	906.8649	-9.4859E-07	2446.3574	-17.2746
1815690.						
820.000	8.39E-05	-9058.1976	735.1032	-1.2181E-06	2440.3027	-17.0777
2035810.						
830.000	7.08E-05	-2546.6343	568.2386	-1.3368E-06	2435.5048	-16.2952
2302263.						
840.000	5.71E-05	2335.9860	411.6883	-1.3390E-06	2435.3495	-15.0149
2627290.						
850.000	4.40E-05	5716.5889	269.9722	-1.2566E-06	2437.8405	-13.3283
3029236.						
860.000	3.20E-05	7763.0753	146.7056	-1.1186E-06	2439.3484	-11.3250
3537090.						
870.000	2.16E-05	8675.3106	44.6517	-9.5042E-07	2440.0205	-9.0857
4201320.						
880.000	1.30E-05	8677.0185	-34.1197	-7.7284E-07	2440.0218	-6.6685
5125890.						
890.000	6.17E-06	8009.9187	-87.8413	-6.0207E-07	2439.5303	-4.0758
6606752.						
900.000	9.68E-07	6933.4386	-108.8849	-4.4915E-07	2438.7371	-0.1329555
1373373.						
910.000	-2.81E-06	5842.1020	-107.5999	-3.1840E-07	2437.9329	0.3899579
1385873.						
920.000	-5.40E-06	4788.4458	-101.8745	-2.0961E-07	2437.1566	0.7551183

1398373.					
930.000	-7.01E-06	3809.2234	-93.1566	-1.2163E-07	2436.4351	0.9884681
1410873.					
940.000	-7.83E-06	2927.9901	-82.6399	-5.2680E-08	2435.7857	1.1149
1423373.					
950.000	-8.06E-06	2157.5837	-71.2793	-6.3579E-10	2435.2181	1.1573
1435873.					
960.000	-7.85E-06	1502.4182	-59.8115	3.6820E-08	2434.7353	1.1363
1448373.					
970.000	-7.32E-06	960.5427	-48.7809	6.2025E-08	2434.3361	1.0698
1460873.					
980.000	-6.60E-06	525.4348	-38.5661	7.7232E-08	2434.0155	0.9731238
1473373.					
990.000	-5.78E-06	187.5211	-29.4073	8.4528E-08	2433.7665	0.8586329
1485873.					
1000.	-4.91E-06	-64.5716	-21.4325	8.5787E-08	2433.6759	0.7363258
1498373.					
1010.	-4.06E-06	-243.0172	-14.6816	8.2639E-08	2433.8074	0.6138543
1510873.					
1020.	-3.26E-06	-360.0226	-9.1282	7.6467E-08	2433.8936	0.4968319
1523373.					
1030.	-2.53E-06	-427.2638	-4.6984	6.8411E-08	2433.9431	0.3891231
1535873.					
1040.	-1.89E-06	-455.4965	-1.2871	5.9377E-08	2433.9639	0.2931353
1548373.					
1050.	-1.35E-06	-454.3131	1.2290	5.0066E-08	2433.9631	0.2100984
1560873.					
1060.	-8.92E-07	-432.0175	2.9811	4.0995E-08	2433.9466	0.1403238
1573373.					
1070.	-5.26E-07	-395.5924	4.0999	3.2526E-08	2433.9198	0.0834366
1585873.					
1080.	-2.41E-07	-350.7344	4.7100	2.4888E-08	2433.8867	0.0385767
1598373.					
1090.	-2.84E-08	-301.9399	4.9257	1.8209E-08	2433.8508	0.0045687
1610873.					
1100.	1.23E-07	-252.6205	4.8489	1.2534E-08	2433.8145	-0.0199393
1623373.					
1110.	2.22E-07	-205.2382	4.5673	7.8480E-09	2433.7795	-0.0363671
1635873.					
1120.	2.80E-07	-161.4463	4.1549	4.0954E-09	2433.7473	-0.0461192
1648373.					
1130.	3.04E-07	-122.2301	3.6717	1.1924E-09	2433.7184	-0.0505268
1660873.					
1140.	3.04E-07	-88.0390	3.1650	-9.5948E-10	2433.6932	-0.0508092
1673373.					
1150.	2.85E-07	-58.9089	2.6707	-2.4633E-09	2433.6717	-0.0480522
1685873.					
1160.	2.54E-07	-34.5709	2.2144	-3.4200E-09	2433.6538	-0.0432010
1698373.					
1170.	2.17E-07	-14.5452	1.8131	-3.9226E-09	2433.6390	-0.0370626
1710873.					
1180.	1.76E-07	1.7776	1.4762	-4.0533E-09	2433.6296	-0.0303167
1723373.					
1190.	1.36E-07	15.0683	1.2070	-3.8809E-09	2433.6394	-0.0235323
1735873.					
1200.	9.83E-08	26.0023	0.7575505	-3.4606E-09	2433.6475	-0.0663511
6750000.					
1210.	6.64E-08	30.2954	0.2018522	-2.8844E-09	2433.6506	-0.0447886
6750000.					
1220.	4.06E-08	30.1028	-0.1591479	-2.2663E-09	2433.6505	-0.0274115
6750000.					
1230.	2.10E-08	27.1623	-0.3671713	-1.6803E-09	2433.6483	-0.0141932
6750000.					
1240.	7.00E-09	22.7964	-0.4617756	-1.1690E-09	2433.6451	-0.0047276
6750000.					
1250.	-2.35E-09	17.9525	-0.4774710	-7.5201E-10	2433.6415	0.0015885

```
6750000.
1260.  -8.04E-09      13.2635   -0.4424060  -4.3255E-10    2433.6381    0.0054245
6750000.
1270.  -1.10E-08       9.1139   -0.3781438  -2.0355E-10    2433.6350    0.0074280
6750000.
1280.  -1.21E-08       5.7051   -0.3001423  -5.1893E-11    2433.6325    0.0081723
6750000.
1290.  -1.20E-08       3.1122   -0.2186380   3.8341E-11    2433.6306    0.0081285
6750000.
1300.  -1.13E-08       1.3315   -0.1397217   8.3817E-11    2433.6293    0.0076547
6750000.
1310.  -1.04E-08    0.3159236   -0.0664630   1.0068E-10    2433.6286    0.0069970
6750000.
1320.  -9.33E-09       0.0000       0.0000   1.0391E-10    2433.6283    0.0062956
3375000.
```

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

```
Pile-head deflection                =      0.50000000 in
Computed slope at pile head         =     -0.00212257
Maximum bending moment              =       3044998. lbs-in
Maximum shear force                 =     37185.22152 lbs
Depth of maximum bending moment     =       210.00000 in
Depth of maximum shear force        =         0.00000 in
Number of iterations                =               10
Number of zero deflection points    =                5
```

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 2

Pile-head boundary conditions are Displacement and Slope (Pile-head Condition Type 5)

```
Specified deflection at pile head   =         0.500000 in
Specified slope at pile head        =        0.000E+00 in/in
Specified axial load at pile head   =      1100000.000 lbs
```

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Soil Res. p lbs/in
Es*h F/L						
0.000	0.500000	-7961505.	63879.8610	0.0000	8299.8972	-409.0390
4090.3897						
10.000	0.499185	-7344087.	59424.3892	-0.0001566	7844.9660	-445.5472
8925.4878						
20.000	0.496867	-6769571.	54788.3465	-0.0003011	7421.6457	-481.6614
9693.9635						
30.000	0.493164	-6241697.	50947.1717	-0.0004342	7032.6926	-286.5736
5810.9202						
40.000	0.488183	-5741075.	48591.7734	-0.0005569	6663.8196	-184.5061
3779.4457						
50.000	0.482027	-5257610.	46683.3891	-0.0006694	6307.5891	-197.1708
4090.4527						

60.000	0.474795	-4792680.	44649.4041	-0.0007723	5965.0146	-209.6262
4415.0919						
70.000	0.466582	-4347633.	42491.9955	-0.0008658	5637.0909	-221.8555
4754.9129						
80.000	0.457479	-3923792.	40213.5051	-0.0009504	5324.7929	-233.8426
5111.5515						
90.000	0.447573	-3522453.	38194.2104	-0.0010267	5029.0743	-170.0164
3798.6314						
100.000	0.436946	-3137322.	36648.2108	-0.0010948	4745.2985	-139.1836
3185.3749						
110.000	0.425677	-2765403.	35218.9055	-0.0011552	4471.2578	-146.6775
3445.7496						
120.000	0.413841	-2407529.	33728.1467	-0.0012082	4207.5659	-151.4743
3660.2015						
130.000	0.401514	-2064261.	32220.9999	-0.0012539	3954.6357	-149.9551
3734.7453						
140.000	0.388763	-1735523.	30729.4710	-0.0012928	3712.4122	-148.3507
3815.9664						
150.000	0.375658	-1421229.	29254.3943	-0.0013251	3480.8317	-146.6646
3904.2117						
160.000	0.362261	-1121283.	27796.5704	-0.0013511	3259.8221	-144.9001
3999.8820						
170.000	0.348635	-835573.	26356.7688	-0.0013712	3049.3031	-143.0602
4103.4369						
180.000	0.334838	-563982.	24935.7299	-0.0013855	2849.1867	-141.1476
4215.3999						
190.000	0.320926	-306378.	23534.1665	-0.0013944	2659.3768	-139.1651
4336.3660						
200.000	0.306950	-62622.2391	22152.7660	-0.0013982	2479.7702	-137.1150
4467.0094						
210.000	0.292962	167436.	20792.1918	-0.0013971	2557.0004	-134.9998
4608.0931						
220.000	0.279009	383957.	19453.0849	-0.0013914	2716.5394	-132.8216
4760.4815						
230.000	0.265134	587110.	18136.0652	-0.0013815	2866.2280	-130.5824
4925.1533						
240.000	0.251379	777072.	16841.7333	-0.0013675	3006.1975	-128.2840
5103.2191						
250.000	0.237783	954030.	15570.6715	-0.0013498	3136.5858	-125.9283
5295.9408						
260.000	0.224382	1118181.	14323.4456	-0.0013286	3257.5370	-123.5169
5504.7560						
270.000	0.211210	1269729.	13100.6057	-0.0013042	3369.2017	-121.0511
5731.3068						
280.000	0.198298	1408886.	11902.6883	-0.0012768	3471.7364	-118.5324
5977.4750						
290.000	0.185675	1535872.	10730.2170	-0.0012466	3565.3035	-115.9619
6245.4254						
300.000	0.173366	1650916.	9779.5116	-0.0012140	3650.0714	-74.1792
4278.7705						
310.000	0.161394	1758170.	9015.6672	-0.0011791	3729.0996	-78.5897
4869.4175						
320.000	0.149783	1857170.	8208.6056	-0.0011421	3802.0456	-82.8226
5529.5080						
330.000	0.138552	1947470.	7360.3779	-0.0011032	3868.5808	-86.8229
6266.4626						
340.000	0.127719	2028648.	6473.5929	-0.0010625	3928.3955	-90.5341
7088.5376						
350.000	0.117301	2100317.	5551.4268	-0.0010203	3981.2029	-93.8991
8004.9398						
360.000	0.107314	2162122.	4597.6256	-0.0009766	4026.7432	-96.8611
9025.9631						
370.000	0.097769	2213755.	3616.5006	-0.0009319	4064.7877	-99.3639
10163.1479						
380.000	0.088677	2254953.	2612.9167	-0.0008861	4095.1436	-101.3529
11429.4721						

390.000	0.080046	2285508.	1592.2713	-0.0008397	4117.6574	-102.7762
12839.5800						
400.000	0.071884	2305271.	560.4664	-0.0007927	4132.2193	-103.5848
14410.0573						
410.000	0.064193	2314156.	-476.1286	-0.0007454	4138.7663	-103.7342
16159.7683						
420.000	0.056976	2312147.	-1510.7219	-0.0006981	4137.2859	-103.1845
18110.2707						
430.000	0.050232	2299299.	-2536.1531	-0.0006509	4127.8190	-101.9018
20286.3331						
440.000	0.043958	2275743.	-3544.9543	-0.0006040	4110.4623	-99.8585
22716.5917						
450.000	0.038151	2241689.	-4529.4185	-0.0005578	4085.3702	-97.0344
25434.3960						
460.000	0.032802	2197427.	-5481.6746	-0.0005124	4052.7565	-93.4169
28478.9232						
470.000	0.027903	2143328.	-6393.7676	-0.0004680	4012.8950	-89.0017
31896.6823						
480.000	0.023443	2079847.	-7257.7420	-0.0004247	3966.1200	-83.7932
35743.6079						
490.000	0.019408	2007518.	-8065.7274	-0.0003829	3912.8259	-77.8039
40088.0879						
500.000	0.015785	1926956.	-8810.0217	-0.0003427	3853.4659	-71.0549
45015.5481						
510.000	0.012555	1838855.	-9483.1682	-0.0003041	3788.5507	-63.5744
50635.8183						
520.000	0.009702	1743983.	-10078.0200	-0.0002674	3718.6461	-55.3960
57095.8958						
530.000	0.007206	1643179.	-10587.7787	-0.0002328	3644.3705	-46.5557
64604.3765						
540.000	0.005047	1537349.	-11005.9823	-0.0002002	3566.3919	-37.0850
73485.0843						
550.000	0.003202	1427464.	-11326.3879	-0.0001699	3485.4258	-26.9961
84321.2013						
560.000	0.001649	1314559.	-11542.5694	-0.0001418	3402.2337	-16.2402
98501.4007						
570.000	0.000365	1199733.	-11646.2461	-0.0001161	3317.6269	-4.4951
123179.						
580.000	-0.000673	1084188.	-11624.1441	-9.2729E-05	3232.4898	8.9155
132413.						
590.000	-0.001490	969291.	-11476.1631	-7.1714E-05	3147.8299	20.6806
138829.						
600.000	-0.002108	856243.	-11214.7900	-5.3032E-05	3064.5329	31.5940
149905.						
610.000	-0.002550	746161.	-10848.4744	-3.6634E-05	2983.4218	41.6692
163390.						
620.000	-0.002840	640079.	-10386.0340	-2.2447E-05	2905.2573	50.8189
178923.						
630.000	-0.002999	538935.	-9837.2430	-1.0381E-05	2830.7311	58.9393
196514.						
640.000	-0.003048	443563.	-9212.8918	-3.2681E-07	2760.4582	65.9310
216316.						
650.000	-0.003006	354684.	-8524.6961	7.8422E-06	2694.9698	71.7082
238568.						
660.000	-0.002891	272896.	-7785.1375	1.4265E-05	2634.7062	76.2035
263584.						
670.000	-0.002720	198667.	-7007.2644	1.9091E-05	2580.0122	79.3711
291754.						
680.000	-0.002509	132331.	-6204.4670	2.2478E-05	2531.1336	81.1884
323558.						
690.000	-0.002271	74083.5156	-5390.2360	2.4590E-05	2488.2152	81.6578
359580.						
700.000	-0.002017	23985.2138	-4577.9110	2.5594E-05	2451.3013	80.8072
400544.						
710.000	-0.001759	-18037.7703	-3780.4271	2.5655E-05	2446.9191	78.6896
447344.						

720.000	-0.001504	-52187.7335	-3010.0647	2.4936E-05	2472.0818	75.3829
501103.						
730.000	-0.001260	-78787.6598	-2278.2102	2.3596E-05	2491.6814	70.9880
563255.						
740.000	-0.001032	-98271.0450	-1595.1344	2.1784E-05	2506.0373	65.6271
635661.						
750.000	-0.000825	-111170.	-969.7970	1.9640E-05	2515.5413	59.4403
720801.						
760.000	-0.000640	-118099.	-409.6870	1.7294E-05	2520.6472	52.5817
822084.						
770.000	-0.000479	-119744.	79.2909	1.4860E-05	2521.8590	45.2139
944397.						
780.000	-0.000342	-116840.	492.8643	1.2439E-05	2519.7196	37.5008
1095194.						
790.000	-0.000230	-110160.	828.3484	1.0116E-05	2514.7975	29.5960
1286899.						
800.000	-0.000140	-100496.	1084.4411	7.9601E-06	2507.6765	21.6225
1543434.						
810.000	-7.08E-05	-88646.4743	1260.6640	6.0245E-06	2498.9456	13.6220
1924648.						
820.000	-1.96E-05	-75415.0228	1355.4163	4.3455E-06	2489.1963	5.3284
2718074.						
830.000	1.61E-05	-61633.7502	1357.2879	2.9430E-06	2479.0419	-4.9541
3070612.						
840.000	3.93E-05	-48334.0115	1276.9887	1.8176E-06	2469.2422	-11.1057
2829009.						
850.000	5.25E-05	-36133.9646	1144.8998	9.5321E-07	2460.2529	-15.3120
2917323.						
860.000	5.83E-05	-25456.9863	977.4729	3.2290E-07	2452.3858	-18.1733
3116096.						
870.000	5.89E-05	-16591.6102	786.7020	-1.0741E-07	2445.8535	-19.9808
3389761.						
880.000	5.62E-05	-9720.5828	582.0233	-3.7668E-07	2440.7907	-20.9549
3730444.						
890.000	5.14E-05	-4942.8565	370.8491	-5.2674E-07	2437.2704	-21.2800
4139178.						
900.000	4.56E-05	-2292.0128	233.1105	-6.0078E-07	2435.3171	-6.2678
1373373.						
910.000	3.94E-05	-267.4302	174.4731	-6.2698E-07	2433.8254	-5.4597
1385873.						
920.000	3.31E-05	1211.2423	124.0327	-6.1732E-07	2434.5208	-4.6284
1398373.						
930.000	2.70E-05	2226.8048	81.8094	-5.8213E-07	2435.2691	-3.8163
1410873.						
940.000	2.15E-05	2860.2381	47.4584	-5.3007E-07	2435.7358	-3.0539
1423373.						
950.000	1.64E-05	3187.6339	20.3804	-4.6818E-07	2435.9771	-2.3617
1435873.						
960.000	1.21E-05	3278.1456	-0.1848069	-4.0201E-07	2436.0438	-1.7514
1448373.						
970.000	8.41E-06	3192.7821	-15.0827	-3.3579E-07	2435.9809	-1.2282
1460873.						
980.000	5.38E-06	2983.8790	-25.1843	-2.7258E-07	2435.8269	-0.7921128
1473373.						
990.000	2.96E-06	2695.0929	-31.3408	-2.1446E-07	2435.6141	-0.4391868
1485873.						
1000.	1.09E-06	2361.7813	-34.3510	-1.6271E-07	2435.3685	-0.1628625
1498373.						
1010.	-2.98E-07	2011.6517	-34.9399	-1.1796E-07	2435.1106	0.0450987
1510873.						
1020.	-1.27E-06	1665.5791	-33.7454	-8.0324E-08	2434.8556	0.1938009
1523373.						
1030.	-1.90E-06	1338.5116	-31.3135	-4.9581E-08	2434.6146	0.2925791
1535873.						
1040.	-2.26E-06	1040.4006	-28.0980	-2.5236E-08	2434.3949	0.3505202
1548373.						

1050.	-2.41E-06	777.1074	-24.4648	-6.6356E-09	2434.2009	0.3761205
1560873.						
1060.	-2.40E-06	551.2513	-20.6989	6.9584E-09	2434.0345	0.3770603
1573373.						
1070.	-2.27E-06	362.9772	-17.0132	1.6314E-08	2433.8958	0.3600742
1585873.						
1080.	-2.07E-06	210.6287	-13.5583	2.2185E-08	2433.7835	0.3308985
1598373.						
1090.	-1.83E-06	91.3227	-10.4324	2.5275E-08	2433.6956	0.2942775
1610873.						
1100.	-1.56E-06	1.4238	-7.6910	2.6224E-08	2433.6294	0.2540137
1623373.						
1110.	-1.30E-06	-63.0740	-5.3557	2.5593E-08	2433.6748	0.2130470
1635873.						
1120.	-1.05E-06	-106.2529	-3.4227	2.3860E-08	2433.7066	0.1735523
1648373.						
1130.	-8.25E-07	-132.0526	-1.8697	2.1421E-08	2433.7256	0.1370459
1660873.						
1140.	-6.24E-07	-144.1180	-0.6619995	1.8595E-08	2433.7345	0.1044930
1673373.						
1150.	-4.53E-07	-145.7017	0.2425209	1.5629E-08	2433.7357	0.0764111
1685873.						
1160.	-3.12E-07	-139.6115	0.8894070	1.2709E-08	2433.7312	0.0529661
1698373.						
1170.	-1.99E-07	-128.1932	1.3245	9.9686E-09	2433.7228	0.0340564
1710873.						
1180.	-1.12E-07	-113.3404	1.5917	7.4968E-09	2433.7118	0.0193865
1723373.						
1190.	-4.91E-08	-96.5234	1.7313	5.3491E-09	2433.6994	0.0085270
1735873.						
1200.	-5.51E-09	-78.8320	1.7925	3.5546E-09	2433.6864	0.0037185
6750000.						
1210.	2.20E-08	-60.7510	1.7370	2.1261E-09	2433.6731	-0.0148295
6750000.						
1220.	3.70E-08	-44.1393	1.5379	1.0527E-09	2433.6608	-0.0249843
6750000.						
1230.	4.30E-08	-30.0161	1.2678	2.9382E-10	2433.6504	-0.0290411
6750000.						
1240.	4.29E-08	-18.7902	0.9778178	-2.0565E-10	2433.6422	-0.0289509
6750000.						
1250.	3.89E-08	-10.4552	0.7017391	-5.0494E-10	2433.6360	-0.0262648
6750000.						
1260.	3.28E-08	-4.7444	0.4597438	-6.6049E-10	2433.6318	-0.0221343
6750000.						
1270.	2.57E-08	-1.2458	0.2623314	-7.2179E-10	2433.6292	-0.0173482
6750000.						
1280.	1.84E-08	0.5181501	0.1136398	-7.2924E-10	2433.6287	-0.0123901
6750000.						
1290.	1.11E-08	1.0430	0.0141716	-7.1326E-10	2433.6291	-0.0075035
6750000.						
1300.	4.09E-09	0.8172739	-0.0371515	-6.9422E-10	2433.6289	-0.0027611
6750000.						
1310.	-2.77E-09	0.3152493	-0.0416146	-6.8263E-10	2433.6286	0.0018685
6750000.						
1320.	-9.56E-09	0.0000	0.0000	-6.7941E-10	2433.6283	0.0064545
3375000.						

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 2:

Pile-head deflection = 0.50000000 in
Computed slope at pile head = -0.00000632

Maximum bending moment = -7961505. lbs-in
Maximum shear force = 63879.86102 lbs
Depth of maximum bending moment = 0.00000 in
Depth of maximum shear force = 0.00000 in
Number of iterations = 7
Number of zero deflection points = 5

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 3

Pile-head boundary conditions are Displacement and Moment (Pile-head Condition Type 4)
Specified deflection at pile head = 1.000000 in
Specified moment at pile head = 0.000 in-lbs
Specified axial load at pile head = 1100000.000 lbs

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Soil Res. p lbs/in	Es*h F/L lbs/in
0.000	1.000000	0.0000	49286.3543	-0.0037684	2433.6283	-486.4321	2432.1603
10.000	0.962316	509994.	44229.2033	-0.0037631	2809.4067	-524.9981	5455.5667
20.000	0.924737	967373.	38791.2992	-0.0037480	3146.4170	-562.5827	6083.7029
30.000	0.887356	1368276.	34318.8645	-0.0037241	3441.8142	-331.9043	3740.3733
40.000	0.850255	1735681.	31599.5468	-0.0036924	3712.5287	-211.9592	2492.8904
50.000	0.813509	2081499.	29416.0894	-0.0036533	3967.3375	-224.7322	2762.5046
60.000	0.777189	2404375.	27106.8756	-0.0036074	4205.2420	-237.1105	3050.8726
70.000	0.741361	2702999.	24675.9034	-0.0035551	4425.2767	-249.0839	3359.8179
80.000	0.706087	2976106.	22127.2709	-0.0034970	4626.5098	-260.6426	3691.3664
90.000	0.671422	3222478.	19850.9275	-0.0034336	4808.0442	-194.6261	2898.7172
100.000	0.637416	3448662.	18088.5317	-0.0033653	4974.7034	-157.8530	2476.4532
110.000	0.604116	3658285.	16475.1032	-0.0032926	5129.1595	-164.8327	2728.4949
120.000	0.571565	3850601.	14807.5033	-0.0032157	5270.8633	-168.6873	2951.3254
130.000	0.539802	4025181.	13136.5526	-0.0031351	5399.4990	-165.5028	3065.9941
140.000	0.508862	4182304.	11497.6462	-0.0030511	5515.2722	-162.2785	3189.0448
150.000	0.478779	4322258.	9891.1768	-0.0029641	5618.3945	-159.0154	3321.2694
160.000	0.449581	4445338.	8317.5253	-0.0028744	5709.0830	-155.7149	3463.5595
170.000	0.421292	4551845.	6777.0612	-0.0027823	5787.5605	-152.3779	3616.9213
180.000	0.393935	4642089.	5270.1436	-0.0026882	5854.0553	-149.0056	

3782.4946						
190.000	0.367528	4716388.	3797.1213	-0.0025924	5908.8008	-145.5989
3961.5744						
200.000	0.342086	4775065.	2358.3338	-0.0024953	5952.0357	-142.1586
4155.6379						
210.000	0.317622	4818451.	954.1122	-0.0023971	5984.0039	-138.6857
4366.3769						
220.000	0.294144	4846884.	-415.2201	-0.0022982	6004.9539	-135.1808
4595.7367						
230.000	0.271658	4860707.	-1749.3460	-0.0021989	6015.1394	-131.6444
4845.9655						
240.000	0.250167	4860272.	-3047.9540	-0.0020994	6014.8186	-128.0772
5119.6742						
250.000	0.229670	4845935.	-4310.7361	-0.0020000	6004.2544	-124.4793
5419.9121						
260.000	0.210166	4818058.	-5537.3864	-0.0019011	5983.7143	-120.8508
5750.2626						
270.000	0.191647	4777012.	-6727.5985	-0.0018030	5953.4703	-117.1916
6114.9648						
280.000	0.174107	4723171.	-7881.0634	-0.0017057	5913.7988	-113.5013
6519.0719						
290.000	0.157533	4656917.	-8997.4655	-0.0016097	5864.9807	-109.7791
6968.6572						
300.000	0.141912	4578636.	-9839.3142	-0.0015152	5807.3012	-58.5907
4128.6665						
310.000	0.127228	4493466.	-10430.1489	-0.0014224	5744.5450	-59.5763
4682.6331						
320.000	0.113464	4401326.	-11028.8450	-0.0013314	5676.6536	-60.1630
5302.3773						
330.000	0.100601	4302179.	-11631.2307	-0.0012423	5603.5991	-60.3142
5995.3838						
340.000	0.088618	4196032.	-12232.7787	-0.0011553	5525.3868	-59.9954
6770.0864						
350.000	0.077495	4082940.	-12828.6312	-0.0010706	5442.0577	-59.1751
7636.0242						
360.000	0.067207	3963012.	-13413.6304	-0.0009883	5353.6912	-57.8247
8604.0346						
370.000	0.057730	3836409.	-13982.3526	-0.0009084	5260.4065	-55.9197
9686.4960						
380.000	0.049038	3703351.	-14529.1493	-0.0008313	5162.3650	-53.4396
10897.6365						
390.000	0.041104	3564114.	-15048.1906	-0.0007569	5059.7717	-50.3686
12253.9413						
400.000	0.033900	3419039.	-15533.5133	-0.0006854	4952.8757	-46.6959
13774.7032						
410.000	0.027395	3268524.	-15979.0705	-0.0006170	4841.9719	-42.4155
15482.8041						
420.000	0.021560	3113031.	-16378.7813	-0.0005517	4727.4005	-37.5266
17405.8866						
430.000	0.016361	2953085.	-16726.5782	-0.0004896	4609.5477	-32.0327
19578.2549						
440.000	0.011767	2789271.	-17016.4446	-0.0004308	4488.8447	-25.9406
22044.3273						
450.000	0.007744	2622235.	-17242.4339	-0.0003755	4365.7676	-19.2573
24866.0441						
460.000	0.004258	2452683.	-17398.6399	-0.0003235	4240.8365	-11.9839
28143.9022						
470.000	0.001274	2281380.	-17479.0214	-0.0002751	4114.6156	-4.0924
32128.6709						
480.000	-0.001244	2109154.	-17476.5770	-0.0002302	3987.7147	4.5813
36837.6606						
490.000	-0.003329	1936912.	-17384.7886	-0.0001887	3860.8014	13.7764
41378.7978						
500.000	-0.005019	1765611.	-17199.6024	-0.0001509	3734.5820	23.2608
46349.2819						
510.000	-0.006346	1596239.	-16918.9833	-0.0001165	3609.7835	32.8630

51781.3792					
520.000	-0.007348	1429793.	-16542.5676	-8.5485E-05	3487.1417	42.4202
57732.8805					
530.000	-0.008056	1267268.	-16071.5912	-5.7884E-05	3367.3883	51.7751
64267.4525					
540.000	-0.008505	1109635.	-15508.8388	-3.3560E-05	3251.2397	60.7754
71455.4411					
550.000	-0.008727	957829.	-14858.5907	-1.2402E-05	3139.3850	69.2743
79375.6607					
560.000	-0.008753	812736.	-14126.5565	5.7175E-06	3032.4758	77.1326
88117.3548					
570.000	-0.008613	675173.	-13319.7918	2.0944E-05	2931.1152	84.2204
97782.3909					
580.000	-0.008335	545879.	-12446.5937	3.3440E-05	2835.8481	90.4192
108488.					
590.000	-0.007944	425505.	-11516.3778	4.3381E-05	2747.1528	95.6240
120369.					
600.000	-0.007467	314597.	-10539.5328	5.0955E-05	2665.4328	99.7450
133583.					
610.000	-0.006925	213593.	-9527.2575	5.6361E-05	2591.0101	102.7100
148315.					
620.000	-0.006340	122812.	-8491.3797	5.9803E-05	2524.1200	104.4655
164781.					
630.000	-0.005729	42450.0593	-7444.1596	6.1495E-05	2464.9068	104.9785
183238.					
640.000	-0.005110	-27423.8308	-6398.0816	6.1648E-05	2453.8350	104.2371
203995.					
650.000	-0.004496	-86867.8353	-5365.6368	6.0479E-05	2497.6351	102.2518
227423.					
660.000	-0.003900	-136067.	-4359.1002	5.8197E-05	2533.8865	99.0555
253975.					
670.000	-0.003332	-175330.	-3390.3073	5.5010E-05	2562.8167	94.7031
284210.					
680.000	-0.002800	-205083.	-2470.4358	5.1117E-05	2584.7398	89.2712
318826.					
690.000	-0.002310	-225863.	-1609.7954	4.6707E-05	2600.0511	82.8568
358717.					
700.000	-0.001866	-238307.	-817.6361	4.1957E-05	2609.2198	75.5750
405043.					
710.000	-0.001471	-243139.	-101.9781	3.7030E-05	2612.7804	67.5565
459359.					
720.000	-0.001125	-241161.	530.5222	3.2074E-05	2611.3229	58.9435
523825.					
730.000	-0.000829	-233234.	1074.6611	2.7219E-05	2605.4823	49.8842
601600.					
740.000	-0.000581	-220267.	1526.7039	2.2578E-05	2595.9273	40.5243
697646.					
750.000	-0.000378	-203197.	1884.2859	1.8244E-05	2583.3498	30.9921
820690.					
760.000	-0.000216	-182982.	2146.0763	1.4292E-05	2568.4551	21.3660
989231.					
770.000	-9.18E-05	-160590.	2310.7513	1.0776E-05	2551.9557	11.5690
1260388.					
780.000	-4.61E-07	-137004.	2369.4366	7.7307E-06	2534.5772	0.1680595
3643296.					
790.000	6.28E-05	-113371.	2319.0476	5.1684E-06	2517.1636	-10.2459
1630849.					
800.000	0.000103	-90737.2222	2183.7674	3.0797E-06	2500.4862	-16.8102
1633520.					
810.000	0.000124	-69763.7196	1992.4044	1.4371E-06	2485.0323	-21.4624
1725018.					
820.000	0.000132	-50920.7511	1762.3502	2.0208E-07	2471.1482	-24.5484
1864670.					
830.000	0.000128	-34521.1622	1508.2468	-6.7231E-07	2459.0645	-26.2722
2045168.					
840.000	0.000118	-20741.0246	1242.8487	-1.2379E-06	2448.9109	-26.8074

2267889.						
850.000	0.000104	-9636.9559	977.1835	-1.5487E-06	2440.7291	-26.3257
2538562.						
860.000	8.72E-05	-1163.2832	720.5342	-1.6593E-06	2434.4855	-25.0042
2866484.						
870.000	7.05E-05	4810.2314	480.3935	-1.6219E-06	2437.1726	-23.0239
3264978.						
880.000	5.48E-05	8480.2702	262.4639	-1.4859E-06	2439.8768	-20.5620
3752821.						
890.000	4.08E-05	10092.1997	70.7640	-1.2959E-06	2441.0645	-17.7780
4357414.						
900.000	2.89E-05	9924.0589	-37.9530	-1.0910E-06	2440.9407	-3.9654
1373373.						
910.000	1.90E-05	9357.1415	-70.9314	-8.9370E-07	2440.5229	-2.6303
1385873.						
920.000	1.10E-05	8525.0920	-91.7735	-7.1070E-07	2439.9099	-1.5382
1398373.						
930.000	4.77E-06	7537.3071	-102.8258	-5.4632E-07	2439.1820	-0.6722967
1410873.						
940.000	7.33E-08	6480.5956	-106.2394	-4.0286E-07	2438.4034	-0.0104305
1423373.						
950.000	-3.29E-06	5421.3820	-103.9280	-2.8106E-07	2437.6230	0.4727091
1435873.						
960.000	-5.55E-06	4408.2188	-97.5467	-1.8047E-07	2436.8764	0.8035478
1448373.						
970.000	-6.90E-06	3474.4178	-88.4879	-9.9798E-08	2436.1884	1.0082
1460873.						
980.000	-7.54E-06	2640.6564	-77.8893	-3.7218E-08	2435.5740	1.1115
1473373.						
990.000	-7.65E-06	1917.4504	-66.6514	9.4282E-09	2435.0412	1.1361
1485873.						
1000.	-7.36E-06	1307.4202	-55.4605	4.2431E-08	2434.5917	1.1021
1498373.						
1010.	-6.80E-06	807.3060	-44.8152	6.4072E-08	2434.2232	1.0270
1510873.						
1020.	-6.07E-06	409.7076	-35.0539	7.6527E-08	2433.9302	0.9252803
1523373.						
1030.	-5.27E-06	104.5450	-26.3830	8.1790E-08	2433.7054	0.8088975
1535873.						
1040.	-4.44E-06	-119.7515	-18.9026	8.1634E-08	2433.7166	0.6871835
1548373.						
1050.	-3.63E-06	-275.3025	-12.6305	7.7591E-08	2433.8312	0.5672238
1560873.						
1060.	-2.89E-06	-374.0693	-7.5238	7.0946E-08	2433.9039	0.4541194
1573373.						
1070.	-2.22E-06	-427.3398	-3.4968	6.2744E-08	2433.9432	0.3512875
1585873.						
1080.	-1.63E-06	-445.3854	-0.4365619	5.3813E-08	2433.9565	0.2607580
1598373.						
1090.	-1.14E-06	-437.2550	1.7845	4.4780E-08	2433.9505	0.1834538
1610873.						
1100.	-7.36E-07	-410.6807	3.2990	3.6103E-08	2433.9309	0.1194466
1623373.						
1110.	-4.17E-07	-372.0692	4.2371	2.8092E-08	2433.9025	0.0681822
1635873.						
1120.	-1.74E-07	-326.5558	4.7214	2.0943E-08	2433.8689	0.0286732
1648373.						
1130.	2.06E-09	-278.1016	4.8631	1.4755E-08	2433.8332	-0.0003420
1660873.						
1140.	1.21E-07	-229.6189	4.7600	9.5589E-09	2433.7975	-0.0202723
1673373.						
1150.	1.93E-07	-183.1118	4.4958	5.3351E-09	2433.7632	-0.0325772
1685873.						
1160.	2.28E-07	-139.8212	4.1394	2.0303E-09	2433.7313	-0.0386971
1698373.						
1170.	2.34E-07	-100.3688	3.7459	-4.2777E-10	2433.7023	-0.0400074

```
 1710873.
 1180.   2.19E-07     -64.8945        3.3569 -2.1190E-09    2433.6761   -0.0377923
 1723373.
 1190.   1.91E-07     -33.1849        3.0017 -3.1227E-09    2433.6528   -0.0332352
 1735873.
 1200.   1.57E-07      -4.7913        2.3062 -3.5114E-09    2433.6318   -0.1058654
 6750000.
 1210.   1.21E-07      13.0169        1.3677 -3.4272E-09    2433.6379   -0.0818326
 6750000.
 1220.   8.83E-08      22.6388     0.6605795 -3.0623E-09    2433.6450   -0.0595981
 6750000.
 1230.   6.00E-08      26.2958     0.1601320 -2.5615E-09    2433.6477   -0.0404913
 6750000.
 1240.   3.71E-08      25.8978    -0.1674120 -2.0274E-09    2433.6474   -0.0250175
 6750000.
 1250.   1.94E-08      22.9922    -0.3581068 -1.5271E-09    2433.6453   -0.0131215
 6750000.
 1260.   6.52E-09      18.7693    -0.4457244 -1.0997E-09    2433.6421   -0.0044020
 6750000.
 1270.  -2.55E-09      14.1019    -0.4591127 -7.6330E-10    2433.6387    0.0017244
 6750000.
 1280.  -8.74E-09       9.6038    -0.4209784 -5.2070E-10    2433.6354    0.0059025
 6750000.
 1290.  -1.30E-08       5.6938    -0.3476967 -3.6415E-10    2433.6325    0.0087538
 6750000.
 1300.  -1.60E-08       2.6579    -0.2498349 -2.7868E-10    2433.6303    0.0108185
 6750000.
 1310.  -1.85E-08    0.7032109    -0.1331620 -2.4428E-10    2433.6288    0.0125160
 6750000.
 1320.  -2.09E-08       0.0000        0.0000 -2.3709E-10    2433.6283    0.0141164
 3375000.
```

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 3:

```
Pile-head deflection                =      1.00000000 in
Computed slope at pile head         =     -0.00376836
Maximum bending moment              =       4860707. lbs-in
Maximum shear force                 =     49286.35427 lbs
Depth of maximum bending moment     =       230.00000 in
Depth of maximum shear force        =         0.00000 in
Number of iterations                =                9
Number of zero deflection points    =                5
```

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 4

```
Pile-head boundary conditions are Displacement and Slope (Pile-head Condition
Type 5)
Specified deflection at pile head   =         1.000000 in
Specified slope at pile head        =       0.000E+00 in/in
Specified axial load at pile head   =      1100000.000 lbs
```

Depth X	Deflect. y	Moment M	Shear V	Slope S	Total Stress	Soil Res. p
Es*h F/L						

in	in	lbs-in	lbs	Rad.	lbs/in**2	lbs/in
0.000	1.000000	-1.3866E+07	93591.8876	0.0000	12650.3251	-486.4321
2432.1603						
10.000	0.998581	-1.2955E+07	88293.1297	-0.0002745	11979.0841	-529.8758
5306.2875						
20.000	0.994511	-1.2094E+07	82779.2164	-0.0005308	11344.7367	-572.9069
5760.6918						
30.000	0.987965	-1.1288E+07	78209.9991	-0.0007701	10750.5966	-340.9366
3450.8986						
40.000	0.979109	-1.0513E+07	75407.4671	-0.0009932	10179.7051	-219.5698
2242.5479						
50.000	0.968101	-9757513.	73136.0055	-0.0012006	9623.2482	-234.7225
2424.5667						
60.000	0.955096	-9023583.	70714.1457	-0.0013928	9082.4677	-249.6495
2613.8677						
70.000	0.940244	-8312587.	68144.2435	-0.0015702	8558.5852	-264.3310
2811.3015						
80.000	0.923691	-7626153.	65428.8474	-0.0017334	8052.8003	-278.7482
3017.7647						
90.000	0.905577	-6965876.	62959.9273	-0.0018827	7566.2893	-215.0358
2374.5724						
100.000	0.886037	-6325535.	61003.9044	-0.0020187	7094.4672	-176.1688
1988.2771						
110.000	0.865203	-5701387.	59194.0684	-0.0021418	6634.5764	-185.7984
2147.4556						
120.000	0.843201	-5094534.	57304.9230	-0.0022523	6187.4299	-192.0306
2277.3995						
130.000	0.820157	-4505738.	55393.4443	-0.0023505	5753.5876	-190.2651
2319.8613						
140.000	0.796191	-3934954.	53500.1514	-0.0024369	5333.0172	-188.3935
2366.1846						
150.000	0.771419	-3382123.	51626.0888	-0.0025118	4925.6754	-186.4190
2416.5725						
160.000	0.745955	-2847173.	49772.2692	-0.0025755	4531.5085	-184.3449
2471.2591						
170.000	0.719909	-2330016.	47939.6757	-0.0026285	4150.4522	-182.1738
2530.5131						
180.000	0.693385	-1830552.	46129.2642	-0.0026711	3782.4326	-179.9085
2594.6406						
190.000	0.666487	-1348667.	44341.9648	-0.0027036	3427.3654	-177.5514
2663.9895						
200.000	0.639312	-884233.	42578.6842	-0.0027265	3085.1571	-175.1048
2738.9541						
210.000	0.611957	-437111.	40840.3066	-0.0027400	2755.7042	-172.5708
2819.9810						
220.000	0.584512	-7146.9715	39127.6955	-0.0027445	2438.8944	-169.9514
2907.5758						
230.000	0.557066	405823.	37441.6952	-0.0027405	2732.6507	-167.2486
3002.3110						
240.000	0.529703	801977.	35783.1315	-0.0027281	3024.5485	-164.4641
3104.8353						
250.000	0.502504	1181504.	34152.8132	-0.0027078	3304.1951	-161.5996
3215.8851						
260.000	0.475547	1544605.	32551.5324	-0.0026799	3571.7385	-158.6566
3336.2968						
270.000	0.448906	1891493.	30980.0657	-0.0026447	3827.3354	-155.6367
3467.0231						
280.000	0.422652	2222391.	29439.1745	-0.0026026	4071.1508	-152.5415
3609.1506						
290.000	0.396853	2537535.	27929.6051	-0.0025539	4303.3578	-149.3724
3763.9213						
300.000	0.371573	2837170.	26272.0033	-0.0024989	4524.1376	-182.1480
4902.0723						

310.000	0.346874	3117951.	24403.4961	-0.0024380	4731.0256	-191.5535
5522.2706						
320.000	0.322814	3378875.	22443.4695	-0.0023715	4923.2822	-200.4518
6209.5208						
330.000	0.299444	3618993.	20397.5652	-0.0022999	5100.2083	-208.7290
6970.5415						
340.000	0.276816	3837424.	18272.5680	-0.0022236	5261.1543	-216.2704
7812.7870						
350.000	0.254973	4033364.	16076.4043	-0.0021430	5405.5283	-222.9623
8744.5483						
360.000	0.233955	4206099.	13818.1277	-0.0020587	5532.8046	-228.6930
9775.0708						
370.000	0.213799	4355018.	11507.8889	-0.0019711	5642.5324	-233.3547
10914.6936						
380.000	0.194533	4479621.	9156.8916	-0.0018807	5734.3436	-236.8447
12175.0151						
390.000	0.176185	4579531.	6777.3332	-0.0017880	5807.9601	-239.0670
13569.0899						
400.000	0.158774	4654503.	4382.3296	-0.0016935	5863.2018	-239.9338
15111.6668						
410.000	0.142315	4704434.	1985.8256	-0.0015977	5899.9924	-239.3671
16819.4779						
420.000	0.126820	4729369.	-397.5100	-0.0015012	5918.3653	-237.3001
18711.5936						
430.000	0.112292	4729509.	-2752.4031	-0.0014044	5918.4686	-233.6786
20809.8638						
440.000	0.098733	4705217.	-5063.1062	-0.0013078	5900.5693	-228.4621
23139.4740						
450.000	0.086136	4657019.	-7313.5424	-0.0012120	5865.0556	-221.6252
25729.6585						
460.000	0.074493	4585610.	-9487.4587	-0.0011174	5812.4394	-213.1581
28614.6312						
470.000	0.063788	4491853.	-11568.5873	-0.0010245	5743.3563	-203.0676
31834.8311						
480.000	0.054002	4376777.	-13540.8116	-0.0009338	5658.5655	-191.3772
35438.6348						
490.000	0.045113	4241579.	-15388.3324	-0.0008456	5558.9474	-178.1269
39484.7925						
500.000	0.037091	4087613.	-17095.8298	-0.0007603	5445.5008	-163.3725
44046.0417						
510.000	0.029906	3916389.	-18648.6117	-0.0006784	5319.3382	-147.1839
49214.7544						
520.000	0.023523	3729566.	-20032.7401	-0.0006002	5181.6811	-129.6418
55112.3600						
530.000	0.017903	3528938.	-21235.1129	-0.0005259	5033.8528	-110.8327
61906.4671						
540.000	0.013006	3316433.	-22243.4701	-0.0004558	4877.2727	-90.8387
69845.7188						
550.000	0.008787	3094097.	-23046.2485	-0.0003902	4713.4491	-69.7170
79343.1078						
560.000	0.005201	2864093.	-23632.0905	-0.0003292	4543.9753	-47.4514
91231.5093						
570.000	0.002202	2628698.	-23988.2738	-0.0002730	4370.5300	-23.7852
108024.						
580.000	-0.000259	2390334.	-24088.6704	-0.0002217	4194.8960	3.7059
142823.						
590.000	-0.002232	2151802.	-23920.4812	-0.0001752	4019.1386	29.9319
134130.						
600.000	-0.003763	1915778.	-23503.2703	-0.0001336	3845.2297	53.5103
142192.						
610.000	-0.004903	1684675.	-22859.7635	-9.6715E-05	3674.9457	75.1911
153364.						
620.000	-0.005698	1460711.	-22009.2106	-6.4526E-05	3509.9226	94.9195
166597.						
630.000	-0.006193	1245910.	-20971.9356	-3.6827E-05	3351.6512	112.5355
181705.						

640.000	-0.006434	1042082.	-19769.9227	-1.3413E-05	3201.4649	127.8671	198734.
650.000	-0.006462	850807.	-18426.7916	5.9588E-06	3060.5275	140.7592	217841.
660.000	-0.006315	673415.	-16967.5586	2.1557E-05	2929.8204	151.0874	239255.
670.000	-0.006030	510981.	-15418.2941	3.3678E-05	2810.1342	158.7655	263275.
680.000	-0.005641	364309.	-13805.7215	4.2636E-05	2702.0615	163.7491	290266.
690.000	-0.005178	233929.	-12156.7804	4.8758E-05	2605.9939	166.0392	320681.
700.000	-0.004666	120100.	-10498.1707	5.2381E-05	2522.1217	165.6828	355071.
710.000	-0.004130	22812.9678	-8855.8907	5.3843E-05	2450.4376	162.7732	394116.
720.000	-0.003589	-58202.1234	-7254.7807	5.3481E-05	2476.5133	157.4488	438660.
730.000	-0.003060	-123459.	-5718.0843	5.1622E-05	2524.5967	149.8905	489764.
740.000	-0.002557	-173699.	-4267.0399	4.8581E-05	2561.6152	140.3184	548789.
750.000	-0.002089	-209869.	-2920.5138	4.4656E-05	2588.2658	128.9868	617505.
760.000	-0.001664	-233092.	-1694.6916	4.0123E-05	2605.3775	116.1776	698284.
770.000	-0.001286	-244645.	-602.8431	3.5234E-05	2613.8901	102.1921	794412.
780.000	-0.000959	-245924.	344.8144	3.0213E-05	2614.8324	87.3394	910652.
790.000	-0.000682	-238414.	1141.1202	2.5257E-05	2609.2985	71.9217	1054382.
800.000	-0.000454	-223657.	1781.7739	2.0528E-05	2598.4256	56.2090	1238208.
810.000	-0.000272	-203230.	2264.7830	1.6159E-05	2583.3740	40.3928	1487411.
820.000	-0.000131	-178717.	2589.0385	1.2251E-05	2565.3124	24.4583	1870338.
830.000	-2.66E-05	-151719.	2748.7665	8.8689E-06	2545.4190	7.4873	2819627.
840.000	4.66E-05	-123937.	2722.6428	6.0479E-06	2524.9488	-12.7120	2727397.
850.000	9.44E-05	-97398.8211	2537.1238	3.7828E-06	2505.3946	-24.3918	2583757.
860.000	0.000122	-73277.8188	2252.1003	2.0362E-06	2487.6216	-32.6129	2667394.
870.000	0.000135	-52401.6105	1897.1908	7.5000E-07	2472.2394	-38.3690	2839460.
880.000	0.000137	-35350.5022	1494.4462	-1.4803E-07	2459.6756	-42.1799	3072883.
890.000	0.000132	-22509.4294	1061.4268	-7.4016E-07	2450.2139	-44.4239	3361198.
900.000	0.000122	-14105.6834	755.2141	-1.1149E-06	2444.0218	-16.8186	1373373.
910.000	0.000110	-7380.6197	594.9885	-1.3348E-06	2439.0666	-15.2265	1385873.
920.000	9.58E-05	-2176.5481	451.8970	-1.4326E-06	2435.2321	-13.3918	1398373.
930.000	8.12E-05	1688.8364	327.6437	-1.4375E-06	2434.8727	-11.4589	1410873.
940.000	6.70E-05	4407.9511	222.6549	-1.3752E-06	2436.8762	-9.5388	1423373.
950.000	5.37E-05	6172.1885	136.3965	-1.2669E-06	2438.1762	-7.7128	1435873.
960.000	4.17E-05	7163.7520	67.6495	-1.1304E-06	2438.9068	-6.0366	1448373.

970.000	3.11E-05	7550.0474	14.7449	-9.7983E-07	2439.1914	-4.5444
1460873.						
980.000	2.21E-05	7480.2058	-24.2442	-8.2601E-07	2439.1400	-3.2534
1473373.						
990.000	1.46E-05	7083.3359	-51.3486	-6.7697E-07	2438.8475	-2.1674
1485873.						
1000.	8.54E-06	6468.1273	-68.5854	-5.3829E-07	2438.3942	-1.2799
1498373.						
1010.	3.82E-06	5723.4696	-77.8717	-4.1353E-07	2437.8455	-0.5773265
1510873.						
1020.	2.72E-07	4919.7906	-80.9652	-3.0461E-07	2437.2534	-0.0413767
1523373.						
1030.	-2.27E-06	4110.8662	-79.4282	-2.1219E-07	2436.6573	0.3487911
1535873.						
1040.	-3.97E-06	3335.8955	-74.6090	-1.3598E-07	2436.0863	0.6150366
1548373.						
1050.	-4.99E-06	2621.6774	-67.6390	-7.5012E-08	2435.5600	0.7789629
1560873.						
1060.	-5.47E-06	1984.7653	-59.4392	-2.7870E-08	2435.0908	0.8610094
1573373.						
1070.	-5.55E-06	1433.5073	-50.7349	7.1113E-09	2434.6846	0.8798373
1585873.						
1080.	-5.33E-06	969.9102	-42.0760	3.1707E-08	2434.3430	0.8519574
1598373.						
1090.	-4.91E-06	591.2906	-33.8584	4.7684E-08	2434.0640	0.7915546
1610873.						
1100.	-4.38E-06	291.6933	-26.3483	5.6720E-08	2433.8432	0.7104646
1623373.						
1110.	-3.78E-06	63.0768	-19.7047	6.0351E-08	2433.6748	0.6182646
1635873.						
1120.	-3.17E-06	-103.7275	-14.0011	5.9935E-08	2433.7047	0.5224439
1648373.						
1130.	-2.58E-06	-218.2640	-9.2458	5.6640E-08	2433.7891	0.4286244
1660873.						
1140.	-2.04E-06	-289.8890	-5.3986	5.1439E-08	2433.8419	0.3408085
1673373.						
1150.	-1.55E-06	-327.3678	-2.3864	4.5123E-08	2433.8695	0.2616353
1685873.						
1160.	-1.13E-06	-338.6094	-0.1150591	3.8307E-08	2433.8778	0.1926300
1698373.						
1170.	-7.86E-07	-330.5118	1.5203	3.1460E-08	2433.8718	0.1344376
1710873.						
1180.	-5.05E-07	-308.8959	2.6276	2.4916E-08	2433.8559	0.0870323
1723373.						
1190.	-2.87E-07	-278.5073	3.3123	1.8905E-08	2433.8335	0.0498998
1735873.						
1200.	-1.27E-07	-243.0660	3.9901	1.3567E-08	2433.8074	0.0856689
6750000.						
1210.	-1.61E-08	-199.0031	4.4729	9.0431E-09	2433.7749	0.0108815
6750000.						
1220.	5.39E-08	-153.8073	4.3452	5.4325E-09	2433.7416	-0.0364125
6750000.						
1230.	9.25E-08	-112.2180	3.8509	2.7101E-09	2433.7110	-0.0624571
6750000.						
1240.	1.08E-07	-76.8492	3.1736	7.7520E-10	2433.6849	-0.0729983
6750000.						
1250.	1.08E-07	-48.7630	2.4440	-5.1028E-10	2433.6642	-0.0729223
6750000.						
1260.	9.79E-08	-27.9579	1.7488	-1.2954E-09	2433.6489	-0.0661095
6750000.						
1270.	8.21E-08	-13.7576	1.1411	-1.7223E-09	2433.6385	-0.0554341
6750000.						
1280.	6.35E-08	-5.0975	0.6496662	-1.9153E-09	2433.6321	-0.0428580
6750000.						
1290.	4.38E-08	-0.7221200	0.2874881	-1.9748E-09	2433.6289	-0.0295776
6750000.						

```
1300.   2.40E-08   0.6956832   0.0586121 -1.9751E-09   2433.6288  -0.0161975
6750000.
1310.   4.32E-09   0.4935751  -0.0369434 -1.9629E-09   2433.6287  -0.0029136
6750000.
1320.  -1.53E-08      0.0000      0.0000 -1.9579E-09   2433.6283   0.0103022
3375000.
```

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 4:

```
Pile-head deflection                =     1.00000000 in
Computed slope at pile head         =    -0.00000932
Maximum bending moment              =     -13865760. lbs-in
Maximum shear force                 =    93591.88759 lbs
Depth of maximum bending moment     =        0.00000 in
Depth of maximum shear force        =        0.00000 in
Number of iterations                =               7
Number of zero deflection points    =               5
```

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

```
Type 1 = Shear and Moment,          y = pile-head displacment in
Type 2 = Shear and Slope,           M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness,  V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment,     S = Pile-head Slope, radians
Type 5 = Deflection and Slope,      R = Rot. Stiffness of Pile-head in-lbs/rad
```

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
4	y= 0.500000	M= 0.000	1100000.	0.5000000	3044998.	37185.2215
5	y= 0.500000	S= 0.000	1100000.	0.5000000	-7961505.	63879.8610
4	y= 1.000000	M= 0.000	1100000.	1.0000000	4860707.	49286.3543
5	y= 1.000000	S= 0.000	1100000.	1.0000000	-1.3866E+07	93591.8876

The analysis ended normally.

Summary of Warning Messages

APPENDIX E:

REFERENCES

APPENDIX E

REFERENCES

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