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# **Portland Metropolitan Exposition Center (EXPO) Hall E Tilt Panel, Micropiling Project**

**RFB 12-2004**

**Metro Property and Project Management Office**

600 NE Grand Ave.  
Portland, OR 97232  
503-797-1700

**Project Manager**

Josh Lipscomb  
Josh.lipscomb@oregonmetro.gov  
503-867-5967

**Procurement Analyst**

Renee Pace  
Renee.pace@oregonmetro.gov  
503-797-1911

Notice is hereby given that bids for RFB 12-2004 for EXPO - Hall E Tilt Panel, Micropiling Project shall be received by Metro, 600 NE Grand Avenue, Portland OR 97232 until **2:00 p.m. on November 22, 2011**. It is the sole responsibility of the bidder to ensure that Metro receives the Bid by the specified date and time. All late Bids shall be rejected. Bidders shall review all instructions and contract terms and condition.



# Portland Metropolitan Exposition Center (EXPO) Hall E Tilt Panel, Micropiling Project Request for Bid (RFB 12-2004)



600 NE Grand Ave.  
Portland, OR 97232-2736  
503-797-1700

**Metro Property and Project Management Office hereby requests sealed bids for EXPO - Hall E Tilt Panel, Micropiling Project.** Bids are due (postmarks and faxes are not accepted for formal bids) no later than **2:00 p.m. on November 22, 2011** at Metro, 600 NE Grand Avenue, Portland, OR 97232, Attention: Josh Lipscomb. First Tier Subcontractor and Good Faith Effort forms are due from all bidders within two (2) hours of the bid due time or the bid will be considered non-responsive.

All bids must be submitted in sealed envelopes that clearly identify the item(s) as stated in the RFB. Bidding documents, (including plans and specifications depicting the work) may be viewed at the Metro website, [www.oregonmetro.gov](http://www.oregonmetro.gov) under "Doing Business".

All bids must conform to the RFB format and be complete including the use of any required forms. Metro/MERC may accept or reject any or all bids, in whole or in part, or waive irregularities not affecting substantial rights if such action is deemed in the public interest.

Metro/MERC and its contractors will not discriminate against any person(s), employee or applicant for employment based on race, creed, color, national origin, sex, sexual orientation, age, religion, physical handicap, political affiliation or marital status. Metro/MERC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. For more information, or to obtain a Title VI Complaint Form, see [www.oregonmetro.gov](http://www.oregonmetro.gov).

Metro/MERC extends equal opportunity to all persons and specifically encourages minority, women-owned, and emerging small businesses to access and participate in this and all Metro/MERC projects, programs and services.

**A Mandatory Pre-Bid Conference is scheduled for all potential prime contractors on Friday, November 4, 2011 at 1:30pm at EXPO Hall E, 2060 N Marine Dr. Portland, OR 97217.** Interested sub-contractors are also invited. Contact Renee Pace at 503-797-1911 or [renee.pace@oregonmetro.gov](mailto:renee.pace@oregonmetro.gov) to RSVP.

This project will be subject to prevailing wage requirements as established by the Oregon Bureau of Labor and Industries (BOLI). By submitting a bid, all bidders certify that they will pay and comply with minimum prevailing wage requirements of ORS 279C.800-279C.870. For all construction projects over \$25,000, all bidders must be appropriately licensed with the Construction Contractors Board or the State Landscape Contractors Board. (ORS 279C.365 (1)(k)).

Metro Code provisions 2.04.100 and 200 require all Bidders/Proposers to follow and document a specific good faith outreach effort to State certified Minority, Women and Emerging Small Businesses. Certification of good faith compliance and a declaration of any actual utilization pursuant to both programs are required within two (2) hours of Bid closing.

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**ATTACHMENT A**

STRUCTURAL ENGINEERING DOCUMENTS .....	8 pages
EXPO Plan Set – Sheets S0, S1 & S2	
Structural Calculations for Expo Hall E Panel Repair	

**ATTACHMENT B**

GEOPACIFIC ENGINEERING REPORT .....	50 pages
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# Portland Metropolitan Exposition Center (EXPO) Hall E Tilt Panel, Micropiling Project Request for Bid (RFB 12-2004)



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## INVITATION TO BID

Metro is requesting bids for EXPO - Hall E Tilt Panel, Micropiling Project. Sealed bids must be enclosed in a sealed envelope and mailed or delivered to Metro, 600 NE Grand Avenue, Portland, Oregon 97232-2736, to Josh Lipscomb, no later than 2:00 pm on November 22, 2011, and will be publicly opened and read at that time in Room 274.

### Description of Work

#### SUMMARY OF WORK

##### Project Description:

Micropiles and pressure grouting at the Portland Expo Center Hall E (southeast location). Micropiles are to be installed in support of the building location that has been determined to be settling. Hall E is the Exposition Hall that is located at the southeast section of the property.

##### Background:

It has been determined through investigation and monitoring that the southeast corner of the building has settled. The building is pile supported. It has been speculated by the latest geotechnical investigation that one or two of the piles in the southeast corner have failed due to settlement in a pocket of soft organic soils.

#### SCOPE OF WORK

The proposed fix is a total of eight (8) micropiles, at approximate locations shown in the Structural Engineering Documents, *Attachment "A"*. The Structural Engineering Documents also demonstrate the attachment of the structural steel components to the micropilings. FIGURE 4 - COMPARISON OF CPT SOUNDING DATA (page 14 of *Attachment "B"*) shows a comparison of two CPTs done inside the building, the conditions in the area that has settled are represented by CPT-2. Contractor shall read and familiarize themselves with the entire GeoPacific Engineering "Geotechnical Engineering Report (*Attachment "B"*) as well as the structural engineering documents (*Attachment "A"*). The proposed fix shall include 2 7/8 - inch Titan rods in 8 -inch diameter holes, extending 60 feet into the medium dense sand layer at that depth. There would be a 30-foot "no-load" zone, i.e. PVC sleeve, in the upper part of the pile where it extends through the soft organic soil zone. There are existing pile caps and grade beams to attach micropile brackets to. After the piles are in, the contractor shall jack up the corner of the building to the extent possible, (2 inches (+/-) in order to grout the zone under the floor slab (pressure grout).

The City will require load testing and potentially special inspections. The contractor is responsible for the load testing and special inspection costs.

##### Micropiles

Micropiles shall be installed at M-11 and N-11, in the approximate locations shown on FIGURE 3. Preliminary analysis indicates that eight (8) micropiles will be adequate, designed for allowable loads of 35 kips each. We recommend 2 7/8-inch diameter Titan micropiles (73/56 or better), installed in 8-inch diameter boreholes. Micropiles 60 feet long are recommended. The upper 30 feet of each micropile should consist of a "no-load" zone to prevent a reduction in pile capacity due to downdrag loading. The no-load zone can be achieved by sleeving the upper portion of the Titan rod with a grease-filled PVC sleeve, or other method that will prevent grout from bonding to the bar in the no-load zone.

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The structural engineer should verify the appropriate bar size based on the required design loads. Larger bars may be required for the sacrificial piles to facilitate the performance tests. Steel bars used for micropiles should be fully encapsulated with double corrosion protection.

The bond between the grout body and the soil is highly dependent on subsurface conditions and construction techniques utilized. For preliminary estimating purposes, we assumed Titan micropiles would be utilized. Other micropile systems and installation methods may be feasible. Consideration should be given to subsurface conditions which include sand layers that may be prone to caving. If it is desired to pursue other micropile options, the geotechnical Engineer (GeoPacific Engineering) should be contacted to provide additional recommendations.

Prior to installation of production micropiles, we recommend installation and performance testing of two sacrificial micropiles to verify required capacities are being achieved. Micropiles are generally not designed to incorporate end bearing; therefore tension tests may be performed. Performance tests should be held at 200% of the design load for at least 10 minutes to monitor the pile performance and then taken to failure. Adjustments to the micropile lengths and/or installation methods may be necessary based on results of the performance testing.

At least two sacrificial micropiles should be successfully tested prior to installation of the recommended micropiles beneath the structure, using the same equipment and methods to be used for production work. The verification test micropiles should be loaded to 200% of the design load. The design load (DL) is equal to the design pullout resistance, multiplied by the bond length of the micropile. The locations of the tests should be approved by the geotechnical engineer.

The verification test micropiles should have a minimum bond length of 30 feet and a minimum free length of 30 feet. Verification test micropile bars should be sized such that the test load does not exceed 80% of the yield or ultimate strength of the steel.

Test locations proposed by the contractor should be reviewed by the geotechnical engineer during construction and modified as appropriate based on conditions encountered.

Verification micropiles should be tested as follows:

1. A small seating load should be applied to the micropile before starting the test. Gauges to measure displacement should be mounted on a tripod or similar independent reference point. Measurements of the micropile displacement should be taken to 0.001 inch, using the bar end as the point being measured.
2. The micropile should be loaded in increments of 25 percent of the design load to twice the design load. The load should be held for 60 minutes at 1.5 DL, otherwise the load should be held for 10 minutes. Displacements should be recorded at 0, 1, 2, 3, 5, 10, 20, 30, 50, and 60 minutes.
3. For a successful test, a plot of displacement versus log time for the 1.5 DL loading should show a creep rate that does not exceed 0.08 inches per log cycle of time and should be linear or decreasing. In addition, the total displacement should exceed 80 percent of the theoretical elastic elongation of the non-bonded length.

Following micropile installation, the existing grade beam can be jacked back to near its original elevation. We recommend that the conditions of the existing structures be documented prior transferring loads to the micropiles. Survey points should be established on existing columns and footings. Both vertical and horizontal

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deformations should be monitored. Micropile installation and testing should be monitored by GeoPacific Engineering.

## **Pressure Grouting**

Following micropile installation, pressure grouting shall be performed to fill the zone between the bottom of the floor slab and existing crushed rock.

Grouting shall be performed in approximately 15 foot wide zone, north of grid line 11 and between grid lines L and M.

1. Soil stabilization by permeation/compaction grouting is to fill voids beneath the floor slab and lift the slab back to level.
2. The grouting contractor shall maintain, at the jobsite, records of as-built conditions. The grouting contractor shall record the locations of grout holes, depth of holes, amount of grout, composition of grout, pressures used and flow rate of grout. Upon completion of the work, contractor shall provide the owner with 2 copies of the maintained records – no exceptions.
3. Grout Mix:
  - a. Portland Cement ASTM C150 Type I or II
  - b. Class “C” Class “F” flyash
  - c. Water – clean and potable
  - d. Portland Cement of at least 12% by weight.
4. All equipment used for preparing and injecting the grouts shall be of an approved type and shall be in working conditions at all times. The equipment shall include hose and supply lines, grout of maintaining pressures up to 100 pounds per square inch, compressors, mechanical and colloidal type grout mixers, sump and holdover tanks designed to keep the mixed grout agitated and in suspension, water meters and pressure gauges of appropriate type. The pump shall be capable of displacing zero pump grouts. Rate of displacement shall be as low as 0.5 cubic feet per minute.

The grout should be prepared in appropriate quantities so that grout constituent ratios can be changed without disrupting the grouting sequence.

5. Grouting pressures shall be sufficiently in excess of confining overburden pressures to adequately compact the soil and fill all voids in the soil beneath the indicated areas. If grouting pressure cannot be developed and/or if grout escapes through surface fissures, the contractor shall consult with the engineer for additional recommendations.

Owner reserves the right to reduce or increase the scope of work depending on the available budget and subsequent bid prices. Reduction, or increase in the scope of work are subject to agreement between Owner and Contractor prior to or following the start of work. Contractor is responsible for field measuring Owner designated areas for exact square footage areas for exact square footage area to be calculated in bid.

Contractor is to provide three sets of As-Built drawings.

Work will need to be done around building schedule. Schedule will need to be coordinated with project manager. Tentative dates are December, 2011 through January, 2012

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Please break out pricing on the SCHEDULE OF BID PRICES, in the BID FORMS. Pricing to include labor & materials, and any related shipping costs.

**Lowest Bid will be selected based on Lump Sum Total.**

Any questions please contact Josh Lipscomb, Project Manager at 503-867-5967 or via e-mail to [josh.lipscomb@oregonmetro.gov](mailto:josh.lipscomb@oregonmetro.gov)

### Qualifications

Contractor must have five (5) or more years of successful experience in the area(s) of Micropile Installation & Pressure Grouting. Qualifications and references shall be supplied with bid. Metro/MERC reserves the right to evaluate, approve or reject firms on the basis of their review.

Bidder must identify the following in the bid submittal:

1. Equipment available to conduct the work.
2. Description of expertise to perform the work.
3. Projects of similar scope completed in the last five years.
4. Number of full-time employees to be assigned to the project.
5. References for projects of similar scope completed in the last five years.
6. Disclosure of any claims or suits in which the Bidder was found "not responsible" under Oregon public contracting laws.
7. Indication of satisfactory record of integrity in accordance with standards for Conduct Disqualification under OAR 137-049-0370.

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## INSTRUCTIONS TO BIDDERS

### **BID**

Metro is soliciting Bids for EXPO – Hall E Tilt Panel, Micropiling Project. Bids must be enclosed in a sealed envelope and mailed or delivered to: Metro, 600 NE Grand, Portland, Oregon 97232-2736, Attention: Josh Lipscomb RFB 12-2004.

All bids must be received no later than by 2:00pm, November 22, 2011, and will be publicly opened and read at that time. First Tier Subcontractor and Good Faith Effort forms are due from all bidders within two (2) hours of the bid due time or the bid will be considered non-responsive. Bids may not be submitted by facsimile (FAX) transmittal or electronically by email.

The outside of the envelope shall plainly identify the subject of the Bid, the opening date, and the Bid number.

All bids must be clearly and distinctly typed or written with ink or indelible pencil. All blank spaces must be completed. No erasures are permitted. Mistakes must be crossed out and corrections typewritten or written in ink adjacent thereto, and initialed in ink by the party signing the Bid, or their authorized representative.

Written amounts shall be shown in both words and figures. Words shall govern in cases of discrepancy between the amounts stated in words and the amounts stated in figures.

All bids must be on the form furnished by Metro/MERC or they may be rejected by Metro/MERC. Where plans and specifications are attached to the bid, the Bidder must return them with the bid response.

### **COST OF BID**

This Request for Bid does not commit Metro/MERC to pay any costs incurred by any Bidder in the submission of a bid, or in making necessary studies or designs for the preparation thereof, or for procuring or contracting for the items to be furnished under the invitation to bid.

### **ERRORS/OMISSIONS**

Any Bid may be deemed non-responsive by the Procurement Officer if it is: Not on the Bid forms provided; contains errors or omissions, erasures, alterations, or additions of any kind; proposes prices which are unsolicited or obviously unbalanced; or not in complete conformance with any and all conditions of the bidding documents.

### **ADDENDA TO PLANS OR SPECIFICATIONS**

Requests for additional information or interpretation of the contract documents shall be delivered to the Renee Pace, renee.pace@oregonmetro.gov, in writing at least five (5) business days prior to the Bid opening date and time. If, in the opinion of Metro/MERC, additional information or interpretation is needed by the Bidders, an addendum will be issued to all known specification holders. The provisions of any written addenda issued by the Procurement Officer at least seventy two (72) hours prior to the Bid opening date and time shall be binding upon the Bidders, and failure of a Bidder to obtain such addenda shall not excuse compliance therewith by the successful bidder.

### **MODIFICATION OF BID**

An offer to modify the bid that is received from the successful Bidder after award of contract that makes the terms of the Bid more favorable or advantageous to Metro/MERC will be considered, and may thereafter be accepted. To be effective, every modification must be made in writing over the signature of the Bidder.

### **WITHDRAWAL OF BIDS**

A Bidder may withdraw its bid in person, or by written or telegraphic request, which are received prior to the scheduled closing time for filing Bids. A bid may not be withdrawn by facsimile (FAX). Negligence on the part of the Bidder in preparing his bid confers no right to withdraw the bid after the scheduled closing time for filing Bids.

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## **LATE BID**

Bids received after the scheduled closing time for filing Bids will be returned to the Bidder unopened, unless such closing time is extended by Metro/MERC in writing.

## **EXECUTION**

Each Bid shall give the Bidder's full business address and bear its legal signature.

Bids by partnerships must list the full name of all partners and be signed by a partner or agent authorized to execute the contract on behalf of the partnership and identified by printed name and title.

Bids by corporations must bear the legal name of the corporation, the name of the state of incorporation, and the signature of the officer or agent authorized to legally bind the corporation.

Upon request by Metro/MERC, satisfactory evidence of the authority of the partner or officer shall be furnished.

If an agent who is not an officer of the corporation or a member of the partnership signs the Bid, a notarized Power of Attorney must be on file with Metro/MERC prior to the opening of Bids or be submitted with the Bid. Without such notice of authority, the Bid shall be considered improperly executed, defective and therefore non-responsive.

A Bid submitted by a joint venture must include a certified copy of the terms and conditions of the agreement creating the joint venture.

## **EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK**

It is understood that the Bidder, before submitting a Bid, has made a careful examination of the plans, specifications, and contract; that it has fully informed itself as to the quality and quantity of materials and the character of the work required; and that it has made a careful examination of the location and condition of the work and the sources of supply for materials.

## **COMPLIANCE**

Each Bidder shall inform itself of, and the Bidder awarded a contract shall comply with, federal, state, and local laws, statutes, and ordinances relative to the execution of the work. This requirement includes, but is not limited to, nondiscrimination in the employment of labor, protection of public and employee safety and health, environmental protection, waste reduction and recycling, the protection of natural resources, fire protection, burning and non-burning requirements, permits, fees and similar subjects.

## **ELIGIBILITY**

Prior to submitting a Bid, all Bidders (and subcontractors of bidders) on public works/construction projects are required to be appropriately registered with the State of Oregon Construction Contractors Board pursuant to ORS 701.035.

## **EQUAL EMPLOYMENT AND NONDISCRIMINATION**

Metro/MERC and its contractors will not discriminate against any person(s), employee or applicant for employment based on race, color, religion, sex, national origin, age, marital status, familial status, gender identity, sexual orientation, disability for which a reasonable accommodation can be made, or any other status protected by law. Metro/MERC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. For more information, or to obtain a Title VI Complaint Form, see [www.oregonmetro.gov](http://www.oregonmetro.gov).

## **PERMITS AND LICENSES**

Each Bidder shall obtain and include in their Bid the cost for all trade permits and licenses, which may be required to perform the contract. Metro/MERC will secure and pay for building permits and special inspections. The Contractor will receive a Notice to Proceed once all Owner secured permits have been issued by the relevant regulatory agencies.

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## **CONFLICT OF INTEREST**

A Bidder filing a bid thereby certifies that no officer, agent, or employee of Metro/MERC or Metro/MERC has a pecuniary interest in this Bid or has participated in contract negotiations on behalf of Metro/MERC; that the bid is made in good faith without fraud, collusion, or connection of any kind with any other Bidder for the same call for Bids; the Bidder is competing solely in its own behalf without connection with, or obligation to, any undisclosed person or firm.

## **IMMATERIAL VARIANCES**

Metro/MERC reserves the right to determine whether equipment or materials that comply substantially in quality and performance with the specifications are acceptable to Metro/MERC, and whether any variance listed by the Bidder in a bid is material or immaterial.

## **LATEST MODEL**

Parts and materials must be new, of latest model, of current date, and meet specifications. This provision excludes all surplus, remanufactured, and used products, unless such material is proposed in lieu of items specified.

## **"OR APPROVED EQUAL" CLAUSE**

In order to establish a basis of quality, certain processes, types of machinery and equipment, or kinds of materials may be specified, either by description of process or by designating a manufacturer by name and referring to his brand or product designation, or by specifying a kind of material. It is not the intent of these specifications to exclude other processes, equipment, or materials of equal value, utility or merit.

Whenever a process is designated or a manufacturer's name, brand, or product is described, it shall be understood that the words, "or approved equal" follow such name, designation, or description, whether in fact they do so or not.

If a Bidder proposes to furnish an item, process or material which it claims to be of equal utility to the one designated, then:

1. Bidder shall submit as part of their Bid, a written statement describing it together with supporting data and details sufficient to permit Metro/MERC to evaluate the same.

If the product contains chemical properties, the relevant Material Safety Data Sheets (MSDS) shall be included to document all health and physical hazards, chemical ingredients, exposure limits, personal protective equipment for handling and use, and emergency procedures in response to unanticipated spills or environmental release.

2. Metro/MERC may require demonstration, additional tests, and additional data, all to be supplied at the expense of the Bidder.
3. Metro/MERC shall in its sole discretion determine if an item submitted as an alternate or approved equal is "equal" or "equivalent".

## **RECYCLABLE PRODUCTS**

Vendors shall use recyclable products to the maximum extent economically feasible in the performance of the work set forth in this contract document.

## **RECYCLED PRODUCTS AS BID ITEMS**

Oregon Law (ORS 279A.125) requires Metro/MERC and all public agencies to give preference to materials and supplies manufactured from recycled materials.

All Bidders are therefore required to specify the exact or minimum percentage of recycled paper and fiber type in all paper products or recycled content in all other products offered, plus both the post-consumer and secondary waste content of the products offered.

Only Bids submitted with such information shall receive preference consideration and post Bid declaration or discovery shall not be allowed.

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## **TERMS**

A Bid may be rejected if it requires payment in less than thirty (30) calendar days after an approved invoice date or if it requires payment, in whole or in part, less than fifteen (15) days after invoice approval prior to delivery.

## **PRICES**

All prices submitted shall be firm during the contract period. If unit prices are requested, they should be provided for each unit on which there is a Bid. In case of mistake in extension of price, unit prices shall govern. All prices shall be Freight on Board (F.O.B.) the destination designated by Metro/MERC.

## **WARRANTY/GUARANTY**

Each Bid for the furnishing of materials and equipment shall provide an explanation of both the Bidder's and manufacturer's warranties on materials and workmanship.

Every Bid shall indicate any warranty costs to Metro/MERC, including but not limited to, all parts, labor, and shipping costs required for compliance with any specific requirement(s) contained in the special conditions.

Each Bidder on a public works/construction project shall provide at minimum a one-year guaranty on all materials and workmanship.

## **SERVICE**

Each Bidder shall furnish detailed information on any service facilities, locations, and procedures as well as information on any maintenance agreements or contracts available to Metro/MERC.

## **BID SECURITY**

All bids must be accompanied by bid security in the form of a cashier's check, certified check, irrevocable letter of credit, or a bid bond issued by a surety authorized to conduct such business in Oregon. Security shall be in the amount of five percent (5%) of the total bid price. The bid security shall serve as a guarantee that the bidder will not withdraw the bid for a period of sixty (60) days after bid opening, and if awarded the contract, will execute the MERC contract and furnish all required bonds and insurance within the time frame specified.

The Attorney-in-Fact who executes any bond on behalf of the surety must attach a notarized copy of his or her Power of Attorney as evidence of authority to bind the surety on the date of bond execution.

Bid securities will be held until the Contract has been fully executed, after which all Bid securities, other than those which have been forfeited, will be returned to the respective Bidders whose Bid they accompanied.

## **RESIDENT/NON-RESIDENT BIDDER**

Oregon law requires Metro/MERC, in determining the lowest responsive Bidder, to add a percent increase on the Bid of a non-resident Bidder equal to the percent, if any, of the preference given to that Bidder in the state in which that Bidder resides. Therefore, each Bidder must indicate whether it is a resident or non-resident Bidder. A resident Bidder is a Bidder that has paid unemployment taxes or income taxes in the state of Oregon during the last twelve (12) months immediately preceding submission of this Bid, has a business address in Oregon, and has stated in its Bid that it is a "resident Bidder."

## **EXPERIENCE AND ABILITY TO PERFORM THE WORK**

Upon request, Bidders must present all necessary information indicating that the Bidder has met the standards of responsibility set forth in ORS 279B.110. Metro/MERC will make the final determination as to whether or not the Bidder is qualified to perform the work.

The Contractor and/or First Tier sub-contractor shall provide a list of three (3) different project references with their Bid submission. These references will be contacted regarding the quality of workmanship and service that the Bidder or sub-contractors have provided on projects of comparable size and scope. The Bidder shall submit this information using the Contractor Qualification Statement.

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## **BASIS OF AWARD**

The award shall be made to the responsible Bidder submitting the lowest responsive bid submitting the lowest total BASE BID. Metro/MERC reserves the right to consider any and all alternates offered by the selected Bidder.

Any determination of bidder's responsibility or responsiveness is subject to review and determination by the Office of the Metro Attorney as to legal sufficiency. Metro/MERC reserves the right to accept or reject any and all bids in whole or in part and to waive any irregularities in the best interest of Metro/MERC. Only those bidders that, in the sole opinion of Metro/MERC, meet the minimum experience requirements shall be considered to be responsible bidders.

In the event all Bids exceed the engineer's estimate, Metro/MERC reserves the right to negotiate with the selected low Bidder in an effort to meet the project budget.

## **NOTICE OF AWARD**

Within twenty (20) calendar days after the opening of Bids, Metro/MERC will accept one of the Bids, or combination of Bids, or reject all Bids in accordance with the Basis of Award. The acceptance of the Bid will be by written Notice of Award, mailed or delivered to the office designated in the Bid. The Notice of Award shall not entitle the party to whom it is delivered to any rights whatsoever.

## **APPEAL OF CONTRACT AWARD**

Aggrieved bidders who wish to appeal the award of this contract must do so in writing within seven (7) days of issuance of the notice of intent to award by Metro/MERC. Appeals must be submitted to Darin Matthews, Procurement Officer, 600 NE Grand Avenue, Portland, OR 97232 and must state the specific deviation of rule or statute in the contract award. Metro/MERC will issue a written response to the appeal in a timely manner.

## **CONTRACT**

Within seven (7) business days of receipt of the contract from MERC, the Successful Bidder shall sign and deliver the Contract to MERC, along with all required insurance certificates and bonds listed below.

## **BONDS**

Contractor shall provide the following on MERC's standard bond forms:

- A Performance Bond in an amount equal to 100 percent of the contract price.
- A Labor and Materials bond in an amount equal to 100 percent of the contract price.

## **INSURANCE AND WORKERS COMPENSATION**

Contractor shall purchase and maintain at the Contractor's expense, the following types of insurance, covering the Contractor, its employees, and agents:

1. The most recently approved ISO (Insurance Services Office) Commercial General Liability policy, or its equivalent, written on an occurrence basis, with limits not less than \$1,000,000 per occurrence and \$1,000,000 aggregate. The policy will include coverage for bodily injury, property damage, personal injury, contractual liability, premises and products/completed operations. Contractor's coverage will be primary as respects Metro/MERC;
2. Automobile insurance with coverage for bodily injury and property damage and with limits not less than minimum of \$1,000,000 per occurrence;
3. Workers' Compensation insurance meeting Oregon statutory requirements including Employer's Liability with limits not less than \$500,000 per accident or disease; and
4. If required by the Scope of Work, Professional Liability Insurance, with limits of not less than \$1,000,000 per occurrence, covering personal injury and property damage arising from errors, omissions or malpractice.

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Metro/MERC, its elected officials, departments, employees, and agents shall be named as ADDITIONAL INSUREDS on Commercial General Liability and Automobile policies.

Contractor shall provide to Metro/MERC 30 days notice of any material change or policy cancellation.

Contractor shall provide Metro/MERC with a Certificate of Insurance complying with this article upon return of the Contractor signed agreement to Metro/MERC.

Contractor, and all subsequent subcontractors and suppliers performing work pursuant to this contract shall provide Workers' Compensation benefits as required by and in accordance with all applicable state and federal laws.

## **COMMENCEMENT OF WORK**

Prior to starting work on a contract or sub-contract for a public works project, a contractor or sub-contractor shall file a public works bond with the Construction Contractors Board. Bond shall be from a corporate surety authorized to do business in the state of Oregon and be in the amount of \$30,000 and shall comply with all other requirements of ORS 279C.800 to 279C.870. Contractor shall provide written documentation of bond number(s) of bond(s) for contractor and all sub contractor(s) to MERC Project Manager with original bid or prior to starting project work.

Contractor shall only commence work on this project upon receipt of a Notice to Proceed issued by Metro/MERC.

## **FOREIGN CONTRACTOR**

A Contractor that is not domiciled in or registered to do business in the State of Oregon shall, upon execution of a contract in excess of \$10,000, promptly report the total contract price, terms of payment, length of contract and all other required information to the Oregon Department of Revenue. Compliance shall be documented and Metro/MERC shall be fully satisfied as to complete compliance prior to release of final payment.

## **NOTICE OF ASSIGNMENT**

Metro/MERC will not recognize any assignment or transfer of any interest in this contract without the prior written consent of the Procurement Officer and the Metro Attorney.

## **HAZARD COMMUNICATION**

The Contractor shall be required to strictly adhere to, coordinate with Metro/MERC and document full compliance with the policies and procedures of the Oregon Occupational Health and Safety Code, OAR Chapter 437, Division 155, Hazard Communication.

Therefore, the Contractor and all subcontractors and suppliers within his or her control shall notify Metro/MERC and all parties to the agreement as to:

- > Hazardous materials to which they may be exposed on site;
- > Employee measures to lessen the possibility of exposure;
- > All contractor measures to reduce the risk;
- > Procedures to follow if exposed.

The Contractor shall provide Metro/MERC with all Material Safety Data Sheets (MSDS) prior to delivery or introduction of the material on site. For further information or clarification, contact the Metro Risk Management Division at 503-797-1622.

## **PATENTS**

The Contractor agrees to protect, to defend (if Metro/MERC requests) and save the agency harmless against any demand for payment for wrongful or unauthorized use of any patented material, process, article, or device that may enter into manufacture, construction, or forms a part of the work covered by this contract.

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## **INVOICES, PAY APPLICATIONS**

Invoices/pay applications shall be prepared and submitted to Project Manager unless otherwise specified. Invoices shall contain the following information: Contract number, item numbers, description of supplies or services, sizes, quantities, unit prices and extended totals.

## **LAW OF STATE OF OREGON**

This contract is entered into within the state of Oregon, and the law of said State, whether substantive or procedural, shall apply and be followed with respect to this contract.

## **PREVAILING WAGE**

The contractor, and all subcontractors and suppliers, shall be required to comply with ORS 279C.800 through 279C.870 and ensure that all workers are paid not less than, and in accordance with, the Oregon Bureau of Labor and Industries (BOLI) "Prevailing Wage Rates for Public Contract Works Contracts in Oregon - Effective July 1, 2011" and "Amendments to Oregon Determination 2011-02 Effective October 1, 2011", pursuant to the administrative rules established by the Commissioner of Labor and Industries. This project is covered by appropriate Bureau of Labor and Industries (BOLI) prevailing wage rates available at <http://www.boli.state.or.us> or by calling the State of Oregon Bureau of Labor and Industries at 971-673-0839. If the project is subject to Davis-Bacon Act (40U.S.C. 276A), Contractor and all subcontractors shall pay the higher rate of state or federal prevailing wages.

Bureau of Labor and Industries  
Wage and Hour Division, Prevailing Wage Unit  
800 NE Oregon Street, #32  
Portland, OR 97232  
[www.boli.state.or.us](http://www.boli.state.or.us)

## **CERTIFIED PAYROLL**

The Contractor and all sub-contractors, in compliance with ORS 279C.845, shall file certified payroll statements with MERC Project Manager to be due once per month by the fifth business day of the following month. Metro/MERC shall retain 25% of any amount earned by Contractor if certified payrolls are not submitted as required. Contractor shall retain 25% of sub-contractor earnings if sub-contractor certified payrolls are not submitted as required. Upon receipt of appropriate certified payrolls, Metro/MERC and Contractor shall release any amounts so retained within fourteen (14) days.

## **MINORITY, WOMEN AND EMERGING SMALL BUSINESS PROGRAM**

In the event that any subcontracts are to be utilized in the performance of this agreement, the Bidder's attention is directed to Metro Code Section 2.04.100, which encourages the use of minority, women and emerging small businesses (MWESB) sub-contractors to the maximum extent practical. Copies of these MWESB requirements are available from Metro Procurement Services, 600 NE Grand Avenue, Portland, OR 97232 or by calling 503-797-1648.

## **FIRST OPPORTUNITY TARGET AREA (FOTA) PROGRAM**

In the event that any subcontracts are to be utilized in the performance of this agreement, the Bidder's attention is directed to MERC's First Opportunity Area (FOTA) Program which is intended to provide maximum employment for economically disadvantaged residents living in the target area, for contracts and employment, in accordance with House Bill 3075, passed by the Oregon Legislature in 1989. Additional information regarding the FOTA Program is available from Metro Procurement Services, 600 NE Grand Avenue, Portland, OR 97232 or by calling 503-797-1648

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## **NOTICE TO ALL BIDDERS**

The attached agreement included herein reflects preliminary, draft contract language and selected, proposed contract terms for this procurement. Bidders should be aware that such language terms and provisions are for illustrative purposes only and that Metro/MERC reserves the right, following submission and ranking of all bids submitted in response to this procurement, to amend, modify or negotiate over any and all such contract language, terms and provisions before making a final determination regarding the issuance of the Notice of Intent to Award the agreement rising from this procurement. By submitting a bid in response to this procurement, bidders acknowledge that they are aware of and do not object to any later, potential amendment and modification of such preliminary, draft language and terms. In addition, by responding to this procurement, bidders acknowledge that they are aware of their ability to offer alternatives to any of the preliminary, draft contract language and proposed contract terms set forth herein

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## GENERAL CONDITIONS

### ARTICLE 1 GENERAL PROVISIONS

1.1. Definitions. Unless otherwise defined or specified in the Contract Documents, the following terms shall have the meanings indicated:

1.1.1. Act of God -- means an earthquake, flood, typhoon, cyclone or other natural phenomenon of catastrophic proportions or intensity.

1.1.2. Addendum (Plural: Addenda) -- means a document issued by Metro during the bidding period, which modifies, interprets, supersedes or supplements the Contract Documents and becomes a part of the Contract Documents. It is the Bidder's responsibility to determine how addenda impact the Work. All Bids submitted shall include the cost of the Work included in any addenda issued prior to award.

1.1.3. Alternate Bids -- are portions of the Work for which a Bidder must submit a separate Bid amount. Alternate Bid items may or may not be awarded at Metro's discretion.

1.1.4. Engineer -- is the firm representing Metro as designers and its agents, representatives, employees and consultants or such other firm as Metro may appoint. The Engineer will have authority to act on behalf of Metro only to the extent provided in these Contract Documents.

1.1.5. "As-Builts" or Record Documents -- are those drawings made, revised or annotated by Contractor and approved by Metro during the performance of the Contract, fully illustrating how all elements of the work were actually installed and completed.

1.1.6. Authorized Representative -- is a person, corporation, partnership or other legal entity acting on behalf of another through expressly delegated authority as specified in these Contract Documents.

1.1.7. Bid -- is the written offer of a Bidder to perform the Work as defined in these Contract Documents, when made out in accordance with all of the Contract Documents and submitted on the appropriate Bid Forms.

1.1.8. Bidder -- is any individual, partnership, corporation, or joint venture, acting directly or through a duly and legally authorized representative, submitting or intending to submit a Bid for the Work as described in these Contract Documents.

1.1.9. Bidding Documents -- See "Contract Documents."

1.1.10. Bid Forms -- include the following: the Bid proposal (including Schedule of Bid Prices and Recycled Product Attachment), Surety; Minority, Women-Owned and Emerging Small Business Program Compliance Form; Resident/Non-Resident Bidder Status form; Signature Page; the Non-Collusion Affidavit; and Bid Bond.

1.1.11. City or County -- means the city or county in which the Work is located.

1.1.12. Change Order -- is a written document signed by Metro and Contractor stating their agreement upon all of the following:

1.1.12.1. a change in the Work;

1.1.12.2. the amount of the increase or decrease in the Contract Amount, if any; and

1.1.12.3. the extent of the adjustment to the Contract Time, if any.

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1.1.13. Clarification -- is a written document consisting of supplementary details, instruction or information issued by Metro after the award of Contract which clarifies, or supplements the Contract Documents and becomes a part of the Contract Documents. A Clarification may or may not affect the scope of work.

1.1.14. Completion -- See "Substantial Completion" and "Final Completion and Acceptance."

1.1.15. Construction Manager -- is the Metro representative on the construction site. The Construction Manager will be an employee of Metro, who will represent Metro to the extent of his authority as delegated by the Chief Operating Officer. For purposes of administering this contract the terms "Construction Manager" will refer to the on-site Metro representative and to any duly appointed assistants who may be designated in writing. The Landscape Architect/Engineer of Record will be called upon as required by and at the direction of Metro for technical assistance and for interpretation of the Contract Documents.

1.1.16. Construction Schedule or Schedule -- is the timeline described in Section 01310 of the Specifications.

1.1.17. Contract Amount -- is the total amount shown in the Construction Agreement as revised by Change Orders.

1.1.18. Contract Documents or Contract or Bidding Documents -- consist of the Advertisement for Bids, the Invitation to Bid, the Instructions to Bidders, the Bid Forms, the Construction Agreement, the Performance Bond, the Labor and Materials Payment Bond, the General Conditions, the Supplementary Conditions, the Specifications, the Drawings, the approved and updated Construction Schedule, and any modifications of any of the foregoing in the form of Addenda, Clarifications, Change Orders or Force Account Work.

1.1.19. Contractor -- is the party who has entered into this Contract with Metro and who is responsible for the complete performance of the Work contemplated by the Contract Documents and for the payment of all legal debts pertaining to the Work, including its officers, agents, employees and representatives.

1.1.20. Contract Time -- is the period of time, including adjustments approved by Metro, which is allowed in the Contract Documents for Contractor to substantially complete the Work.

1.1.21. Critical Path Method or CPM -- means the critical path method of scheduling as understood and interpreted by standard industry practice.

1.1.22. Days -- means calendar day including Saturdays, Sundays and legal holidays.

1.1.23. Direct Costs -- are those costs of labor (including benefits), material and equipment incurred by the person, corporation, partnership or joint venture whose employees are actually performing the task.

1.1.24. Minority Business Program -- is Metro's program to provide maximum opportunities to Minority, Women-Owned and Emerging Small Business Enterprises in contracts, which is contained in Metro Code Section 2.04.

1.1.25. Drawings -- means the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

1.1.26. Equal, Approved, Approved Equal -- is used to indicate that the material or product to be supplied or installed must be equal to or better than that named in function, performance, reliability, quality and general configuration and that the substitute must be approved by Engineer. Equality in reference to the Project design requirements shall be determined by Landscape Architect/Engineer prior to installation of any material or product in the Project. Where the term "or equal" is not used and a sole product is specified, the term "or equal" is implied.

1.1.27. Final Completion and Acceptance -- means the completion by Contractor of all of the Work called for under the Contract, whether expressly or impliedly required, including but not limited to, satisfactory operation of all equipment, completion and correction of all punch list items to the satisfaction of Metro, settlement of all claims, delivery of all

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warranties and agreements to correct Work, equipment operation and maintenance manuals, as-built drawings, required approvals and acceptances by federal, state or local governments or other authorities having jurisdiction over the Work, and removal of all rubbish, tools, scaffolding and surplus materials and equipment from the Site.

1.1.28. Final Payment -- is the balance of the Contract Amount to be paid to the Contractor upon Final Completion and Acceptance of the Work.

1.1.29. Force Account Work -- is work, ordered in writing by Metro, for which Contractor must report its actual costs in accordance with Paragraph 8.4 of the General Conditions.

1.1.30. Furnish -- means, unless the context requires otherwise, supply and deliver materials, systems and equipment to the Site, ready for unpacking, assembly, installation, etc., as applicable in each instance.

1.1.31. General Contractor -- is the party who enters into the Contract with Metro. See also "Contractor".

1.1.32. Geotechnical Engineer -- The Geotechnical Engineer is an agent of the Engineer.

1.1.33. Install -- includes, unless the context requires otherwise, unload, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, connect to electrical power and/or piping, and similar operations at the Site, as applicable in each instance.

1.1.34. Lump Sum -- means all costs and expenses of whatever nature, including Overhead and Profit, associated with the Work involved.

1.1.35. Material or Materials -- shall be construed to include machinery, equipment, manufactured articles, materials of construction such as formwork, fasteners, etc., and any other classes of items to be provided in connection with the Contract, except where a more limited meaning is indicated by the context.

1.1.36. Metro -- is a metropolitan service district organized under the laws of the State of Oregon and the Metro Charter.

1.1.37. Metro Chief Operating Officer or COO -- means the Chief Operating Officer of Metro.

1.1.38. Metro Council or Council -- means the elected Council of Metro.

1.1.39. Miscellaneous Phrases -- in the Contract Documents shall be interpreted as follows:

Wherever the words "as directed," "as instructed," "as required," "as permitted," or words of like effect are used, it shall be understood that the direction, requirement, or permission of Metro is intended.

The words "sufficient," "necessary," "proper," and the like shall mean sufficient, necessary or proper in the judgment of Metro.

The words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to, Metro.

1.1.40. Notice of Award -- is the document issued by Metro to the lowest responsive, responsible Bidder whose Bid complies with all the requirements prescribed by the Contract Documents. The Notice of Award shall be given pursuant to the provisions of the Instructions to Bidders. It shall not entitle the party to whom it is given to any payment under the Contract, nor shall Metro be liable to such party or to any person for any alleged damages for any action taken in reliance upon such notice.

1.1.41. Notice to Proceed -- is the written notice given Contractor to commence the prosecution of its Work as defined in the Contract Documents. The Notice to Proceed will also establish the date and time of a preconstruction conference.

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1.1.42. Other Metro Contractors -- are all individuals, corporations, partnerships, or joint ventures (except Contractor or Landscape Architect/Engineer) with whom Metro has a contract to perform work on, or related to, the Project.

1.1.43. Overhead -- when applied to the cost of the work, shall include the following items, when reasonable and necessary for completion of the work:

1.1.43.1. All on-site payroll costs, taxes, insurance, fringe benefits and bonuses of same, for supervising, estimating, expediting, purchasing, drafting and clerical/secretarial services where directly incurred in the performance of the Contract.

1.1.43.2 Small tools (less than \$250 capital cost per item).

1.1.43.3 Contractor Owned Equipment.

1.1.43.4 Equipment maintenance and repairs.

1.1.43.5 Temporary construction, utilities, and safety requirements.

1.1.43.6 Transportation of materials other than direct identifiable cost of specific deliveries, or as included in price of material.

1.1.43.7 Parking fees for workers (if applicable).

1.1.43.8 Permit fees.

1.1.43.9 Cost of reproduction.

1.1.43.10 Field office costs.

Home or branch office overhead shall not be included, but shall be part of Contractor's profit and shall include, but is not limited to, the following:

1.1.43.10.1. Accounting functions of Contractor's Home and Branch Office.

1.1.43. 10.2. General expenses of Contractor's Home and Branch Office.

1.1.43. 10.3. Interest on capital.

1.1.43. 10.4. Salaries of any home and branch office estimators and administration..

1.1.44. Owner -- means Metro.

1.1.45. Plans -- means Drawings.

1.1.46. Profit -- means that portion of Contractor's Bid price that is not Direct Costs or Overhead

1.1.47. Project -- means the Work described in the Contract Documents.

1.1.48. Provide -- means furnish and install complete and in place and ready for operation and use.

1.1.49. Punch List -- is the list prepared by the Landscape Architect/Engineer and/or Construction Manager at the time of Substantial Completion, which reflects Contractor's incomplete, nonconforming work. Punch list items must be completed to the satisfaction of the Landscape Architect/Engineer and Metro in order for the Project to reach Final Completion and Acceptance.

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1.1.50. Request for Clarification -- is a written request made by Contractor for additional information to clarify an ambiguity in the Contract Documents.

1.1.51. Retainage or Retention -- is the difference between the amount earned by Contractor on the Contract and the amount paid on the Contract by Metro.

1.1.52. Schedule of Values -- is the detailed breakdown of a lump sum contract amount as required in Section 01025 of the Specifications.

1.1.53. Separate Contract -- is a contract between Metro and a party other than Contractor for the construction or furnishing of a portion of the Project.

1.1.54. Shown, As Shown -- work shown on the Drawings which is a part of the Contract Documents.

1.1.55. Site -- is the real property upon which the Project is located.

1.1.56. Special Inspector -- is a representative of the Owner, Landscape Architect, Engineer or Geotechnical Engineer with specialized knowledge applicable to the installation of certain elements of the work.

1.1.57. Specifications -- are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

1.1.58. Subcontractor -- means a person, partnership, corporation or joint venture, which has a direct contract with Contractor to perform a portion of the Work at the Site.

1.1.59. Submittals -- include shop drawings, samples, manufacturer's brochures, pamphlets, catalog cuts, color charts or other descriptive data, clearly defining the article, material, equipment or device proposed by Contractor for use in the Work. "Shop drawings" are the drawings and diagrams showing details of fabrication and erection, which Contractor is required to submit to the Landscape Architect/Engineer.

1.1.60. Substantial Completion -- is the stage in the progress of the Work, as determined by Metro, when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that Metro can occupy or use the Work for its intended use.

1.1.61. Supplier -- means an individual, partnership, corporation or joint venture entering into an agreement with Metro or Contractor for furnishing a portion of the Work which requires no labor at the Site, other than common carriers.

1.1.62. Unit Prices -- are the costs for specific units of work as defined in the Bid and Supplementary Conditions and include all costs, including, but not limited to, equipment, labor, materials, incidentals, Overhead and Profit, for the unit of work described.

1.1.63. Unusually Persistent Severe Weather -- Severe weather conditions exist when the average day time temperature at the Project is less than 32°F, and is accompanied by an accumulation of ice or snow. Such conditions are unusually persistent when they continue for a number of consecutive days, in excess of the annual average. Contractor shall determine the annual average number of consecutive days severe weather conditions occur for the part of the Metro region where the Project is located, based upon ten-year averages, with reference to the annual publication of Local Climatological Data for Portland Oregon, available at the Portland Weather Service Office. Contractor shall incorporate said annual average number of consecutive days severe weather conditions exist into the Project schedule.

1.1.64. Work -- means, unless the context requires otherwise, the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by Contractor to fulfill Contractor's obligations. The Work may constitute all or a portion of the Project as the context requires.

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## 1.2. Intent and Interpretation of Contract Documents

1.2.1. Intent -- The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intent of the Contract Documents is to include in the Contract price the cost of all labor and materials, water, fuel, tools, plant, scaffolding, equipment, power, light, transportation, and all other facilities, services and expense as may be necessary for the proper execution of the Work, unless otherwise indicated in these Contract Documents. In interpreting the Contract Documents, words describing materials or work which have a well-known technical or trade meaning, unless otherwise specifically defined in the Contract Documents, shall be construed in accordance with such well-known meaning recognized by Landscape Architect, Engineer and Metro.

1.2.2. Divisions and Headings -- Titles and headings are for the convenience of organizing the Contract Documents and shall not be construed to limit Contractor's obligations hereunder. The General Conditions are divided into fifteen (15) Articles. The first-tier subheadings of each Article shall be referred to as Paragraphs; the second-tier sub-headings shall be referred to as Subparagraphs; and the third-tier subheadings shall be referred to as Clauses.

1.2.3. Mandatory Nature of Specifications and Drawings -- mention in the Specifications or indication on the drawings of articles, materials, operations, sequence or methods requires Contractor to furnish and install (i.e., provide) each article mentioned or indicated, of quality or according to qualifications noted, to perform each operation called for, in the sequence called for, and to provide therefore, all necessary labor, equipment and incidentals. The determination of the type of operations and methods to be utilized in the performance of the Work shall be the responsibility of Contractor unless the Contract Documents prescribe a specific type of operation, sequence or method, in which case Contractor shall comply with the prescribed operation, sequence or method. Sentences in the imperative tense or command format in these Contract Documents shall be deemed to be directed to Contractor and to require Contractor to perform the services and/or provide the materials described.

1.2.4. Precedence of Contract Documents -- all determination of the precedence of, or discrepancy in, the Contract Documents shall be made by Metro, but in general, precedence will be in accordance with the following list with the highest precedence item at the top:

1.2.4.1. Signed Construction Agreement.

1.2.4.2. Supplementary Conditions.

1.2.4.3. General Conditions, Advertisement for Bids, Instructions to Bidders, Invitation to Bid, Bid Forms, Performance Bond and Labor and Materials Payment Bond.

1.2.4.4. Specifications

1.2.4.5. Drawings.

Within each of the above documents, detailed information takes precedence over general information and words take precedence over numbers unless obviously incorrect.

Addenda, Clarifications and all Change Orders to the Contract Documents take the same order of precedence as the specific sections that they are amending.

1.2.5. Discrepancies, Errors and Omissions -- the intent of the Contract Documents is to require Contractor to perform and provide every detail and item necessary for completion of the Project. The Contract Documents are not complete in every detail, however, and Contractor shall comply with their intent and meaning, taken as a whole, and shall not avail itself of any manifest errors or omissions to the detriment of the Work. Should any error, omission, discrepancy or ambiguity appear in the Contract Documents, instructions or work done by others, Contractor shall immediately upon discovery submit a Request for clarification to Metro pursuant to Paragraph 3.2. If Contractor proceeds with any such work without receiving a Clarification, Contractor shall be responsible for all resulting damage and defects, and shall perform any work

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necessary to comply with Metro's Clarifications at no cost to Metro. Any work or material not indicated in the Contract Documents, which is manifestly necessary for full and faithful performance of the Work in accordance with the intent of the Contract Documents shall be indicated by Contractor on the shop drawings and provided by Contractor to the same extent as if both indicated and specified. Any work indicated on the drawings but not specified, or vice versa, shall be furnished in the manner specified above as though fully set forth in both. Work not particularly detailed, marked or specified shall be the same as similar parts that are detailed, marked or specified. In case of discrepancy or ambiguity, in quantity or quality, the greater quantity or better quality as determined by Metro shall be provided at no extra cost to Metro.

1.2.6. Standards to Apply Where Detailed Specifications Are Not Furnished --wherever in these Contract Documents or in any directions given by Metro pursuant to or supplementing these Contract Documents, it is provided that Contractor shall furnish materials or manufactured articles or shall do work for which no detailed Specifications are set forth, the materials or manufactured articles shall conform to the usual standards for first-class materials or articles of the kind required, with due consideration of the use to which they are to be put. Work for which no detailed Drawings or Specifications are set forth herein shall conform to the usual standards for first-class work of the kind required.

1.3. Supply of Contract Documents -- Metro shall supply Contractor, without charge, a maximum of ten (10) sets of Contract Documents. Contractor shall contact Metro for additional sets of documents for which Contractor shall be charged the cost of printing.

1.4. Use of Contract Documents -- the Contract Documents were prepared for use in the construction of this Project only. No part of the Contract Documents shall be used for any other construction or for any other purpose except with the written consent of Metro. Any unauthorized use of the Contract Documents is at the sole responsibility of the user and such unauthorized use shall be deemed an activity in the performance of the Contract for purposes of Contractor's duty to indemnify under Article 11.

1.5. Copyright -- all submittals, record documents and any other products or documents produced by Contractor pursuant to this Contract are the property of Metro and it is agreed by the parties hereto that such documents are works made for hire. Contractor does hereby convey, transfer and grant to Metro all rights of reproduction and the copyright to all such documents.

1.6. Severability Clause -- should any provision of this Contract at any time be in conflict with any law, regulation or ruling, or be legally unenforceable for any reason, then such provision shall continue in effect only to the extent that it remains valid. In the event that any provision of this Contract shall become legally unenforceable, in whole or in part, the remaining provisions of this Contract shall nevertheless remain in full force and effect.

1.7. Notice or Service -- any written notice required or allowed under the Contract shall be deemed to have been communicated to the other party and service thereof shall be deemed to have been made if such notice is delivered in person to the individual, a member of the partnership or joint venture, or an officer of the corporation for whom it was intended or if delivered at or sent by regular, registered or certified mail to the last business address of the relevant person or party known to the person or party giving the notice or to Contractor's Site office if the notice is directed to Contractor. The date or time of service for purposes of all notices required or allowed under the Contract shall be the date and/or time upon which the relevant document was mailed or delivered as above-described.

The address given in the Bid is hereby designated as the legal business address of Contractor, but such address may be changed at any time by ten (10) days prior notice in writing, delivered to Metro.

## ARTICLE 2 CONTRACTOR'S ORGANIZATION

2.1. Contractor's Authorized Representatives -- prior to commencing any work under this Contract, Contractor shall submit in writing to Metro a list of Contractor's authorized representatives. Such list shall include the name and title of each representative along with the extent to which each representative is authorized to represent, bind and act for Contractor. The description of extent of representation shall include, but not be limited to, the maximum dollar value of Change Orders which the individual may authorize, whether the individual may respond to Request for Proposals and for what maximum

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dollar amount and whether the individual may submit a claim pursuant to Paragraph 3.3. Contractor shall be fully liable for the acts, omissions and decisions of such representatives to the extent stipulated in the written list submitted to Metro.

Contractor shall at all times be represented at the Site by one or more of such authorized representatives, who, cumulatively, shall have complete authority to represent, bind and act for Contractor in all matters pertaining or related to this Contract. In the event that Contractor does not comply with this paragraph and, consequently, is not fully represented at the Site at all times, Contractor shall be deemed to acquiesce in all actions taken by Metro which pertain or relate to this Contract.

**2.2. Contractor's Office at the Site** -- prior to commencement of work at the site, Contractor shall establish a field office at the site acceptable to the Construction Manager. This office shall be located in a job trailer or temporary building. This office shall be the headquarters of Contractor's representatives authorized to receive notices, instructions, drawings or other communications from the Construction Manager on behalf of Metro or the Landscape Architect/Engineer and to act on Change Orders or other actions. Such notices, instructions, drawings or other communications given to such a representative or delivered to Contractor's site office in his/her absence shall be deemed to have been given to Contractor.

**2.2.1 Use of the Site by Contractor** -- Contractor shall have complete and exclusive use of the premises for execution of the work within the boundaries shown on the drawings. The contractor's use of the premises is limited only by the Owner's right to perform work or to retain other contractors on portions of the project. All construction activities, storage, staging and work shall be confined to the limits of Work, as per the drawings. Under no circumstances shall portions of the site beyond the limits of work shall be disturbed. The contractor shall appropriately fence and maintain barriers to confine limits of work to those areas indicated on the drawings. All driveways and entrances to the site shall remain clear and available to the Owner and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule delivery of materials to minimize space and time requirements for storage of materials and equipment on site. Keep roadway pavement clean, free of mud, rocks, debris associated with materials and vehicles. Coordinate use of the premises under the direction of the Landscape Architect and Owner. Assume all responsibility for the protection and safe keeping of the site, structures and products stored on the site included in this contract. At no cost to the owner, move any stored products which interfere with operations of the Owner or construction activities. Obtain and pay for the use of additional storage or work areas needed for operations.

**2.2.2 Construction Staking** -- Contractor shall provide all necessary construction staking as to lines and grades shown on the Drawings. Contractor shall protect and preserve all control points in their original position or be responsible for providing new control points established from Engineer's original control points.

**2.2.3 Construction Staging Area** -- Coordinate use of the site with Landscape Architect prior to utilization of the area. Providing site security, barriers, and other temporary protection is the responsibility of the Contractor. Limit all construction activities within the work limits shown on the Drawings. All areas disturbed in any way or during construction and not covered by roads, parking, or structures shall be rehabilitated to their pre-construction condition.

**2.3. Key Personnel** -- Contractor shall submit, in writing, to Metro a list of the names, addresses, and telephone numbers of its key personnel who are to be contacted in case of emergencies on the job during non-working hours, including Saturdays, Sundays and holidays and all other key personnel as may be required.

**2.4. Contractor's Employees** -- Contractor shall enforce strict discipline and good order among Contractor's employees and other persons carrying out the Work. Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

Whenever Metro shall notify Contractor that any employee on the Work is, in the judgment of Metro, incompetent, unfaithful, disorderly or refuses to carry out the provisions of the Contract, such employee shall be discharged or transferred from the Work.

Contractor shall give Metro, at its request at any time, full and correct information as to the number of workers employed in connection with each subdivision of the Work, the classification and rate of pay of each worker, the cost to Contractor of

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each class of materials, tools and appliances used by it in the Work, and the amount of each class of materials used in each subdivision of the Work.

2.5. Contractor to Supply Sufficient Material and Workers -- Contractor shall at all times keep on the premises sufficient material and employ sufficient supervision and workers to prosecute the Work at the rate necessary to substantially complete the Work herein required within the time specified in the Contract and in accordance with the Construction Schedule. Contractor shall coordinate the Work of its Subcontractors so that information required by one will be provided by others involved in time for incorporation in the Work in proper sequence and without delay of any materials, devices or provisions for future work.

2.6. Construction Plant, Equipment and Methods --The construction plant and equipment provided by Contractor, and Contractor's methods and organization for handling the Work shall be such as will secure a good quality of work and rate of progress which will ensure the completion of the Work within the time specified, in accordance with the Construction Schedule, and without violating city, local, state or federal environmental regulation during construction.

Contractor shall give Metro full information in advance as to Contractor's plans for carrying on any part of the Work. If at any time before the commencement or during the progress of the Work, any part of Contractor's plant or equipment, or any of Contractor's methods of executing the Work, appears to Metro to be inadequate to ensure the required quality, environmental protection or rate of progress of the Work, Metro may order Contractor to increase or improve its facilities or methods, and Contractor shall promptly comply with such orders. Neither compliance with such orders nor failure of Metro to issue such orders shall relieve Contractor from obligation or liability to secure the quality of work and the rate of progress required by the Contract. Contractor shall be responsible for overload of any part or parts of structures beyond their safe calculated carrying capacities, and for release of pollutants into surrounding waters resulting from Contractor's activities on the Site.

Contractor shall provide temporary utilities pursuant to the Specifications and shall be responsible for the safety and adequacy of its plant, equipment and methods.

2.7. Contractor's Temporary Structures -- Contractor shall obtain all necessary permits for and shall erect and maintain at its own expense, and remove upon completion of the Work or as ordered by Metro temporary structures, sheds, barriers, walks, hoisting equipment, scaffolds, etc., as are necessary for the Work pursuant to these Contract Documents.

Contractor's temporary structures, equipment, stored materials, stored equipment, etc., shall be located so as not to interfere with the prosecution of the Work. If not so located, they shall be moved by Contractor, as directed by Metro, at no cost to Metro. Contractor's temporary structures, equipment or materials that obstruct progress of any portion of the work shall be removed or relocated by Contractor at Contractor's expense.

## ARTICLE 3 ADMINISTRATION OF THE CONTRACT

3.1. Authority and Relationships of Metro and Engineer -- the following provisions shall govern the authority of the various officers, agents, representatives, consultants and employees of Metro, and Engineer. Except as specifically provided in this section, no individual acting or purporting to act as an officer, agent, representative, consultant or employee of Metro or Engineer shall have any authority to make representations, statements or decisions of whatever nature binding Metro or Engineer regarding any aspect of this Contract. Except as specifically provided in this Article, Contractor shall have no right to, and shall not rely on any such representation, statement or decision. Any reference to action by Metro in this Contract requires the written approval of the Metro Chief Operating Officer or a person who is designated in writing by the Metro Chief Operating Officer as having authority to act for Metro but only to the extent that such authority is expressly delegated in writing.

3.1.1. Authority of Metro -- except as otherwise provided herein, Metro shall determine the amount, quality, acceptability, fitness, and progress of the Work covered by the Contract. Metro and Engineer will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the work, and they will not be responsible for Contractor's failure to carry out the Work in accordance with the Contract Documents. Metro and Engineer will not be responsible for or have control over the acts or

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omissions of Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the Work. Nothing contained in this Contract is intended nor shall be construed to create any third-party beneficiary relationship between Metro and Contractor's subcontracting agents or employees.

It shall be the duty of Contractor to comply with all procedures established and/or implemented by Metro as stated above. In the event any such procedures are at variance with other provisions of these Documents, such procedures shall prevail.

Metro may call for meetings of Contractor, Contractor's Subcontractors and Suppliers as Metro deems necessary for the proper supervision and inspection of the Work. Such meetings shall be held at the Site on regular working days during regular working hours, unless otherwise directed by Metro. Attendance shall be mandatory for all parties notified to attend.

Contractor shall immediately comply with any and all orders and instructions given in accordance with the terms of this Contract by Metro.

Contractor has no right to, and shall not, rely on representations of whatever nature made by any individual, whether or not employed by or purporting to represent Metro or Engineer, unless such individual has been specifically and expressly delegated authority to make such representations pursuant to these Contract Documents. Likewise Contractor has no right, and shall not rely on any representations of authorized changes in the contract of whatever size or nature unless such change is in writing and signed by Metro.

Nothing contained in this Paragraph shall obligate Metro or Engineer to supervise Contractor's work under this Contract and Contractor shall remain fully responsible for the complete and proper supervision of all of the Work.

**3.2. Request for Information** -- should it appear that the Work to be done or any of the matters relative to the Contract Documents are not sufficiently detailed or explained in the Contract Documents, or should there be any questions which may arise as to the meaning or intent of the Contract Documents, Contractor shall immediately submit to Metro a written Request for Information (RFI) which shall fully describe the information sought. All correspondence shall be directed to the Construction Manager. Subcontractors shall direct correspondence through the Contractor to the Construction Manager. At a minimum the RFI shall contain: 1) project title, 2) identify the nature and location of each clarification/verification, 3) date, 4) response by, RFI number, 5) subject, 6) initiator of the question, 7) indication of the costs, 8) contract drawings reference, 9) contract specification section and paragraph, 10) descriptive text and space for a reply. Each RFI shall be numbered sequentially beginning with #001 and a separate RFI shall be submitted for each item. Verbal discussions/clarifications for minor items can be addressed with the Engineer by phone and the contractor shall follow-up with a confirming RFI.

It is Contractor's responsibility to request information under this Paragraph in sufficient time for review by the Engineer and Metro so that the orderly progress and prosecution of the Work is not delayed.

The Engineer, in consultation with Metro, shall interpret the meaning and intent of the Contract Documents and shall issue, within ten (7) working days of receiving an RFI from Contractor, a written Clarification describing such meaning and intent. Additionally, the Engineer, after consulting with Metro, may at any time issue written RFI as deemed necessary to carry out the Work included in the Contract Documents. Notwithstanding any dispute or disagreement which Contractor may have concerning any such RFI, Contractor shall perform the Work as prescribed and in accordance with all such RFI.

If notified by Metro that an RFI is forthcoming, any related work done before the receipt of the RFI shall be coordinated with Metro so as to minimize the effect of the RFI on work in progress. Any related work not coordinated with Metro done before receipt of the RFI shall be at Contractor's risk and at no cost to Metro if that work does not conform to the Clarification.

If Contractor proceeds with work which is not sufficiently detailed or explained in the Contract Documents without requesting and obtaining an RFI pursuant to this Paragraph, Contractor shall do so at its own risk and shall, at no cost to Metro, perform any additional work which may be required by Metro to bring the work into conformance with the intent of the Contract Documents.

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### 3.3. Contractor's Claims

3.3.1. Generally -- No claims of any sort whatsoever by Contractor shall be considered or allowed under this Contract except as specifically provided and prescribed under this Paragraph. Failure to make a claim as specifically prescribed by this Paragraph or failure to perform disputed work, if any, as directed by Metro shall bar Contractor from any recovery of any sort or extension of time resulting from the facts surrounding the claim. Contractor's full and complete compliance with this Paragraph shall be a condition precedent to any right of Contractor to further prosecute any claim against Metro arising out of or related to Work described in the Contract Documents. Every decision and action of Metro shall be considered final unless Contractor makes a claim concerning such decision or action pursuant to this Paragraph.

3.3.2. Types of Claims -- Contractor claims are limited to the following:

3.3.2.1 Claims based upon Excusable Delays as described in Subparagraph 3.3.3

3.3.2.2. Claims based upon differing Site conditions as described in Subparagraph 3.3.4;

3.3.2.3. Claims based upon Clarifications or Change Orders issued by Metro or any other decision, action or failure to act by Metro as described in subparagraph 3.3.5.

As a condition precedent to any such claim, Contractor shall comply with all applicable procedural and substantive requirements of this Contract.

### 3.3.3 Claims For Excusable Delays

3.3.3.1. Definition of Excusable Delay A Delay is "Excusable" if such act, event or condition has a materially adverse effect on the ability of Contractor to perform its obligations under this Contract as scheduled, and/or materially increases the cost to Contractor to perform such obligations as scheduled and if such act, event or condition and its effect:

- (a) Are beyond the reasonable control of Contractor (or any third party for whom Contractor is directly responsible); and
- (b) Do not arise out of (a) strikes, labor disputes or other labor difficulties involving Contractor or its Subcontractors or Suppliers or entities providing transportation to Contractor or its Subcontractors or Suppliers, (b) labor shortages, or (c) changing economic conditions; and
- (c) Could not have been reasonably anticipated by Contractor.

3.3.3.2 Types of Excusable Delay Claims. Excusable Delays are either Compensable or Non-compensable. Claims for Non-compensable Excusable Delays are limited to claims for extension of Contract Time. Contractor may claim both an increase in the Contract Amount and an extension of the Contract Time for Compensable Excusable Delays.

3.3.3.3 Non-Compensable Excusable Delay Claims. Delays resulting from the following acts, events and conditions are Non-Compensable Excusable Delays:

- (a) An Act of God.
- (b) Unusually Severe Weather. No claim for extension of the Contract Time will be considered for Unusually Severe Weather unless Contractor submits documentation satisfactory to Metro establishing that the weather at the Project satisfied the definition of Unusually Severe Weather set forth herein.
- (c) Acts of a public enemy, war (whether or not declared) or governmental intervention resulting there from, blockage, embargo, insurrection, riot or civil disturbance.

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- (d) The failure to issue or renew, or the suspension, termination, interruption or denial of, any permit, license, consent, authorization or approval essential to the Work, if such act or event is not the result of the willful or negligent action or inaction of Contractor, or of any third party for whom Contractor is directly responsible, and if Contractor is taking, has taken or will cause to be taken, all reasonable actions in good faith to contest such action (it being understood that the contesting in good faith of any such action shall not constitute or be construed as a willful or negligent act of Contractor).
- (e) The failure of any appropriate federal, state, municipal, county or other public agency or authority or private utility having operational jurisdiction over the Work or Site to provide and maintain utilities, services, water and sewer lines and power transmission lines to the Site, which are required for and essential to the Work.
- (f) Epidemics or quarantines.
- (g) Material, equipment or fuel shortages or freight embargoes.
- (h) Priorities or privileges established for the manufacture, assembly or allotment of material by order, decree, or otherwise of the U. S. or by any department, bureau, commission, committee, agent or administrator of any legally constituted public authority.

3.3.3.4 Compensable Excusable Delay Claims. Delays resulting from the following acts, events and conditions are Compensable Excusable Delays:

- (a) Changes in the work ordered by Metro if they require additional time to complete the work and adversely impact the Critical Path.
- (b) The prevention by Metro of Contractor from commencing or prosecuting the Work.

3.3.3.5 Inexcusable Delays. Delays resulting from the following acts, events and conditions shall not result in Excusable Delays:

- (a) Any delay which could have been avoided by the exercise of care, prudence, foresight and diligence on the part of Contractor.
- (b) Any delay in the prosecution of parts of the Work, which may in itself be unavoidable but which does not necessarily prevent or delay the prosecution of other parts of the Work, nor the Substantial Completion of the Work of this Contract within the time specified.
- (c) Any reasonable delay resulting from the time required by Metro for review of Submittals or Shop Drawings submitted by Contractor and for the making of surveys, measurements and inspections.
- (d) any delay arising from an interruption in the prosecution of the Work on account of the reasonable interference from Other Metro Contractors which does not necessarily prevent the Substantial Completion of the Work of this Contract within the time specified.
- (e) any delay resulting in any manner from labor disputes, strikes or difficulties or any delay resulting in any manner from any labor-related event, act or condition whether or not Contractor has any control over such event, act or condition.
- (f) any delays in delivery of equipment or material purchased by Contractor or its Subcontractors or Suppliers (including Metro-selected equipment) if timely ordering would have made the equipment available. Contractor shall be fully responsible for the timely ordering, scheduling, expediting, delivery, and installation of all equipment and materials.

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3.3.3.6. Excusable Delay Claims Procedure -- Contractor shall, within twenty-four (24) hours of the start of the occurrence or Contractor's first knowledge of the occurrence which is the basis of the claim for Excusable Delay, whichever is earlier, notify Metro in writing of such delay. The written notice by Contractor shall indicate the cause of the delay and shall estimate the possible time extension requested. Within ten (10) days after the cause of the delay has been remedied, Contractor shall give written notice to the Construction Manager of any actual time extension and, if the Excusable Delay is a Compensable Excusable Delay, any increase in the Contract Amount requested as a result of the aforementioned occurrence in accordance with this Contract. If Contractor believes that a single circumstance or set of facts gives rise to both a claim for an extension to the Contract Time and an increase in the Contract Amount, Contractor must state both such allegations in one written claim or waive the unstated allegation;

Within Twenty-one (21) days after Contractor submits to the Construction Manager such a written notice for an extension of Contract Time and/or increase in the Contract Amount, the Construction Manager will issue the decision on each request. If Contractor is dissatisfied with such decision, Contractor may preserve its claim as provided and prescribed by Subparagraph 3.3.6.

3.3.4. Claims for Differing Site Conditions -- Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Construction Manager of (i) subsurface or latent physical conditions at the Site which differ materially from those indicated in this Contract, or (ii) unknown physical conditions at the Site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

The Construction Manager shall investigate the Site conditions promptly after receiving the notice. If the conditions do materially so differ as to cause an increase or decrease in Contractor's cost of, or the time required for performing any part of the Work under this Contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made and a Change Order issued.

If Contractor is dissatisfied with the decision of the Construction Manager under this Subparagraph, Contractor may preserve its claim as provided and prescribed by Subparagraph 3.3.6.

3.3.5. Other Contractor Claims -- Contractor claims based upon Clarifications or Change Orders issued by Metro or any other decision, action or failure to act by Metro shall be made according to this Subparagraph. Contractor shall, within twenty-four (24) hours following discovery of the facts, which give rise to its claim, notify the Construction Manager in writing of its intent to make the claim. Within ten (10) days following discovery of the facts, which give rise to its claim and prior to commencing the work or conforming to the Clarification on which the claim is based, if any, Contractor shall submit its formal written claim to the Construction Manager. Contractor's formal claim shall include a description of:

3.3.5.1. The factual occurrences upon which Contractor bases the claim including the decision, action or failure to act by Metro or its authorized representatives that allegedly give rise to the claim;

3.3.5.2. How Metro's decision, action or failure to act has affected Contractor's performance or otherwise affected Contractor;

3.3.5.3. Whether the claim is for an extension in the Contract Time or increase in the Contract Amount or both and the specific extension or increase requested;

3.3.5.4. The provisions of the Contract upon which the claim is based.

Submission of written notice of intent to make a claim and formal claim as specified above shall be mandatory and failure to comply shall be a conclusive waiver to any claim by Contractor. Oral notice or statement will not be sufficient nor will notice or statement after commencing the work in question.

After the written notification is submitted by Contractor (if the claim is not resolved or withdrawn in writing) and only upon written direction by the Construction Manager, Contractor shall proceed without delay to perform the work pursuant to the

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direction of the Construction Manager. While the work on an unresolved claim is being performed, Contractor shall keep track of costs and maintain records in the manner set forth in the section on Force Account Work, at no cost to Metro. Such notice by Contractor and the fact that Contractor is keeping track of costs and maintaining records shall not in any way be construed as proving the validity of the claim nor the costs thereof.

Provided the claim or claims have been submitted in accordance with the requirements of this Article, the Construction Manager will consider and investigate the claim or claims of Contractor. Within twenty-one (21) days of receipt of the above-described written notification of claim the Construction Manager will advise Contractor of the Construction Manager's decision to accept or reject the claim or claims, in full or in part. If Contractor is dissatisfied with the decision of the Construction Manager under this Subparagraph, Contractor may preserve its claim as provided and prescribed by Subparagraph 3.3.6.

**3.3.6. Preservation of Claims** -- Within thirty (30) days after a rejection of claim, in whole or in part, by Metro under Subparagraphs 3.3.3, 3.3.4 or 3.3.5, Contractor may preserve its claim by submitting a fully documented claim package to Contracts Manager of Finance and Administrative Services Department, Metro. That package shall include substantiating documentation with an itemized breakdown of Contractor and Contractor's Subcontractor's costs on a daily basis which shall include, but not be limited to, labor, material, equipment, supplies, services, Overhead and Profit. All documentation that Contractor believes is relevant to the claim shall be provided in the claim package including without limitation, payroll records, purchase orders, quotations, invoices, estimates, correspondence, profit and loss statements, daily logs, ledgers and journals. Failure to submit the claim package in full compliance with this requirement, and/or maintain cost records as herein required, will constitute a waiver of the claim.

If Contractor elects to pursue any claims by filing a lawsuit against Metro, it must commence such lawsuit within six (6) months after the date of Substantial Completion. Failure to commence a lawsuit within this time limitation shall constitute a waiver of all such claims by Contractor.

### **3.4. Metro's Right to Adjust Payments**

**3.4.1. Adjusted Payments for Delay** -- Time is of the essence in this Contract. Metro and Contractor understand and agree that Metro will be damaged if Contractor fails to substantially complete the Work within the Contract Time, and that Metro will be vulnerable to further damages if Metro is obligated to continue paying Contractor for work performed after the Contract Time has expired. It is therefore agreed that after the Contract Time, Metro may adjust its payments to Contractor by any combination of the following: (1) making no further payments to Contractor until the Work is substantially complete, (2) paying the Subcontractor costs incurred by Contractor without any overhead, profit or fee of any kind going to Contractor, and/or (3) by collection of liquidated damages as designated in Section 00800, Supplementary Conditions of this document.

Permitting Contractor to continue and finish the work or any part thereof after the Contract Time has expired shall in no way operate as a waiver on the part of Metro of any of its rights under this subparagraph or the balance of the Contract Documents.

**3.4.2. Adjusted Payments Not a Bar to Metro's Right to Other Damages** -- Payment of adjusted payments shall not release Contractor from obligations in respect to the complete performance of the Work, nor shall the payment of such adjusted payments constitute a waiver of Metro's right to collect any additional adjusted payments which it may sustain by failure of Contractor to fully perform the Work, it being the intent of the parties that the aforesaid adjusted payments be full and complete payment only for failure of Contractor to complete the Work on time. Metro expressly reserves the right to make claims for any and all other damages which Metro may incur due to Contractor's failure to perform in strict accordance with this Contract.

**3.5. Mediation** -- Both parties shall, in good faith, attempt to negotiate resolutions to all disputes arising out of this Contract. It is agreed, subject to the conditions and limitations of this paragraph, that any controversy or claim arising out of or relating to this Contract, which remains unresolved after such negotiations, shall submit to mediation prior to the commencement of litigation. The mediator shall be an individual mutually acceptable to both parties. Should the parties lack specific recommendations for a mediator, the parties shall look to the local circuit court or the Oregon Dispute

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Resolution Commission. Each party shall pay its own costs for the time and effort involved in mediation. The cost of the mediator shall be split equally between the two parties. Both parties agree to exercise their best effort in good faith to resolve all disputes in mediation. Participation in mediation is a mandatory requirement on both the Owner and Contractor. The schedule and time allowed for mediation shall be mutually acceptable. The mediation process is nonbinding.

Contractor agrees to consolidation of any mediation between Metro and Contractor with any other mediation involving, arising from, or relating to this Contract.

All disputes not resolved by mediation shall be decided exclusively by a court of competent jurisdiction in Multnomah County, under the laws of the state of Oregon.

In no event shall submission of a dispute arising out of this Contract, by either party, relieve Contractor of its obligation to fully perform the requirements of the Contract as directed by Metro, pending resolution of the dispute pursuant to the procedures set forth in this Article. In the event Contractor, in Metro's opinion, fails to fully perform the requirements of the Contract pending resolution of a dispute, Metro shall be entitled to exercise its rights to impose adjusted payments pursuant to Subparagraph 3.4.1, and/or terminate the Contract pursuant to Article 15 of this Contract.

## ARTICLE 4 SUBCONTRACTING AND ASSIGNMENT OF THE CONTRACT

4.1. Contractor's Responsibility for the Work -- Contractor shall perform or cause to be performed all labor, services and work of whatever nature and shall provide or cause to be provided all materials, equipment, tools and other facilities of whatever nature necessary to complete the Work and shall otherwise cause the Work to be completed in accordance with the Contract Documents.

Contractor shall take and assume all risk for all work and material involved in the Project until the entire Project has been finally accepted by Metro.

Contractor shall supervise and direct the Work, using Contractor's best skill and attention. Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters.

4.2. Subcontracting -- Contractor shall arrange and delegate its work in conformance with trade practices and union regulations, if applicable, but shall remain responsible to Metro for performance of all work required or implied by the Contract Documents. Contractor shall also be responsible for coordinating the efforts of its Subcontractors and Suppliers.

4.2.1. Objection to Subcontractors or Suppliers -- Metro reserves the right to make reasonable objection to any of Contractor's Subcontractors or Suppliers if Metro discovers any data or information at any time during the performance of the Contract which gives Metro a basis for such reasonable objection.

Metro will notify Contractor in writing if Metro has any reasonable objection to any of Contractor's Subcontractors or Suppliers. Contractor shall not subcontract with any Subcontractor or Supplier to which Metro has made a reasonable objection. In the event of Metro's reasonable objection to any Subcontractor or Supplier, Contractor shall propose another entity to which Metro has no reasonable objection. The Contract Amount shall not be increased by any difference in cost occasioned by such substitution, nor shall the Contract Time be extended.

4.2.2. Substitution, Change or Addition of Subcontractors or Suppliers -- At any time that Contractor intends to substitute, change or add a Subcontractor or Supplier during the performance of the Contract, Contractor shall give Metro prior written notice of such intention. Contractor shall not substitute, change or add any such Subcontractor or Supplier if Metro gives Contractor reasonable objection in writing within ten (10) days after Metro receives such notice.

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When any Subcontractor fails to prosecute a portion of the Work in a satisfactory manner, Metro may so notify Contractor. If the Subcontractor fails to cure the unsatisfactory work promptly, Contractor shall remove such Subcontractor immediately upon written request of Metro and Contractor shall request approval from Metro of a new Subcontractor to perform this section of the Work at no increase in the Contract Amount, and with no change in the Contract Time.

**4.2.3. Metro Not Obligated to Detect Unsatisfactory Work** -- Nothing contained in this Contract shall obligate Metro or place on Metro an affirmative duty to detect or discover unsatisfactory work or materials of Contractor's Subcontractors or Suppliers. Failure of Metro to detect or discover such unsatisfactory work or materials shall not relieve Contractor of any of its obligations under this Contract.

**4.2.4. No Contractual Relationships Between Metro and Contractor's Subcontractors and Suppliers** -- Nothing contained in this Contract is intended nor shall be construed to create any contractual or third-party beneficiary relationship between Metro and any of Contractor's Subcontractors, Suppliers or agents, save and except in relation to the Labor and Materials Payment Bond.

**4.2.5. Contractor's Agreements with Subcontractors** -- Contractor shall provide in all subcontract and supply agreements that the Subcontractor or Supplier will be bound by the terms and conditions of this Contract to the extent that they relate to the Subcontractor's or Supplier's work. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with sub-tier Subcontractors and Suppliers. Contractor shall make available to each proposed Subcontractor and Supplier, prior to the execution of the subcontract or supply agreement, copies of the Contract Documents, which apply to the work and materials to be provided by the Subcontractor or Supplier. Subcontractors and Suppliers shall similarly make copies of applicable portions of such documents available to their respective proposed sub-tier Subcontractors and Suppliers.

All Subcontractor's and Supplier's agreements shall also provide that they are assignable to Metro at Metro's option, in the event that Metro terminates the Contract. Contractor will provide to Metro, a copy of all subcontracts and supply contracts for permanent materials.

Nothing contained in this Subparagraph shall be construed as creating a direct or indirect contractual relationship between Metro and any of Contractor's Subcontractors or Suppliers. No such Subcontractor or Supplier shall have, or shall claim to have, any third-party beneficiary rights or status in relations to this Contract, save and except in relation to the Labor and Materials Payment Bond provided by Contractor.

**4.3. Assignment** -- Contractor shall constantly give its personal attention to the faithful prosecution of the Work. Contractor shall keep the Work under its personal control and shall not assign any or all of Contractor's rights, by power of attorney or otherwise, nor delegate any of its duties except with the prior written approval of the Metro Council.

## **ARTICLE 5 TIME OF COMPLETION AND SCHEDULE FOR THE WORK**

**5.1. Prosecution of Work Generally** -- Contractor shall commence the Work within five (5) days after issuance of written Notice to Proceed from Metro and will diligently prosecute the Work to its Final Completion and Acceptance. The start of Work shall include attendance at preconstruction conferences, preparation and submittal of shop drawings, equipment lists, Schedule of Values, CPM construction schedules, requests for substitutions and other similar activities, as described by these Contract Documents.

**5.2. Time of Completion** -- Contractor shall bring the Work to Substantial Completion within the Contract Time as set forth in the Construction Agreement.

The time limits stated in these Contract Documents are of the essence of this Contract. By executing the Construction Agreement, Contractor confirms that the Contract Time is a reasonable period for performing all of the Work.

Failure of Contractor to substantially complete the Work within the Contract Time and according to the provisions of these Contract Documents shall subject Contractor to damages pursuant to the applicable sections of these Contract Documents.

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5.3.Extensions of Time -- Extensions of the Contract Time shall be made pursuant to the procedure and according to the provisions and requirements contained in Articles 3 and 8 of these Contract Documents.

5.4.Project Scheduling -- Contractor shall submit to Metro a detailed Construction Schedule for completion of the work pursuant the Specifications. The Construction Schedule shall, when approved and as updated and approved by Metro, become a part of the Contract Documents.

5.5.Use of Completed Parts of the Work Before Acceptance -- Whenever, in the opinion of Metro, the Work or any part thereof is in a condition suitable for use and it is in the best interest of Metro to require such use, Metro may take possession of, connect to, open for public use, or use the Work or a part thereof. When so used, maintenance and repair due to ordinary wear and tear or vandalism will be made at Metro's expense and Metro will defend liability claims, which may result from such use by Metro. The use by Metro of the Work or part thereof as contemplated in this Paragraph shall in no case be construed as constituting acceptance of the Work or any part thereof. Such use shall neither relieve Contractor of any of its responsibilities under the Contract Documents, nor act as a waiver by Metro of any of the conditions thereof.

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## ARTICLE 6 COORDINATION WITH OTHER METRO CONTRACTORS

6.1. Other Metro Contractors Generally -- Metro reserves the right to award other contracts in connection with the work. Contractor shall afford all such Other Metro Contractors reasonable opportunity for storage of their materials and execution of their Work, shall provide that the execution of Contractor's Work properly connects and coordinates with work of all Other Metro Contractors, and shall cooperate with Other Metro Contractors to the end of facilitating the Work in such a manner as Metro may direct. Connection between the work of the Contractor and other Metro Contractors will be the responsibility of the party, which is last in time to construct, unless otherwise directed in the Contract Documents.

6.2. Duty to Inspect Other Metro Contractors' Work -- Where Contractor's Work is associated with that of Other Metro Contractors, or is to interface in any way with such Other Metro Contractor's work, Contractor shall examine, inspect and measure the adjacent or in-place work of such Other Metro Contractors. If Contractor determines that any defect or condition of such adjacent or in-place work will impede or increase the cost of Contractor's performance or otherwise prevent the proper execution of Contractor's Work, Contractor shall immediately, and before performing any work affected by the Other Metro Contractors' work, submit a Request for Information to Metro pursuant to Paragraph 3.2. If Contractor proceeds without examining or inspecting the work and submitting a Request for Clarification, Contractor shall be held to have accepted the Other Metro Contractors' work or material and the existing conditions, and shall be responsible for any defects in Contractor's Work resulting there from and shall not be relieved of any obligation or any warranty under this Contract because of any such condition or imperfection. This provision shall be included in any and all of Contractor's subcontracts for Work to be performed.

The foregoing does not apply to latent defects. Contractor shall report latent defects in any Other Metro Contractors' work at any time such defects become known or Contractor should have known, and Metro shall promptly thereafter take such steps as may be appropriate. If Contractor in the exercise of reasonable care should have known of such defects but did not report them, such defects shall not be considered latent.

6.3. Duty to Maintain Schedule -- It shall be the responsibility of Contractor to maintain its schedule so as not to delay the progress of the Project or the work of Other Metro Contractors. Contractor is required to cooperate in every way possible with Other Metro Contractors. Except as otherwise specifically provided in this Contract, no additional compensation will be paid for such cooperation. If Contractor delays the progress of the Project or the progress of Other Metro Contractors, it shall be the responsibility of Contractor to take all of the steps necessary to bring the affected work into compliance with any affected schedules and to indemnify Metro from all liability for such delays pursuant to Article 11.

Metro shall be under no duty to monitor or detect any delays of Contractor or any Other Metro Contractor on the Project or any lack of coordination on the Project. Consequently, the failure of Metro to so monitor or detect shall not be construed as relieving Contractor of its duties to fully perform all of its obligations under the Contract.

6.4. Failure to Maintain Schedule -- If, in the opinion of Metro, Contractor falls behind the Construction Schedule or delays the progress of Other Metro Contractors and is not entitled to an extension of time pursuant to the Contract Documents, Contractor shall perform all steps which are necessary, in the opinion of Metro, to bring Contractor's Work into compliance with the Construction Schedule or to remedy any delay to the progress of Other Metro Contractors. Contractor shall submit operation plans to Metro, which plans shall fully demonstrate the manner of intended compliance with this Paragraph. The steps referred to above shall include, but not be limited to:

6.4.1. Increase manpower in such quantities and crafts as will substantially eliminate the backlog of work.

6.4.2. Increase, when permitted, the number of working hours per shift, shifts per working day, working days per week, or the amount of equipment or any combination of the foregoing, sufficient to eliminate the backlog of work.

6.4.3. ...Reschedule activities to achieve maximum practical concurrence of accomplishment of activities.

6.4.4. Expedite delivery of materials and equipment such as use of airfreight.

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If Metro directs Contractor to take measures described in this Paragraph, or if Contractor takes such measures without direction from Metro, Contractor shall bear all costs of complying. Metro shall, however, reimburse Contractor for reasonable costs of complying if such directive to accelerate from Metro was issued to overcome delay caused by the acts or omissions of Metro or persons acting for Metro, provided Contractor has complied with all applicable provisions of Articles 3 and 8 of this Contract.

Failure to maintain the construction schedule or to take action to regain the schedule or to furnish a schedule as outlined in the specifications may result in withholding of all or part of the monthly progress payments.

**6.5. Failure to Coordinate Work** -- If Contractor fails to coordinate its work with the work of Other Metro Contractors as directed by Metro, Metro may, upon written notice to Contractor:

6.5.1. Withhold any payment otherwise due hereunder until Contractor complies with Metro's directions.

6.5.2. Direct others to perform portions of the affected Work and charge the cost of such Work against the Contract Amount or deduct the cost from sums held in Retainage.

6.5.3. Terminate any or all portions of the Work for Contractor's failure to perform in accordance with the Contract.

**6.6. Other Metro Contractors' Failure to Coordinate** -- If Contractor determines that any Other Metro Contractor on this Project is failing to coordinate its work with the Work of Contractor, Contractor shall immediately and before performing any affected Work submit a Request for Clarification to Metro pursuant to Paragraph 3.2.

**6.7. Conflicts Among Contractors** -- Any difference or conflict that may arise between Contractor and Other Metro Contractors in regard to their work shall be adjusted as determined by Metro. If directed by Metro, Contractor shall suspend any part of the Work specified or shall carry on the same in such manner as may be prescribed by Metro when such suspension or prosecution is necessary to facilitate the work of Other Metro Contractors.

**6.8. Coordination Drawings** -- Contractor shall prepare coordination drawings as determined necessary by Metro, to satisfactorily coordinate and interface its Work with the work of all Other Metro Contractors, thereby avoiding conflicts, which may arise.

**1.8.1 Owner Responsibilities for FOIC Items** -- Owner furnished products/items are indicated on the drawings as FOIC (Furnished by Owner, Installed by Contractor). Owner's responsibilities include: 1) arrange for and deliver necessary shop drawings, product data, and samples to the contractor, 2) Arrange and pay for Product delivery to the site, 3) Deliver supplier's bill of materials to Contractor, 4) Inspect deliveries jointly with the Contractor, record shortages, damaged or defective items, 5) Submit claims for transportation damage, 6) Arrange for replacement of damaged, defective or missing items, 7) Arrange for manufacturer's warranties, bonds, service and inspections as required and 8) Owner is responsible for scheduling all FOIC items in accordance with Contractor's Construction Schedule.

**1.8.2 Contractor Responsibilities for FOIC Items** -- The following outlines the responsibilities of the Contractor for FOIC items: 1) Designate a delivery date for each item in the Construction Schedule, 2) Review shop drawings, product data and samples, 3) Immediately notify the Construction Manager of any discrepancies or problems anticipated in the use of this product, 4) Review and unload products at the site, 5) Promptly inspect products jointly with Owner, record shortages, damaged or defective items, 6) Handle products at the site, including uncrating, and storage, 7) Protect products from exposure to elements and damage, 8) Assemble, install, connect, adjust and finish product as stipulated in the respective Section of Specifications and 9) Repair or replace items damaged by Contractor.

**6.9. Conferences** -- At any time during the progress of the Work, Metro shall have authority to require Contractor to attend any conference of any or all of Contractors engaged in the Project or related projects.

**6.9.1. Project Meetings** -- The Construction Manager will schedule and chair meetings and conferences at the Project site unless otherwise indicated. Inform participants and others involved, and individuals whose presence is required of the date and time of each meeting. Construction Manager shall prepare an agenda, distribute to all attendees, and prepare

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minutes that reflect significant discussions and agreements achieved. Meeting minutes shall be distributed to everyone concerned including the owner within three days of the meeting.

6.9.2. Pre-construction Conference – A pre-construction conference before starting construction, at a time convenient to the Owner and Landscape Architect but no later than 5 days after execution of the Agreement. The conference will be held at the project site on another convenient location. The purpose of the meeting is to review responsibilities and personnel assignments. Attendees: Authorized representatives of the Owner, Landscape Architect and their consultants, Contractor and its superintendent, major subcontractors, suppliers and other concerned parties shall attend the conference. All participants shall be familiar with the project and authorized to conclude matters relating to the work. The agenda shall include the following items: tentative construction schedule, phasing, critical work sequencing and long-lead items, designation of key personnel and their duties, procedures for processing field decisions and change orders, procedures for requests for interpretations (RFI's), procedures for testing and inspecting, procedures for processing applications for payment, distribution of contract documents, submittal procedures, preparation of record documents, use of premises, work restrictions, owner's occupancy requirements, responsibilities for temporary facilities and site protection, construction waste management and recycling, parking availability, office, work and storage areas, equipment deliveries and priorities, first aid, security, progress cleaning, working hours.

6.9.3. Pre-installation Conferences – Conduct a pre-installation conference at the Project site before each construction activity that requires coordination with other construction and includes installation of FOIC items. Contractor is responsible for conducting these meetings and shall occur on the same date as progress meetings if possible. Attendees shall include the installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination with other materials or installations. Agenda items will include: contract documents, options, related RFI's, related change orders, purchases, deliveries, submittals, review of mock-ups, possible conflicts, compatibility problems, time schedules, weather limitations, manufacturer's written recommendations, warranty requirements, compatibility of materials, acceptability of materials, temporary facilities and controls, space and access limitations, regulations of authorities having jurisdiction, testing and inspecting, installation procedures, coordination with other work, required performance results, protection of adjacent work, protection of the sites and its elements. Landscape Architect shall record significant conference discussions, agreements and disagreements including corrective action measures and action.

## ARTICLE 7 CONTROL AND QUALITY OF WORK AND MATERIAL

### 7.1. Quality Control

7.1.1. Generally -- Contractor has the primary responsibility for quality control. Contractor will provide continuous superintendence and inspection to insure that the work is completed in accordance with the plans and specifications, Additionally, during the performance of the Work, Metro, the Landscape Architect/Engineer, and Special Inspectors, or any other persons deemed necessary by any of them acting within the scope of the duties entrusted to them, including representatives of federal, state, and local agencies having jurisdiction over the Work, may at any time, and for any purpose, enter upon the Site, the shops where any part of such Work may be in preparation, or the factories or sites where any materials for use in the Work are being or are to be manufactured or derived. Contractor shall provide proper and safe facilities therefore, and shall make arrangements with manufacturers or other suppliers to facilitate inspection of their processes and products to such extent as Metro's interest may require.

No claims for extension of the Contract Time or increase in the Contract Amount shall be allowed for any access allowed to Metro under this Paragraph.

7.1.2. Quality Control Plan -- Contractor shall prepare and submit to the Construction Manager within thirty (30) days following Notice to Proceed a Quality Control Plan, which describes Contractor's, procedures for implementing the Quality Control Program. The Plan shall include, but not be limited to, the Quality Control Organization, inspection procedures, tests anticipated, materials control, contingency plans related to fire protection and remediation of contaminated releases or other environmental improvement, and reports. Metro reserves the right to accept or reject or modify the Quality Control Plan. Contractor will submit an interim Quality Control Plan prior to the start of work to cover the first thirty days (30) of construction.

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7.1.3.Quality Control Manager -- Prior to initiation of construction, Contractor shall designate in writing a Quality Control Manager who shall be responsible for coordinating Contractor's Quality Control Program. The individual so designated shall be the interface with the Construction Manager on matters relating to submittals, inspection, scheduling, unacceptable work product and corrective actions. Metro reserves the right to accept or reject the Quality Control Manager designated by Contractor.

7.2.Inspection -- Contractor has the primary responsibility for providing inspection and testing, except as otherwise set forth in the specifications. Metro and its agents will also inspect at their discretion or as outlined in the specifications.

7.2.1.Generally -- Contractor shall at all times commencing with the issuance of the Notice to Proceed until Final Completion and Acceptance of the Work, permit Metro, the Landscape Architect/Engineer, and Special Inspectors, or any other persons deemed necessary by any of them acting within the scope of the duties entrusted to them, including representatives of federal, state, and local agencies having jurisdiction over the Work, to visit and monitor the progress of the Work for conformance of the Work with the Contract Documents.

7.2.2.Special Inspections -- Contractor shall at all times, commencing with the issuance of the Notice to Proceed until Final Completion and Acceptance of the Work, permit Metro, the Landscape Architect/Engineer, and Special Inspectors, or any other persons deemed necessary by any of them acting within the scope of the duties entrusted to them, including representatives of federal, state, and local agencies having jurisdiction over the Work, to visit and inspect the Work, the materials and the manufacture and preparation of such materials, and subject the Work and materials to inspection and testing to determine if the Work conforms to the requirements of the Contract Documents. Contractor shall maintain proper facilities and safe access for all such inspections. Where the Contract requires work to be inspected or tested, it shall not be covered up until inspected, tested and approved by Metro. Contractor shall be solely responsible for notifying Construction Manager at least two (2) working days prior to performing such work, so that necessary arrangements for inspection and testing can be made. Should any work be covered without such inspection or test and approval, it shall be uncovered and repaired at Contractor's expense.

7.2.3.Notice to Metro for Certain Work Days -- Whenever Contractor intends to perform work on Saturday, Sunday or any legal holiday, it shall give written notice to Metro of such intention at least two (2) working days prior to performing such work, or such other period as may be specified by Metro, so that Metro may make the necessary arrangement for testing and inspection.

7.2.4.Correction of Defective Work Before Acceptance -- Any defective work or work which otherwise fails to conform to the Contract Documents, which is discovered before Final Completion and Acceptance of the Work, shall be corrected immediately by Contractor, and any unsatisfactory materials shall be rejected and replaced with satisfactory materials, notwithstanding that they may have been overlooked by the authorized inspector. The inspection of the Work by Metro, the Landscape Architect/Engineer or any other agency shall not relieve Contractor of any of its obligations to perform fully all of the terms and provisions of the Contract Documents.

7.2.5.Acceptance Not Implied by Failure to Object -- Failure or neglect on the part of Metro or any of its authorized representatives to condemn or reject defective, improper or inferior work or materials shall not be construed to imply a final acceptance of such work or materials and shall not be construed as relieving Contractor of its duties to perform fully all requirements of the Contract Documents.

## 7.3. Unsatisfactory Materials and Workmanship

7.3.1.Generally -- Material, work or workmanship which, in the opinion of the Construction Manager, does not conform to the Contract Documents, or is not equal to the samples submitted to and approved by the Construction Manager, or is in any way unsatisfactory or unsuited to the purpose for which it is intended, will be rejected. Contractor shall bear the cost of correcting or removing as deemed necessary by Metro, all non-conforming materials, work or workmanship. Contractor shall make a close inspection of all materials as delivered, and shall promptly replace all defective materials with conforming materials without waiting for their rejection by Metro.

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7.3.2. Removal of Rejected or Non-Conforming Work or Material -- All rejected material or work, and all defective or non-conforming work or material, shall be removed from the Site without delay. If Contractor fails to do so within forty-eight (48) hours after having been so directed by Metro, the rejected material may be removed by Metro and the cost of removal charged against Contractor and deducted from Retainage held by Metro or offset against payments due Contractor, at Metro's option.

If in the judgment of Metro it is undesirable or impracticable to replace any defective or non-conforming work or materials, the compensation to be paid to Contractor shall be reduced by Change Order or Force Account, as applicable, by such amount as, in the judgment of Metro, shall be equitable.

7.4. General Warranty of Contractor -- Contractor warrants to Metro that materials and equipment provided under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects and contaminants not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by Metro, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

The warranty made by Contractor under this Paragraph shall be in addition to any other specific warranties and certifications required elsewhere in these Contract Documents.

7.5. Correction of Work by Contractor -- Contractor shall be responsible for and shall promptly correct or replace any defective Work, whether due to faulty or contaminated materials or errors in workmanship, or Work failing to conform to the requirements of the Contract Documents which may be discovered or which may develop within one (1) year after the date of Substantial Completion or within such longer period as is specified below or otherwise in these Contract Documents.

In the case of equipment manufactured by others and supplied and/or installed by Contractor, the one (1) year period shall commence upon the date of first beneficial operation of such equipment by Metro. In the case of Work which is corrected or replaced by Contractor, the one (1) year period shall commence again on the date of acceptance by Metro of such corrected or replaced Work. Testing shall not be construed to mean acceptance.

If Metro does not require correction or replacement of defective Work or Work failing to conform to the Contract Documents, Contractor, if required by Metro, shall repay to Metro such portion of the Contract Amount as is equitable under the circumstances, as determined by Metro.

Contractor's responsibilities under this Paragraph shall not extend to correction or replacement of defects, which are attributable to mistreatment by Metro, or to normal wear and tear.

## 7.6. Warranty and Correction Agreements by Subcontractors

7.6.1. Generally -- In addition to any requirements for written warranties required by the Specifications, Contractor shall require all of its Subcontractors and Suppliers of any tier to make the same warranty to Metro as Contractor makes under Paragraph 7.4. Contractor shall also require all of its Subcontractors and Suppliers of any tier to agree to correct or replace defective Work or Work not conforming to the Contract Documents, and to take full responsibility for defective materials, in the same manner as Contractor agrees to correct or replace such Work under Paragraph 7.5.

7.6.2. Form of Submissions -- Contractor shall require all of its Subcontractors and Suppliers of any tier to sign documents evidencing the promises made pursuant to Subparagraph 7.6.1 above and shall submit such documents to Metro with its request for Final Payment. Such documents shall be signed by both Contractor and the applicable Subcontractor or Supplier and shall be in the following form:

"We the undersigned hereby warrant that the \_\_\_\_\_

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(described work performed and/or materials provided)

which we have provided for INSERT PROJECT NAME has been done in accordance with the Contract Documents and that the work as provided will fulfill the requirements of the warranty included in Article 7 of the Contract Documents.

"We agree to correct or remove and replace any or all of our work, together with any other adjacent work which may be displaced or affected by so doing, that may be defective in its workmanship or materials or which may fail to conform to the requirements of the Contract Documents within a period of one (1) year following the applicable date described in Paragraph 7.5 without any expense whatsoever to Metro, normal wear and tear and mistreatment excepted.

"In the event of our failure to comply with the above-mentioned conditions within twenty (20) calendar days after Metro notifies Contractor in writing, we collectively and separately do hereby authorize Metro to proceed to have said defects repaired and corrected at our expense and we will honor and pay the costs and to dispose of nonconforming materials and charges therefore upon demand."

7.7. Remedies Not Restrictive -- The remedies provided for in this Article shall not be restrictive of but shall be cumulative and in addition to all other remedies of Metro in respect to latent defects, frauds or failure to perform all work as required by the Contract Documents.

7.8. Proof of Compliance with Contract Provisions -- For Metro to determine whether Contractor has complied or is complying with the requirements of the Contract which are not readily enforceable by inspection and test of the Work, Contractor shall, upon request, promptly submit to Metro such properly authenticated documents as may be necessary to demonstrate compliance with the Contract or other satisfactory proof of its compliance with such requirements.

7.9. Patents, Copyrights, Trademarks -- All fees or costs of claims for any patented invention, article or arrangement or any copyrights or trademarks that may be used upon or in any manner connected with the performance of the Work or any part thereof, shall be included in the Bid for doing the Work. Contractor shall save, keep, hold harmless, and fully indemnify Metro and Landscape Architect from all damages, claims for damage, lawsuits, costs, expenses or liabilities of whatever nature in law or equity, including attorney's fees and court costs, which may at any time arise or be set up for any infringement of the patent rights, copyrights or trademarks of any person or persons in consequence of the use by Metro of articles to be supplied under the Contract and of which Contractor is not the patentee or assignee or has not the lawful right to sell the same. This is in addition to all other hold harmless and indemnification clauses in these Contract Documents.

7.10. Anti-Trust Claims -- By entering into this Contract, Contractor, for consideration paid to Contractor under the Contract, does irrevocably assign to Metro any claim for relief or cause of action which Contractor now has or which may accrue to Contractor in the future, including, at Metro's option, the right to control any such litigation on such claim for relief or cause of action, by reason of any violation of 15 USC Section 1-15, ORS 646.725 or ORS 646.730, in connection with any goods or services that are used, in whole or in part, for the purpose of carrying out Contractor's obligations under this Contract.

Contractor shall require all Subcontractors and Suppliers to irrevocably assign to Metro, as a third party beneficiary any right, title or interest that has accrued or may accrue to the Subcontractors or Suppliers by reason of any violation of 15 USC Section 1-15, ORS 646.725 or ORS 646.730, including, at Metro's option, the rights to control any litigation arising hereunder, in connection with any goods or services provided to the Subcontractors or Suppliers by any person, in whole or in part, for the purpose of carrying out the Subcontractors' or Suppliers' obligations as agreed to by Contractor in pursuance of the completion of the Contract.

In connection with Contractor's, Subcontractors' or Suppliers' assignment, it is an express obligation of Contractor, Subcontractor or Supplier that it will take no action which will in any way diminish the value of the rights conveyed or assigned hereunder to Metro. It is an express obligation of Contractor, Subcontractor or Supplier to advise the Office of Metro Attorney:

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7.10.1. In advance, of its intention to commence any action on its own behalf regarding such claims for relief or causes of action;

7.10.2. Immediately, upon becoming aware of the fact that an action has been commenced on its own behalf by some other person or persons, of the imminency of such action; and

7.10.3. The date on which it notified the obligor(s) of any such claims for relief or causes of action of the fact of its assignment to Metro.

Furthermore, it is understood and agreed that in the event that any payment under any such claim is made to Contractor, Subcontractor or Supplier, it shall promptly pay over to Metro its proportionate share thereof, if any, assigned to Metro hereunder.

## ARTICLE 8 CHANGES IN THE WORK

8.1. Change Orders Generally -- Metro may order changes in the Work herein required, including deletions of work, and may order additional materials and work in connection with the performance of the Work.

If such changes in the Work increase or decrease the cost of any part of the Work or change the time necessary to complete the Work, the Contract Amount shall be increased or decreased by such amount and the Contract Time changed as Contractor and Metro may agree upon as reasonable in a written Change Order. Contractor shall promptly comply with such Change Orders and carry them out in accordance with the Contract Documents.

No order for any alteration, modification or additional work which shall increase or decrease the Contract Amount or change the Contract Time shall become part of the Contract unless the resulting Change Order shall have been agreed upon in writing and the Change Order signed by Contractor and Metro, unless the work is Force Account work. Metro may, at its discretion, also require the signature of Contractor's surety on the Change Order. Prior to the approval of such Change Order, the Landscape Architect/Engineer shall have approved any design modifications entailed thereby.

Owner anticipates generating not more than one change order per month.

### 8.2. Procedure for Determining Impact of Change Orders on Contract Amount

8.2.1. Price before Proceeding -- If Metro intends to order changes in the Work, it may request a proposal by Contractor for the proposed added or deleted work before directing Contractor to commence work. Within fourteen (14) days after issuance of such request by Metro, Contractor shall furnish three copies of a complete breakdown of costs of both credits and additions directly attributable to the change in the Work proposed, itemizing materials, labor, taxes, affect on Contract Time, if any, and Overhead and Profit on a form approved by Metro and in accordance with the limitations described in the following Paragraph. Subcontract work shall be so indicated and written proposals from Subcontractors or Suppliers shall be included with similar breakdowns provided. Following submission of its cost breakdown, Contractor shall meet with Metro to discuss all aspects of scope, costs, scheduling and construction methods.

8.2.2. Proceed While Pricing -- If Metro finds it necessary to make changes in the Work in an expeditious manner, it may direct Contractor to proceed with the change while preparing a proposal for the added or deleted Work. In such an instance, Metro may assign an estimated value to the change, which Contractor shall not exceed without further authorization by Metro. Within fourteen (14) days after issuance of such by Metro, Contractor shall furnish three copies of a complete breakdown of costs of both credits and additions directly attributable to the change in the Work proposed, itemizing materials, labor, taxes, affect on Contract Time, if any, and Overhead and Profit on a form approved by Metro and in accordance with the limitations described in the following Paragraph. Subcontract work shall be so included with similar breakdowns provided. Following submission of its cost breakdown, Contractor shall meet with Metro to discuss all aspects of scope, costs, scheduling and construction methods.

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8.2.3. Unit Prices -- If the proposed additional or deleted work is the subject of Unit Prices stated in the Contract Documents or subsequently agreed upon, such Unit Prices shall be binding upon Contractor in calculating the increase or decrease in the Contract Amount attributable to the proposed additional or deleted work.

A unit price schedule is as follows:

Unit Price No. 1 – Cost to over-excavate unsatisfactory soil material and legally dispose of off-site.

Description: Excavation and haul-off site unsatisfactory soil according to Division 2, Section 02300, "Earthwork"  
Unit of Measurement: cubic yard in truck.

Unit Price No. 2 – Cost to excavate boulders and legally dispose of off-site.

Description: Excavation and haul-off site boulders according to Division 2, Section 02300, "Earthwork"  
Unit of Measurement: cubic yard in truck.

Unit Price No. 3 – Cost to deliver, place and compact structural fill.

Description: Place structural fill according to Division 2, Section 02300, "Earthwork"  
Unit of Measurement: cubic yard placed and compacted to specified density.

Unit Price No. 4 – Cost to prepare subgrade, deliver, place and compact 3/4-inch minus

Description: Prepare subgrade and place 3/4-inch minus aggregate according to Division 2, Section 02300, "Earthwork" and Section 02745, "Aggregate Paving".  
Unit of Measurement: cubic yard placed and compacted to specified density.

Unit Price No. 5 – Cost to deliver, place and compact 1/4-inch minus

Description: Place 1/4-inch minus aggregate according to Division 2, Section 02745, "Aggregate Paving"  
Unit of Measurement: cubic yard placed and compacted to specified density.

Unit Price No. 6 – Cost to cut-down tree 6-inch or greater diameter at breast height and remove stump.

Description: Cost to cut-down tree 6-inch or greater diameter at breast height, clear limbs and remove stump according to Division, Section 02230, "Site Clearing".  
Unit of Measurement: one tree.

Unit Price No. 7 – Cost to install trail drainage crossing.

Description: Deliver and place drain rock and filter fabric per Drawings detail, Trail Drainage Crossing.  
Unit of Measurement: one trail drainage crossing.

Unit Price No. 8 – Cost to locate and install way-finding signage.

Description: Located, place post and attach sign per Drawings detail.  
Unit of Measurement: one sign and post.

8.3. Limitations when Change Orders Impact Contract Amount-- The following limitations shall apply in the calculation of the costs of changes in the Work:

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**8.3.1. Overhead and Profit** -- Contractor will be permitted a reasonable allowance for Profit and Overhead on its increased Direct Cost resulting from any changes in the Work ordered by Metro. Likewise, Profit and Overhead will be deducted for any portion of the Work, which is deleted. In the case of a change involving both credits and extras, Overhead and Profit shall be applied to the net extra after subtraction of credits.

Overhead and Profit for the entity performing the work with its own crews shall not exceed twenty percent (20%) of the Direct Cost of the changed work.

Overhead and Profit for Contractor or Subcontractor who has had the work performed by a lower tier Subcontractor shall not exceed five percent (5%) of the Direct Cost of the changed work.

If the Work is performed by a second-tier or inferior Subcontractor, the total Overhead and Profit for all tiers shall in no event exceed thirty percent (30%) of the Direct Cost of the changed work. Distribution of this Overhead and Profit among the tiers is the responsibility of Contractor.

**8.3.2. Taxes and Insurance** -- Federal, state, regional, county and local taxes, including, but not limited to, income taxes, excise taxes, sales and use taxes and payroll taxes and insurance shall be shown separately and will be allowed on extras and shall be credited on credits. No Overhead and Profit will be allowed on taxes and insurance.

**8.3.3. Bond Premiums** -- The actual rate of bond premium as paid on the additional Direct Cost plus the cost of taxes defined in 8.3.2 will be allowed. No Overhead and Profit will be allowed on such premiums.

**8.3.4. Equipment Costs** -- The allowance for equipment costs (both rental as well as Contractor-owned equipment) shall be limited to those rates in the Rental Rate Bluebook published by Dataquest Incorporated, 1290 Ridder Park Drive, San Jose, California 95131-2398, (800) 227-8444.

**8.4. Force Account Work** -- If Contractor does not respond to Metro's Request for Proposal with a cost breakdown within the fourteen (14) day period as required above, or if Metro determines that Contractor's breakdown of costs is unreasonable in consideration of the work proposed to be added or deleted, or if Metro determines that the proposed work must be commenced promptly to avoid delay to the Project, Metro may issue an order for Force Account work and Contractor shall promptly perform or delete the work described in such order. Change, if any, in the Contract Amount due to such Force Account work shall be the sum total of the following items:

8.4.1. Actual labor cost, including premium on compensation insurance and charge for social security taxes, and other taxes pertaining to labor.

8.4.2. The proportionate cost of premiums of public liability property damage and other insurance applicable to the extra work involved and required by these Contract Documents.

8.4.3. Actual cost of material, including applicable taxes pertaining to materials.

8.4.4. Actual cost of plant and equipment rental, at rates to be agreed upon in writing before the work is begun or at rates per Subparagraph 8.3.4 above. No charge for the cost of repairs to plant or equipment will be allowed. Equipment items having a capital cost of under \$250.00 are considered small tools and classified as Overhead.

8.4.5. Overhead and Profit as provided and limited in Paragraph 8.3.

8.4.6. The proportionate actual costs of premiums for bonds required by these Contract Documents.

Whenever any Force Account work is in progress, Contractor shall furnish each working day to Metro a detailed written report signed by Contractor and Metro's representative of the amount and cost of all of the items listed in (1) through (6) above, and no claim for compensation for such extra work will be allowed unless such report shall have been made. Metro reserves the right to provide such materials as it may deem expedient and no compensation, overhead or profit will be allowed to Contractor for such materials.

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8.5. Oral Modifications -- No oral statement of any person whomsoever shall in any manner or degree modify or otherwise affect the terms of this Contract.

## 8.6. Contractor Proposals for Changes in Work

8.6.1. Generally -- At any time during the performance of the Work, Contractor may propose to Metro changes in work which Contractor believes will result in higher quality work, improve safety, shorten the Contract Time, decrease the Contract Amount, or otherwise result in better or more efficient work.

8.6.2. Purpose -- Metro encourages Contractor to submit Value Engineering Change Proposals (VECPs) in order to avail Metro of potential cost savings that may result. Contractor and Metro will share any savings, computed in accordance with instructions herein. Contractor is encouraged to submit VECPs whenever he identifies an area which can be improved, using the format described herein.

8.6.3. Application -- This clause applies to a contractor developed and documented VECP which: (1) requires a change to this Agreement to implement the VECP; and (2) reduces the Contract Price without impairing essential functions or characteristics of the Work, provided it is not based solely on a change in specified quantities.

8.6.4. Documentation -- At a minimum, the following information shall be submitted by Contractor with each VECP: (1) description of the existing requirements of the Contract Documents which are involved in the proposed change; (2) description of the proposed change; (3) discussion of differences between existing requirements and the proposed change, together with advantages and disadvantages of each changed item; (4) itemization of the requirements which must be changed if the VECP is accepted (e.g., Drawing numbers and Specifications); (5) justification for changes in function or characteristics of each such affected item and effect of the change on the performance of the end item; (6) effect of proposed change on life-cycle costs, including operation and maintenance, replacement costs, and life expectancy; (7) date or time by which a Change Order adopting the VECP must be issued in order to obtain the maximum cost reduction, noting any effect on Contract Time or delivery schedule; and (8) cost estimate for existing contract requirements correlated to his lump sum breakdown and proposed changed requirements. Costs of development and implementation by Contractor shall be identified. Estimated Metro costs (e.g., cost of testing and redesign) shall also be identified.

8.6.5. Submission -- Proposals will be processed expeditiously; however, Metro will not be liable for any delay in acting upon any proposal submitted pursuant to this clause. Contractor shall have the right to withdraw, in whole or in part, any VECP at any time prior to acceptance by Metro.

8.6.6. Acceptance -- Metro may accept, in whole or in part, by Change Order, any VECP submitted pursuant to this clause. Until a Change Order is issued, Contractor shall remain obligated to perform in accordance with this Agreement. The decision as to acceptance or rejection of any VECP will be at the sole discretion of Metro and will be final and not subject to review by mediation or otherwise.

8.6.7. Sharing -- If a VECP submitted by Contractor pursuant to this clause is accepted, Contractor shall proceed with the change and the Contract Price will be adjusted in accordance with the following provisions:

### *Definitions*

8.6.7.1. Estimated Gross Savings to Contractor (GS): The difference between cost of performing the Work according to the existing requirement and the cost if performed according to the proposed change. In each instance, Contractor's profit shall not be considered part of the cost.

8.6.7.2. Contractor Costs (CC): Reasonable costs incurred by Contractor in preparing the VECP and making the change such as cancellation or restocking charges where required.

8.6.7.3. Estimated Net Savings to Contractor (NS): Gross savings (GS) less Contractor costs (CC).

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8.6.7.4. Metro's Costs (OC): Reasonable costs incurred by Metro for evaluating and implementing the VECP, such as testing and redesign, where required.

#### *Calculations*

8.6.7.5. The Contract Price shall be reduced by an amount equal to 50 percent of (NS) plus 50 percent of (OC), expressed by the formula:

$$\text{Reduction} = 0.5 (\text{NS}) + 0.5 (\text{OC}).$$

8.6.7.6. Contractor's profit will not be reduced by application of the VECP.

8.6.8. Subcontracts -- Contractor shall include appropriate value engineering incentive provisions in all subcontracts of \$25,000 or greater. He may include such provisions in any Agreement. Subcontracts shall contain a provision that any benefits accruing to Contractor as a result of an accepted VECP initiated by a Subcontractor shall be shared by Contractor and Subcontractor. To compute any adjustment in the Contract Price under Paragraph 6.45 above, Contractor's costs of preparation and charge for a VECP shall include any preparation and change costs. Examples are cancellation or restocking charges when required.

8.6.9. Disclosure Restrictions -- Contractor may restrict Metro's right to use any sheet of a VECP or of the supporting data submitted pursuant to this clause, in accordance with the terms of the following legend if it is marked on such sheet:

#### *Legend*

To the extent allowed by law, data furnished pursuant to the value engineering incentive clause of the Agreement shall not be: (1) disclosed to any outside person or agency, (2) duplicated, or (3) used. Metro may disclose, duplicate, or use furnished data to evaluate a VECP submitted under said clause. This restriction does not limit Metro's right to use information that has been obtained, or is otherwise available, from Contractor or from another source without limitations. If such a VECP is accepted, Metro shall have the right to duplicate, use, and disclose any data reasonably necessary to the full utilization of such VECP as accepted, in any manner and for any purpose whatsoever, and have others so do.

8.7. Impact of Authorized Changes in the Contract -- Changes in the Work made pursuant to this Article and extensions of the Contract Time allowed by Metro due to such changes shall not in any way release any warranty or promises given by Contractor pursuant to the provisions of the Contract Documents, nor shall such changes in the Work relieve or release the sureties of bonds executed pursuant to said provisions. The sureties, in executing such bonds, shall be deemed to have expressly agreed to any such change in the Work and to any extension of Contract Time made by reason thereof.

## **ARTICLE 9 PAYMENTS AND COMPLETION**

9.1. Scope of Payment -- Payment to Contractor of the Contract Amount for performing all Work required under the Contract, as adjusted for any Change Orders approved as hereinbefore specified, shall be full compensation for furnishing all labor, materials, equipment and tools necessary to the Work, and for performing and completing, in accordance with these Contract Documents, all Work required under the Contract, and for all expenses incurred by Contractor for any purpose in connection with the performance and completion of said Work.

Whenever it is specified herein that Contractor is to do work or provide materials of any class for which no price is fixed in the Contract, it shall be understood that Contractor is to do such work or provide such materials without extra charge or allowance or direct payment of any sort, and that the cost of doing such work or providing such materials is included in its Bid.

#### 9.2. Schedule of Values

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9.2.1. Generally -- Within fifteen (15) days after the Notice to Proceed, Contractor shall submit a detailed breakdown of its lump sum bid items. The format and detail of the breakdown shall be as directed by Metro and in accordance with Section 01025 of the Specifications to facilitate and clarify future progress payments to Contractor. This breakdown shall be referred to as the Schedule of Values.

9.2.2. Review of Schedule of Values -- Metro will review the Schedule of Values to ascertain that the dollar amounts of the Schedule of Values are in fact fair cost allocations for the work item listed. Upon concurrence by Metro, a formal approval of this Schedule of Values will be issued. Metro shall be the sole judge of fair cost allocations. Contractor's monthly progress payment requests shall reflect the cost figures included in the approved Schedule of Values and shall be based upon completed work items or percentages of work items completed prior to the end of the payment period as more fully described below.

### 9.3. Progress Payment Procedure

9.3.1. Generally -- Subject to the approval of Metro, disbursements shall be made by Metro of progress payments upon written request of Contractor and pursuant to the Contract Documents as specified in Section 01025 of the Specifications.

Before the end of each calendar month, Contractor shall file with the Construction Manager in duplicate on a form approved by Metro, a proposed payment estimate for the period commencing on the 26th day of the previous month through midnight on the 25th day of the calendar month in question. Metro and the Construction Manager shall review Contractor's estimate and shall determine the value of Contractor's work based upon the Schedule of Values and incorporated labor and materials for the payment period. Contractor shall not be paid for any work, which is, in Metro's opinion, defective or improper or for work needed to correct Contractor's defective or improper work. Contractor shall be paid 95 percent (95%) of the determined value of work accomplished less any offset or withholding of sums by Metro allowed under the Contract Documents within thirty (30) days after receipt by Metro of Contractor's payment estimate. Metro will routinely withhold five percent (5%) as Retainage.

No inaccuracy or error in any monthly progress payment estimates shall operate to release Contractor or its surety from damages arising from such work or from the enforcement of each and every provision of the Contract Documents, and Metro shall have the right subsequently to correct any error made in any estimate for progress payments.

9.3.2. Retainage -- If, in Metro's opinion, work on the Project is progressing satisfactorily, Metro may eliminate additional Retainage on any remaining monthly progress payments after 50 percent (50%) of the Work under the Contract is, in Metro's opinion, completed. Elimination of additional Retainage under this Subparagraph shall be allowed by Metro only upon written application by Contractor, which application shall include written approval of Contractor's surety.

If after Metro allows such an elimination of additional Retainage, Metro determines that progress of the Work is not satisfactory or that Contractor has breached any provision of the Contract, Metro may again retain and continue to retain, in addition to that Retainage already being held by Metro, five percent (5%) of any future progress payments made to Contractor.

When Metro determines that the Work is 97-½ percent (97-½%) complete, Metro may, at its discretion and without application by Contractor reduce the retained amount to 100 percent (100%) of the value of the Work remaining to be done.

All funds retained by Metro under this section shall be retained in a fund by Metro and paid in accordance with ORS 279C.570.

Contractor may elect to deposit bonds or securities of the type described below with Metro or in any bank or trust company to be held in lieu of the cash retainage described above and for the benefit of Metro. In such event, Metro shall reduce the Retainage in an amount equal the value of the bonds and securities and shall pay the amount of the reduction to Contractor in accordance with ORS.279C.570. Interest on such bonds or securities shall accrue to Contractor.

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Bonds and securities deposited or acquired as described above shall be of a character approved by the Director of Oregon's Department of General Services including, but not limited to:

- 9.3.2.1 Bills, certificates, notes or bonds of the United States.
- 9.3.2.2 Other obligations of the United States or its agencies.
- 9.3.2.3 Obligations of any corporation wholly owned by the federal government.
- 9.3.2.4 Indebtedness of the Federal National Mortgage Association.

Contractor may elect to require Metro to deposit the accumulated Retainage in an interest bearing account in a bank, savings bank, trust company or savings association for the benefit of Metro. Interest on such an account shall accrue to Contractor.

If Metro incurs additional costs as a result of Contractor's exercise of any of the above-described options, Metro may recover such costs from Contractor by reduction of the Final Payment. Metro shall inform Contractor of all such accrued costs.

9.3.3. Payment for Material Stored Off Site -- Payment for material stored off of the Site will not be allowed unless the payment for such material benefits Metro in terms of lead time, scarcity, schedule, etc. Metro has sole discretion as to what materials will be paid for in advance of delivery to or installation on Site. Proof of off-site material purchases (invoice or checks) and appropriate insurance coverage will be required for payment. Title to all equipment and materials shall pass to Metro upon payment therefore or incorporation in the Work, whichever shall first occur, and Contractor shall prepare and execute all documents necessary to effect and perfect such transfer of title. Contractor must provide to Metro written consent from Contractor's surety approving the advanced payment for materials stored off-site.

The maximum prepayment allowed by Metro shall be 75 percent of the actual fair market value of the item being considered. Metro shall be the sole judge of fair market value. Contractor shall protect stored materials from damage, and damaged or otherwise unacceptable materials, even though paid for, shall not be incorporated into the Work.

9.3.4. Other Conditions Precedent to Payment -- It is a condition precedent to Contractor's rights to any payments under the Contract that all bills for labor and materials, including labor and materials supplied by or to Contractor, shall have been paid in full and, if requested by Metro, Contractor shall submit receipted invoices and/or lien waivers, as evidence of payment in full of all such accounts. As a further condition precedent to Contractor's right to any payments under this Contract, if requested by Metro, Contractor shall submit a claims release before any payment, and a final claims release stating Contractor has been paid in full prior to the Final Payment.

Payments to Contractor shall be conditioned upon Contractor complying with all provisions of this Contract regarding scheduling and progress reports submissions and upon Contractor furnishing all other information and data necessary to ascertain actual progress. Metro's determination that Contractor has failed or refused to furnish the required information, data, schedules or other reports shall constitute a basis for withholding all payments until the required information, data, revised schedules and diagrams, if necessary, and other reports are furnished.

9.3.5. Payment Does Not Imply Acceptance of Work -- The granting of any progress payment, or the receipt thereof by Contractor, shall not constitute acceptance of the Work or any portion thereof, and shall in no way lessen the liability of Contractor to replace unsatisfactory work or material, though the unsatisfactory character of such work or material may or may not have been apparent or detected at the time such payment was made

9.3.6. Offset of Sums Due Metro from Contractor -- In addition to any retention rights allowed Metro under this Contract, it is mutually understood and agreed that Metro may, upon prior written notice to Contractor, offset from any payment otherwise due Contractor, as much as may be necessary to protect and compensate Metro from any costs or expenses it may incur due to any breach of the Contract by Contractor, including applicable liquidated damages. Any sums so offset shall become the property of Metro.

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9.3.7. Time of the Essence --Time is of the essence for the performance of the Work under this Contract.

9.4. Substantial Completion -- When Contractor considers the Work to be substantially complete, Contractor shall submit to Metro a written notice that the Work is substantially complete and a punch list of items to be completed or corrected. Within a reasonable time after receipt of such notice, Metro and Landscape Architect will review the Work, including a physical inspection, to determine the status of completion. Should the Landscape Architect and Metro determine that the Work is not substantially complete:

9.4.1. Construction Manager will promptly notify Contractor in writing, giving the reasons therefore.

9.4.2. Contractor shall remedy the deficiencies in the Work, and thereafter send a second written notice of Substantial Completion to Metro.

The above-described procedure shall be followed until the Work is, in the opinion of Metro and Landscape Architect/Engineer, substantially complete. At that point:

9.4.2.1. The Landscape Architect/Engineer will prepare a Certification of Substantial Completion on AIA Document G704, accompanied by the approved punch list of items to be completed or corrected as verified and amended by the Landscape Architect/Engineer.

9.4.2.2. Metro shall submit the Certificate of Substantial Completion to Contractor for signature. Contractor shall complete the items on the approved punch list.

9.5. Final Completion and Acceptance -- When Contractor considers the Work to be finally complete, Contractor shall submit written certification to Metro that:

9.5.1. Contract Documents have been reviewed.

9.5.2. Work has been inspected for compliance with Contract Documents.

9.5.3. Work has been completed in accordance with Contract Documents to include submission of record documents.

9.5.4. Equipment systems have been tested in presence of Metro and are operational.

9.5.5. Work is ready for final inspection.

Landscape Architect/Engineer and Metro will promptly review the Work and include a physical inspection to verify the status of completion and shall inform Metro of the conclusions. Metro shall, within fifteen (15) days after receipt of Contractor's certification, either accept the Work or notify Contractor of the work yet to be performed on the Contract as outlined below.

Should the Landscape Architect/Engineer and Metro consider that the work is incomplete or defective:

9.5.5.1. Construction Manager will promptly notify Contractor in writing, listing the incomplete or defective work.

9.5.5.2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Metro that the Work is complete. Metro will then advise the Landscape Architect/Engineer.

9.5.5.3. Landscape Architect/Engineer and Metro will review and re-inspect the Work.

The above-described procedure shall be followed until the Work is, in the opinion of Metro and Landscape Architect/Engineer, finally complete. Contractor shall immediately thereafter prepare and submit Closeout Submittals as described below.

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9.6. Closeout Submittals -- Contractor shall submit the following items, as applicable, with its request for Final Payment:

9.6.1. Evidence of Compliance with Requirements of Governing Authorities.

9.6.2. Project record documents in accordance with the Specifications.

9.6.3. Operation and maintenance data in accordance with the Specifications.

9.6.4. Warranties in accordance with requirements of various Specification sections and these General Conditions.

9.6.5. Extra stock and maintenance materials. Contractor shall submit receipts, signed by Metro, for the various specific items.

9.6.6. Evidence of payment and release of claims in accordance with the following section.

9.6.7. Consent of surety to Final Payment.

9.6.8. Certificates of insurance for products and completed operations in accordance with Article 11 of these General Conditions.

9.6.9. If Contractor is a non-resident bidder as that term is defined in Subparagraph 14.3.6, complete documentation of Contractor's compliance with ORS 279A.120

9.7. Releases -- Contractor and each assignee under any assignment in effect at the time of Final Payment shall execute and deliver, at the time of application for Final Payment, as a condition precedent to Final Payment, a release in form and substance satisfactory to Metro, discharging and releasing Metro and the Landscape Architect/Engineer of and from all liabilities, obligations and claims arising under this Contract.

In addition to the above-described release, Contractor shall:

9.7.1. Submit to Metro an affidavit certifying that Contractor has paid all federal, state and local taxes including excise, use, sales, and employee withholding taxes.

9.7.2. Deliver to Metro written releases of all rights to file claims against Metro or to file claims on any bonds in connection with the Contract, signed by each Subcontractor and Supplier who performed labor or furnished materials in connection with the work.

9.7.3. Deliver to Metro Contractor's written undertaking, with sureties acceptable to Metro:

9.7.3.1. To promptly pay and obtain a release of claims on any bonds which may in the future affect the premises; and

9.7.3.2. To defend, indemnify and save Metro harmless from any liability or expense because of any claim on any bond or any other claim related to the Contract or the Work.

9.8. Final Payment -- Upon application of Contractor and Contractor's completion of and compliance with all of the provisions of the above Paragraphs and settle of all claims arising from the agreement including claims that Metro may have against Contractor, Metro shall pay Contractor the balance of the Contract Amount subject to the availability of monies in the Construction Fund as described in Paragraph 9.1 and less any previous payments, offsets and withholdings allowed Metro under this Contract and Retainage which has been returned to Contractor.

Acceptance of Final Payment by Contractor shall constitute a waiver of all claims of whatever nature which Contractor may have or allege to have against Metro arising out of or related to Work described in the Contract Documents.

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9.9. No Waiver of Rights -- Neither the final review by Metro, nor any order or certificate for the payment of money, nor any payment for, nor acceptance of the whole or any part of the Work by Metro, nor any extension of time, nor any position taken by Metro shall operate as a waiver of any provision of this Contract or of any power herein reserved by Metro or any right to damage herein provided; nor shall any waiver of any breach of this Contract be held to be a waiver of any other or subsequent breach. All of Metro's remedies provided in this Contract shall be taken and construed as cumulative; that is, in addition to each and every other remedy herein provided; and Metro shall have any and all equitable and legal remedies, which it would in any case have.

## ARTICLE 10 SAFETY AND PROTECTION OF THE WORK

### 10.1. Safety Requirements

10.1.1. Safety Generally -- Contractor shall be solely and completely responsible for the safety of the Work and the Site, including, but not limited to, the safety of all persons and property involved in the Work at the Site at any time until Final Completion and Acceptance of the Work.

All Work shall be performed in full accordance with all applicable safety codes, laws, ordinances and requirements including, but not limited to, the Safety and Health Regulations for Construction, promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Safety Standards Act as set forth in Title 29 of the Code of Federal Regulations, federal and state OSHA, Metro's insurance standards, and all other applicable safety codes. Where any of these are in conflict, the more stringent requirement shall be followed. Contractor's failure to thoroughly familiarize itself with the aforementioned safety provisions shall not relieve it from any requirements in the Contract Documents to comply with such safety provisions or from any penalties for failure to so comply.

Contractor shall inspect the Work and the Site daily and immediately correct any unsafe conditions. All job personnel shall be knowledgeable of and comply with the above safety requirements.

Contractor shall take all precautions to prevent the possibility of fire resulting from contract operations. Contractor shall provide properly maintained emergency fire extinguishing equipment of a readily available type and quantity as necessary to meet potential fire hazards.

10.1.2 Health and Safety Program -- Contractor shall develop, publish and implement the overall Health and Safety Program for the Project. Refer to Section 01500 of the Technical Specifications. This Program shall conform to all applicable codes. Contractor shall submit the written Health and Safety Program to Metro for review and comment within fourteen (14) days after the receipt of the written Notice To Proceed. The Program, as approved by Metro, shall subsequently be distributed to and implemented by Contractor's personnel as well as its Subcontractors and Suppliers. Contractor shall fully implement and comply with the approved Safety Program.

10.1.3. Health and Safety Officer -- Prior to initiation of construction, Contractor shall designate in writing a Site Health and Safety Officer who shall be responsible for coordinating Contractor's Health and Safety Program. The individual so designated shall be the interface with the Construction Manager on matters relating to safety, and Contractors compliance with the approved Safety Program. Metro reserves the right to accept or reject the Health and Safety Officer designated by Contractor.

10.2. First Aid -- Contractor shall maintain on the Site during work operations, a member of its work force who is qualified in administering first aid to its personnel and shall have available in its job office the first aid equipment as required to meet all applicable safety codes. The names and credentials of qualified personnel will be submitted to the Construction Manager.

Contractor shall require or provide adequate clothing and protective gear for all personnel working on the job site. This includes but is not limited to hard hats; substantial boots or shoes, shirts with sleeves at all times; eye and ear protection, gloves, face masks, welding hoods, safety belts as required for the type of work being done.

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10.3. Protection of Work, Persons and Property Against Damages -- Contractor shall protect the Work from damage due to construction operations, the action of the elements, including erosion due to normal and extraordinary weather conditions, the carelessness of other contractors, vandalism, or any other cause whatever until Final Completion and Acceptance of the Work.

Contractor shall protect all public and private property insofar as it may be endangered by operations of Contractor including adjoining lands, air and waterways, and shall be fully responsible for taking proper precautions for the prevention of accidents to persons and/or damage to such property at, on or near the Site.

All federal, state and local safety and environmental protection laws, rules and orders including fire codes, applicable to the Work to be done under the Contract, shall be obeyed, complied with and enforced by Contractor.

Contractor shall provide and maintain such guards, fences, barriers, signs, regulatory and warning lights, and other traffic control and safety devices adjacent to and on the Site as may be necessary to prevent accidents to the public and damage to property. Contractor shall also provide, place and maintain such lights as may be necessary for illuminating the said signs, guards, fences, barriers and other traffic and safety control devices.

Upon Final Completion and Acceptance of the Work, Contractor shall remove all temporary signs, lights, barriers, etc., from the Site.

## **ARTICLE 11 INDEMNIFICATION AND INSURANCE**

11.1. Indemnification -- Contractor agrees that for purposes of the Oregon Tort Claims Act (ORS 30.260 through 30.300), neither Contractor, its officers, agents and employees nor any Subcontractor or Supplier of Contractor of any tier, or its officers, agents or employees, are agents of Metro. Contractor for itself and its officers, agents, employees and its Subcontractors and Suppliers of any tier and their officers, agents and employees will make no claim whatsoever against Metro for indemnification pursuant to ORS 30.260 to 30.300 and Contractor agrees to hold Metro harmless and indemnify Metro from any such claims.

Contractor shall assume all responsibility for the Work and shall bear all losses and damages directly or indirectly resulting to Contractor, Metro, Landscape Architect, their officers, agents and employees, or to others on account of the character or performance of the Work, or accidents, unless such cause is due to the sole negligence of Metro or Landscape Architect.

Contractor shall assume the defense, if requested, indemnify and hold harmless Metro and Landscape Architect from all claims, liability, loss, damage, consequential or otherwise, and injury of every kind, nature and description, directly or indirectly resulting from activities in the performance of the Contract, the ownership, maintenance or use of motor vehicles in connection therewith, or the acts, omissions, operations, or conduct of Contractor or any Subcontractor or Supplier under the Contract or in any way arising out of the Contract, irrespective of whether fault is the basis of the liability or claim.

Any specific duty or liability imposed or assumed by Contractor, as may be otherwise set forth in the Contract Documents, shall not be construed as a limitation or restriction of the general liability or duty imposed upon Contractor by this Paragraph.

Such liabilities and losses from which Contractor shall indemnify and hold harmless the above-described indemnities shall include, but not be limited to:

11.1.1. Special activities by Metro to verify and/or expedite delivery of materials and those losses incurred by Metro as a result of any delays to Other Metro Contractors resulting from acts of Contractor or its failure to act.

11.1.2. Acceleration payments to Other Metro Contractors on the project or related projects resulting from Contractor falling behind the Construction Schedule for causes not entitling it to an extension of time under any provisions of the

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Contract Documents which cause other Metro Contractors to fall behind the Construction Schedule and who must then accelerate the performance of the work, as directed by Metro, in order to maintain progress.

11.1.3. Violations of the ordinances or regulations of Metro, any federal, state, county or city laws or order of any properly constituted authority in any manner affecting this Contract, in addition to any laws or regulations which might affect this Contract.

11.1.4. Any and all suits, actions, damages or claims of every name and description to which the above indemnified may be subjected or put by reason of injury to persons or property arising out of, in connection with, or incident to the execution of the work or resulting from acts or omissions on the part of Contractor, its Subcontractors, officers, employees or agents and all attorney's fees and court costs incident thereto.

## 11.2. Insurance

### 11.2.1. Public Liability and Property Damage Insurance

Contractor shall purchase and maintain, at the Contractor's expense, the following types of insurance covering the Contractor, its employees and agents.

A. Broad form comprehensive general liability insurance covering bodily injury, property damage, and personal injury with automatic coverage for premises/completed operations and product liability. The policy must be endorsed with contractual liability coverage.

B. Automobile bodily injury and property damage liability insurance.

Insurance coverage shall be on an occurrence basis with an annual aggregate limit of \$1,000,000.

Metro, its elected officials, departments, employees and agents shall be named as an ADDITIONAL INSURED. Notice of any material change or policy cancellation shall be provided to Metro thirty (30) days prior to the change.

C. Subcontractor's Insurance – Contractor shall require that all of its Subcontractors and Suppliers of any tier provide insurance coverage and conditions identical to Contractor's insurance coverage, except that the policy limits of all Subcontractors' insurance coverage shall be at least \$1,000,000 combined single limit for each occurrence and in the aggregate.

### 11.2.2. Workers' Compensation and Employer's Liability Insurance

The Contractor, its subcontractors, and all employers working under this contract are subject employers under the Oregon Workers' Compensation Law and shall comply with ORS 656.017, which requires them to provide workers' compensation coverage for all their subject workers. The Contractor shall provide Metro with certification of workers' compensation insurance including employer's liability of \$1,000,000.

11.2.3. Forms of Policies and Other Insurance Requirements -- In addition to filing any other insurance certificates specified elsewhere in these Contract Documents, Contractor shall, within seven (7) days following Notice of Award of Contract, provide Metro two (2) certified copies of the policies of all insurance herein required to be obtained by Contractor except that Worker's Compensation Insurance may be evidenced by a Certificate of Insurance. At Metro's request, Contractor shall immediately deliver to Metro the receipts for payment of premiums on any or all such policies.

All policies of insurance and Certificates of Insurance shall be satisfactory to Metro. Approval of the insurance by Metro shall not relieve or decrease the extent to which Contractor or Contractor's Subcontractors and Suppliers of any tier may be held responsible for payment of any and all damages resulting from performance of the Work.

Each such policy or Certificate of Insurance shall bear an endorsement precluding its cancellation, expiration or any reduction in its coverage without giving to Metro at least sixty (60) days prior written notice. Contractor shall file with Metro two (2) certified copies of the required new or renewed policy or two (2) Certificates of Insurance for each such policy, as applicable, before the effective date of such cancellation, change or expiration.

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If Contractor neglects to obtain or maintain in force any such insurance or to deliver such policy or policies, certificates and receipts to Metro, then Metro may, at its option, obtain and maintain such insurance. Contractor hereby appoints Metro its true and lawful attorney, to do all things necessary to obtain and maintain such insurance. All monies expended by Metro for such insurance shall be charged to Contractor and Metro may offset its costs in obtaining and/or maintaining such policies from sums due or to become due Contractor under the Contract or otherwise collect such sums from Contractor. Failure of Metro to obtain or maintain such insurance shall in no way relieve Contractor of any of its responsibilities under this Contract.

Contractor's failure to maintain any item of the required insurance shall be sufficient cause for termination or suspension of this Contract.

All insurance required shall be obtained through a company or companies having a policyholders surplus of at least ten (10) times the amount or limit of liability afforded by such insurance company on policies issued for this Contract. Such company shall be duly and legally licensed to transact business in the state of Oregon and shall be acceptable to Metro. Said insurance shall be primary over any insurance or self-insurance of Metro.

### 11.3. Builder's All Risk Insurance

11.3.1. Contractor, for the life of this Contract, shall effect and maintain Builders All Risk Insurance and fire insurance with extended coverage and malicious mischief coverage upon the structures on which the work of this Contract is to be done to 100 percent (100%) of the insurable value thereof, protecting: 1) Owner's interest; 2) Contractor's interest; and 3) the subcontractor's interests in the work. Contractor's interest and the subcontractor's interests, as used herein, means their property interests and the property interests of others for which they are responsible in the Project, in all materials and supplies entering into or used or destined for use therein, and in all expendable items of equipment which are used in or are incidental to but which do not become a part of the finished Project, located at the job site at the time of loss or damage. Such insurance shall not exclude coverage for landslides, collapse, explosion or loss due to the result of faulty workmanship.

11.3.2. Contractor and all subcontractors shall be responsible for any loss or damage to their machinery and apparatus and nonexpendable items of their equipment.

11.3.3. Contractor shall provide adequate fire protection equipment and safeguards to protect the Owner and Contractor's interests in accordance with the Owner's insurance carrier's requirements.

### 11.4. Labor and Materials and Performance Bonds

11.4.1 Contractor shall provide continuous coverage of a separate Performance Bond and a Labor and Materials Bond for the duration of the Contract. The Bonds shall be in the forms provided in these Contract Documents.

11.4.2 As an alternative to providing either or both of the bonds specified in this section 11.03, Contractor may provide a Letter or Letters of Credit, issued by a sound financial institution satisfactory to Metro. Such Letter or Letters of Credit shall be in a form acceptable to Metro. The Letter or Letters of Credit shall be in an amount equivalent to the bonds required under this section.

## **ARTICLE 12 MINORITY BUSINESS PROGRAM**

Contractor shall comply with all pertinent provisions of Metro's Minority Business Program which are contained in Metro Code 2.04 and which are by this reference expressly incorporated herein and made a part of this Contract.

Contractor shall not replace a minority, women-owned or emerging small business enterprise Subcontractor with another Subcontractor, either before Contract award or during Contract performance, without prior written approval of Metro. In replacing a minority, women-owned or emerging small business Subcontractor, Contractor shall replace such minority, women-owned or emerging small business Subcontractor with another certified minority, women-owned or emerging

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small business Subcontractor or make good faith efforts to do so. Failure to do so shall constitute Contractor's default of this Contract, and Metro, at its option, may terminate this Contract under the procedures set out in Article 15.

Metro reserves the right, at all times during the period of this Contract, to monitor Contractor's compliance with the terms of the Minority Business Program and enforce the program if Contractor should fail to so comply. Contractor shall be bound by any and all representations made concerning its compliance with the program prior to Contract award and any and all representations made by Contractor concerning the replacement of a minority or women-owned business Subcontractor during the performance of this Contract.

## ARTICLE 13 EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION REQUIREMENT

Contractor shall be certified as Equal Employment Opportunity Affirmative Action Employers by the City of Portland, Oregon, for the entire term of the Contract. Contractor's Subcontractors and Suppliers shall be certified prior to commencement of any of their Work on the Project and shall remain certified for the entire duration of the Contract.

## ARTICLE 14 MISCELLANEOUS STATUTORY RESPONSIBILITIES OF CONTRACTOR

14.1. Generally -- Contractor shall keep itself fully informed of and shall fully comply with all federal, state, regional and local laws, rules, regulations, ordinances and orders pertaining in any manner, to this Contract and those rules, regulations and orders of any agency or authority having jurisdiction over the work or those persons employed or engaged therein. Contractor shall pay all taxes, including federal, state, regional, county, city or taxes of any other governmental entity applicable to the work performed or materials provided under this Contract.

14.2. Environmental Laws -- Contractor shall fully comply with all federal, state and local laws, ordinances and regulations dealing with the prevention of environmental pollution and the preservation of natural resources and all amendments thereto. Contractor shall also fully comply with all rules, regulations and ordinances enacted or to be enacted by any federal, state or local agency dealing with the prevention of environmental pollution and the preservation of natural resources that affect the performance of the Contract. Such statutes, rules, regulations and ordinances shall include, but are not limited to those in 7 USCA Sections 136 to 136Y, 15 USCA Sections 2601 to 2629, 33 USCA Sections 1251 to 1376, 33 USCA Sections 1401 to 1445, 42 USCA Sections 300f to 300j-11, 42 USCA Sections 4321 to 4370a, 42 USCA Sections 4901 to 4918, 42 USCA Sections 6901 to 6991i, 42 USCA Sections 7401 to 7642, 42 USCA Sections 9601 to 9675, 29 USCA Sections 651 et seq., Oregon Administrative Rules Chapter 61, and Title 18 of the City of Portland Code.

Such agencies shall include, but not be limited to, the following:

### FEDERAL AGENCIES

Agriculture, Department of  
Forest Service  
Soil Conservation Service  
Defense, Department of  
Army Corps of Engineers  
Energy, Department of  
Environmental Protection Agency  
Health and Human Services, Department of  
Interior, Department of  
Fish and Wildlife Service  
Heritage Conservation and Recreation Service  
Bureau of Land Management  
Bureau of Indian Affairs  
Water and Power Resource Service  
Office of Surface Mining  
Labor, Department of  
Occupational Safety and Health Administration  
Mine Safety and Health Administration

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Transportation, Department of  
Coast Guard  
Federal Highway Administration

## STATE AGENCIES

Agriculture, Department of  
Energy, Department of  
Environmental Quality, Department of  
Fish and Wildlife, Department of  
Forestry, Department of  
Geology and Mineral Industries, Department of  
Human Resources, Department of  
Land Conservation and Development, Department of  
Soil and Water Conservation Commission  
State Engineer  
State Land Board and Division of State Lands  
Water Resources Board, Department of  
Bureau of Labor and Industries

## LOCAL AGENCIES

Clackamas County  
Metro  
North Clackamas Parks and Recreation District

### 14.3. Other Provisions of Oregon Law

14.3.1. Generally -- The provisions set out in Oregon Revised Statutes Chapters 187 and 279A, 279 B and 279C, as amended or superseded, including the latest additions and revisions, are incorporated by reference as part of these Contract Documents. Such sections include, but are not necessarily limited to, ORS 187.010, 187.020 279A.120 279C.505 , 279C.515, 279C.520, 279C.525, 279C.530, 279C.540,, 279C.800, 279C.840, 279.352 279C.830, 279C.845, 279C.850, 279C.855, 279C.815, 279C.860, 279C.870, and 279C.550 through 279C.570. Contractor shall fully comply with all applicable provisions of these statutes. The specific requirements of certain of these sections are set out below.

14.3.2. Payment to Subcontractors and Laborers -- Pursuant to ORS 279C.505, Contractor shall make payment promptly, as due, to all persons supplying such Contractor labor or material for the projection of the Work provided in this Contract. Contractor shall pay all contributions or amounts due the Industrial Accident Fund (IAF) from such Contractor, Subcontractor or Supplier incurred in the performance of the Contract. Contractor shall not permit any lien or claim to be filed or prosecuted against Metro, the State, County, school district, municipality, municipal corporation, or subdivision thereof, on account of any labor or material furnished. Contractor shall pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

14.3.3. Failure to Make Payment for Labor or Services -- Pursuant to ORS 279C.515, if Contractor fails, neglects, or refuses to make prompt payment of any claim for labor or services furnished to Contractor or a Subcontractor by any person in connection with this Contract as such claim becomes due, Metro may pay such claim to the person furnishing the labor or services and charge the amount of the payment against funds due or to become due Contractor by reason of such Contract. Metro's payment of such a claim in the manner authorized by ORS 279C.515 shall not relieve Contractor or Contractor's surety from obligation with respect to any unpaid claims.

14.3.4. Hours of Work -- Except as provided in ORS 279C.540 no person shall be employed for more than ten (10) hours in any one day, or forty (40) hours in any one week, except in cases of necessity, emergency, or where the public policy absolutely requires it, and in such cases the laborer shall be paid at least time and a half pay for all overtime in excess of ten (10) hours a day and for work performed on Saturday and on any legal holiday specified in ORS 279C.540 Contractor shall furthermore comply with any applicable provisions of ORS , 279C.520 279C.540, and 279C.545

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14.3.5. Payment for Medical Care -- Pursuant to ORS 279C.530 , Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation, furnishing medical, surgical and hospital care or other needed care and attention, incident to sickness or injury, to the employees of Contractor, of all sums which Contractor agrees to pay for such services and all monies and sums which Contractor collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying such service.

14.3.6. Requirements for Non-resident bidder-- Pursuant to ORS279A.120, any "non-resident bidder awarded a public contract with a price exceeding \$10,000, shall promptly report to the Department of Revenue, on forms to be provided by the Oregon Department of Revenue, the total contract price, terms of payment, length of contract and such other information as may be required before Final Payment can be received on the public contract. Final Payment shall not be made until this provisions has been complied with.

For purposes of this paragraph, a "foreign contractor" is one who is not domiciled in or registered to do business in the state of Oregon.

14.3.7. Prevailing Wage -- Except as limited by Oregon Revised Statutes, Contractor shall pay his/her workers and require his/her Subcontractors to pay its workers the prevailing rate of wage as required in ORS 279C.840 , and shall comply with all other requirements contained therein. The Appendix to this Contract contains a schedule of the existing prevailing rate of wage which may be paid to workers in each trade or occupation required to perform the Work, either by Contractor or its Subcontractors or any other person doing or contracting to do the whole or any part of the Work contemplated by this Contract, and such workers shall be paid not less than such specified minimum hourly rate of wage. The specifications for each subcontract shall include a copy of the prevailing wage schedule applicable to this project, and each subcontract shall include a clause regarding conformance to the schedule. In order to insure compliance of prevailing wage requirements, under Chapter 279C, Metro will require that all certified payrolls be submitted by contractor and subcontractor on a schedule to be determined by Metro. If project is subject to Davis-Bacon Act (40 U.S.C. 276a) contractor and all subcontractors shall pay higher of state or federal prevailing wages.

14.3.8. Sanitary Facilities -- Contractor shall be responsible for all costs that may be incurred in complying with ORS 654.150 and the rules adopted pursuant thereto including, but not limited to, securing exemption or partial exemption from the requirements of ORS 654.150, (sanitary facilities at construction projects; standards, exemptions).

14.3.9. Royalty Payments -- Contractor shall promptly pay when due, all royalties owed to the State of Oregon or other governmental entity under ORS Chapter 274 or other provision of law.

14.4.Work to Comply with Codes -- All Work shall be in full compliance with any and all codes specified in the Contract Documents and all federal, state and local laws, ordinances, rules, regulations and orders and all amendments to such codes, laws, ordinances, rules, regulations and orders. If Contractor observes or discovers that any portion or portions of the Contract Documents are at variance with any such requirements, Contractor shall promptly submit a written Request for Clarification to Metro pursuant to Paragraph 3.2, which shall fully describe the variance. If Contractor performs Work contrary to codes, laws, ordinances, rules, regulations or orders without submitting such Request to Metro, Contractor shall assume full responsibility for such Work and shall bear all costs attributable thereto.

Persons authorized by Metro or any governmental body having jurisdiction over the Project may at any time enter upon any part of the work to ascertain whether Contractor is complying with such laws, ordinances, regulations or orders.

14.5.No Additional Compensation Allowed for Compliance with Laws -- The Contract Amount includes full compensation for compliance with all applicable laws, rule, regulations, ordinances and orders and all amendments thereto and Contractor shall not make claim for nor be allowed any additional compensation for such compliance.

## ARTICLE 15 TERMINATION OR SUSPENSION OF THE WORK

15.1.For Default of Contractor -- If Contractor should be adjudged bankrupt, or if Contractor should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of insolvency, or if Contractor

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should refuse to or fail to supply enough properly skilled workers or proper materials for the efficient prosecution of the Work, disregard laws, ordinances or the instructions of Metro, or otherwise be in violation of any provision of the Contract, Metro may, without prejudice to any other right or remedy and after giving Contractor and Contractor's surety on the Performance Bond prior written notice, terminate the Contract or any portion of the Contract, which termination shall be effective ten (10) days after service of such notice. Such notice shall contain the reasons for the termination and shall state that unless, within ten (10) calendar days of service of the termination notice on Contractor, Contractor or its surety on the Performance Bond shall have cured or shall have made, in Metro's opinion, appropriate arrangements for prompt cure of all of the cause(s) for termination cited in the notice of termination, the Contract shall terminate.

Upon termination, Metro may take possession of the premises and of all materials, tools and appliances thereon as well as all other materials whether on the premises or not, for which Contractor has received partial payment, and finish the Work or the portion terminated by whatever method it may deem expedient.

In the event action as above indicated is taken by Metro, Contractor, or Contractor's surety, shall provide Metro with immediate and peaceful possession of all of the materials, tools and appliances located on the premises as well as all other materials whether on the premises or not, for which Contractor has received any progress payment. Upon termination, in the event that the surety does not complete the Contract, at the election of Metro, Contractor shall assign any and all subcontracts and material contracts to Metro or Metro's designee. Further, Contractor shall not be entitled to receive any further payment until the Work is completed. On completion of the Work, determination shall be made by Metro of the total amount Contractor would have been entitled to receive for the Work, under the terms of the Contract, had Contractor completed the Work. If the difference between said total amount and the sum of all amounts previously paid to Contractor, which difference will hereinafter be called the "unpaid balance," exceeds the expense incurred by Metro in completing the Work, including expense for additional managerial and administrative service, and all other costs, damages and expenses incurred by Metro due to Contractor's failure to complete the Contract, such excess will be paid to Contractor, with the consent of the surety. If, instead, the described expenses incurred by Metro exceed the unpaid balance, the amount of the excess shall be paid to Metro by Contractor or his/her surety. If only a portion of the Contract is terminated, this paragraph shall be deemed to apply to that portion of the Work only.

In addition to the above-mentioned right, Metro shall have the right, at its option, to suspend all or part of Contractor's performance under the Contract should any of the events occur which give Metro the right to terminate the Contract as above-described. In such event Metro shall give Contractor and Contractor's surety prior written notice of such suspension and Contractor shall stop or cause to stop all such work under the Contract immediately on receipt of such notice and shall not commence such work under the Contract again unless and until Contractor shall receive written notice from Metro to proceed. Metro shall not be responsible or liable to Contractor or others for any costs or expenses of whatever nature related to Contractor's failure to stop work as directed by Metro.

After receipt of a notice of termination or suspension, and except as otherwise directed by Metro, Contractor shall as regards those portions of the Contract terminated or suspended:

- 15.1.1. Stop work under the Contract on the date and to the extent specified in the notice of termination or suspension.
- 15.1.2. Place no further orders or subcontracts, or suspend the same, as applicable, for materials, services or facilities except as necessary to complete the portion of the work under the Contract, which is not terminated or suspended.
- 15.1.3. Terminate or suspend, as applicable, all orders and subcontracts to the extent that they relate to the performance of such work terminated or suspended.

Metro may, at its discretion, avail itself of any or all of the above rights or remedies and its invoking of any one of the above rights or remedies will not prejudice or preclude Metro from subsequently invoking any other right or remedy set forth above or elsewhere in the Contract.

None of the foregoing provisions shall be construed to require Metro to complete the Work, nor to waive or in any way limit or modify the provisions of the Contract relating to the fixed and liquidated damages suffered by Metro on account of failure to complete the Project within the time prescribed.

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15.2 Termination in the Public Interest -- It is hereby agreed that Metro has the right to terminate the Contract in whole or in part when Metro considers it to be in the public interest.

In the event the Contract is terminated as being in the public interest, Contractor shall be entitled to a reasonable amount of compensation for preparatory work and for all reasonable costs and expenses arising out of the termination, excluding lost profits.

In the event of termination under this Paragraph, the amount to be paid to Contractor shall be determined on the basis of the Schedule of Values in the case of any fully completed separate item or portion of the Work for which there is a separate or unit contract price and in respect to any other work under the Contract, Contractor will be paid a percent of the Contract price equal to the percentage of the work completed.

\*\*\* END OF SECTION \*\*\*

**Portland Metropolitan Exposition Center (EXPO)  
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**APPENDIX A**



# Portland Metropolitan Exposition Center (EXPO) Hall E Tilt Panel, Micropiling Project Request for Bid (RFB 12-2004)



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## CONTENTS

Note: The following documents (1-15) **must be returned** as part of the bid response or the bid will be considered non-responsive.

	Bid Response Packet Contents	Due By Bid Due Date and Time	Due Within Two Hours of Bid Closing	Due Within Seven Days of Award Notification
1	Bidder's Checklist	✓		
2	Bid Declaration & Signature Form	✓		
3	Schedule of Bid Prices	✓		
4	Schedule of Values	✓		
5	Addenda Acknowledgement /Surety	✓		
6	Bid Bond	✓		
7	Resident/Non-Resident Bidder Status	✓		
8	Non-Collusion Affidavit	✓		
9	Contractor Qualification Statement	✓		
10	Certificate of Compliance for Recycling	✓		
11	Drug Certification Form	✓		
12	First-Tier Subcontractor Disclosure Form		✓	
13	Good Faith/ MBE/WBE/ESB/FOTA Program Form		✓	
14	Labor & Material Payment Bond			✓
15	Performance Bond			✓



# Bidders Checklist (RFB 12-2004)

## BIDDERS'S CHECKLIST

 FIRM \_\_\_\_\_  
 NAME \_\_\_\_\_  
 MAILING ADDRESS \_\_\_\_\_  
 PHONE \_\_\_\_\_ FAX \_\_\_\_\_ E-MAIL \_\_\_\_\_

### BIDDER REPRESENTS/CERTIFIES/ACKNOWLEDGES AS PART OF THIS OFFER THAT:

(Contractor shall check or complete all applicable boxes)  
**(BID WILL BE CONSIDERED NON-RESPONSIVE WITHOUT THE FOLLOWING DOCUMENTS\*)**

1. **BID FORMS AND ATTACHED SIGNATURE SHEET\***
2. **SCHEDULE OF BID PRICES** *Located in Bid Forms*
3. **SCHEDULE OF VALUES** *Instructions located in Bid Forms*
4. **ADDENDA ACKNOWLEDGEMENT & SURETY** *Located in Bid Forms*
5. **BID BOND\***: Bidder has complied with MERC's requirements for bid surety and guarantees that this Bid is irrevocable for the period specified herein. *Form Located in Bid Forms*
6. **CONFLICT OF INTEREST**: Bidder hereby certifies that no officer, agent, or employee of MERC has participated on behalf of MERC in preparation of this Bid, that the Bid is made in good faith without fraud, collusion, or connection of any kind with any other Bidder for the same work, and the Bidder is competing solely in its own behalf without connection or obligation to any undisclosed person or firm. \_\_\_\_\_ *(initial)*
7. **RESIDENT/NON-RESIDENT\***: *Form located in Bid Forms* Undersigned Bidder states that it is a  resident or  non-resident of the State of Oregon. State in which Bidder resides \_\_\_\_\_
8. **NON-COLLUSION AFFIDAVIT\*** *Located in Bid Forms*
9. **TYPE OF BUSINESS ORGANIZATION**: Prosper operates as  an individual,  a corporation, incorporated under the laws of the state of \_\_\_\_\_,  a non-profit organization,  a partnership. (If partnership, attach names of the partners)
10. **OREGON LICENSE**: If a corporation,  it is, or  is not, licensed with Oregon Corporation Commission
11. **REGISTRATION NO**: \_\_\_\_\_ with Construction Contractors Board.
12. **CONTRACTOR QUALIFICATION STATEMENT\*** *Located in Bid Forms*
13. **OREGON RECYCLING CERTIFICATE OF COMPLIANCE\*** *Located in Bid Forms*
14. **CERTIFICATE OF EMPLOYEE DRUG TESTING PROGRAM\*** *Located in Bid Forms*
15. **DOING BUSINESS AS**: Provide any assumed names utilized. \_\_\_\_\_
16. **BIDDERS CHECKLIST\*** *(This Document)*

### TO BE SUBMITTED IN SEPARATE ENVELOPE BY BID DUE DATE AND TIME OF 4:00 P.M.

1. **FIRST TIER SUBCONTRACTOR DISCLOSURE FORM\*** *Form Located in Bid Forms*
2. **MBE/WBE/ESB/FOTA PROGRAM FORMS\*** *Form located in Bid Forms*

### PRIOR TO AWARD:

- Financial records and other information in accordance with ORS 279C at the option of MERC's Project Manager
- Performance Bond**: Cost of the Bond shall be included in the Bid.
- Labor and Materials Bond**: Cost of the Bond shall be included in the Bid  
 Bond amounts shall each equal 100% of contract total, or as stated in RFB.  
 (Below \$50K Performance and Labor, and Materials Bonds may be combined)

By signing this document Bidder certifies that Bidder has secured and considered all addenda and clarifications to this Request for Bids Document

 \_\_\_\_\_  
 NAME AND TITLE OF PERSON AUTHORIZED TO  
 CONTRACT/SIGN OFFER (TYPE OR PRINT)

 \_\_\_\_\_  
 SIGNATURE OF AUTHORIZED PERSON



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# Bid Forms (RFB 12-2004)

## BID FORMS

**NOTE TO BIDDER:** Bidders must provide all of the information requested in this Bid. Bidder should type or use ink for completing this Bid.

To: Metro Properties & Project Management Office,  
 Att: Josh Lipscomb  
 600 N.E. Grand Avenue, Portland, OR 97232

### **BID EXPO – Hall E Tilt Panel, Micropiling Project**

Bidder: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Bidder's Contact: \_\_\_\_\_ Telephone: \_\_\_\_\_ Date: \_\_\_\_\_  
 Tax ID Number \_\_\_\_\_ Oregon Contractors Board Number \_\_\_\_\_

#### **BIDDER'S DECLARATION AND UNDERSTANDING**

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this Bid are those named herein, that this Bid is, in all respects, fair and without fraud, that it is made without collusion with any official of Metro/MERC, and that the Bid is made without any connection or collusion with any person submitting another Bid on this Contract.

The Bidder further declares that it has carefully examined the Contract Documents for the completion of the Work, has personally inspected the Site, has satisfied itself as to the Work involved, and that this Bid is made in accordance with the provisions and under the terms of the Contract Documents, which are hereby made a part of this Bid.

Any printed matter on any letter or paper enclosed herewith which is not part of the Bidding Documents or which was not requested by Metro/MERC is not to be considered a part of this Bid, and the undersigned agrees that such printed matter shall be entirely disregarded and, notwithstanding such printed matter, that the Bid is a bid to do the Work and furnish the labor and materials and all other things required by the Contract Documents strictly within the time and in accordance with such Specifications. This Bid is irrevocable for sixty- (60) days following the date of the opening of Bids.

#### **BID SECURITY**

Bid security in the form of a certified check, cashier's check, irrevocable letter of credit or bid bond as further described in the Instructions for Bidders and in the amount of five percent (5%) of the total bid price is enclosed herewith and is subject to all the conditions stated in the Instructions for Bidders.

#### **CONTRACT EXECUTION, BONDS AND INSURANCE**

The Bidder agrees that if this Bid is accepted, it will, within seven (7) days after award of the Contract by the MERC, sign the Construction Agreement in the form annexed hereto, and will at that time deliver to MERC the Performance Bond and the Labor and Materials Payment Bond required herein and in the form annexed hereto, along with all certificates of insurance and certified copies of insurance policies specified and required in these Contract Documents, and will, to the extent of its Bid, furnish all machinery, tools, apparatus, and other means of operation and construction and do the Work and furnish all the materials necessary to complete all Work as specified or indicated in the Contract Documents

#### **COMMENCEMENT OF WORK AND CONTRACT COMPLETION TIME**

The time frame for the award and execution of this Contract shall be as described in the Instructions for Bidders and other Contract Documents. The Successful Bidder further agrees to commence the Work within five (5) days of issuance of the Notice to Proceed and to diligently prosecute the Work to its final completion in accordance with the Contract Documents.

#### **ADJUSTED PAYMENTS**

In the event the Bidder is awarded the Contract and fails to complete the Work in compliance with the time required by the Contract Documents, adjusted payments shall be paid to MERC as described in the General Conditions.

#### **SALES AND USE TAXES**

The Bidder agrees that all applicable federal, state and local sales and use taxes are included in the stated bid prices for the Work.



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# Bid Forms (RFB 12-2004)

### LUMP SUM AND UNIT PRICE WORK

The Bidder further proposes to accept as full payment for the Work proposed herein the amounts computed under the provisions of the Contract Documents and based on the listed lump sum and unit price amounts. The amounts shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.

### ELIGIBILITY

Bidder and all its subcontractors performing construction work as defined in ORS 701.005 (2) are/will continue to be registered with the Construction Contractor's Board (ORS 701.035 - 701.0050). Bidder and its subcontractors will have a Public Works Bond filed with the Construction Contractors Board prior to starting work on the Contract, unless exempt, in accordance with ORS 279C.830(3).

### PREVAILING WAGES FOR PUBLIC WORK

Bidder hereby certifies that the provisions of ORS 279C.800 - 279C.870, regarding prevailing wages, shall be complied with on this project.

### EQUAL EMPLOYMENT AND NONDISCRIMINATION

Bidder has not/will not discriminate against minorities, women, or emerging small business enterprises in obtaining any required subcontracts for goods or services (ORS 279.111).

Now therefore, based upon acts, intentions and certifications herein above, and in full and complete compliance with all terms and conditions of the attached plans and specifications, and all applicable local, state and federal requirements, **I declare my BASE BID to be:**

## **EXPO Center - Hall E Tilt Panel, Micropiling Project**

### **TOTAL BASE BID**

\$ \_\_\_\_\_ (Numerical Amount)

\_\_\_\_\_ Dollars

### If Individual

IN WITNESS hereto the undersigned has set his/her hand this \_\_\_\_\_ day of 20\_\_\_\_\_

Signature of Bidder \_\_\_\_\_

Printed Name of Bidder \_\_\_\_\_

Title \_\_\_\_\_



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# Bid Forms (RFB 12-2004)

### If Partnership or Joint Venture

IN WITNESS hereto the undersigned has set his/her hand this \_\_\_\_\_ day of 20\_\_\_\_\_.

\_\_\_\_\_  
Name of Partnership or Joint Venture

By: \_\_\_\_\_

\_\_\_\_\_  
Printed Name of Person Signing

Title: \_\_\_\_\_

### If Corporation

IN WITNESS WHEREOF the undersigned corporation has caused this instrument to be executed and its seal affixed by its duly authorized officers this \_\_\_\_\_ day of 20\_\_.

\_\_\_\_\_  
Name of Corporation

\_\_\_\_\_  
State of Incorporation

By: \_\_\_\_\_

\_\_\_\_\_  
Printed Name of Person Signing

Title: \_\_\_\_\_

The name of the Bidder submitting this Bid is \_\_\_\_\_ doing  
business at \_\_\_\_\_  
Street City State Zip

which is the full business address to which all communications concerned with this Bid and with the Contract shall be sent.

The names of the principal officers of the corporation submitting this Bid, or of all of the partners, if the Bidder is a partnership or joint venture, or of all persons interested in this Bid as individuals are as follows:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Bid Forms (RFB 12-2004)

## SCHEDULE OF BID PRICES

BID: EXPO – Hall E Tilt Panel, Micropiling Project

BIDDER: \_\_\_\_\_

*In addition to Lump Sum Pricing as below, Bidder must also submit a Bid-specific Schedule of Values showing unit pricing for all labor & materials separately. Bidder may submit Schedule of Values in their own format and on their own Form*

The Bidder, whose legal signature binding the Bidder to the Bid prices indicated on these pages is found on the signature page, hereby bids as follows:

All Pricing to include Labor & Materials & any related shipping costs	
	Lump Sum
<b>MOBILIZATION</b>	\$

	Unit price per foot	Lump Sum Total
<b>MICOPILES</b>	\$	\$

	Unit price	Lump Sum Total
<b>GROUTING</b>	\$	\$

	Lump Sum
<b>LOAD TESTING</b>	\$

	Lump Sum
<b>SURVEY</b>	\$

<b>Lump Sum Total - (labor &amp; materials) NUMERIC</b>	\$
<b>Lump Sum Total - STORES #1 &amp; #2 (labor &amp; materials) WRITTEN</b>	

Schedule of Bid Prices - Page 1



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## Bid Forms (RFB 12-2004)

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**Note: If any of the items listed on the Bid Schedule contain recycled product (see attached), the Bidder shall specify the amounts of such product in an attachment to the Bid Form. If no attachment is included, the amount of recycled product in the items listed will be considered to be zero for the purpose of this Bid. MERC reserves the right to reject any or all Bids.**

Bidder Signature \_\_\_\_\_

Print Name of Bidder \_\_\_\_\_

Print Name of Company \_\_\_\_\_

Signature \_\_\_\_\_

Print Name and Title \_\_\_\_\_

*Schedule of Bid Prices - Page 2*

**Bid Forms** (RFB 12-2004)

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**SCHEDULE OF VALUES**BID: EXPO – Hall E Tilt Panel, Micropiling Project

BIDDER: \_\_\_\_\_

**INSTRUCTIONS:**

In addition to Lump Sum Pricing above, Bidder MUST also submit a Schedule of Values; to be submitted in Bidders own format and on their *own Form*.

**Bid Forms (RFB 12-2004)****ADDENDA**BID: EXPO – Hall E Tilt Panel, Micropiling Project

The Bidder is presumed to have read and hereby acknowledges receipt and acceptance of Addenda Numbers:

(Insert No. and Date of Each Addendum Received)

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**SURETY**

If the Bidder is awarded a Contract on this Bid, the surety or sureties who provide(s) the Performance Bond and Labor and Materials Payment Bond will be:

SURETYADDRESS

1. _____	_____
	_____
	_____
2. _____	_____
	_____
	_____

Print Name of Company \_\_\_\_\_

Print Name of Bidder \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_



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# Bid Forms (RFB 12-2004)

## BID BOND

(NOTE: BIDDERS MUST USE THIS FORM, NOT A SURETY COMPANY FORM)

Bond Number: \_\_\_\_\_

Bond Amount: \_\_\_\_\_

### KNOW ALL MEN BY THESE PRESENTS:

We the undersigned, \_\_\_\_\_, as PRINCIPAL, and \_\_\_\_\_, a corporation organized and existing under and by virtue of the laws of the state of \_\_\_\_\_ and duly authorized to do surety business in the state of Oregon and name on the current list of approved surety companies acceptable on federal bonds and conforming with the underwriting limitations as published in the he Federal Register by the audit staff of the Bureau of Accounts and the U.S. Treasury Department and is of the appropriate class for the bond amount as determined by Best's Rating System, as SURETY, hereby hold and firmly bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, unto the MERC, as OBLIGEE, in the sum of \$\_\_\_\_\_ in lawful money of the United States of America, for the payment of which sum, well and truly to be made as agreed and liquidated damages.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT whereas the PRINCIPAL has submitted to the MERC a certain bid for work required for the "EXPO – Hall E Tilt Panel, Micropiling Project", which work is specifically described in the accompanying Bid;

NOW, THEREFORE, if MERC does not award a contract to the PRINCIPAL within the time specified in the Instructions to Bidders for the work described in said Bid, or in the alternate, if said bid shall be accepted and the PRINCIPAL, within the time and in the manner described under the Contract Documents, enters into a written contract in accordance with the BID, files the two bonds, one guaranteeing faithful performance of the work to be done and the other guaranteeing payment for labor and materials as required by the law, and files the required certified copies of insurance policies and certificates of insurance, then the obligation shall be null and void; otherwise, the same shall remain in full force and effect.

THE SURETY, for value received, hereby stipulates and agrees that the obligation of said SURETY and this bond shall be in no way impaired or affected by any extension of the time within which MERC may accept such Bid; and said SURETY does hereby waive notice of any such extension.

If more than one SURETY is on this bond, each surety hereby agrees that it is jointly and severally liable for all obligation on this bond.

INWITNESS WHEREOF, we have hereunto set our hands and seals this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
SURETY

\_\_\_\_\_  
PRINCIPAL

BY: \_\_\_\_\_

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

TITLE: \_\_\_\_\_

**Bid Forms (RFB 12-2004)****RESIDENT/NON-RESIDENT BIDDER STATUS****BID EXPO – Hall E Tilt Panel, Micropiling Project**

Oregon law requires that Metro/MERC, in determining the lowest responsive Bidder, must add a percent increase on the Bid of a non-resident Bidder equal to the percent, if any, of the preference given to that Bidder in the state in which that Bidder resides.

Consequently, each Bidder must indicate whether it is a resident or non-resident Bidder. A resident Bidder is a Bidder that has paid unemployment taxes or income taxes in the state of Oregon during the twelve (12) calendar months immediately preceding submission of this Bid, has a business address in Oregon, and has stated in its Bid that the Bidder is a "resident Bidder." A "non-resident Bidder" is a Bidder who is not a resident Bidder (ORS 279A.120).

The undersigned Bidder states that it is: (check one)

1. \_\_\_\_\_ A resident Bidder

2. \_\_\_\_\_ A non-resident Bidder

Indicate state in which Bidder resides: \_\_\_\_\_

Print Name of Company \_\_\_\_\_

Print Name of Bidder \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

**Bid Forms (RFB 12-2004)****NON-COLLUSION AFFIDAVIT****BID EXPO – Hall E Tilt Panel, Micropiling Project**

STATE OF \_\_\_\_\_ County of \_\_\_\_\_

I state that I am \_\_\_\_\_ (Title) of \_\_\_\_\_ (Name of Bidder) and that I am authorized to make this Affidavit on behalf of the Bidder. I am the person authorized by the Bidder and responsible for the price(s) and the amount of this Bid.

I state that: (1) the price(s) and amount of this Bid have been arrived at independently and without consultation, communication or agreement with any other contractor, Bidder or potential Bidder, except as disclosed in the attached appendix.

(2) Neither the price(s) nor the amount of this Bid, and neither the approximate price(s) nor approximate amount of this Bid, have been disclosed to any other person who is a Bidder or potential Bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any person to refrain from bidding on this contract, or to submit a Bid higher than this Bid, or to submit any intentionally high or non-competitive bid or other form of complementary Bid.

(4) This Bid is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any person to submit a complementary or other noncompetitive Bid.

(5) \_\_\_\_\_ (Name of Bidder), its affiliates, subsidiaries, officers, directors and employees (as applicable) are not currently under investigation by any governmental agency and have not in the last four years been convicted of or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as listed and described in the attached appendix.

I state that I and \_\_\_\_\_ (Name of Bidder) understand and acknowledge that the above representations are material and important, and will be relied on by Metro/MERC in awarding the Contract for which this Bid is submitted. Any misstatement in this Affidavit will be treated as fraudulent concealment from Metro/MERC of the true facts relating to the submission of Bids for this Contract.

\_\_\_\_\_  
Signature of Affiant\_\_\_\_\_  
Printed Name of Affiant

Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

Notary Public for \_\_\_\_\_

My Commission Expires: \_\_\_\_ / \_\_\_\_ / \_\_\_\_



600 NE Grand Ave.  
Portland, OR 97232-2736  
503-797-1700

# Bid Forms (RFB 12-2004)

## CONTRACTOR QUALIFICATION STATEMENT

**BID** EXPO – Hall E Tilt Panel, Micropiling Project

**NOTE: The prime contractor or first tier sub-contractor proposed to conduct the following work must complete this Contractor Qualification Statement:** (list type of work applicable)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading:

Contractor Name \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_ E-Mail \_\_\_\_\_

### **ORGANIZATION** \_\_\_\_\_

How many years has your organization been in business as a Contractor? \_\_\_\_\_

Under what former names has your organization operated? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

### **LICENSING AND BONDING**

Oregon CCB# \_\_\_\_\_ Public Works Bond # \_\_\_\_\_

Other licenses \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

### **EXPERIENCE**

List the type of work your organization normally performs with its own forces and the number of full time employees to be assigned to the project? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Bid Forms (RFB 12-2004)****CONTRACTOR QUALIFICATION STATEMENT continued**

Does your firm own or able to obtain the necessary equipment for this job? Please indicate equipment available to conduct the work. \_\_\_\_\_

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**CLAIMS AND SUITS**

Has your organization ever failed to complete any work awarded to it? \_\_\_\_\_

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Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or officers? \_\_\_\_\_

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Has your organization filed any lawsuits or requested arbitration with regard to construction contracts within the last five years? Provide information \_\_\_\_\_

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Have any officers or employees been convicted of any crimes relative to a project such as this? \_\_\_\_\_

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# Bid Forms (RFB 12-2004)

## CONTRACTOR QUALIFICATION STATEMENT continued

### REFERENCES

List the major construction projects your organization has **in progress**

Project Name	Owner	Architect/Engineer	Amount	% Complete	Completion Date	Contact Person	Phone #

List the major public park and/or trail construction projects your organization has **completed in last 5 years**

Project Name	Owner	Architect/Engineer	Amount	% Complete	Completion Date	Contact Person	Phone #

List 3 subs Metro/MERC can contact for a reference.

Name	Specialty	Contact Name	Phone #

List 3 suppliers Metro/MERC can contact for a reference.

Name	Specialty	Contact Name	Phone #

**Bid Forms (RFB 12-2004)**

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**CONTRACTOR QUALIFICATION STATEMENT continued****Bank Reference**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Name: \_\_\_\_\_ Phone number: \_\_\_\_\_

**Bidder signature**

This information provided is true and complete.

Print Name of Company \_\_\_\_\_

Print Name of Bidder \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

# Bid Forms (RFB 12-2004)

## CERTIFICATE OF COMPLIANCE FOR RECYCLING

### BID EXPO – Hall E Tilt Panel, Micropiling Project

I, the undersigned duly authorized representative of the Bidder, hereby certify that the products offered in this bid contain the following minimum percentages:

- (A) \_\_\_\_\_ Percentage of post-consumer waste as defined in  
ORS 279A.010(s) (formerly ORS 279.545(1))
- (B) \_\_\_\_\_ Percentage of secondary waste materials as defined in  
ORS 279A.010 (hh) (formerly ORS 279.545(6))

It is the bidder's responsibility to provide additional signed copies of this Certification of Compliance for each item which contains a different percentage of recycled materials than listed above.

#### DEFINITIONS:

ORS 279A.010(s): "Post Consumer Waste' means a finished materials that would normally be disposed of as solid waste, having completed its life cycle as a consumer item. 'Post-consumer waste' does not include manufacturing waste."

ORS 279A.010(hh): "Secondary Waste Materials' is defined as fragments of products or finished products of a manufacturing process which has converted a virgin resource into a commodity of real economic value, and includes post-consumer waste, but does not include excess virgin resources of the manufacturing process. For paper, 'secondary waste materials' does not include fibrous waste generated during the manufacturing process such as fibers recovered from waste water or trimmings of paper machine rolls, mill broke, wood slabs, chips, sawdust or other wood residue from a manufacturing process."

I, the undersigned duly authorized representative of the bidder, understand that the bid must be signed in ink by the bidder or an authorized representative of the bidder and that any alterations or erasures must be initialed in ink by the person signing the bid. Further, I acknowledge that I have read and understand all bid instructions, specifications, terms and conditions (including the attachments indicated above and agree, on behalf of myself and the bidder to be bound by them.

I, the undersigned duly authorized representative of the bidder certify that the information provided in this bid is true and accurate. Further, I understand and acknowledge that providing incorrect or incomplete information may be cause for bid rejection or contract termination.

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Telephone: \_\_\_\_\_





## Bid Forms (RFB 12-2004)

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The above listed first-tier subcontractor(s) are providing labor and materials with a dollar value equal to or greater than:

- a) 5% of the total Contract Price, but at least \$15,000 of the Bid Price,
- b) \$350,000 regardless of the percentage of the total Bid Price.

**Failure to submit this form in a separate envelope by the disclosure deadline will result in a bid submitted becoming non-responsive, and such bid shall not be considered for award.**

Form Submitted by (Name of Bidder) \_\_\_\_\_

Name of Company \_\_\_\_\_

Contact Name \_\_\_\_\_ Phone # \_\_\_\_\_

*First Tier Subcontractor Disclosure Form – Page2*

# Bid Forms (RFB 12-2004)

## GOOD FAITH PROGRAM

Metro/MERC is committed to doing business with minority, woman-owned firms and emerging small businesses (MBE/WBE/ESB). The Council recognizes that supporting these firms will result in a stronger economy and increased competition.

To this end, Metro/MERC has established these procedures to maximize utilization of MBEs, WBE's and ESBs for Metro/MERC projects. The following steps are required to help Metro/MERC monitor the usage of these firms.

### Good Faith Efforts Steps:

2. Identify areas in which Bidder intends to use sub-contractors.
3. Attend the Pre-Bid meeting if held. Meet any MBE/WBE/ESB firms at the Pre-Bid meeting.
4. Contact several (or all) certified MBE/WBE/ESB firms listed (with the State of Oregon) to perform the work needed. (Metro Procurement Services can provide Bidder with a list of firms upon request 503-797-1648.)
5. Negotiate with interested, available and capable MBE/WBE/ESB firms who submit competitive bids.
6. Report to Metro/MERC all sub-contractors contacted. Please include their response and price quoted.
7. List all sub-contractors that Bidder intend to use on this project.

Please note a selected MBE/WBE/ESB firm must be used unless Metro/MERC authorizes a substitution after contract award.

The following MBE/WBE/ESB Program forms are to be completed and returned as part of your Bid submission. Please contact Procurement Services at 503 797-1648 if additional information is required.

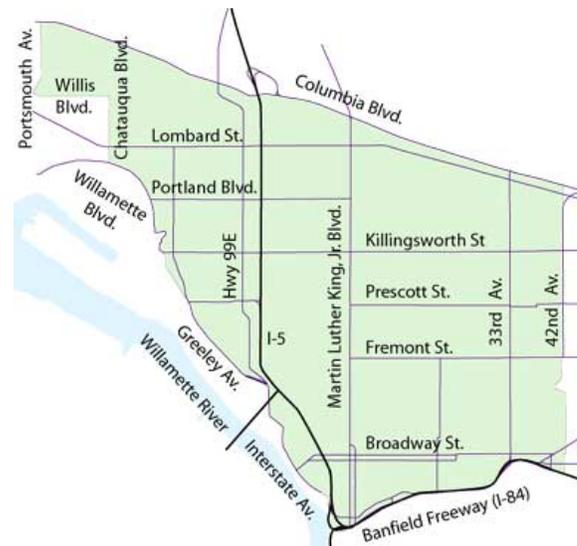
## FOTA

MERC's First Opportunity Area (FOTA) program is intended to provide maximum employment for economically disadvantaged residents living in the target area, for contracts and employment, in accordance with House Bill 3075, passed by the Oregon Legislature in 1989,

Accordingly MERC aspires to utilize 10% (by dollar value) of subcontractors within the First Opportunity Target Area (FOTA) on this project. First Opportunity recruitments are openings for target area Applicants for vacant positions. In addition to standard recruiting techniques, good faith outreach efforts will be made through target area jobs training and economic development agencies to identify recruit and refer such applicants. First Opportunity applicants will be given consideration for employment after the internal recruitment process has concluded

### First Opportunity Target Area

- North boundary: Columbia Boulevard  
 East boundary: 42nd Avenue  
 South boundary: Banfield Freeway (I-84)  
 West boundary: Chatauqua Avenue to Willamette Boulevard;  
 follow the Willamette River and Greeley Avenue  
 by Fremont Bridge; west on Fremont Bridge to  
 Albina Community and Northwest target area  
 but continue south along Willamette River  
 to I-5 and I-84 boundaries but continue south  
 along Willamette River to I-5 and I-84.



# Bid Forms (RFB 12-2004)

## MBE/WBE/ESB/FOTA PROGRAM FORM

**BID EXPO – Hall E Tilt Panel, Micropiling Project**

**THIS IS A REQUIRED FORM TO BE SUBMITTED WITHIN TWO HOURS OF BID CLOSING**

Bidder/Proposer \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

**Bid Closing Date and Time: AS INDICATED ON THE RFB COVER PAGE.**

**YOU MUST SUBMIT THIS FORM WITHIN TWO (2) HOURS OF THE ABOVE CLOSING DATE**

Step 1. Identify areas in which you intend to use sub-contractors.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Step 2. Attend the Pre-Bid meeting if held. Meet any MBE/WBE/ESB/FOTA firms at the Pre-Bid meeting.

Name of person who attended pre-bid \_\_\_\_\_

Steps 3. List all firms contacted for sub-contracting work. (use more sheets if necessary)

Sub-contract for \_\_\_\_\_

MBE, WBE, ESB,FOTA Other	Certification #	Name of Firm	Date Contacted	Mode of Communication	Amount of Bid	Comments

# Bid Forms (RFB 12-2004)

## MBE/WBE/ESB/FOTA PROGRAM FORM CONTINUED

Sub contract for \_\_\_\_\_

MBE, WBE, ESB, FOTA Other	Certification #	Name of Firm	Date Contacted	Mode of Communication	Amount of Bid	Comments

Sub contract for \_\_\_\_\_

MBE, WBE, ESB, FOTA Other	Certification #	Name of Firm	Date Contacted	Mode of Communication	Amount of Bid	Comments

Step 4: List all sub-contractors used for this project.

### BIDDER INTENDS TO SUBCONTRACT WITH THE FOLLOWING:

MBE, WBE, ESB, FOTA Other	Certification #	Name of Firm, Address, Phone	CCB#*	Nature of Work	Dollar Value of Participation

*\*Please include Construction Contractors Board Number*



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# Bid Forms (RFB 12-2004)

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## MBE/WBE/ESB/FOTA PROGRAM FORM CONTINUED

Total Bid Amount \_\_\_\_\_

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_

Print Name of Bidder \_\_\_\_\_

Print Name of Company \_\_\_\_\_



## LABOR AND MATERIALS PAYMENT BOND

(NOTE: CONTRACTOR MUST USE THIS FORM, NOT A SURETY COMPANY FORM)

KNOW ALL MEN BY THESE PRESENTS:

We the undersigned \_\_\_\_\_ as PRINCIPAL, and \_\_\_\_\_, a corporation organized and existing under and by virtue of the laws of the state of \_\_\_\_\_, and duly authorized to do surety business in the state of Oregon and named on the current list of approved surety companies acceptable on federal bonds and conforming with the underwriting limitations as published in the Federal Register by the audit staff of the Bureau of Accounts and the U.S. Treasury Department and which carries an "A" rating and is of the appropriate class for the bond amount as determined by Best's Rating System, as Surety, hereby hold and firmly bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, unto MERC, as OBLIGEE, in the sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) in lawful money of the United States of America, for the payment of that sum for the use and benefit of claimants as defined below.

The condition of this obligation is such that whereas the PRINCIPAL entered into a contract with MERC dated \_\_\_\_\_, 2011, which contract is hereunto annexed and made a part hereof, for accomplishment of the project described as follows: "EXPO Center – Hall E Tilt Panel, Micropiling Project".

NOW THEREFORE, if the PRINCIPAL shall promptly make payments to all persons, firms, subcontractors, corporations and/or others furnishing materials for or performing labor in the prosecution of the Work provided for in the aforesaid Project, and any authorized extension or modification thereof, including all amounts due for materials, equipment, mechanical repairs, transportation, tools and services consumed or used in connection with the performance of such Work, and for all labor performed in connection with such Work whether by subcontractor or otherwise, and all other requirements imposed by law, then this obligation shall become null and void; otherwise this obligation shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is as specified in ORS 279.526.

The above-named PRINCIPAL and SURETY hereby jointly and severally agree with the OBLIGEE and its assigns that every claimant as above-specified, who has not been paid in full, may sue on this bond for the use of such claimant, prosecute the suit to final judgment in accordance with ORS 279.536 for such sum or sums as may be justly due claimant, and have execution thereon. The OBLIGEE shall not be liable for the payment of any judgment, costs, expenses or attorneys' fees of any such suit.

PROVIDED, FURTHER, that SURETY for the value received, hereby stipulates and agrees that all changes, extensions of time, alterations to the terms of the Contract or to Work to be performed thereunder or the Specifications accompanying the same shall be within the scope of the SURETY's undertaking on this bond and SURETY does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications, shall automatically increase the obligation of the SURETY hereunder in a like amount, provided that the total of such increases shall not exceed twenty-five percent (25%) of the original amount of the obligation without the consent of the SURETY.

This obligation shall continue to bind the PRINCIPAL and SURETY, notwithstanding successive payments made hereunder, until the full amount of the obligation is exhausted, or if the full amount of the obligation is not exhausted and no claim is pending resolution, until such time as no further claims can be made pursuant to law with regard to the above-described project, by any claimant specified in ORS 279.526.

If more than one SURETY is on this bond, each SURETY hereby agrees that it is jointly and severally liable for all obligations of this bond.

IN WITNESS WHEREOF,  
we have hereunto set our hands and seals this \_\_\_\_ day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
SURETY

By: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
Address

\_\_\_\_\_  
City, State ZIP

\_\_\_\_\_  
Phone Number

\_\_\_\_\_  
CONTRACTOR

By: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
Address

\_\_\_\_\_  
City, State ZIP

\_\_\_\_\_  
Phone Number

## PERFORMANCE BOND

(NOTE: CONTRACTS MUST USE THIS FORM, NOT A SURETY COMPANY FORM)

KNOW BY ALL MEN BY THESE PRESENTS:

We the undersigned \_\_\_\_\_ as PRINCIPAL (hereafter called CONTRACTOR), and, \_\_\_\_\_ a corporation organized and existing under and by virtue of the laws of the state of \_\_\_\_\_, duly authorized to do surety business in the state of Oregon and named on the current list of approved surety companies acceptable on federal bonds and conforming with the underwriting limitations as published in the Federal Register by the audit staff of the Bureau of Accounts and the U.S. Treasury Department and is of the appropriate class for the bond amount as determined by Best's Rating System, as Surety, hereby hold and firmly bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, to pay to MERC as OBLIGEE (hereafter called MERC), the amount of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_), in lawful money of the United States of America.

WHEREAS, the CONTRACTOR entered into a contract with MERC dated \_\_\_\_\_, 2011, which Contract is hereunto annexed and made a part hereof, for accomplishment of the project described as follows: "EXPO Center – Hall E Tilt Panel, Micropiling Project".

NOW, THEREFORE, the condition of this obligation is such that if the CONTRACTOR shall promptly, truly and faithfully perform all the undertakings, covenants, terms, conditions, and agreements of the aforesaid project, MERC having performed its obligations thereunder, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever CONTRACTOR shall be declared by MERC to be in default under the Contract Documents for the project described herein, the Surety may promptly remedy the default, or shall promptly complete the project in accordance with the Contract Documents and the project Specifications. Surety, for value received, further stipulates and agrees that all changes, extensions of time, alterations, or additions to the terms of the Contract or Specifications for the project are within the scope of the Surety's undertaking on this bond, and Surety hereby waives notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications. Any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications shall automatically increase the obligation of the Surety hereunder in a like amount, provided that such increase shall not exceed twenty-five (25%) of the original amount of the obligation without the consent of the Surety.

This obligation shall continue to bind the PRINCIPAL and SURETY, notwithstanding successive payments made hereunder, until the full amount of the obligation is exhausted.

No right of action shall accrue on this bond to or for the use of any person or corporation other than MERC or its heirs, executors, administrators, successors or assigns.

If more than one SURETY is on this bond, each SURETY hereby agrees that it is jointly and severally liable for obligations on this bond.

IN WITNESS WHEREOF,  
we have hereunto set our hands and seals this \_\_\_\_ day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
SURETY

By: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
Address

\_\_\_\_\_  
City, State ZIP

\_\_\_\_\_  
Phone Number

\_\_\_\_\_  
CONTRACTOR

By: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
Address

\_\_\_\_\_  
City, State ZIP

\_\_\_\_\_  
Phone Number



# Sample Public Contract (RFB 12-2004)

## SAMPLE PUBLIC CONTRACT

For Public Contracts Greater than \$50,000

CONTRACT NO. \_\_\_\_\_

THIS Contract is entered into between Metropolitan Exposition-Recreation Commission ("MERC"), whose address is 777 NE Martin Luther King, Jr., Blvd., Portland, Oregon 97232-2742, and \_\_\_\_\_, whose address is \_\_\_\_\_, hereinafter referred to as the "CONTRACTOR."

THE PARTIES AGREE AS FOLLOWS:

### ARTICLE I TERM OF CONTRACT

The term of this Contract shall be for the period commencing \_\_\_\_\_, 20\_\_ through and including \_\_\_\_\_, 20\_\_.

### ARTICLE II CONTRACT SUM AND TERMS OF PAYMENT

MERC shall compensate the CONTRACTOR for work performed and/or goods supplied as described in the Scope of Work. MERC shall not be responsible for payment of any materials, expenses or costs other than those which are specifically included in the Scope of Work in an amount not to exceed (written amount) ( \_\_\_\_\_ Dollars and /100 (\$ \_\_\_\_\_) ). Payment shall be on a unit price only for those goods or services received in a condition or manner acceptable to MERC. CONTRACTOR'S invoice shall include an itemized statement of items purchased or services provided, and shall be sent to MERC, Attention: Accounts Payable, 777 NE Martin Luther King, Jr. Blvd., Portland, Oregon 97232-2742. MERC will pay Contractor within 30 days of receipt of an approved invoice.

### ARTICLE III SCOPE OF WORK

CONTRACTOR shall perform the work and/or deliver to MERC the goods described in the Scope of Work attached hereto as Attachment A. All services and goods shall be of good quality and, otherwise, in accordance with the Scope of Work. Contractor agrees to provide all labor, tools, equipment, machinery, supervision, transportation, permits and every other item and service necessary to perform the work described in the contract documents. Contractor agrees to comply with each and every term, condition and provision of the contract documents.

The Contract Time shall commence upon issuance of the Notice to Proceed which is anticipated to be issued following execution of the contract. Contractor shall commence work under this Contract within no more than ten (10) calendar days after issuance of written Notice to Proceed. Contractor shall bring the Work to substantial completion no later than \_\_\_\_\_20\_\_, or at such date as may be extended by Change Order approved by Contractor and Owner. By executing this Contract, Contractor confirms and accepts that the Contract Time so stated is a reasonable period for performance of all of the Work.

The end date of the Contract Term is intended to allow for finalization of all closeout requirements, receipt of warranties, manuals and final payment, but does not alter requirements for substantial completion of the work by the date specified.

A preliminary facility events schedule for \_\_\_\_\_ 20\_\_, will be provided for the duration of the work. This schedule indicates the dates and approximate shifts that are currently available and unavailable to the Contractor to perform the required work, depending on the location in the building of the scheduled event, the type of event and the Work being conducted simultaneously with the event. *Due to the likely possibility of additional "bookings" or cancellations of events in the building, this schedule may be modified, which may positively or negatively impact the work schedule. It is not*

## Sample Public Contract (RFB 12-2004)

*anticipated however, that the net number of days available to the Contractor as indicated on the schedule included as part of these documents will be lessened. In the event of a schedule change, the Owner will notify the Contractor directly following the implementation of the change so that work plans may be modified accordingly.* Due to the nature of the Public Events Facility industry, it will be necessary for the Contractor to work closely with the Project Manager and applicable building staff to coordinate day-to-day logistical requirements for the benefit of the Contractor and to afford Owner Staff the necessary time to perform event or non-event related functions.

### ARTICLE IV LIABILITY AND INDEMNITY

CONTRACTOR is an independent contractor and assumes full responsibility for the content of its work and performance of CONTRACTOR'S labor, and assumes full responsibility for all liability for bodily injury or physical damage to person or property arising out of or related to this Contract, and shall indemnify, defend and hold harmless MERC/METRO, its agents and employees, from any and all claims, demands, damages, actions, losses, and expenses, including attorney's fees, arising out of or in any way connected with its performance of this Contract. CONTRACTOR is solely responsible for paying CONTRACTOR'S subcontractors and nothing contained herein shall create or be construed to create any contractual relationship between any subcontractor(s) and MERC/METRO.

### ARTICLE V TERMINATION

MERC/METRO may terminate this Contract upon giving CONTRACTOR seven (7) days written notice. In the event of termination, CONTRACTOR shall be entitled to payment for work performed to the date of termination. MERC/METRO shall not be liable for indirect, consequential damages or any other damages. Termination by MERC/METRO will not waive any claim or remedies it may have against CONTRACTOR.

### ARTICLE VI INSURANCE

CONTRACTOR shall purchase and maintain at CONTRACTOR'S expense, the following types of insurance covering the CONTRACTOR, its employees and agents.

- A. Broad form comprehensive general liability insurance covering personal injury, property damage, and bodily injury with automatic coverage for premises and operation and product liability shall be a minimum of \$1,000,000 per occurrence. The policy must be endorsed with contractual liability coverage. **MERC/METRO, its appointed officials, departments, employees and agents shall be named as an ADDITIONAL INSURED.**
- B. Automobile bodily injury and property damage liability insurance. Insurance coverage shall be a minimum of \$1,000,000 per occurrence. **MERC/METRO, its appointed officials, departments, employees, and agents shall be named as an ADDITIONAL INSURED.** Notice of any material change or policy cancellation shall be provided to MERC/METRO thirty (30) days prior to the change.

This insurance as well as all workers' compensation coverage for compliance with ORS 656.017 must cover CONTRACTOR'S operations under this Contract, whether such operations be by CONTRACTOR or by any subcontractor or anyone directly or indirectly employed by either of them.

CONTRACTOR shall provide MERC/METRO with a certificate of insurance complying with this article and naming MERC/METRO as an additional insured within fifteen (15) days of execution of this Contract or twenty-four (24) hours before services under this Contract commence, whichever date is earlier.

CONTRACTOR shall not be required to provide the liability insurance described in this Article only if an express exclusion relieving CONTRACTOR of this requirement is contained in the Scope of Work.

# Sample Public Contract (RFB 12-2004)



## ARTICLE VII PUBLIC CONTRACTS

All applicable provisions of ORS chapters 187 and 279A & B, and all other terms and conditions necessary to be inserted into public contracts in the State of Oregon, are hereby incorporated as if such provision were a part of this Agreement. Specifically, it is a condition of this contract that Contractor and all employers working under this Agreement are subject employers that will comply with ORS 656.017 as required by 1989 Oregon Laws, Chapter 684.

For Public Works projects subject to ORS 279C.800 to 279C.870, the Contractor and all sub-contractors shall pay Prevailing Wage Rates as per the Oregon Bureau of Labor and Industries (BOLI) "Prevailing Wage Rates for Public Contract Works Contracts in Oregon - Effective July 1, 2011" and "Amendments to Oregon Determination 2011-02 Effective October 1, 2011", pursuant to the administrative rules established by the Commissioner of Labor and Industries. For projects subject to both State and Federal (Davis Bacon Act) Prevailing Wage Laws, Contractor and all sub-contractors must pay workers the higher of the applicable State or Federal Prevailing Wage Rates. Contractor must provide a written schedule to employees showing the number of hours per day and days per week the employee may be required to work; and must pay daily, weekly, weekend and holiday overtime in accordance with, and as required by ORS 279C.520. Contractors must promptly pay, as due, all persons supplying to such contractor labor or material used in this contract.

Contractors must promptly pay, as due, all persons supplying to such contractor labor or material used in this contract. If the contractor fails to pay for labor or services, the contracting agency can pay and withhold these amounts due the contractor. Additionally, if the contractor or first-tier subcontractor fails, neglects, or refuses to make payment to a person furnishing labor or materials in connection with the public contract for a public improvement within 30 days after receipt of payment from the public contracting agency or a contractor, the contractor or first-tier subcontractor shall owe the person the amount due plus shall pay interest in accordance with ORS 279C.515. If the contractor or first-tier subcontractor fails, neglects, or refuses to make payment, to a person furnishing labor or materials in connection with the public contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580. Contractor must promptly pay for any medical services they have agreed to pay in accordance with ORS 279C.530. Contractor must pay any and all contributions and amounts due to the Industrial Accident Fund from contractor or subcontractor and incurred in the performance of the contract.

Contractor is required to turn in Certified Payroll Reports each month to Contracting Public Agency. In addition to any other retainage obligated by the Public Contracting Code, the Prevailing Wage Requirement Law requires public agencies to withhold 25 percent of any amount earned by the prime contractor if the prime contractor does not submit certified payroll reports. Once the certified payroll reports have been submitted, the public agency must pay the 25 percent withheld within 14 days. ORS 279C.845(7)

Contractor and every subcontractor must have a Public Works Bond filed with the Construction Contractors Board prior to starting work on the Contract, unless exempt, in accordance with ORS 279C.830(3). Contractors are required to pay the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

No liens or claims are permitted to be filed against MERC/METRO on account of any labor or material furnished.

CONTRACTOR shall meet MERC Bonds and Bid Security requirements as follows:

1. Bid Security not exceeding 10 percent of the amount bid for the contract is required unless the contract is for \$50,000 or less.
2. For public improvements, a labor and material bond and a performance bond, both in the amount equal to 100 percent of the contract price are required for contracts over \$50,000.
3. Bid security, labor and material bond and performance bond may be required even though a contract is of a class not identified above, if the General Manager determines it is in the public interest.

CONTRACTOR shall meet the Metro "Good Faith Efforts" Requirement for Construction Projects as below:

## Sample Public Contract (RFB 12-2004)

For construction contracts of \$100,000 or more, the Commission adopts in principle, policy, and content, the "Good Faith Effort" program established by Metro Code§ 2.04.100 through 2.04.190 (Metro Minority Business Enterprise, Women Owned Business, and Emerging Small Business Program) as they apply to contracts of the Commission. This adoption includes any and all ordinances subsequently adopted by the Metro Council relating to Metro's Minority Business Enterprise, Women Owned Business and Emerging Small Business Program. The General Manager shall designate MERC/METRO staff to perform the functions of the Liaison Officer to carry out the MBE/WBE/ESB program as it relates to MERC/METRO contracting activities.

For public improvement work all contractors must demonstrate that an employee drug-testing program is in place.

### ARTICLE VIII ATTORNEY'S FEES

In the event of any litigation concerning this Contract, the prevailing party shall be entitled to reasonable attorney's fees and court costs, including fees and costs on appeal to any appellate courts.

### ARTICLE IX QUALITY OF GOODS AND SERVICES

Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of the highest quality. All workers and subcontractors shall be skilled in their trades. CONTRACTOR guarantees all work against defects in material or workmanship for a period of one (1) year from the date of acceptance or final payment by MERC, whichever is later. All guarantees and warranties of goods furnished to CONTRACTOR or subcontractors by any manufacturer or supplier shall be deemed to run to the benefit of MERC/METRO

### ARTICLE X OWNERSHIP OF DOCUMENTS

Unless otherwise provided herein, all documents, instruments and media of any nature produced by CONTRACTOR pursuant to this agreement are Work Products and are the property of MERC/METRO, including but not limited to: drawings, specifications, reports, scientific or theoretical modeling, electronic media, computer software created or altered specifically for the purpose of completing the Scope of Work, works of art and photographs. Unless otherwise provided herein, upon MERC/METRO request, CONTRACTOR shall promptly provide MERC/METRO with an electronic version of all Work Products that have been produced or recorded in electronic media. MERC/METRO and CONTRACTOR agree that all work Products are works made for hire and Contractor hereby conveys, transfers, and grants to all rights of reproduction and the copyright to all such Work Products.

- A. CONTRACTOR and subcontractors shall maintain all fiscal records relating to such contracts in accordance with generally accepted accounting principles. In addition, CONTRACTOR and subcontractors shall maintain any other records necessary to clearly document:
1. The performance of the CONTRACTOR, including but not limited to the contractor's compliance with contract plans and specifications, compliance with fair contracting and employment programs, compliance with Oregon law on the payment of wages and accelerated payment provisions; and compliance with any and all requirements imposed on the CONTRACTOR or subcontractor under the terms of the contract or subcontract;
  2. Any claims arising from or relating to the performance of the CONTRACTOR or subcontractor under a public contract;
  3. Any cost and pricing data relating to the contract; and
  4. Payments made to all suppliers and subcontractors.
- B. CONTRACTOR and subcontractors shall maintain records for the longer period of (a.) six years from the date of final completion of the contract to which the records relate or (b.) until the conclusion of any audit, controversy or litigation arising out of or related to the contract.

## Sample Public Contract (RFB 12-2004)

- C. CONTRACTOR and subcontractors shall make records available to MERC/METRO, and its authorized representatives, including but not limited to the staff of any MERC/METRO department and the staff of the MERC/METRO Auditor, within the boundaries of the METRO region, at reasonable times and places regardless of whether litigation has been filed on any claims. If the records are not made available within the boundaries of METRO, the CONTRACTOR or subcontractor agrees to bear all of the costs for MERC/METRO employees, and any necessary consultants hired by MERC/METRO, including but not limited to the costs of travel, per diem sums, salary, and any other expenses that MERC/Metro incurs, in sending its employees or consultants to examine, audit, inspect, and copy those records. If the CONTRACTOR elects to have such records outside these boundaries, the costs paid by the CONTRACTOR to MERC/METRO for inspection, auditing, examining and copying those records shall not be recoverable costs in any legal proceeding.
- D. CONTRACTOR and subcontractors authorize and permit MERC/METRO and its authorized representatives, including but not limited to the staff of any MERC/METRO department and the staff of the MERC/METRO Auditor, to inspect, examine, copy and audit the books and records of CONTRACTOR or subcontractor, including tax returns, financial statements, other financial documents and any documents that may be placed in escrow according to any contract requirements. MERC/METRO shall keep any such documents confidential to the extent permitted by Oregon law, subject to the provisions of section E.
- E. CONTRACTOR and subcontractors agree to disclose the records requested by MERC/METRO and agree to the admission of such records as evidence in any proceeding between MERC/METRO and the CONTRACTOR or subcontractor, including, but not limited to, a court proceeding, arbitration, mediation or other alternative dispute resolution process.
- F. CONTRACTOR and subcontractors agree that in the event such records disclose that MERC/METRO is owed any sum of money or establish that any portion of any claim made against MERC/METRO is not warranted, the CONTRACTOR or subcontractor shall pay all costs incurred by MERC/METRO in conducting the audit and inspection. Such costs may be withheld from any sum that is due or that becomes due from MERC/METRO.
- G. Failure of the CONTRACTOR or subcontractor to keep or disclose records as required by this document or any solicitation document may result in disqualification as a bidder or proposer for future MERC/Metro contracts as provided in ORS 279B.130 and Metro Code Section 2.04.070(c), or may result in a finding that the CONTRACTOR or subcontractor is not a responsible bidder or proposer as provided in ORS 279B.110 and Metro Code Section 2.04.052.

### ARTICLE XI SUBCONTRACTORS

CONTRACTOR shall contact MERC prior to negotiating any subcontracts and CONTRACTOR shall obtain approval from MERC before entering into any subcontracts for the performance of any of the services and/or supply of any of the goods covered by this Contract.

MERC/METRO reserves the right to reasonably reject any subcontractor or supplier and no increase in the CONTRACTOR'S compensation shall result thereby. All subcontracts related to this Contract shall include the terms and conditions of this agreement. CONTRACTOR shall be fully responsible for all of its subcontractors as provided in Article IV.

### ARTICLE XII RIGHT TO WITHHOLD PAYMENTS

MERC/METRO shall have the right to withhold from payments due CONTRACTOR such sums as necessary, in MERC/METRO's sole opinion, to protect MERC/METRO against any loss, damage or claim which may result from CONTRACTOR'S performance or failure to perform under this agreement or the failure of CONTRACTOR to make proper payment to any suppliers or subcontractors. In addition for public improvement work, if a CONTRACTOR is required to

## Sample Public Contract (RFB 12-2004)

file certified statements under ORS 279C.845, MERC/METRO shall retain 25 percent of any amount earned by the CONTRACTOR on the public works until the contractor has filed all required certified statements with MERC/METRO.

If a liquidated damages provision is contained in the Scope of Work and if CONTRACTOR has, in MERC/METRO's opinion, violated that provision, MERC/METRO shall have the right to withhold from payments due CONTRACTOR such sums as shall satisfy that provision. All sums withheld by MERC/METRO under this Article shall become the property of MERC/METRO and CONTRACTOR shall have no right to such sums to the extent that CONTRACTOR has breached this Contract.

### ARTICLE XIII SAFETY

If services of any nature are to be performed pursuant to this agreement, CONTRACTOR shall take all necessary precautions for the safety of employees and others in the vicinity of the services being performed and shall comply with all applicable provisions of federal, state and local safety laws and building codes, including the acquisition of any required permits. Contractor shall supply a written safety program/policy that all employees must follow. Workplace safety MUST be in compliance with OSHA regulations at all times

### ARTICLE XIV INTEGRATION OF CONTRACT DOCUMENTS

All of the provisions of any procurement documents including, but not limited to, the Advertisement for Bids, Proposals or responses, General and Special Instructions to Bidders, Proposal, Scope of Work, and Specifications which were utilized in conjunction with the bidding of this Contract are hereby expressly incorporated by reference. Otherwise, this Contract represents the entire and integrated agreement between MERC/METRO and CONTRACTOR and supersedes all prior negotiations, representations or agreements, either written or oral. This Contract may be amended only by written instrument signed by both MERC/METRO and CONTRACTOR. The law of the state of Oregon shall govern the construction and interpretation of this Contract.

### ARTICLE XV COMPLIANCE

CONTRACTOR shall comply with federal, state, and local laws, statutes, and ordinances related to the execution of the work. This requirement includes, but is not limited to, non-discrimination, safety and health, environmental protection, waste reduction and recycling, fire protection, permits, fees and similar subjects.

### ARTICLE XVI INTERGOVERNMENTAL COOPERATIVE AGREEMENT

Pursuant to ORS 279A and the Metro public contract code, Metro participates in an Intergovernmental Cooperative Purchasing program by which other public agencies shall have the ability to purchase the goods and services under the terms and conditions of this awarded contract. Any such purchases shall be between the Contractor and the participating public agency and shall not impact the Contractor's obligation to Metro under this agreement. Any estimated purchase volumes listed herein do not include volumes for other public agencies, and Metro makes no guarantee as to their participation in any purchase. Any bidder may decline to extend the prices and terms of this solicitation to any or all other public agencies upon execution of this contract. Unless the bidder specifically declines to participate in the program by marking the box below, the bidder agrees to participate in the Intergovernmental Cooperative Purchasing program.

**Bidder declines to participate in Intergovernmental Cooperative Purchasing or is not applicable to this Contract.**

### ARTICLE XVII ASSIGNMENT

CONTRACTOR shall not assign any rights or obligations under or arising from this Contract without prior written consent from MERC.

# Sample Public Contract (RFB 12-2004)



## CONTRACTOR

Signature: \_\_\_\_\_

Printed Name \_\_\_\_\_

Date: \_\_\_\_\_

Company \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Telephone: \_\_\_\_\_

Tax I.D. or SS#: \_\_\_\_\_

CCB # \_\_\_\_\_

## METROPOLITAN EXPOSITION-RECREATION COMMISSION

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Date: \_\_\_\_\_

Title: \_\_\_\_\_

Project Manager: \_\_\_\_\_

Telephone: \_\_\_\_\_



**Portland Metropolitan Exposition Center (EXPO)  
Hall E Tilt Panel, Micropiling Project  
Request for Bid (RFB 12-2004)**

---



600 NE Grand Ave.  
Portland, OR 97232-2736  
503-797-1700

**ATTACHMENT A**

# GENERAL STRUCTURAL NOTES

**CODE REQUIREMENTS:**

CONFORM TO THE INTERNATIONAL BUILDING CODE (I.B.C.), 2009 EDITION, AS AMENDED BY THE STATE OF OREGON AND CITY OF PORTLAND.

**TEMPORARY CONDITIONS:**

THE CONTRACTOR SHALL SHORE PANEL AS REQUIRED DURING REPAIR. THE PANEL IS DESIGNED TO BE STABLE IN THE FINAL CONFIGURATION.

**DESIGN CRITERIA:**

1. THE FOUNDATION RPAIR IS BASED ON THE SOIL INFORMATION PROVIDED BY GEOPACIFIC ENGINEERING, DATED NOVEMBER 30, 2010.
2. ROOF 25 PSF SNOW LOAD
3. ALLOWABLE MICROPILE LOAD 35 KIPS
4. WIND 100 MPH 3 SECOND GUST EXPOSURE B
5. EARTHQUAKE DESIGN WAS BASED UPON THE REQUIREMENTS FOR SEISMIC SITE CLASSIFICATION D, S<sub>ds</sub> = 72%, S<sub>1</sub> = 40% OF g.

**SPECIAL INSPECTION AND TESTING:**

1. TWO SACRIFICIAL MICROPILES SHALL BE TESTED PRIOR TO INSTALLATION BENEATH THE STRUCTURE IN ADDITION TO INSPECTION OF MICROPILES BY THE SOILS ENGINEER. SEE SOILS REPORT FOR DESCRIPTION OF TESTS BY GEOPACIFIC ENGINEERING.
2. SPECIAL INSPECTION OF CONCRETE WORK, REVIEW OF REINFORCEMENT AND CYLINDER TESTS SHALL BE PERFORMED.
3. ALL WELDS SHALL BE VISUALLY INSPECTED

**CONCRETE:**

1. CONCRETE WORK SHALL CONFIRM TO CHAPTER 19 OF THE INTERNATIONAL BUILDING CODE. CONCRETE STRENGTHS SHALL BE VERIFIED BY STANDARD 28-DAY CYLINDER TESTS PER ASTM C39, AND SHALL BE AS FOLLOWS:

ABSOLUTE WATER-CEMENT RATIO BY WEIGHT

- |    | <u>F' C (PSI)</u> | <u>NON AIR-ENTRAINED</u> | <u>AIR-ENTRAINED</u> | <u>USE</u>             |
|----|-------------------|--------------------------|----------------------|------------------------|
| 2. | 3,000             | .58                      | .46                  | PILE CAPS & GRADE BEAM |
3. A WATER-REDUCING ADMIXTURE CONFORMING TO ASTM C494, USED IN STRICT ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATION, SHALL BE INCORPORATED IN CONCRETE DESIGN MIXES. A HIGH-RANGE WATER-REDUCING (HRWR) ADMIXTURE CONFORMING TO ASTM C494, TYPE F OR G, MAY BE USED IN CONCRETE MIXES, PROVIDING THAT THE SLUMP DOES NOT EXCEED 10". AN AIR-ENTRAINING AGENT CONFORMING TO ASTM C250 SHALL BE USED IN CONCRETE MIXES FOR EXTERIOR HORIZONTAL SURFACES EXPOSED TO WEATHER. THE AMOUNT OF ENTRAINED AIR SHALL BE 5% + 1% BY VOLUME.
  4. PROVIDE 3/4" CHAMFERS ON ALL EXPOSED CONCRETE EDGES UNLESS NOTED OTHERWISE.

**REINFORCING STEEL:**

REINFORCING STEEL SHALL CONFORM TO ASTM A615, INCLUDING S1, GRADE 60, FOR DEFORMED BARS.

BARS IN BEAMS AND SLABS SHALL BE SUPPORTED ON WELL-CURED CONCRETE BLOCKS OR APPROVED METAL CHAIRS, AS SPECIFIED BY THE CRSI MANUAL OF THE STAND PRACTICE, MSP-1. LAP ALL REINFORCING BARS AT SPLICES 36 DIAMETERS, WITH A MINIMUM LAP OF 18", EXCEPT AS NOTED.

**REINFORCING STEEL SHALL HAVE PROTECTION AS FOLLOWS:**

<u>USE</u>	<u>COVER</u>
WALL BARS EXPOSED TO EARTH	2"
WALL BARS	1 1/2"
FOOTING BARS	3"

**CONCRETE ACCESSORIES:**

1. EXPANSION BOLTS SHALL BE HILTI KWIK BOLT-II OR APPROVED WITH EQUIVALENT ICBO ALLOWABLE TENSION AND SHEAR VALUES.
2. PERMANENTLY EXPOSED EMBEDDED PLATES AND ANGLES SHALL BE HOT DIPPED, GALVANIZED AFTER FABRICATION, UNLESS OTHERWISE NOTED.

**STRUCTURAL STEEL:**

STRUCTURAL STEEL SHALL BE ASTM A36. TUBES SHALL BE ASTM A500, GRADE B (FY=46KSI). WELDING SHALL CONFORM TO THE AWS CODES FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION. WELDS SHALL BE MADE USING E70XX ELECTRODES AND SHALL BE 3/16" MINIMUM UNLESS OTHERWISE NOTED. WELDING SHALL BE BY AWS CERTIFIED WELDERS. PREQUALIFIED WELDING PROCEDURES ARE TO BE USED, UNLESS AWS QUALIFICATION IS SUBMITTED TO THE ARCHITECT PRIOR TO FABRICATION.

**MICROPILES:**

MICROPILES SHALL BE TITAN 73/56 OR BETTER. PILES SHALL CONSIST OF 2 7/8 INCH DIAMETER ROD WITH MINIMUM 8 INCH BOREHOLE. INSTALLATION SHALL BE MONITORED BY THE SOILS ENGINEER.



**GRUMMEL ENGINEERING, LLC**  
7421 SE Powell Blvd., Portland, OR 97206  
Ph. (503) 244-7014, Fax (503) 246-2011  
bgrummel@msn.com

**Expo Center Hall E  
Panel Repair**  
6020 N. Marine Dr.  
Portland, oR 97217

Date: 9/22/11

Project Number: 211105

Sheet Name:  
STRUCTURAL  
NOTES

Sheet Number:

S0



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 7421 SE Powell Blvd., Portland, OR 97206  
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**Expo Center Hall E  
 Panel Repair**  
 6020 N. Marine Dr.  
 Portland, OR 97217

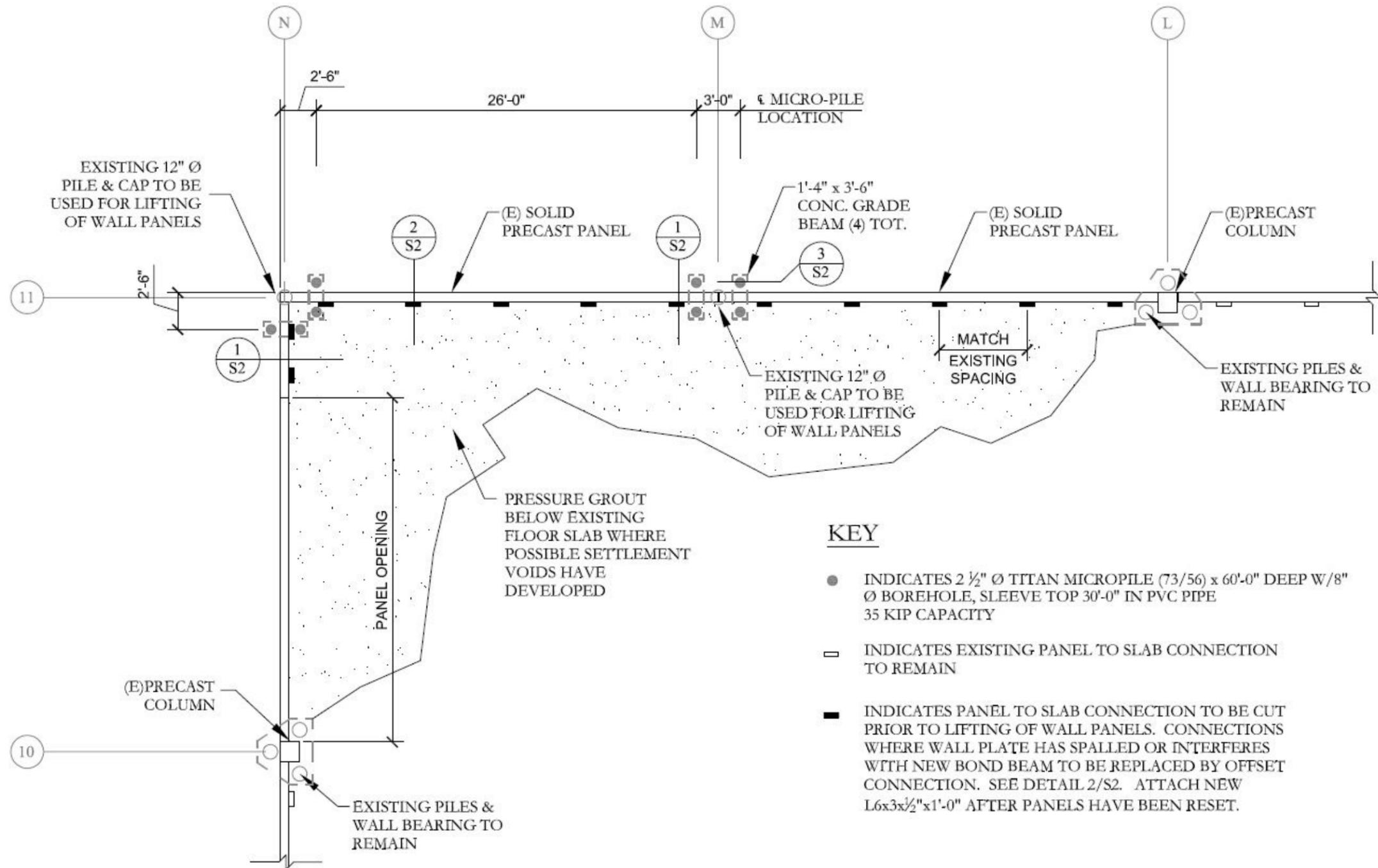
Date: 9/22/11

Project Number: 211105

Sheet Name:  
 FOUNDATION  
 PLAN

Sheet Number:

**S1**



1 PARTIAL FOUNDATION PLAN  
 1/8" = 1'-0"



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Date: 9/22/11

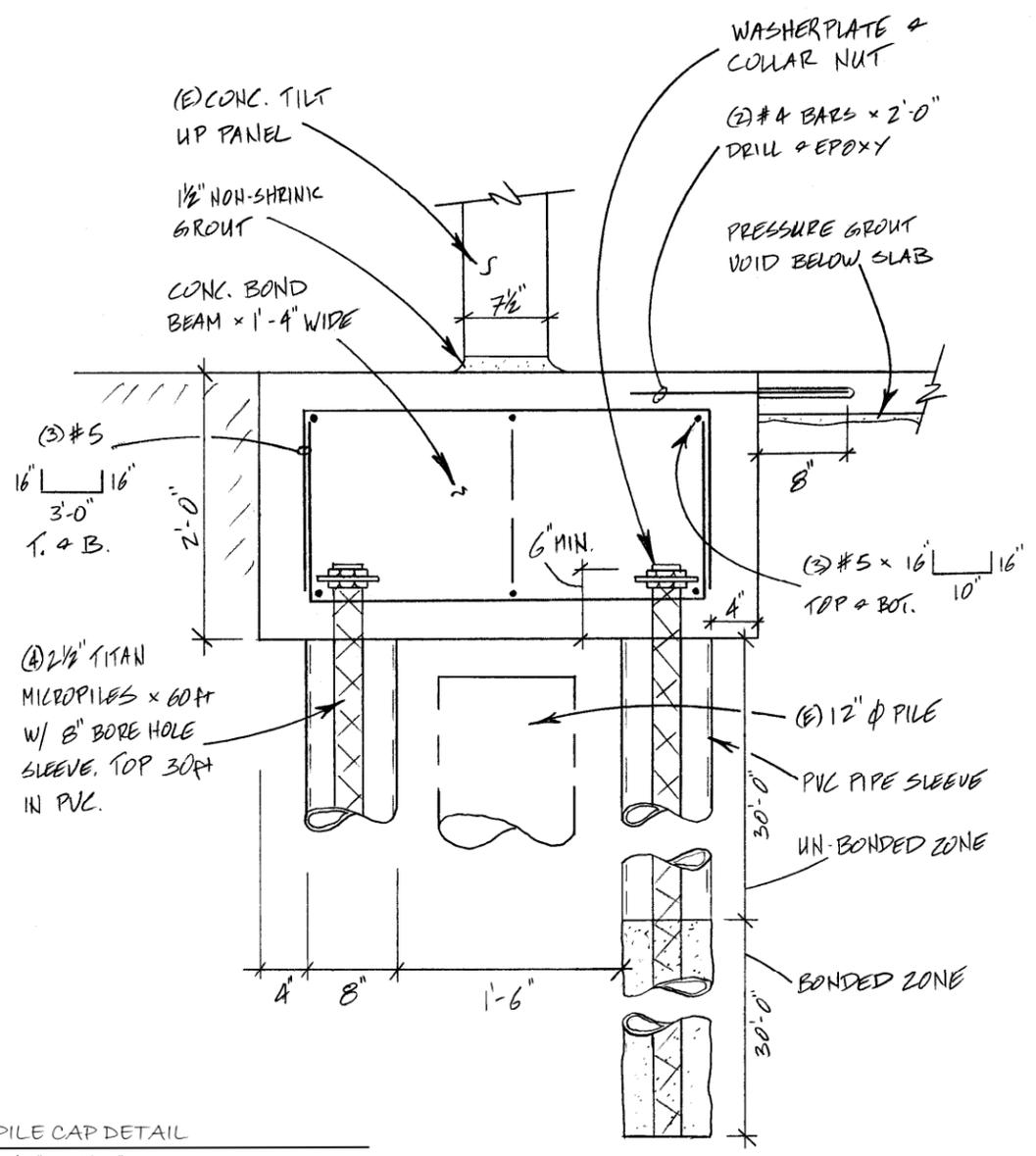
Project Number: 211105

Sheet Name:  
 FOUNDATION  
 PLAN

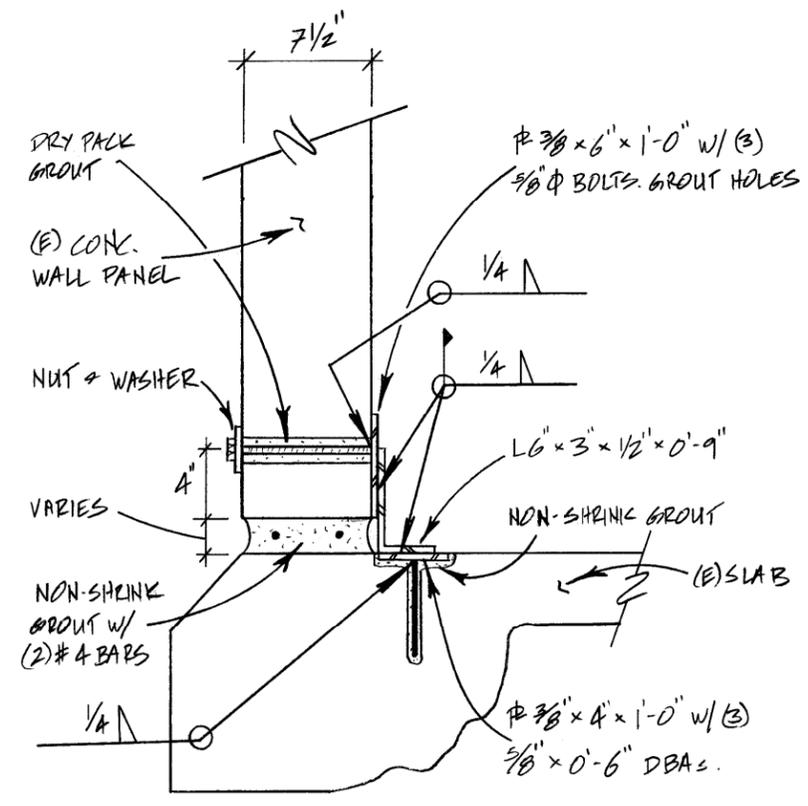
Sheet Number:

**S2**

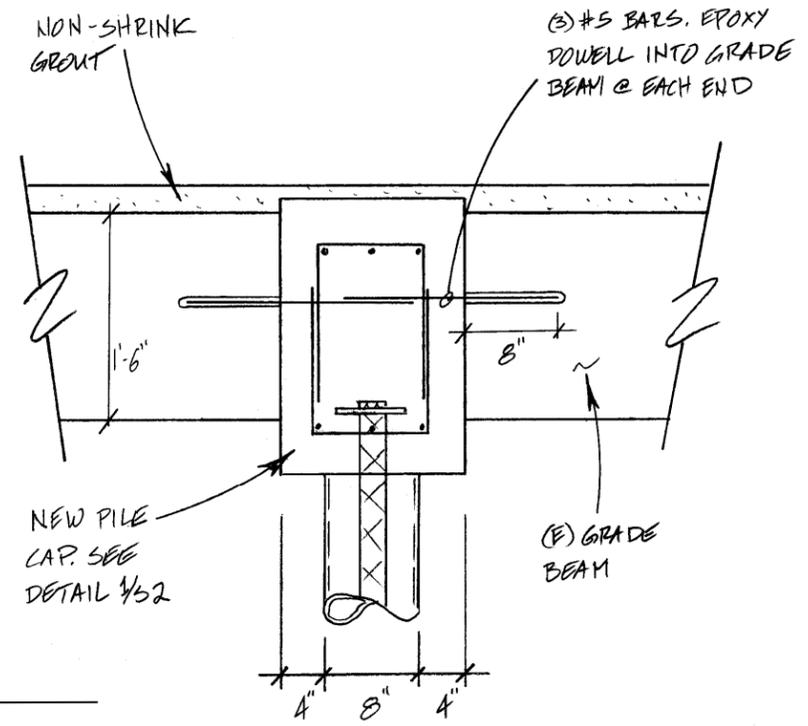
1 PILE CAP DETAIL  
 3/4" = 1'-0"



2 PANEL CONNECTION DETAIL  
 1" = 1'-0"



3 GRADE BEAM DETAIL  
 3/4" = 1'-0"



**Project:** Expo Center Hall E Tilt Up  
6020 N. Marine Drive  
Portland, OR 97217  
**Client:** Josh Lipscomb /Metro Venues

**Date:** 9/21/11  
**Page:** 1  
**By:** JJW  
**Job #** 211105

## Structural Calculations For Expo Hall E Panel Repair

### DESIGN LOADS:

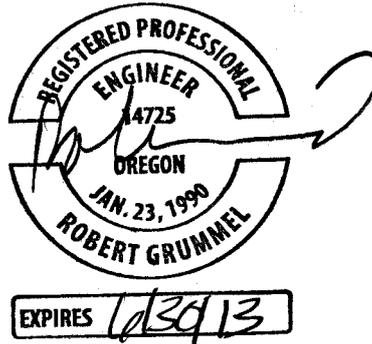
SNOW LOAD	25 PSF
WIND	100 MPH, EXPOSURE "B"
SIEMIC	SITE CLASS "D",\ SDS= 0.726 G, SD1=0.395G. I = 1.25 R=4.0

### ALLOWABLE LOADS

CONCRETE 3,000 PSI  
MICROPILE CAPACITY OF 35 KIPS/EA. BASED ON SOILS ENGINEERING REPORT

### OVERVIEW

In two locations the piles supporting panel joints settled causing displacement of the wall panels above. In both cases a single pile was supporting the load above. The top 30 feet of soil has displayed settlement which most likely produced downdrag forces on the existing piles causing them to fail. The repair is to drill (4) micropiles at each of these locations, raise the existing panels off of the old pile caps, pour new grade beam supports, and re-attach the panel to slab connections. The new piles will be unbonded for the top 30 feet of soil.



Project: Expo Center Hall E Tilt Up  
6020 N. Marine Drive  
Portland, OR 97217  
Client: Josh Lipscomb/Metro Venues

Date: 9/21/11  
Page: 2  
By: JJW  
Job # 211105

PANEL WEIGHT

①

$$HT = 30 \text{ ft}$$

$$WIDTH = 7\frac{1}{2}''$$

$$TRIB \approx 8 \text{ ft}$$

$$DL = 15 \text{ psf}$$

$$SL = 25 \text{ psf}$$

$$W_{DL} = 15(8) + 30\left(\frac{7.5}{12}\right)(150) = 2933 \text{ PLF}$$

$$W_{SL} = 25(8) = 200 \text{ PLF}$$

⑤

$$HT \approx 30 \text{ ft}$$

$$WIDTH = 7\frac{1}{2}''$$

$$TRIB = 30 \text{ ft}$$

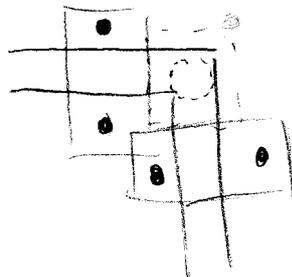
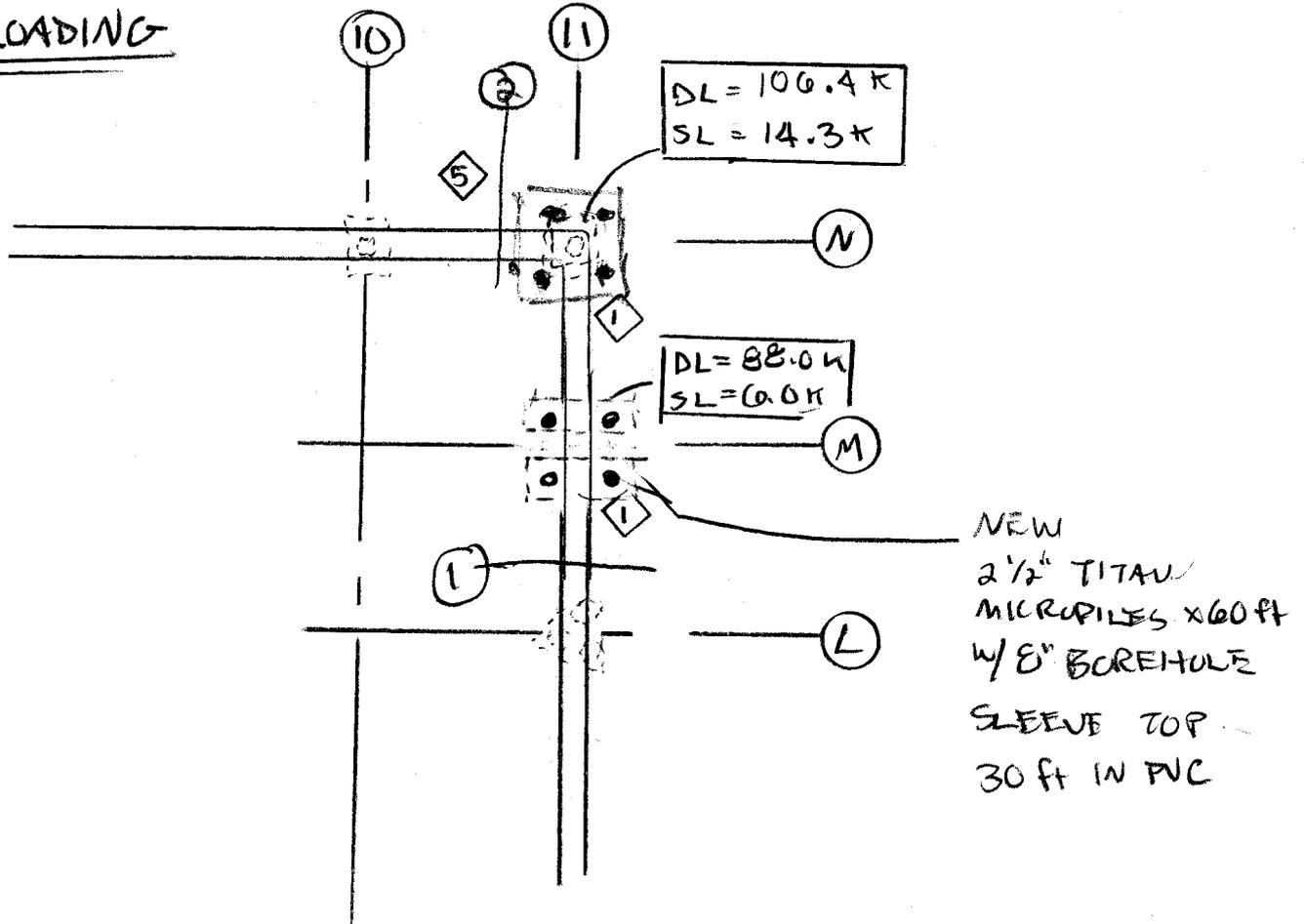
$$DL = 15 \text{ psf}$$

$$SL = 25 \text{ psf}$$

$$W_{DL} = 30(45) + 30\left(\frac{7.5}{12}\right)(150) = 4162$$

$$W_{SL} = 25(30) = 750 \text{ PLF}$$

PILE LOADING

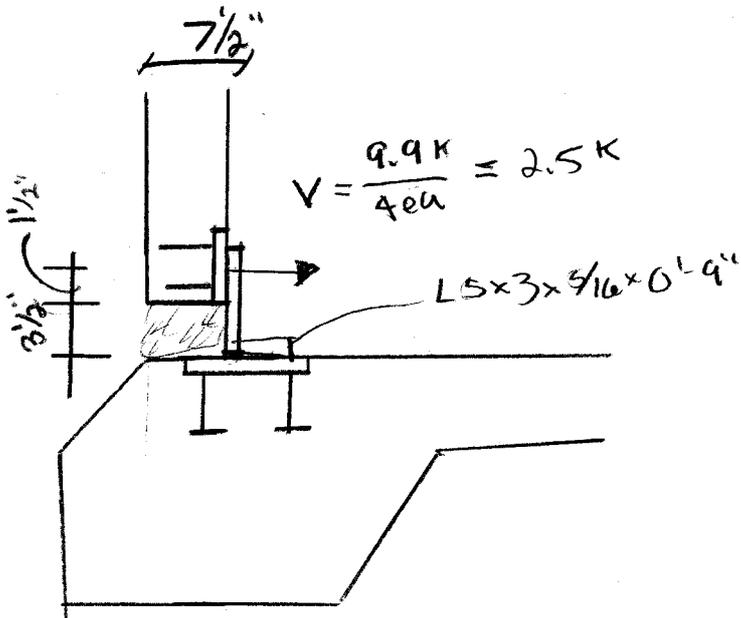
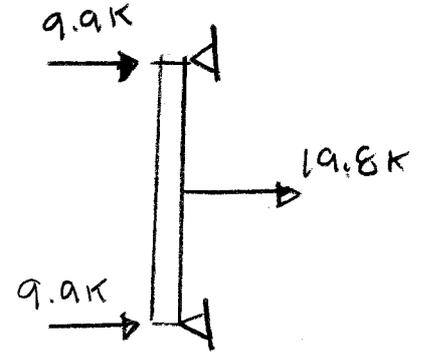


OUT OF PLANE LOADING / CNX. DESIGN

$$C_s = \frac{S_{OS}}{\left(\frac{R}{I}\right)} = \frac{0.72}{\left(\frac{4.0}{1.25}\right)} = 0.225$$

$$W = (2933)(30.5) = 88.0 \text{ k}$$

$$V = C_s W = 19.8 \text{ k}$$



CHECK FLAT PLATE BENDURE

$$M = 2.5 \text{ k}(3.5) = 8.75 \text{ k-in}$$

$$S_{REQ'D} = \frac{8.75}{24} = 0.36$$

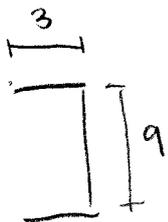
$$S = \frac{(9'')(5/16'')^2}{6} = 0.14 \text{ in}^3$$

USE L5x3x1/2x0'-9"

$$S = \frac{(9)(1/2)^2}{6} = 0.375$$

CHECK WELD TO RESIST

MOMENT & SHEAR



$$M = 5''(2.5) = 12.5 \text{ k-in}$$

$$f_w = \frac{1707(.4)}{2.0} \text{ torsion } \left(\frac{1}{4}\right) = 3.7 \text{ k/in}$$

$$S \approx \frac{(2ea)(.707)\left(\frac{3}{4}\right)^2}{a} = 0.53$$

$$S_{REQ'D} = \frac{12.5}{\frac{70(.4)}{2.0}} = 0.59$$

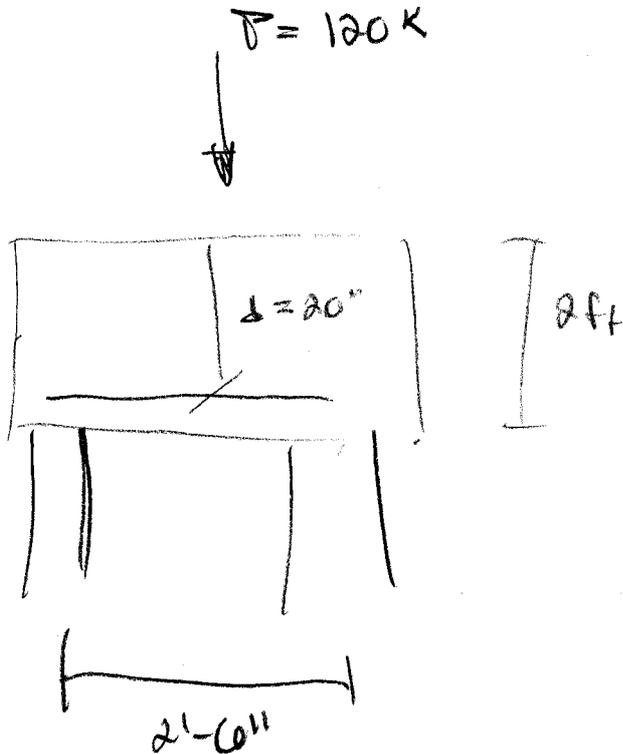
OK

FIXED ATTACHMENT A

Project: Expo Center Hall E Tilt Up  
6020 N. Marine Drive  
Portland, OR 97217  
Client: Josh Lipscomb / Metro Venues

Date: 1/21/11  
Page: 5  
By: JJW  
Job # 211105

## BOND BEAM DESIGN



$$M = \frac{PL}{4} = 75 \text{ K-ft} = 900 \text{ K-in}$$

$$A_s \text{ req'd} = \frac{900}{(0.9)(60)(20)} \\ = 0.833$$

USE MIN

(4) #4's

(5) #5's

**Portland Metropolitan Exposition Center (EXPO)  
Hall E Tilt Panel, Micropiling Project  
Request for Bid (RFB 12-2004)**

---



600 NE Grand Ave.  
Portland, OR 97232-2736  
503-797-1700

**ATTACHMENT B**



**Real-World Geotechnical Solutions  
Investigation • Design • Construction Support**

November 30, 2010  
Project No: 10-2124

Christopher Bailey / Heather Peck / Renee Pace  
**Metropolitan Exposition-Recreation Commission**  
777 NE ML King Jr. Boulevard  
Portland, Oregon 97232

Via e-mail with hard copies mailed

**Subject: Geotechnical Engineering Report  
Expo Center Hall E  
2060 N Marine Drive  
Portland, Oregon**

At your request, GeoPacific Engineering, Inc. (GeoPacific) performed a geotechnical engineering study for the Expo Center Hall E located southeast of the intersection of North Marine Drive and North Force Avenue in the City of Portland, Multnomah County, Oregon. The purpose of this study is to evaluate subsurface conditions at the site, to determine if possible the cause(s) of structural distress, and to provide remedial measures for mitigating the structural settlement. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-3842, dated August 20, 2010, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*.

#### **SITE DESCRIPTION AND BACKGROUND**

The site is located southeast of the intersection of North Marine Drive and North Force Avenue in the City of Portland, Multnomah County, Oregon (Figures 1 and 2). The existing structure was constructed during 1996 and 1997 and is comprised of a conventional concrete tilt-up structure with concrete slab-on-grade floors. Foundation support is provided by driven grout piles of unknown diameter and depth. The southeast corner of Hall E has settled over the years, with the total magnitude of settlement up to several inches. There is significant cracking of the tilt-up concrete panels located in the southeast corner of the structure and on the floor near the same area. Some cracking started soon after construction, and we understand the settlement has continued over the last 10 years.

Structural distress has primarily affected the two concrete tilt-up panels between grid lines L-11 and N-11, as shown on Figure 3. The individual panels are 30 feet wide, and supported by deep foundations. A single pile supports the panel edges at both M-11 and N-11. Pile capacity at these two locations is indicated on the structural plans to be 50 tons each (100 kips). A group of three piles supports the exterior wall at L-11. This pile group also supports roof load from a truss at that location (Figure 3). Individual pile capacity of 115 tons (230 kips) is indicated on the structural plans for this pile group.

The pattern of cracking and distress on conduits that traverse the upper portion of the distressed area indicates that the two tilt-up panels between L-11 and N-11 have moved downward relative to the rest of the structure. Movement appears to be greatest at M-11. To the east and west of this location, the angle brackets connecting the bottom of the tilt-up panels to the concrete slab appear to have rotated toward the interior of the building. This has resulted in arcuate cracks around the tops of the affected angle brackets,

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with maximum separation of about 5/8 inch. Significant cracking has also occurred at the tops of the panels joining at M-11, and several fragments of concrete have broken out and fallen to the floor at this location.

A significant gap has developed between the floor slab and the bottoms of the concrete tilt-up panels between L-11 and N-11. This gap is estimated to be up to about 2 inches wider than the approximately 1/2-inch gap that would have been present immediately after construction. Maintenance personnel have filled this gap with caulking. The cracks in the walls have been patched over the years with non-shrink grout. The cracks have continued to re-open in the grouted areas, with the most recent renewed cracking observed in September of this year. This would tend to indicate that minor movements are still occurring.

Some minor floor slab cracking has occurred in this area as well, predominantly near the south wall just east of L-11. Maximum crack width is about 1/8 inch. The majority of the floor slab cracks are 1/16 inch wide or less.

We understand that settlement was noted in the southwest corner of Hall E, which has similar structural conditions as the southeast corner where significant distress has occurred. The settlement in the southwest corner did not cause any significant cracking of the concrete tilt-up panels and does not appear to be a concern at this time.

## **REGIONAL GEOLOGIC SETTING**

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The subject site is underlain by the Quaternary age (last 1.6 million years) alluvium associated with periodic flooding of the Columbia River (Beeson et al., 1991). These river and stream deposits consist of sand, silt, and organic-rich clay with trace gravel. Underlying the alluvium is the Tertiary aged (about 2.5 to 23 million years ago) Troutdale formation, a conglomerate with trace interbeds of sandstone and mudstone (Beeson et al., 1991). Based on our experience in the area and previous geotechnical studies (AGRA, 1996; GRI, 1999), significant deposits of fill are known to overly the alluvium. Fill composition and density can vary significantly over short distances depending on the source, placement method and time of filling.

## **FIELD EXPLORATION**

One of the primary purposes of this study is to determine why settlement and structural distress have occurred in the southeast corner of Hall E, and not in other areas where similar structural loading and foundation systems are present. To evaluate this, we performed two general groups of explorations, one in the area that has exhibited the most distress, and the other in an area where distress has not occurred. The approximate locations of these explorations are shown on Figure 2.

The site-specific exploration for this study was conducted on September 3, 2010 and consisted of exploratory borings and cone Penetrometer soundings. Three exploratory borings (designated B-1 through B-3) were drilled to depths of 1.2 to 21.5 feet, as shown on Figure 2. It should be noted that exploration locations were determined in the field by cloth taping distances from building corners and other site features shown on the plans provided. The locations of the explorations should be considered approximate.

The boreholes were drilled using a trailer-mounted drill rig and solid stem auger methods. At each boring, SPT (Standard Penetration Test) sampling was performed in general accordance with ASTM D1586 using a 2-inch outside diameter split-spoon sampler and a 140-pound hammer equipped with a rope and cathead mechanism. During the test, a sample is obtained by driving the sampler 18 inches into the soil with the hammer free-falling 30 inches. The number of blows for each 6 inches of penetration is recorded. The Standard Penetration Resistance (“N-value”) of the soil is calculated as the number of blows required for the final 12 inches of penetration. If 50 or more blows are recorded within a single 6-inch interval, the test is terminated, and the blow count is recorded as 50 blows for the number of inches driven. This resistance, or N-value, provides a measure of the relative density of granular soils and the relative consistency of cohesive soils. At the completion of the borings, the holes were backfilled with bentonite.

To evaluate soil conditions at depth, two cone penetrometer soundings (CPT-1 and CPT-2) were advanced to refusal, using an electronic Hogentogler piezocone advanced by a hydraulic ram mounted inside a 20-ton truck. One of these soundings (CPT-2) was located in the area of structural distress and the other (CPT-1) in an area where distress has not been observed. Figure 2 shows the approximate location of the CPT soundings. Coreholes were drilled through the concrete slab and a boring advanced through the crushed rock prior to CPT testing. Separate corehole logs are included that indicate thickness of the concrete slab and crushed rock at the CPT location. The CPT soundings were advanced through the open coreholes. Continuous tip resistance measurements were recorded and correlated with soil behavior type and equivalent Standard Penetration Test (SPT) N-values. Cone penetrometer test data are attached.

Explorations were conducted under the full-time observation of GeoPacific personnel. Soil samples obtained from the borings were classified in the field and representative portions were placed in relatively air-tight plastic bags. These soil samples were then returned to the laboratory for further examination and laboratory testing. Pertinent information including soil sample depths, stratigraphy, soil engineering characteristics, and groundwater occurrence was recorded. Soils were classified in general accordance with the Unified Soil Classification System.

Summary borehole and CPT sounding logs are attached. The stratigraphic contacts shown on the individual borehole logs represent the approximate boundaries between soil types. The actual transitions may be more gradual. The soil and groundwater conditions depicted are only for the specific dates and locations reported, and therefore, are not necessarily representative of other locations and times.

## SUBSURFACE CONDITIONS

The following discussion is a summary of subsurface conditions encountered in our explorations. For more detailed information regarding subsurface conditions at specific exploration locations, refer to the attached boring and CPT logs. Also, please note that subsurface conditions can vary between exploration locations, as discussed in the *Uncertainty and Limitations* section below.

### Soils

Materials encountered in the borings and CPT soundings consisted of the existing 6- to 6.5-inch thick floor slab, base rock, undocumented fill, alluvium, and Troutdale Formation material as described below.

**Base Rock** – The concrete slab in borings and cone penetrometer soundings was directly underlain by 7.5 to 18 inches of crushed rock that serves as base rock for the slab. The rock was generally 1-inch minus angular gravel with silt and sand (GP), and was observed to be loose to medium dense at the boring and CPT sounding locations. It should be noted that a gap was noted between the bottom of the floor slab and the top of the base rock in 3 of the 5 coreholes. The greatest gap, 2.5 inches, was noted in the

westernmost of the explorations (B-1), as shown on Figure 2. The gap decreased in explorations to the east, and was 1.5 inches in CPT-1 and 1 inch in B-3. No gap was noted in the coreholes for the easternmost explorations, CPT-2 and B-2 (see Figure 2).

**Undocumented Fill** – Underlying the base rock in borings and CPT soundings was soft to hard undocumented fill. The fill was typically soft to hard, dark gray to brown, clayey silt to silty clay with orange and gray mottling. In borings, the undocumented fill extended to a depth of about 15 to 17 feet below ground surface (bgs) and contained concrete fragments, other inorganic debris, rock, and trace organics.

**Alluvium** – Underlying the undocumented fill in explorations was alluvium deposited by the Columbia River (Beeson et al., 1991). In CPT-1, between a depth interval of about 20 to 47 feet, the alluvium consisted generally of medium dense to dense silty sand and sand. In a similar depth interval in CPT-2, between about 17 and 45 feet, soils were generally soft to very soft silty clay and clay, particularly in the upper part of this unit. Figure 4 shows a comparison of subsurface conditions encountered in the two CPT soundings. Below this zone of different soil conditions, the substrata were relatively consistent between CPT-1 and CPT-2. As shown on Figure 4, soils below about 47 to 45 feet bgs in CPT-1 and CPT-2 consisted generally of interbedded medium dense silty sand to sand, and medium stiff to stiff silt to clayey silt. In the CPT soundings, the alluvium extended to depths of 117 to 119 feet.

**Troutdale Formation** – Underlying the alluvium in CPT soundings was hard gravelly sand (SP) to sand (SP) belonging to the Troutdale Formation. Both soundings met refusal in the upper part of the Troutdale Formation unit.

### **Groundwater**

Groundwater was encountered in boring B-1 at a depth of 17 feet below the ground surface. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. Perched groundwater conditions often occur over fine-grained native deposits and engineered fill such as those beneath the site, particularly during the wet season.

## **EVALUATION OF THE CAUSE OF STRUCTURAL DISTRESS**

Based on results of this study, it is our opinion that several factors have contributed to the settlement and structural distress in the southeast corner of Hall E. These factors include differential subsurface conditions, soil compressibility, possible pile failure, and groundwater level variations as discussed below.

### **Differential Subsurface Conditions**

Differential subsurface conditions appear to be a major contributor to the settlement and structural distress. This condition also explains why settlement and damage have occurred in the southeast corner of the structure and not in other areas that have similar structural loads and are similarly supported. The differential soil conditions are shown graphically on Figure 4, a comparison of the two CPT soundings.

In the area of no structural distress (CPT-1), soils between about 20 and 47 feet bgs consist of medium dense to dense silty sand to sand. In the area of structural distress (CPT-2), soils within this depth range consist of very soft to soft silt and clay. In particular, soils between about 17 and 25 feet bgs in CPT-2 consist of very soft clay and “sensitive fine grained” deposits. These soils are much more susceptible to settlement under structural loading than those at a similar depth interval in CPT-1. Soil conditions below depths of about 45 to 47 feet bgs were similar in the two CPT soundings.

The differential soil conditions observed in the two CPT soundings likely occurred during the natural processes of erosion and deposition in the Columbia River channel. The area of soft soils may have been eroded by a meander loop in the river, and could subsequently have been backfilled by an overbank or other low-energy deposit. This could have created the localized zone of fine-grained, compressible soils encountered in CPT-2.

### **Soil Compressibility**

Some settlement has likely occurred beneath the entire building floor slab, due to the moderately compressible alluvial soils that underlie the site. Site grades were raised by several feet during building construction, which imposed an additional load on these soils that would have resulted in some settlement. A localized zone of greater settlement has occurred in the zone of soft soils identified in CPT-2, near the area of structural distress. The majority of this type of settlement typically occurs immediately after the application of a new load such as additional fill or foundation loads. The rate of settlement generally decreases over time. Some minor ground movements will continue to occur over time due to a phenomenon known as “secondary compression.”

The reported structural movement and distress fits the pattern of settlement-related damage. The majority of the movement was reported soon after construction, and movement appeared to reduce over time. Some minor movements continue to be noted, that are likely a result of secondary compression of fine-grained soils beneath the site.

An elevation survey was performed for the southeast portion of Hall E in 2004 (see Figure 5). Surface elevation measured at J-11, near boring B-1 where a 2.5-inch gap was noted beneath the floor slab, was 33.365 feet. At M-11, where the floor slab has settled and is currently in contact with the crushed rock surface, measured elevation was 33.17 feet. This equates to a 2.3-inch elevation difference, which is consistent with the estimated total settlement in the distressed area, and the gap between the bottom of slab and base rock observed in B-1.

### **Possible Pile Failure**

In our opinion, it is possible that one or both of the piles at M-11 and N-11 have failed or deformed significantly under the additional loading imparted by soil settlement in the affected area. Based on review of the project geotechnical report (AGRA, 1996) it does not appear that downdrag loads were considered in pile design. The structure is supported by single, relatively slender piles at the primary location of distress (M-11 and N-11). These piles may have been susceptible to flexural failure, particularly within the zone of very soft soils identified in CPT-2.

During the course of this study we were not able to obtain records of pile installation that would indicate specifics of pile configuration and depth within the area of structural distress. The project geotechnical report (AGRA, 1996) recommended driven pipe piles, but we understand a change was made to driven grout piles, a technology proprietary to a local pile driving company. The project plans call for a single 12-inch diameter pile, with minimum depth of 60 feet and allowable capacity of 50 tons, at both M-11 and N-11 (KPFF, 1996; Figure 3).

We were able to find a mention of pile configuration and capacities in a geotechnical report prepared for replacement of nearby Hall D (GRI, 1999). This report contains the following statement:

In our opinion, support for the main structure [Hall D replacement] should be provided by a deep foundation system that extends into the lower silt and sand that underlie the site. Based on the results of load tests performed on 16-inch diameter, driven grout piles for the Hall E project and

our previous experience with similar projects, we anticipate that 16-inch-diameter driven grout piles will be the most suitable for support of the structure.

The report goes on to recommend allowable loads of 70 and 100 tons each for 16-inch diameter driven grout piles extending to depths of 60 and 80 feet respectively, for the Hall D replacement project (GRI, 1999).

Without additional information on the specific pile diameter, length, and reinforcing at Hall E, it is not possible to quantify the potential for flexural failure or pile settlement from downdrag loading. If such information becomes available in the future, GeoPacific should be contacted to provide additional analyses.

### **Settlement from Groundwater Fluctuations**

Settlement of fine-grained soils can be caused by fluctuations in groundwater level. In particular, when groundwater levels are lowered, additional loads are imparted to the soil mass due to the increased weight of soils as buoyant forces are removed. Some of the minor movements observed recently, for example the re-opening of cracks that had been recently grouted, could potentially be explained by groundwater fluctuations.

### **RECOMMENDATIONS**

Results of this study indicate that if no action is taken to repair the ongoing structural distress, some minor additional movement is likely to occur in the future. Other limitations of a potential “no action” approach are discussed below. To provide adequate structural support, and allow jacking of structural elements that have settled back to near their original position, we recommend installation of micropiles at M-11 and N-11. Consideration should also be given to pressure grouting the zone immediately beneath the floor slab, particular near the junction of tilt-up panel walls and the floor slab. Additional geotechnical explorations and evaluations would assist in planning such a grouting operation if the option is pursued. Additional structural engineering review is also recommended.

### **“No Action” Approach**

The history of structural distress that has occurred indicates that the majority of the settlement-related damage occurred soon after construction. Some additional movements continue to occur, even very recently, but to a much lesser degree. This is consistent with the secondary compression behavior of very soft fine-grained soils such as the localized deposit encountered in CPT-2 at the southeast building corner.

A no-action approach may be feasible for management of the observed structural distress. However, minor additional settlement and structural distress should be anticipated. This could likely be handled as it has been in the past, as part of ongoing building maintenance efforts.

Additional settlement and possible floor slab cracking may occur in other portions of the building which have not yet experienced distress. This would most likely occur in the area near the pile-supported exterior structural wall, where voids were detected in several of the core holes between the bottom of the floor slab and surface of the crushed rock building pad.

In our opinion, the potential for catastrophic damage or structural collapse is very low under a “no-action” scenario. The primary hazard resulting from a no action approach would be the potential for small concrete fragments to break off of the tilt-up panels and fall to the floor as has occurred in the past. To reduce the potential for this type of damage, and the need for ongoing maintenance in the affected area, repair measures would be needed as described in the following report sections.

## **Micropiles**

Micropiles should be installed at M-11 and N-11, in the approximate locations shown on Figure 3. Preliminary analysis indicates that 6 micropiles will be adequate, designed for allowable loads of 35 kips each. We recommend 2 7/8-inch diameter Titan micropiles (73/56 or better), installed in 8-inch diameter boreholes. Micropiles 60 feet long are recommended. The upper 30 feet of each micropile should consist of a "no-load" zone to prevent a reduction in pile capacity due to downdrag loading. The no-load zone can be achieved by sleeving the upper portion of the Titan rod with a grease-filled PVC sleeve, or other method that will prevent grout from bonding to the bar in the no-load zone.

The structural engineer should verify the appropriate bar size based on the required design loads. Larger bars may be required for the sacrificial piles to facilitate the performance tests. Steel bars used for micropiles should be fully encapsulated with double corrosion protection.

The bond between the grout body and the soil is highly dependent on subsurface conditions and construction techniques utilized. For preliminary estimating purposes, we assumed Titan micropiles would be utilized. Other micropile systems and installation methods may be feasible. Consideration should be given to subsurface conditions which include sand layers that may be prone to caving. If it is desired to pursue other micropile options, GeoPacific should be contacted to provide additional recommendations.

Prior to installation of production micropiles, we recommend installation and performance testing of two sacrificial micropiles to verify required capacities are being achieved. Micropiles are generally not designed to incorporate end bearing; therefore tension tests may be performed. Performance tests should be held at 200 percent of the design load for at least 10 minutes to monitor the pile performance and then taken to failure. Adjustments to the micropile lengths and/or installation methods may be necessary based on results of the performance testing.

At least two sacrificial micropiles should be successfully tested prior to installation of the recommended micropiles beneath the structure, using the same equipment and methods to be used for production work. The verification test micropiles should be loaded to 200 percent of the design load. The design load (DL) is equal to the design pullout resistance, multiplied by the bond length of the micropile. The locations of the tests should be approved by the geotechnical engineer.

The verification test micropiles should have a minimum bond length of 30 feet and a minimum free length of 30 feet. Verification test micropile bars should be sized such that the test load does not exceed 80 percent of the yield or ultimate strength of the steel.

Test locations proposed by the contractor should be reviewed by the geotechnical engineer during construction and modified as appropriate based on conditions encountered. Verification micropiles should be tested as follows:

1. A small seating load should be applied to the micropile before starting the test. Gauges to measure displacement should be mounted on a tripod or similar independent reference point. Measurements of the micropile displacement should be taken to 0.001 inch, using the bar end as the point being measured.
2. The micropile should be loaded in increments of 25 percent of the design load to twice the design load. The load should be held for 60 minutes at 1.5 DL, otherwise the load should be held for 10 minutes. Displacements should be recorded at 0, 1, 2, 3, 5, 10, 20, 30, 50, and 60 minutes.

3. For a successful test, a plot of displacement versus log time for the 1.5 DL loading should show a creep rate that does not exceed 0.08 inches per log cycle of time and should be linear or decreasing. In addition, the total displacement should exceed 80 percent of the theoretical elastic elongation of the non-bonded length.

Following micropile installation, the existing grade beam can be jacked back to near its original elevation. We recommend that the conditions of the existing structures be documented prior transferring loads to the micropiles. Survey points should be established on existing columns and footings. Both vertical and horizontal deformations should be monitored. Micropile installation and testing should be monitored by GeoPacific.

### **Pressure Grouting**

Following micropile installation, consideration should be given to pressure grouting the zone between the bottom of the floor slab and existing crushed rock. This would be most critical around the perimeter of the structure, where gaps have apparently developed near the pile-supported exterior portion of the floor slab which is not able to settle with the ground beneath. The interior of the floor slab, that is not pile supported, has likely settled along with the underlying ground surface.

### **Additional Geotechnical Studies and Structural Engineering Review**

If it is desired to pursue the floor slab grouting option, we recommend additional coreholes in other locations of Hall E to determine the extent of the grouting needed. In conjunction with the additional coreholes, a detailed topographic map of the existing floor slab would be beneficial. GeoPacific can provide a floor slab level survey using our ZipLevel equipment. The previous survey data (Figure 5) provides some useful information regarding relatively floor slab movements, but it would be beneficial to have a more detailed survey that reflects current floor slab conditions.

We recommend that the structural engineer review this report and evaluate structural concerns that may arise from the proposed mitigation system. Any structural repair measures needed for the distressed concrete tilt-up panels should also be provided by the structural engineer.

### **UNCERTAINTIES AND LIMITATIONS**

We have prepared this report for the owner and their consultants for use in design of this project only. The conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared. No warranty, express or implied, is made. The scope of our work did not include environmental assessments or evaluations

November 30, 2010  
GeoPacific Project No. 10-2124

regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.



We appreciate this opportunity to be of service.

Sincerely,

**GEO PACIFIC ENGINEERING, INC.**

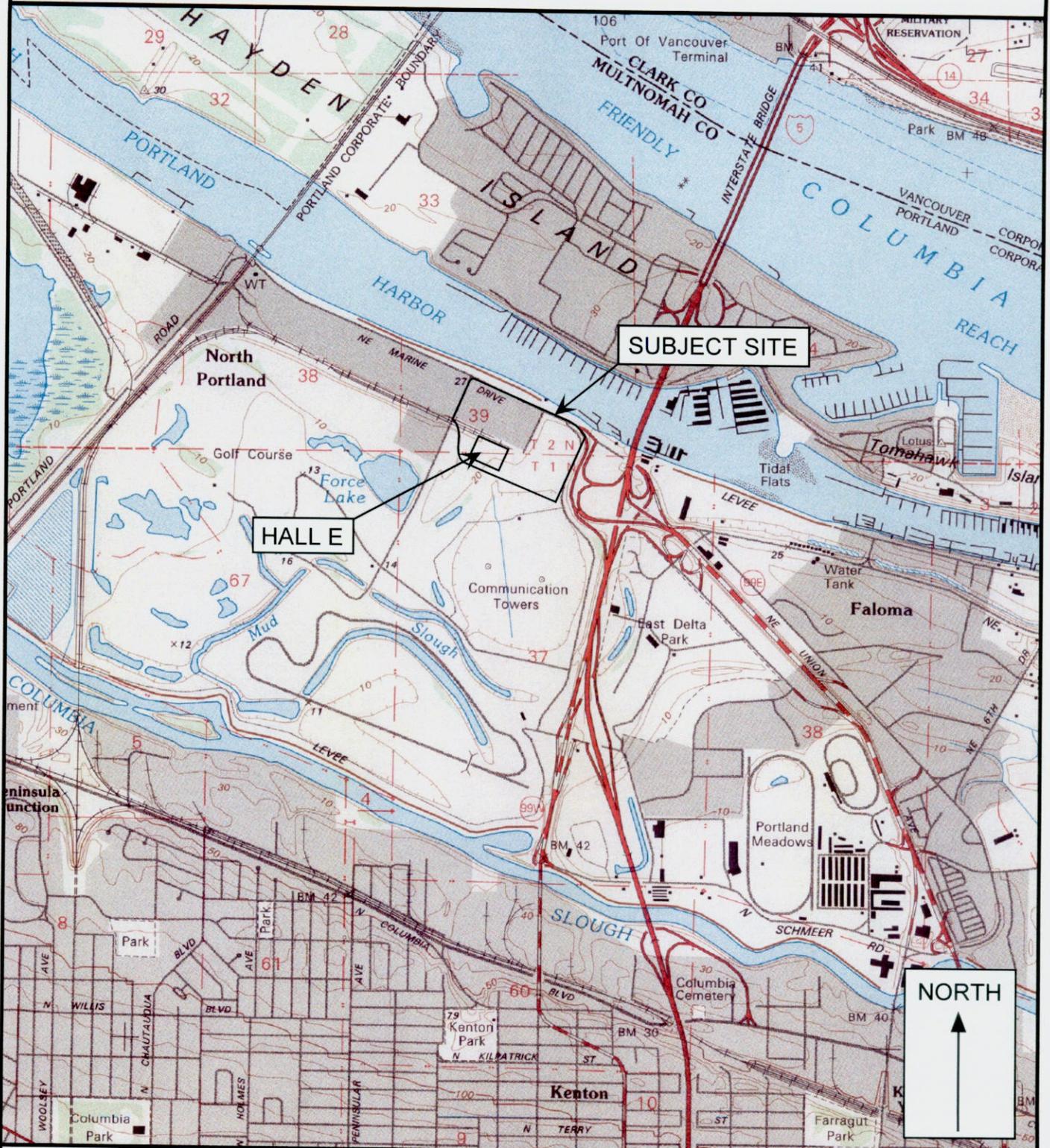
Beth K. Rapp, G.I.T.  
Project Geologist

Scott L. Hardman, P.E., G.E.  
Principal Geotechnical Engineer

- Attachments:   References
- Figure 1 – Vicinity Map
  - Figure 2 – Site and Exploration Plan
  - Figure 3 – Foundation Plan
  - Figure 4 – Comparison of CPT Sounding Data
  - Figure 5 – 2004 Floor Slab Elevation Survey
  - Boring logs (B-1 through B-3; CPT-1 and CPT-2)
  - Cone Penetrometer Test (CPT) Data – CPT-1 and CPT-2

## REFERENCES

- AGRA Earth & Environmental, Inc., 1996, Geotechnical Investigation, Metropolitan Exposition Center Expansion, Portland, Oregon, consultant report dated March 15.
- Beeson, M.H., Tolan, T.L., and Madin, I.P., 1991, Geologic map of the Portland Quadrangle, Multnomah, and Washington Counties, Oregon: Oregon Department of Geology and Mineral Industries Geological Map Series GMS-75, scale 1:24,000.
- Geotechnical Resources, Incorporated (GRI), 1999, Geotechnical Investigation, Portland Exposition Center, Hall D Replacement, Portland, Oregon, consultant report dated October 12.
- KPFF Consulting Engineers, 1996, Expo Facility Addition, Metropolitan Exposition-Recreation Commission, 2060 North Marine Drive, Portland, Oregon, structural plans, Sheets S0.1, S2.1, S2.1B, S5.1, dated 4/15/96 with most recent revision dated 6/21/96.
- Yeats, R.S., Graven, E.P., Werner, K.S., Goldfinger, C., and Popowski, T., 1996, Tectonics of the Willamette Valley, Oregon: in Assessing earthquake hazards and reducing risk in the Pacific Northwest, Vol. 1: U.S. Geological Survey Professional Paper 1560, P. 183-222, 5 plates, scale 1:100,000.



**Legend**

Approximate Scale 1 in = 2,000 ft

Date: 09/27/10

Drawn by: EKR

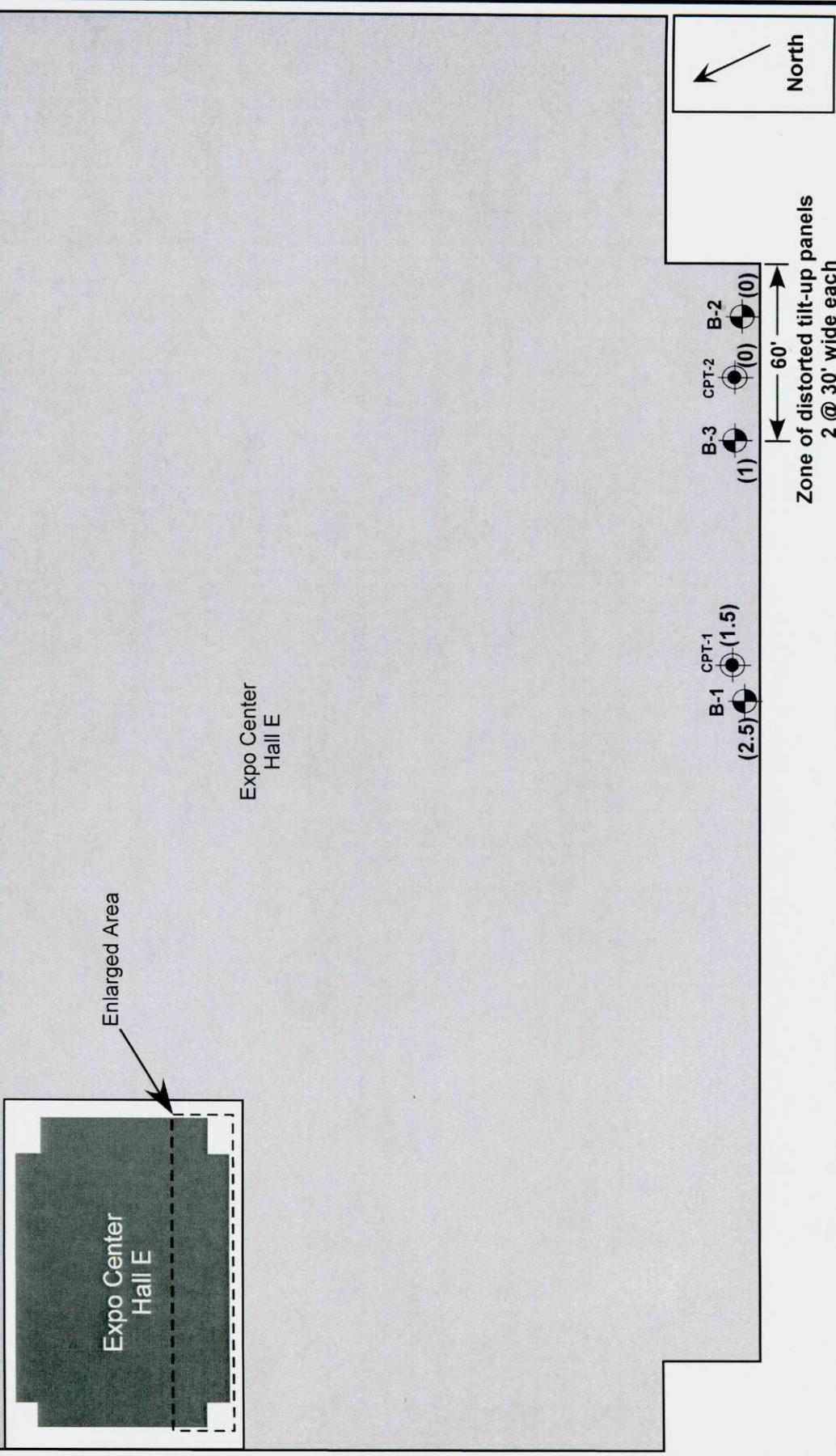
Base map: U.S. Geological Survey 7.5 minute Topographic Map Series, Portland, Oregon Quadrangle, 1990

Project: Expo Center Hall E Portland, Oregon	Project No. 10-2124	FIGURE 1
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# SITE AND EXPLORATION PLAN



Date: 09/07/10  
 Drawn by: EKR

0 50' 50'  
 APPROXIMATE SCALE 1"=50'

**Legend**

- CPT-1 (x) CPT Designation and Approximate Location
- B-1 (x) Boring Designation and Approximate Location

Note: (x) indicates gap in inches between bottom of floor slab and crushed rock

Project: Expo Center Hall E  
 Portland, Oregon

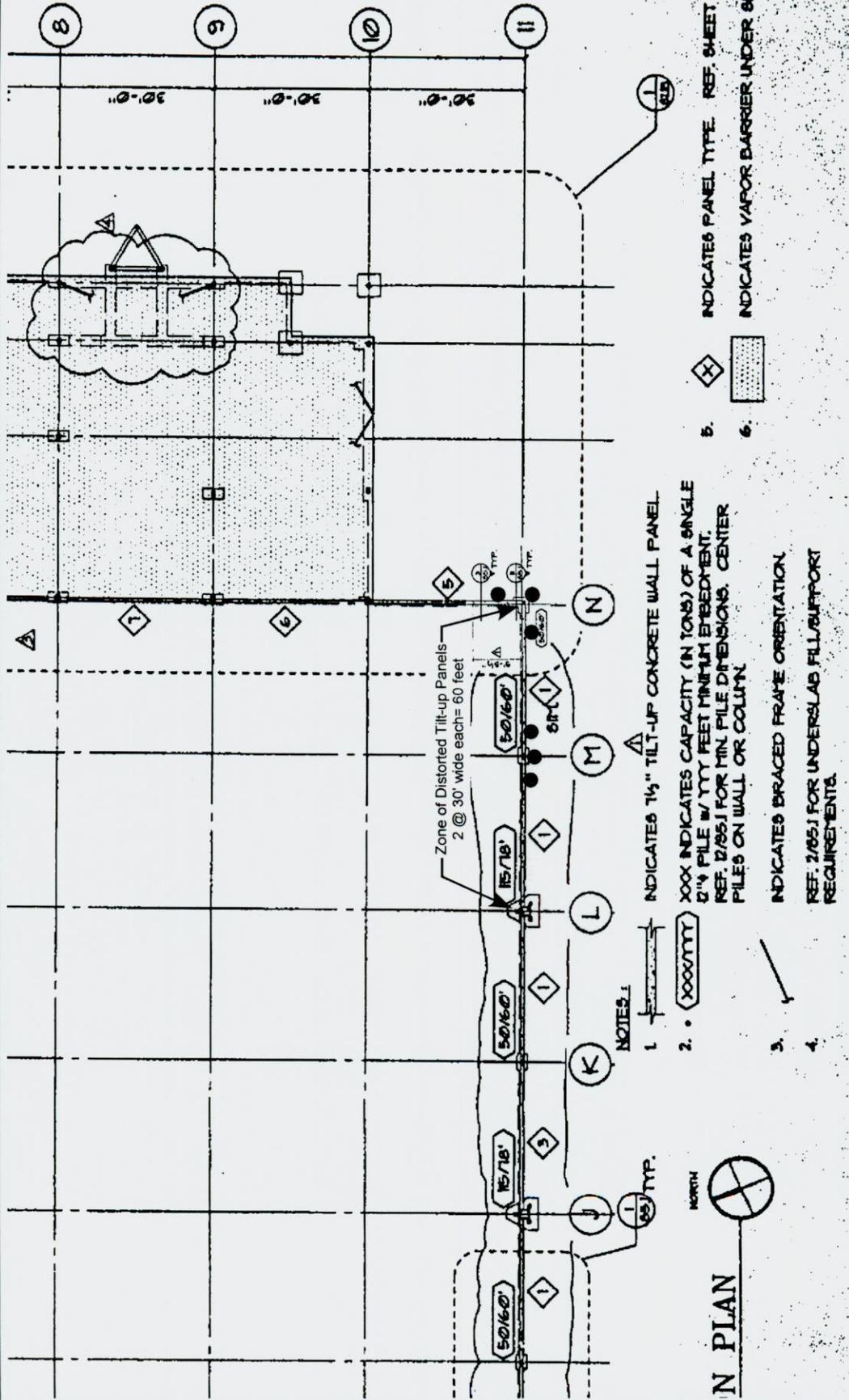
Project No. 10-2124

**FIGURE 2**



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# FOUNDATION PLAN



### NOTES:

1. [Symbol] INDICATES 1 1/2" TILT-UP CONCRETE WALL PANEL.
2. [Symbol] XXX INDICATES CAPACITY (IN TONS) OF A SINGLE 2 1/4" PILE W/ TYPICAL MINIMUM EMBEDMENT. REF. D/85J FOR MIN. PILE DIMENSIONS. CENTER PILES ON WALL OR COLUMN.
3. [Symbol] INDICATES BRACED FRAME ORIENTATION.
4. [Symbol] REF. D/85J FOR UNDERSLAB FILL/SUPPORT REQUIREMENTS.

5. [Symbol] INDICATES PANEL TYPE. REF. SHEET S31.
6. [Symbol] INDICATES VAPOR BARRIER UNDER SLAB.

### N PLAN



Date: 10/18/10  
 Drawn by: SLH



APPROXIMATE SCALE 1"=30'

Legend ● Recommended micropile location - 6 total

Note: Base map from KPFF (1996), Sheet S2.1; information at N-11 added from Sheet S2.1B

Project: Expo Center Hall E  
 Portland, Oregon

Project No. 10-2124

FIGURE 3

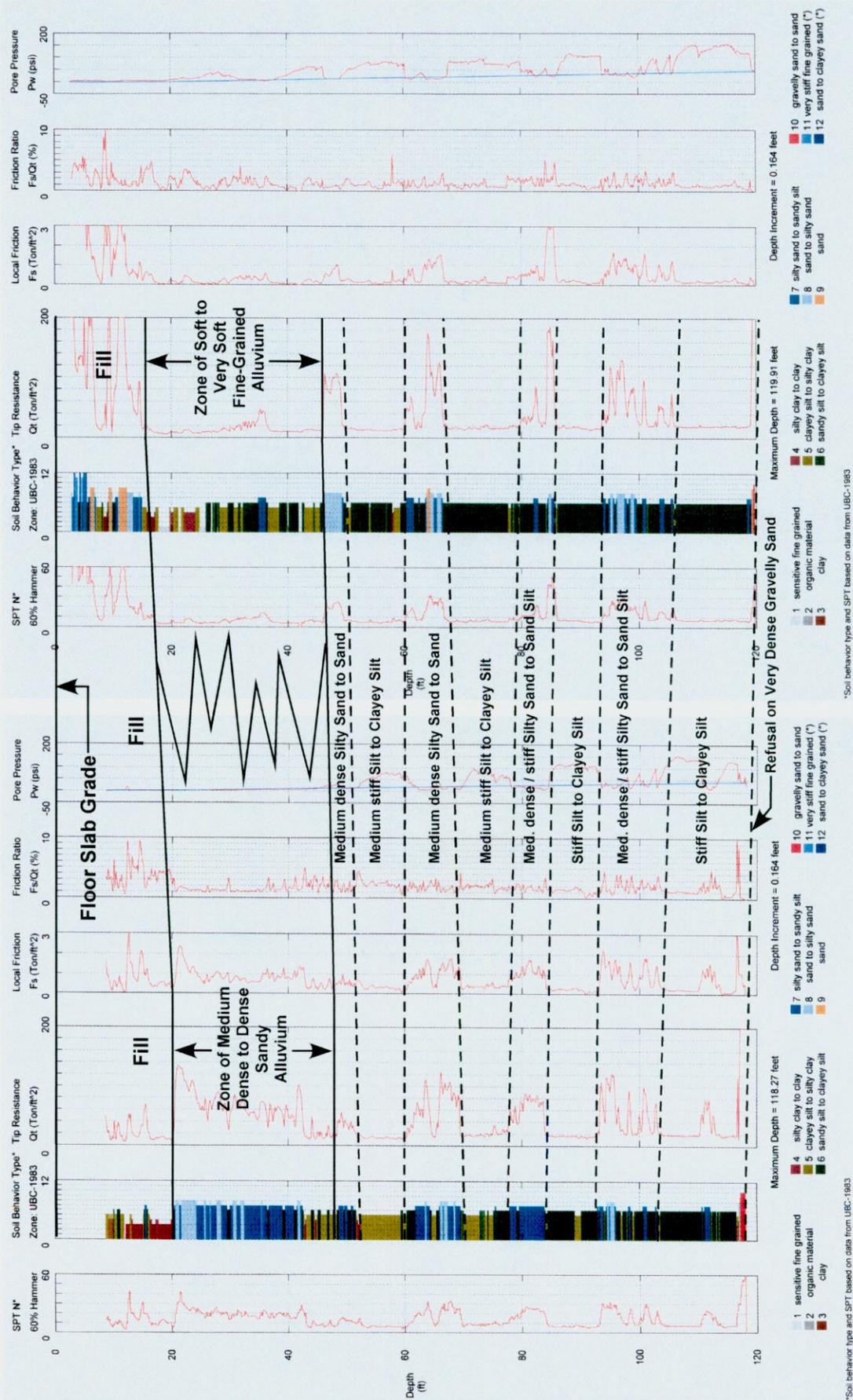
# COMPARISON OF CPT SOUNDING DATA

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## CPT-1 - Area of No Distress

## CPT-2 - Area of Structural Distress



Project: Expo Center Hall E  
Portland, Oregon

Project No. 10-2124

Date: 10/20/10  
Drawn by: SLH

FIGURE 4



Ming Surveyors, Inc.

8025 N.E. Killingsworth  
PORTLAND, OR 97218  
(503) 221-8905

JOB

SHEET NO.

CALCULATED BY

CHECKED BY

SCALE

WORK FROM =

OF

DATE

DATE

1 OF 1

D.V.M

4-27-04

B.B

N.T.S

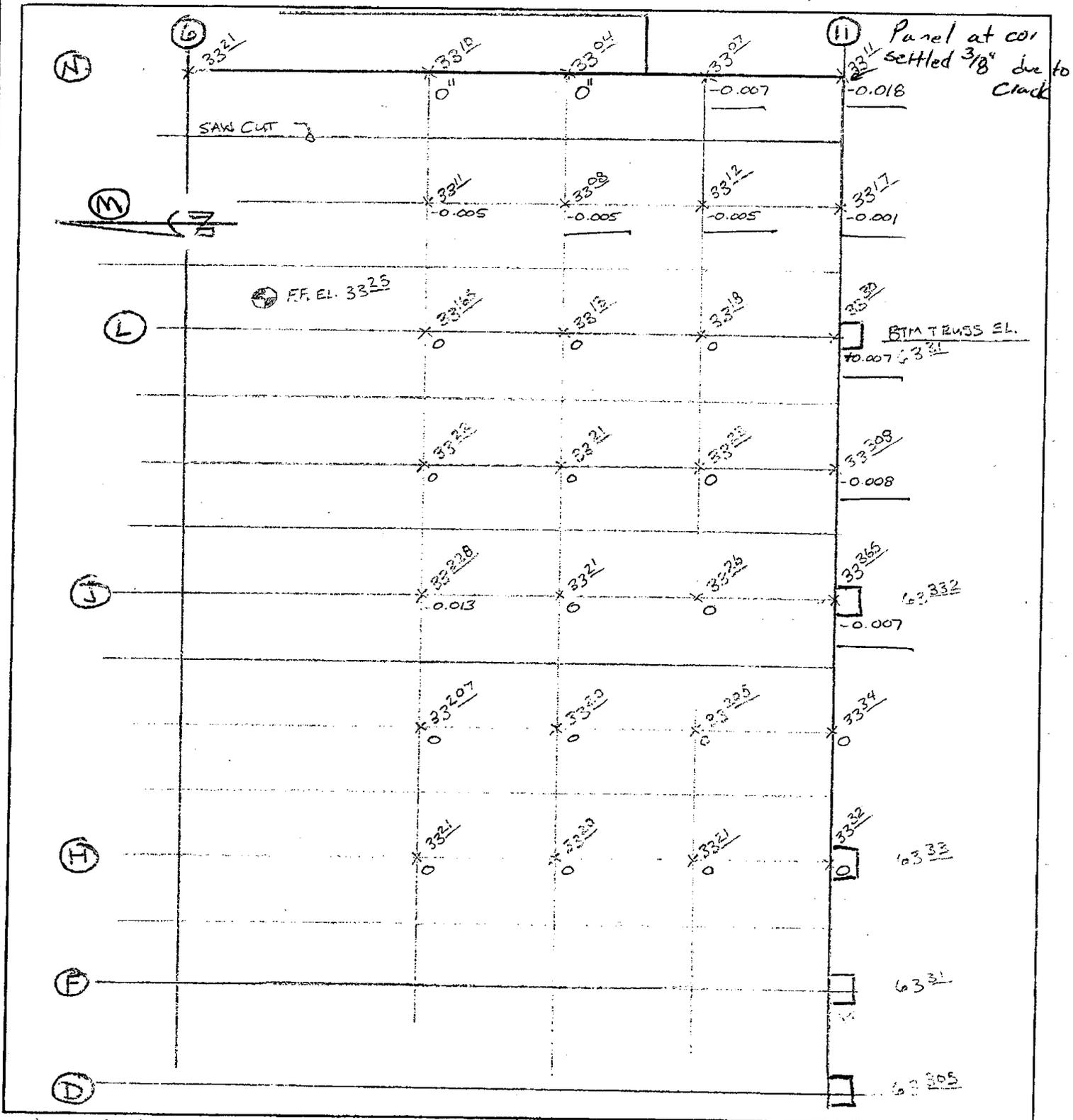


FIGURE 5



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# BORING LOG

Project: Expo Center Hall E  
 Portland, Oregon

Project No. 10-2124

Boring No. B-1

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing Zone	Material Description
						6.5" Concrete Slab with 7.5" loose base rock
5		79				Hard, clayey SILT (ML) to silty CLAY (CL), light brown to dark gray, with rock fill and inorganic debris, trace organics, subtle to strong orange and gray mottling, moist (Fill)
		42				
10						Practical Refusal on concrete debris at 6.5 Feet Noted approx. 2.5-inch gap between bottom of floor slab and crushed rock  No groundwater or seepage encountered
15						
20						
25						
30						
35						

**LEGEND**



Bag Sample



Split-Spoon



Shelby Tube Sample



Static Water Table at Drilling



Static Water Table



Water Bearing Zone

Date Drilled: 9/3/10  
 Logged By: B. Rapp  
 Surface Elevation:



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# BORING LOG

Project: Expo Center Hall E  
 Portland, Oregon

Project No. 10-2124

Boring No. **B-2**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing Zone	Material Description
						6.5" Concrete Slab over 18" loose base rock
5		34				Soft to hard, clayey SILT (ML) to silty CLAY (CL), trace fine to medium grained sand, brown to dark gray, with inorganic debris and rock fill, trace organics, subtle to strong orange and gray mottling, moist (Fill)
		44				
		5				
10		7				
		10				
15		4				Very soft to soft, sandy SILT (ML), light brownish gray, micaceous, strong orange and gray mottling, iron staining, very moist (Alluvium)
20		2				
25						Boring Terminated at 21.5 feet No gap noted between bottom of floor slab and crushed rock
						Static Groundwater at 17 feet below ground surface at time of drilling
30						
35						

**LEGEND**



Bag Sample



Split-Spoon



Shelby Tube Sample



Static Water Table at Drilling



Static Water Table



Water Bearing Zone

Date Drilled: 9/3/10  
 Logged By: B. Rapp  
 Surface Elevation:



13910 SW Galbreath Drive, Suite 102  
 Sherwood, Oregon 97140  
 Tel: (503) 625-4455 Fax: (503) 625-4405

# BORING LOG

Project: Expo Center Hall E  
 Portland, Oregon

Project No. 10-2124

Boring No. B-3

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing Zone	Material Description
						6.5" Concrete Slab with approx. 14" loose base rock
5						Bottom of Hole at 2 feet Noted approx. 1-inch gap between bottom of floor slab and crushed rock  No groundwater or seepage encountered
10						
15						
20						
25						
30						
35						

**LEGEND**



100 to 1,000 g  
 Bag Sample



Split-Spoon



Shelby Tube Sample



Static Water Table at Drilling



10-20-99  
 Static Water Table



Water Bearing Zone

Date Drilled: 9/3/10  
 Logged By: B. Rapp  
 Surface Elevation:



13910 SW Galbreath Drive, Suite 102  
 Sherwood, Oregon 97140  
 Tel: (503) 625-4455 Fax: (503) 625-4405

# BORING LOG

Project: Expo Center Hall E  
 Portland, Oregon

Project No. 10-2124

Boring No. CPT-1

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing Zone	Material Description
						6" Concrete Slab with 7.5" loose base rock
						<p>Bottom of Hole at 1.2 feet            Noted approx. 1.5-inch gap between bottom of floor slab and crushed rock</p> <p>Cone Penetrometer Test (CPT) Sounding extended through corehole.            See separate log of CPT-1</p> <p>No groundwater or seepage encountered</p>

**LEGEND**



100 to 1,000 g  
 Bag Sample



Split-Spoon



Shelby Tube Sample



Static Water Table at Drilling



Static Water Table



Water Bearing Zone

Date Drilled: 9/3/10

Logged By: B. Rapp

Surface Elevation:



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 Sherwood, Oregon 97140  
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# BORING LOG

Project: Expo Center Hall E  
 Portland, Oregon

Project No. 10-2124

Boring No. CPT-2

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing Zone	Material Description
						6" Concrete Slab with 8" very loose base rock
						<p>Bottom of Hole at 1.2 feet            No gap noted between bottom of floor slab and crushed rock</p> <p>Cone Penetrometer Test (CPT) Sounding extended through corehole.            See separate log of CPT-2</p> <p>No groundwater or seepage encountered</p>

**LEGEND**

					
Bag Sample	Split-Spoon	Shelby Tube Sample	Static Water Table at Drilling	Static Water Table	Water Bearing Zone

Date Drilled: 9/3/10  
 Logged By: B. Rapp  
 Surface Elevation:

# GEO PACIFIC ENG. / CPT-1 / EXPO BLD E

Operator: JSP/SVAN/VAN EXP

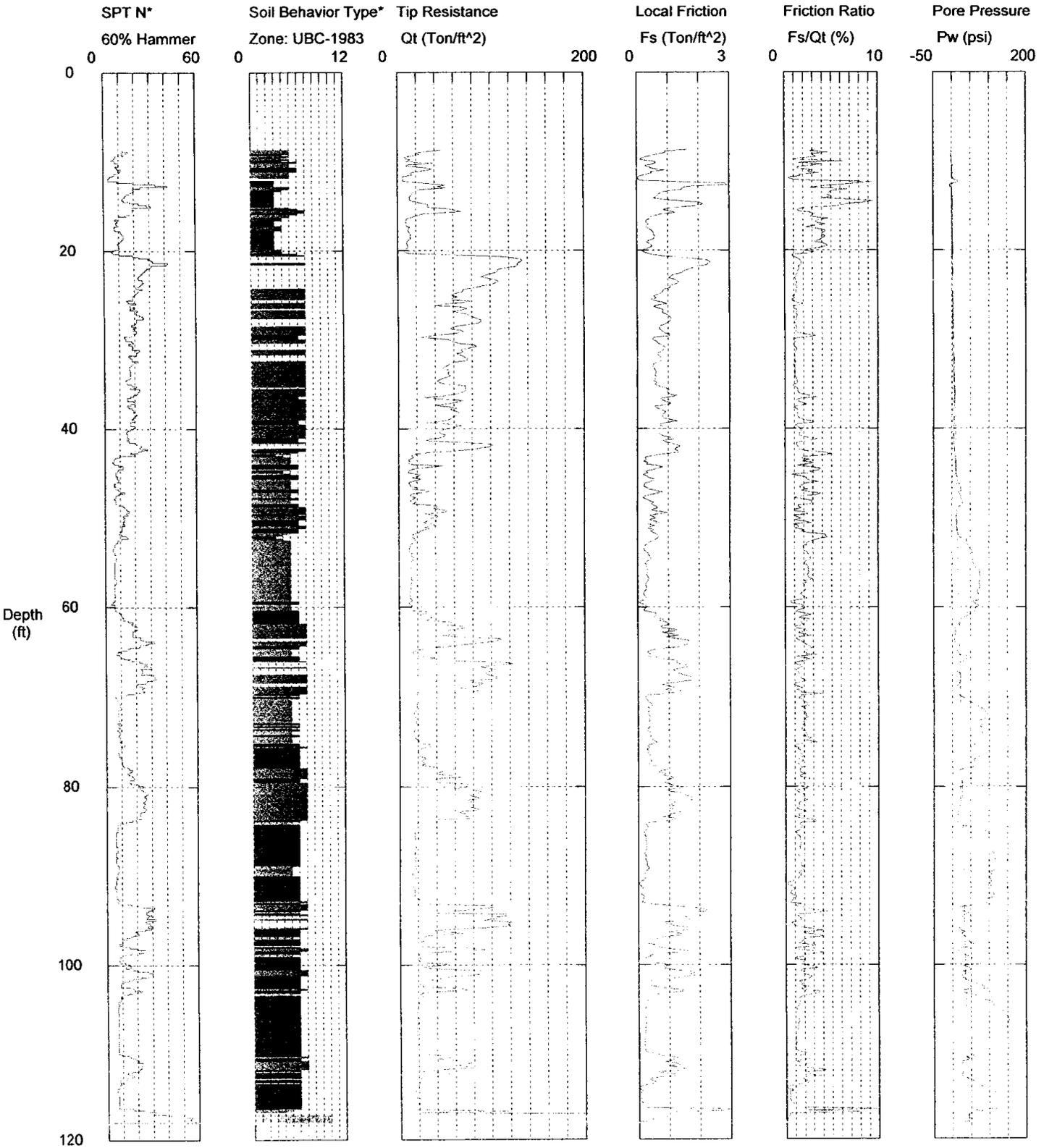
CPT Date/Time: 09-03-10 10:51

Sounding: FILR33

Location: CPT-1 EXPO BLD E

Cone Used: 4CH

Job Number: GEO PAC/N MARINE



Maximum Depth = 118.27 feet

Depth Increment = 0.164 feet

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

RFB 12-2004

ATTACHMENT B

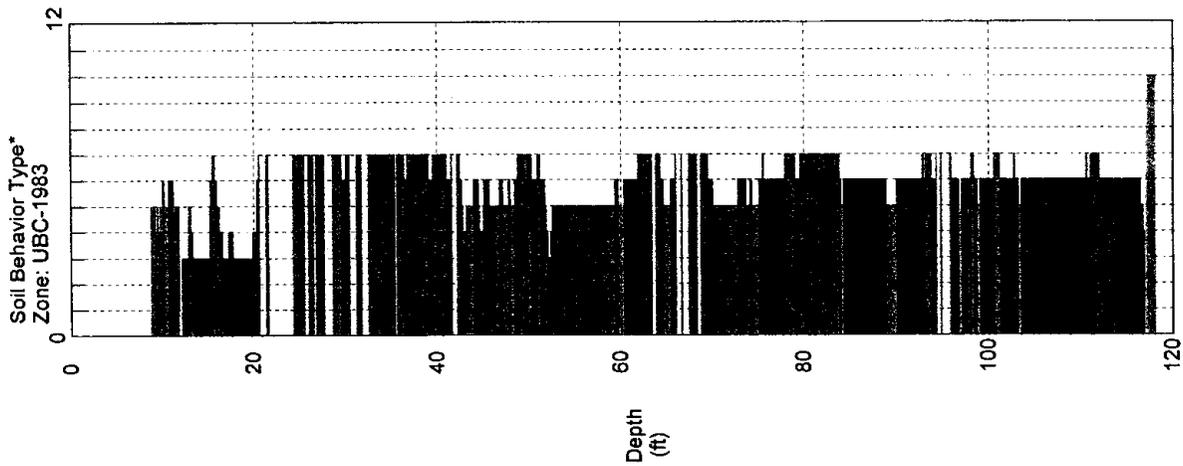
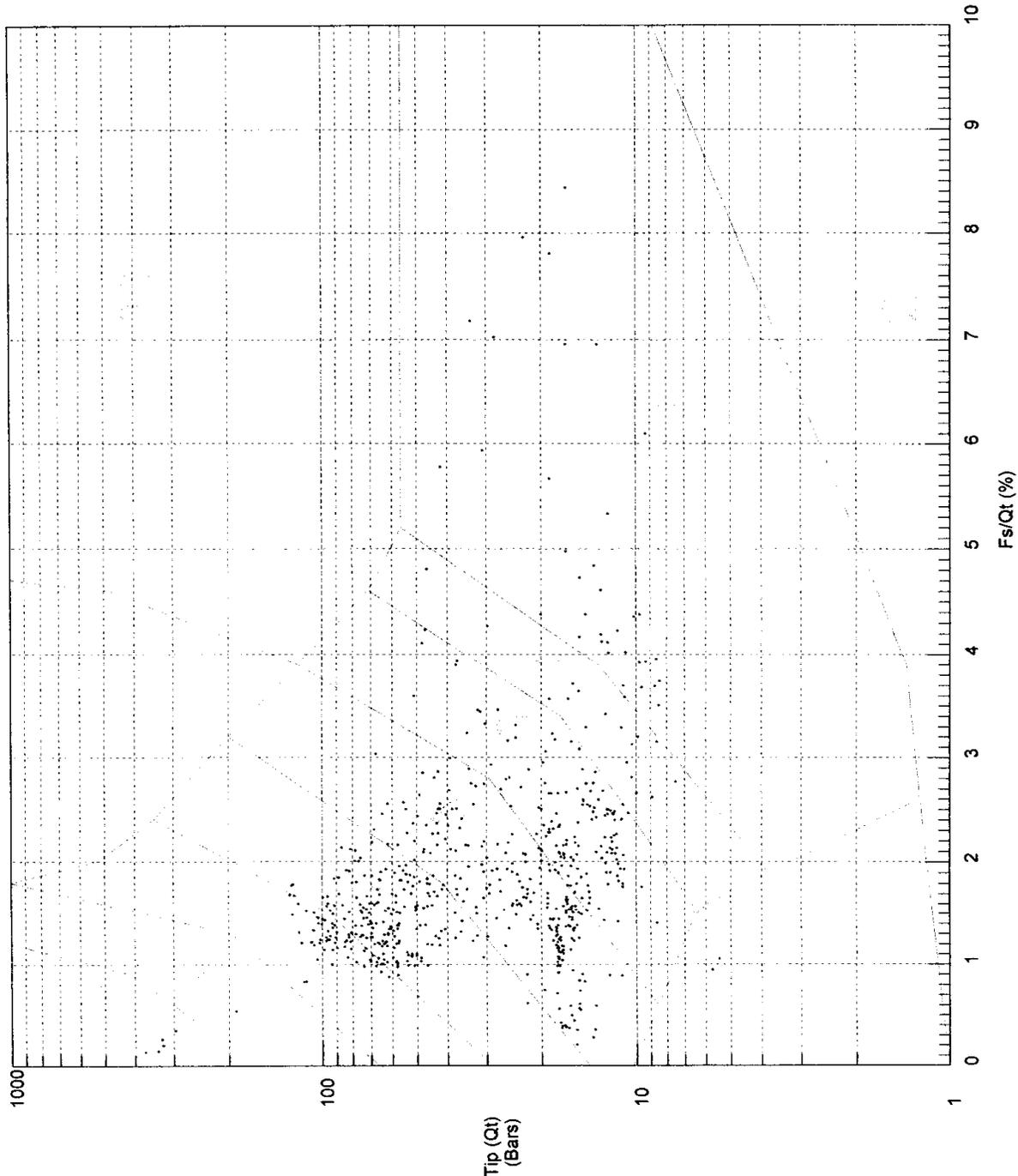
October 28, 2011

\*Soil behavior type and SPT based on data from UBC 9818 Project

# GEO PACIFIC ENG. / CPT-1 / EXPO BLD E

Operator: JSP/SVANVAN EXP  
 Sounding: FILR33  
 Cone Used: 4CH  
 CPT Date/Time: 09-03-10 10:51  
 Location: CPT-1 EXPO BLD E  
 Job Number: GEO PAC/N MARINE

Classification Data:  
 Robertson and Campanella UBC-1983

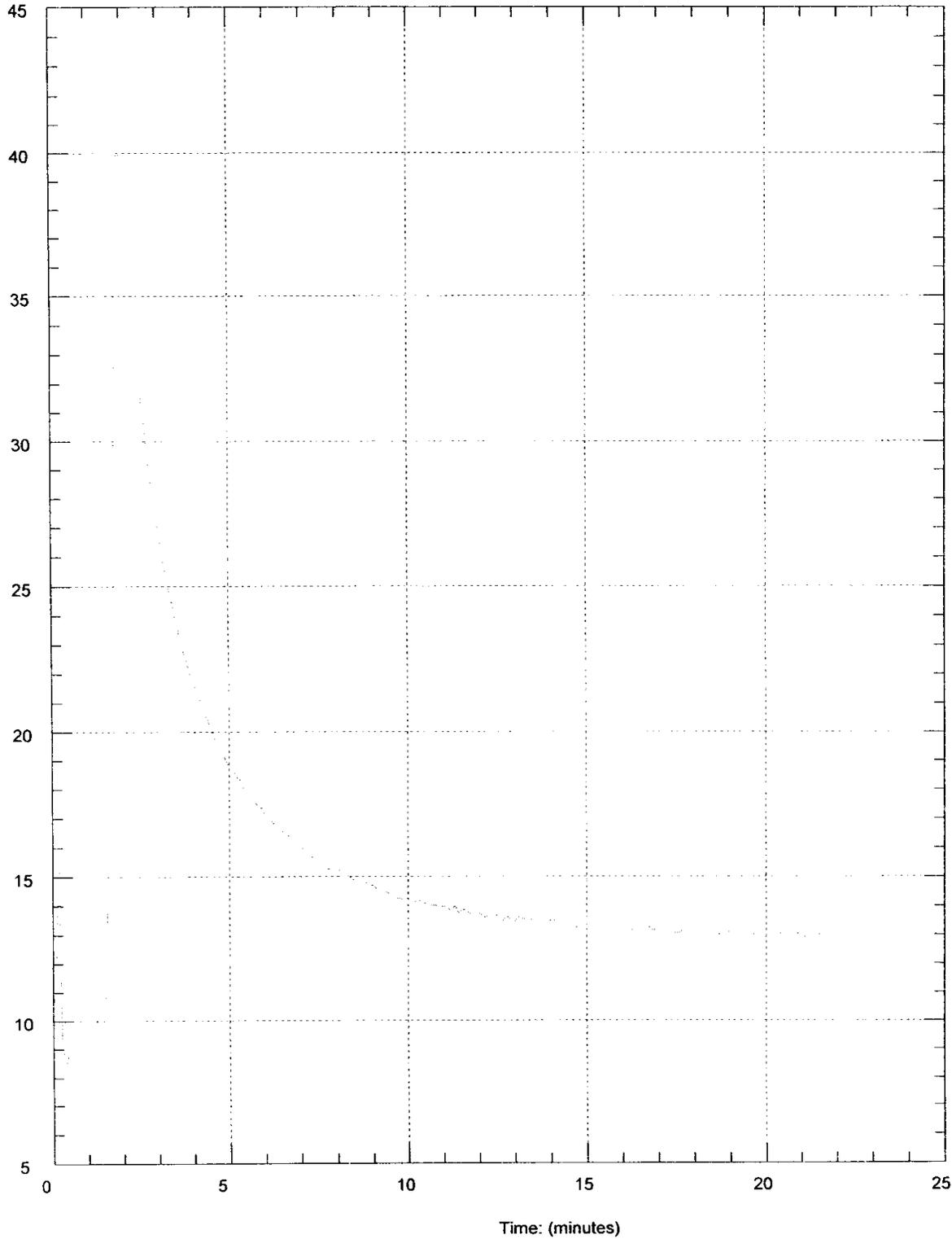


# GEO PACIFIC ENG. / CPT-1 / EXPO BLD E

Operator JSP/SVAN/VAN EXP  
Sounding: FILR33  
Cone Used: 4CH

CPT Date/Time: 09-03-10 10:51  
Location: CPT-1 EXPO BLD E  
Job Number: GEO PAC/N MARINE

Selected Depth(s)  
(feet)



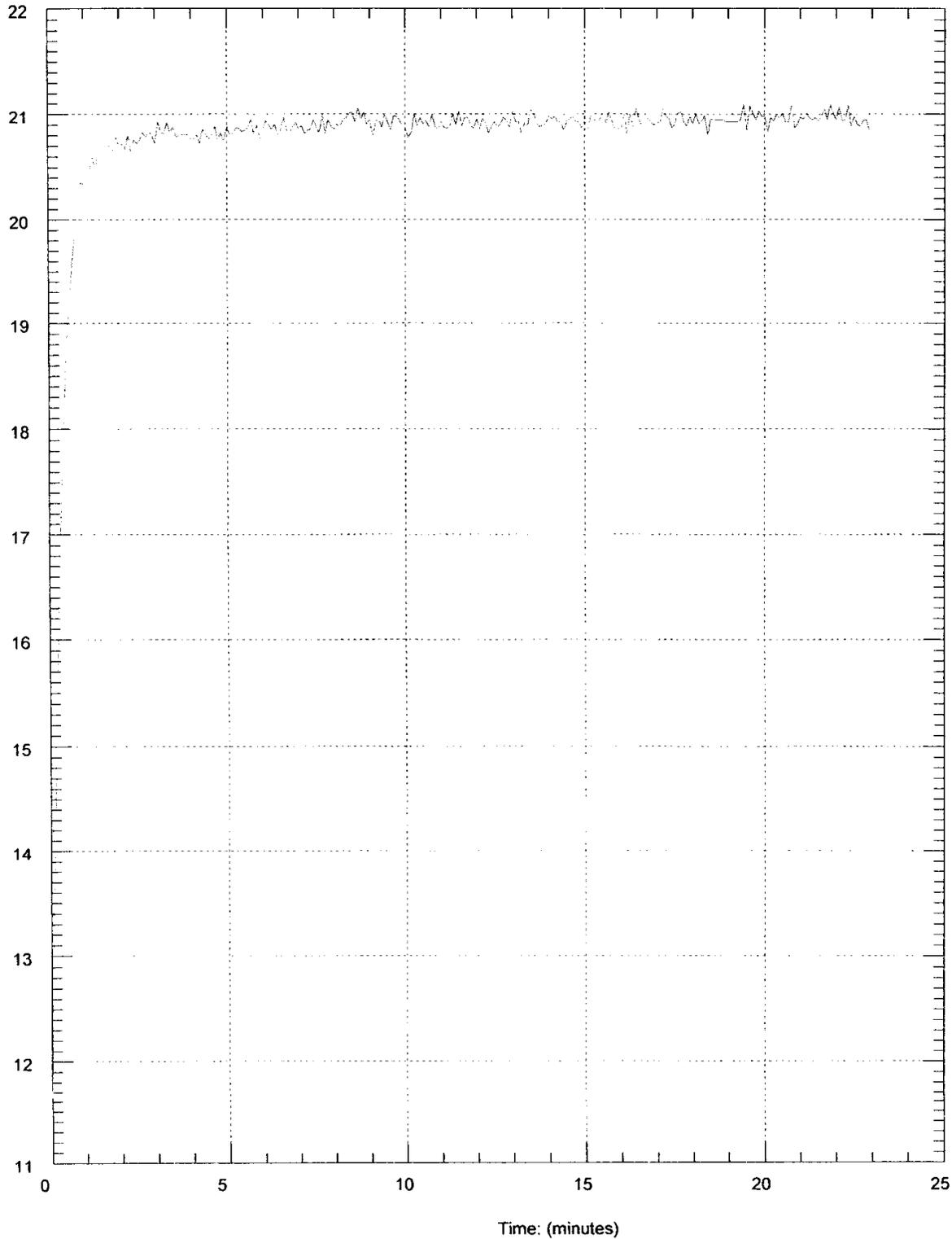
Maximum Pressure = 40.263 psi  
Hydrostatic Pressure = 13.242 psi

# GEO PACIFIC ENG. / CPT-1 / EXPO BLD E

Operator JSP/SVAN/VAN EXP  
Sounding: FILR33  
Cone Used: 4CH

CPT Date/Time: 09-03-10 10:51  
Location: CPT-1 EXPO BLD E  
Job Number: GEO PAC/N MARINE

Selected Depth(s)  
(feet)



Maximum Pressure = 21.098 psi  
Hydrostatic Pressure = 22.711 psi

Data File:FILR33  
 Operator:JSP/SVAN/VAN EXP  
 Cone ID:4CH  
 Customer: CPT-1 / EXPO BLD E

09-03-10 10:51  
 Location:CPT-1 EXPO BLD E  
 Job Number:GEO PAC/N MARINE  
 Units:English

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
8.69	47.6	1.630	3.425	-7.20	13	5	clayey silt to silty clay
8.86	32.8	0.910	2.777	-2.40	16	5	clayey silt to silty clay
9.02	19.8	0.920	4.654	-2.30	12	5	clayey silt to silty clay
9.19	23.3	0.680	2.923	-2.30	13	4	silty clay to clay
9.35	16.2	0.510	3.155	-2.40	8	5	clayey silt to silty clay
9.51	8.0	0.270	3.390	-2.50	7	4	silty clay to clay
9.68	8.3	0.130	1.569	-0.90	5	5	clayey silt to silty clay
9.84	13.9	0.130	0.936	-0.90	7	4	silty clay to clay
10.01	9.1	0.570	6.271	-0.70	8	6	sandy silt to clayey silt
10.17	39.8	0.620	1.558	-0.60	10	5	clayey silt to silty clay
10.33	12.2	0.490	4.018	-0.40	10	5	clayey silt to silty clay
10.50	8.7	0.250	2.868	1.20	8	5	clayey silt to silty clay
10.66	27.1	0.400	1.475	1.30	9	6	sandy silt to clayey silt
10.83	37.9	0.530	1.398	0.70	12	6	sandy silt to clayey silt
10.99	31.1	0.900	2.893	0.70	11	6	sandy silt to clayey silt
11.15	17.8	0.450	2.527	0.60	10	5	clayey silt to silty clay
11.32	13.1	0.480	3.661	0.90	7	5	clayey silt to silty clay
11.48	15.5	0.250	1.613	0.10	6	5	clayey silt to silty clay
11.65	6.4	0.110	1.716	0.60	4	5	clayey silt to silty clay
11.81	5.1	0.020	0.390	1.70	3	1	sensitive fine grained
11.98	6.4	0.040	0.622	1.90	3	1	sensitive fine grained
12.14	5.5	0.120	2.169	16.20	9	3	clay
12.30	17.2	1.620	9.404	15.80	19	3	clay
12.47	35.9	2.840	7.904	9.10	34	3	clay
12.63	52.5	3.120	5.940	-5.00	42	3	clay
12.80	43.4	1.660	3.822	-4.90	24	5	clayey silt to silty clay
12.96	51.6	1.470	2.849	0.30	19	5	clayey silt to silty clay
13.12	21.9	1.470	6.710	0.60	20	4	silty clay to clay
13.29	19.9	1.050	5.272	1.10	19	3	clay
13.45	17.3	0.830	4.793	1.20	17	3	clay
13.62	15.2	0.730	4.797	1.20	15	3	clay
13.78	14.8	0.680	4.589	1.30	14	3	clay
13.94	12.5	0.650	5.191	1.50	13	3	clay
14.11	13.2	0.540	4.086	1.20	12	3	clay
14.27	12.7	0.860	6.760	1.50	13	3	clay
14.44	15.6	1.490	9.535	1.90	17	3	clay
14.60	23.9	2.060	8.609	2.00	23	3	clay
14.76	31.9	2.140	6.702	2.00	28	3	clay
14.93	32.7	2.020	6.172	1.80	31	3	clay
15.09	32.0	1.580	4.934	1.70	19	5	clayey silt to silty clay
15.26	53.0	0.990	1.867	1.80	19	6	sandy silt to clayey silt
15.42	61.5	0.870	1.414	1.30	19	7	silty sand to sandy silt
15.58	68.7	1.090	1.586	1.10	19	7	silty sand to sandy silt
15.75	45.9	1.250	2.722	1.00	18	6	sandy silt to clayey silt
15.91	25.3	0.830	3.279	1.00	15	5	clayey silt to silty clay
16.08	19.9	0.590	2.962	1.40	10	5	clayey silt to silty clay
16.24	15.6	0.440	2.817	1.50	10	4	silty clay to clay
16.40	9.7	0.460	4.732	1.50	7	4	silty clay to clay
16.57	8.7	0.320	3.671	1.20	9	3	clay
16.73	8.6	0.290	3.365	1.30	8	3	clay
16.90	9.2	0.320	3.471	1.30	8	3	clay
17.06	8.6	0.380	4.408	1.40	9	3	clay
17.22	9.5	0.310	3.255	1.60	7	4	silty clay to clay
17.39	12.8	0.300	2.341	1.20	7	4	silty clay to clay
17.55	11.2	0.380	3.387	1.30	7	4	silty clay to clay
17.72	10.9	0.470	4.303	1.60	11	3	clay
17.88	11.7	0.510	4.351	1.40	11	3	clay

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
18.04	13.3	0.540	4.054	1.30	12	3	clay
18.21	13.6	0.540	3.964	1.50	13	3	clay
18.37	13.3	0.580	4.353	1.70	13	3	clay
18.54	13.6	0.580	4.257	1.70	13	3	clay
18.70	13.6	0.540	3.963	1.70	12	3	clay
18.86	11.1	0.420	3.775	1.70	11	3	clay
19.03	9.6	0.310	3.221	1.60	10	3	clay
19.19	9.4	0.380	4.030	2.00	9	3	clay
19.36	10.2	0.460	4.497	2.00	10	3	clay
19.52	10.9	0.500	4.574	2.20	10	3	clay
19.69	10.7	0.430	4.008	1.90	10	3	clay
19.85	8.9	0.270	3.023	2.10	6	4	silty clay to clay
20.01	7.3	0.150	2.047	2.00	5	4	silty clay to clay
20.18	7.2	0.230	3.180	2.20	6	4	silty clay to clay
20.34	13.3	0.350	2.624	2.50	10	6	sandy silt to clayey silt
20.51	59.3	0.500	0.843	2.50	19	7	silty sand to sandy silt
20.67	108.8	0.930	0.855	1.60	23	8	sand to silty sand
20.83	124.3	1.490	1.199	1.20	29	8	sand to silty sand
21.00	132.7	2.010	1.514	1.40	31	8	sand to silty sand
21.16	134.4	2.320	1.726	1.20	32	8	sand to silty sand
21.33	131.4	2.380	1.811	1.20	42	7	silty sand to sandy silt
21.49	128.7	2.310	1.795	1.20	41	7	silty sand to sandy silt
21.65	129.6	2.270	1.751	1.60	31	8	sand to silty sand
21.82	128.0	1.900	1.484	1.50	30	8	sand to silty sand
21.98	116.6	1.810	1.552	1.50	28	8	sand to silty sand
22.15	108.2	1.670	1.543	2.00	27	8	sand to silty sand
22.31	108.4	1.540	1.420	2.00	26	8	sand to silty sand
22.47	106.4	1.490	1.400	1.90	25	8	sand to silty sand
22.64	99.7	1.350	1.354	2.00	24	8	sand to silty sand
22.80	94.7	1.150	1.214	1.90	23	8	sand to silty sand
22.97	89.7	1.080	1.204	1.80	22	8	sand to silty sand
23.13	96.8	1.030	1.064	1.90	23	8	sand to silty sand
23.29	103.9	1.210	1.164	2.10	25	8	sand to silty sand
23.46	109.1	1.300	1.191	2.10	26	8	sand to silty sand
23.62	106.8	1.360	1.273	2.00	25	8	sand to silty sand
23.79	102.5	1.290	1.258	2.20	24	8	sand to silty sand
23.95	95.5	1.100	1.151	2.00	23	8	sand to silty sand
24.11	88.1	1.080	1.225	2.20	21	8	sand to silty sand
24.28	79.0	1.060	1.341	2.30	25	7	silty sand to sandy silt
24.44	70.3	0.870	1.237	2.30	23	7	silty sand to sandy silt
24.61	70.1	0.840	1.198	1.90	22	7	silty sand to sandy silt
24.77	68.5	0.820	1.197	2.10	21	7	silty sand to sandy silt
24.93	58.8	0.740	1.258	2.40	20	7	silty sand to sandy silt
25.10	58.6	0.600	1.023	2.10	19	7	silty sand to sandy silt
25.26	65.2	0.540	0.828	2.10	19	7	silty sand to sandy silt
25.43	57.8	0.630	1.089	2.30	19	7	silty sand to sandy silt
25.59	57.5	0.450	0.782	2.50	15	8	sand to silty sand
25.75	78.0	0.610	0.782	2.40	16	8	sand to silty sand
25.92	68.9	0.830	1.204	2.10	21	7	silty sand to sandy silt
26.08	49.3	0.960	1.946	2.20	17	7	silty sand to sandy silt
26.25	40.1	0.630	1.570	2.20	17	7	silty sand to sandy silt
26.41	68.2	0.530	0.777	2.10	20	7	silty sand to sandy silt
26.57	75.1	0.710	0.945	2.00	17	8	sand to silty sand
26.74	68.6	0.840	1.224	1.80	22	7	silty sand to sandy silt
26.90	59.1	0.840	1.421	1.60	21	7	silty sand to sandy silt
27.07	66.3	0.820	1.236	1.60	21	7	silty sand to sandy silt
27.23	73.9	0.910	1.231	1.60	23	7	silty sand to sandy silt
27.40	77.1	1.020	1.322	1.90	25	7	silty sand to sandy silt
27.56	81.7	1.060	1.297	1.70	26	7	silty sand to sandy silt
27.72	86.2	1.090	1.264	1.80	21	8	sand to silty sand
27.89	89.6	1.100	1.227	1.70	21	8	sand to silty sand
28.05	89.8	1.050	1.169	2.10	21	8	sand to silty sand

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
28.22	86.8	0.970	1.117	1.60	20	8	sand to silty sand
28.38	76.8	0.900	1.171	1.90	18	8	sand to silty sand
28.54	64.3	0.770	1.197	1.80	21	7	silty sand to sandy silt
28.71	58.2	0.720	1.237	2.00	19	7	silty sand to sandy silt
28.87	56.6	0.710	1.254	2.30	19	7	silty sand to sandy silt
29.04	68.3	0.770	1.127	2.20	21	7	silty sand to sandy silt
29.20	70.6	0.830	1.175	2.40	21	7	silty sand to sandy silt
29.36	63.1	0.880	1.394	2.20	19	7	silty sand to sandy silt
29.53	48.3	1.040	2.152	2.10	18	6	sandy silt to clayey silt
29.69	30.8	1.040	3.373	2.50	13	6	sandy silt to clayey silt
29.86	24.6	0.560	2.273	2.20	14	6	sandy silt to clayey silt
30.02	51.7	0.490	0.947	2.50	14	7	silty sand to sandy silt
30.18	56.7	0.530	0.934	2.60	18	7	silty sand to sandy silt
30.35	59.2	0.640	1.080	2.60	19	7	silty sand to sandy silt
30.51	65.1	0.660	1.013	2.60	16	8	sand to silty sand
30.68	80.5	0.750	0.931	2.60	18	8	sand to silty sand
30.84	85.5	0.850	0.994	2.80	19	8	sand to silty sand
31.00	78.0	0.890	1.140	2.80	18	8	sand to silty sand
31.17	67.9	0.880	1.295	2.80	23	7	silty sand to sandy silt
31.33	68.3	0.800	1.171	2.70	22	7	silty sand to sandy silt
31.50	70.0	0.790	1.128	3.00	21	7	silty sand to sandy silt
31.66	62.9	0.630	1.001	3.00	21	7	silty sand to sandy silt
31.82	67.1	0.670	0.998	2.70	16	8	sand to silty sand
31.99	70.9	0.710	1.002	3.90	17	8	sand to silty sand
32.15	72.9	0.770	1.057	4.30	18	8	sand to silty sand
32.32	76.3	0.770	1.010	4.10	18	8	sand to silty sand
32.48	72.6	0.770	1.061	4.20	22	7	silty sand to sandy silt
32.64	59.5	0.670	1.127	4.00	20	7	silty sand to sandy silt
32.81	55.6	0.560	1.008	4.10	18	7	silty sand to sandy silt
32.97	54.0	0.510	0.945	4.10	17	7	silty sand to sandy silt
33.14	50.7	0.510	1.007	4.00	16	7	silty sand to sandy silt
33.30	48.1	0.550	1.144	4.20	16	7	silty sand to sandy silt
33.46	53.7	0.560	1.044	4.10	17	7	silty sand to sandy silt
33.63	56.0	0.600	1.072	4.30	17	7	silty sand to sandy silt
33.79	53.6	0.610	1.139	4.40	17	7	silty sand to sandy silt
33.96	53.6	0.590	1.101	4.40	17	7	silty sand to sandy silt
34.12	56.6	0.570	1.008	4.60	17	7	silty sand to sandy silt
34.28	53.5	0.600	1.122	4.40	17	7	silty sand to sandy silt
34.45	47.8	0.570	1.193	4.50	15	7	silty sand to sandy silt
34.61	44.4	0.570	1.285	4.50	14	7	silty sand to sandy silt
34.78	41.9	0.540	1.290	4.80	14	7	silty sand to sandy silt
34.94	45.3	0.630	1.392	4.60	15	7	silty sand to sandy silt
35.10	50.1	0.580	1.158	4.90	18	7	silty sand to sandy silt
35.27	72.4	0.620	0.857	4.90	21	7	silty sand to sandy silt
35.43	72.8	0.790	1.085	5.60	17	8	sand to silty sand
35.60	72.4	0.950	1.312	5.80	23	7	silty sand to sandy silt
35.76	73.5	1.020	1.388	5.70	23	7	silty sand to sandy silt
35.93	71.0	0.970	1.366	6.10	22	7	silty sand to sandy silt
36.09	67.0	0.970	1.448	5.90	21	7	silty sand to sandy silt
36.25	59.6	1.070	1.796	5.80	19	7	silty sand to sandy silt
36.42	47.5	1.290	2.717	6.00	17	6	sandy silt to clayey silt
36.58	28.6	0.980	3.428	6.10	15	6	sandy silt to clayey silt
36.75	45.1	0.760	1.685	6.90	15	7	silty sand to sandy silt
36.91	69.5	0.820	1.180	5.40	19	7	silty sand to sandy silt
37.07	64.7	0.930	1.438	5.20	20	7	silty sand to sandy silt
37.24	55.7	1.080	1.940	5.10	17	7	silty sand to sandy silt
37.40	40.0	0.960	2.402	5.10	15	7	silty sand to sandy silt
37.57	50.0	0.570	1.140	5.50	16	7	silty sand to sandy silt
37.73	63.7	0.590	0.927	3.90	18	7	silty sand to sandy silt
37.89	55.5	0.730	1.316	3.70	19	7	silty sand to sandy silt
38.06	60.8	0.850	1.399	3.90	19	7	silty sand to sandy silt
38.22	65.2	0.920	1.412	4.10	20	7	silty sand to sandy silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
38.39	65.0	0.850	1.309	4.10	21	7	silty sand to sandy silt
38.55	62.8	0.820	1.307	4.20	20	7	silty sand to sandy silt
38.71	59.2	0.810	1.369	5.10	19	7	silty sand to sandy silt
38.88	58.1	0.860	1.481	5.10	18	7	silty sand to sandy silt
39.04	54.9	1.030	1.877	5.30	20	6	sandy silt to clayey silt
39.21	47.0	1.330	2.831	5.20	17	6	sandy silt to clayey silt
39.37	31.2	0.970	3.111	5.40	17	6	sandy silt to clayey silt
39.53	56.4	0.750	1.330	5.90	17	7	silty sand to sandy silt
39.70	68.9	0.750	1.089	5.00	20	7	silty sand to sandy silt
39.86	60.2	0.860	1.429	4.60	19	7	silty sand to sandy silt
40.03	52.5	0.840	1.601	4.60	17	7	silty sand to sandy silt
40.19	45.9	0.780	1.701	4.70	15	7	silty sand to sandy silt
40.35	44.7	0.770	1.724	4.60	14	7	silty sand to sandy silt
40.52	44.7	0.710	1.589	4.90	15	7	silty sand to sandy silt
40.68	51.1	0.740	1.449	4.90	15	7	silty sand to sandy silt
40.85	49.7	0.840	1.691	4.90	15	7	silty sand to sandy silt
41.01	44.5	1.090	2.451	5.10	16	6	sandy silt to clayey silt
41.17	32.6	1.170	3.592	5.20	14	6	sandy silt to clayey silt
41.34	30.0	0.830	2.768	5.60	16	6	sandy silt to clayey silt
41.50	62.2	0.920	1.479	6.10	20	7	silty sand to sandy silt
41.67	94.5	1.120	1.186	5.20	21	8	sand to silty sand
41.83	101.9	1.290	1.266	5.50	24	8	sand to silty sand
41.99	100.3	1.380	1.376	5.60	23	8	sand to silty sand
42.16	88.5	1.270	1.435	6.30	28	7	silty sand to sandy silt
42.32	77.9	1.200	1.541	6.30	24	7	silty sand to sandy silt
42.49	59.6	1.310	2.198	6.30	22	6	sandy silt to clayey silt
42.65	31.2	1.320	4.232	6.40	17	5	clayey silt to silty clay
42.81	17.8	0.880	4.946	6.40	20	3	clay
42.98	14.0	0.560	3.999	7.10	10	4	silty clay to clay
43.14	16.0	0.300	1.874	7.60	7	5	clayey silt to silty clay
43.31	13.9	0.250	1.797	7.90	6	5	clayey silt to silty clay
43.47	10.4	0.270	2.591	8.30	6	5	clayey silt to silty clay
43.64	11.8	0.210	1.775	9.00	5	5	clayey silt to silty clay
43.80	11.0	0.340	3.081	9.30	6	5	clayey silt to silty clay
43.96	12.0	0.290	2.408	9.80	9	6	sandy silt to clayey silt
44.13	49.2	0.640	1.300	10.30	12	6	sandy silt to clayey silt
44.29	29.1	0.800	2.747	8.70	12	6	sandy silt to clayey silt
44.46	17.5	0.660	3.766	8.80	9	5	clayey silt to silty clay
44.62	11.2	0.410	3.649	9.40	8	4	silty clay to clay
44.78	10.4	0.270	2.585	10.10	7	4	silty clay to clay
44.95	10.7	0.330	3.098	10.50	7	5	clayey silt to silty clay
45.11	23.3	0.160	0.688	10.80	7	6	sandy silt to clayey silt
45.28	21.5	0.310	1.445	10.80	8	6	sandy silt to clayey silt
45.44	14.3	0.330	2.302	16.30	8	6	sandy silt to clayey silt
45.60	23.6	0.530	2.250	17.80	9	5	clayey silt to silty clay
45.77	20.4	0.530	2.597	14.30	9	5	clayey silt to silty clay
45.93	11.5	0.410	3.556	16.00	7	5	clayey silt to silty clay
46.10	11.0	0.240	2.188	18.60	6	5	clayey silt to silty clay
46.26	12.1	0.230	1.901	20.70	6	5	clayey silt to silty clay
46.42	12.9	0.200	1.549	21.80	7	5	clayey silt to silty clay
46.59	19.0	0.300	1.576	23.30	7	5	clayey silt to silty clay
46.75	15.0	0.370	2.460	23.80	9	6	sandy silt to clayey silt
46.92	34.1	0.580	1.703	25.40	10	6	sandy silt to clayey silt
47.08	28.9	0.810	2.808	17.40	13	5	clayey silt to silty clay
47.24	15.8	0.600	3.802	19.50	9	5	clayey silt to silty clay
47.41	12.1	0.390	3.218	22.20	7	5	clayey silt to silty clay
47.57	14.4	0.220	1.524	23.60	7	5	clayey silt to silty clay
47.74	18.1	0.180	0.997	24.70	6	6	sandy silt to clayey silt
47.90	14.5	0.300	2.074	25.40	7	5	clayey silt to silty clay
48.06	12.6	0.370	2.937	27.60	7	5	clayey silt to silty clay
48.23	19.2	0.530	2.759	28.30	7	5	clayey silt to silty clay
48.39	14.7	0.440	2.993	27.80	9	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
48.56	37.9	0.520	1.372	27.30	12	6	sandy silt to clayey silt
48.72	43.6	0.630	1.446	18.10	13	7	silty sand to sandy silt
48.88	37.5	0.640	1.708	18.40	14	7	silty sand to sandy silt
49.05	47.0	0.450	0.957	15.20	15	7	silty sand to sandy silt
49.21	56.6	0.590	1.042	10.20	16	7	silty sand to sandy silt
49.38	43.7	1.000	2.286	9.90	14	7	silty sand to sandy silt
49.54	29.1	0.710	2.444	10.70	15	6	sandy silt to clayey silt
49.70	41.3	0.390	0.945	12.10	12	7	silty sand to sandy silt
49.87	42.7	0.510	1.193	9.80	13	7	silty sand to sandy silt
50.03	34.5	0.590	1.708	10.20	12	7	silty sand to sandy silt
50.20	36.6	0.400	1.094	11.10	13	6	sandy silt to clayey silt
50.36	30.3	0.530	1.752	10.80	12	6	sandy silt to clayey silt
50.52	25.3	0.710	2.809	12.00	12	6	sandy silt to clayey silt
50.69	36.9	0.330	0.894	13.50	13	6	sandy silt to clayey silt
50.85	39.6	0.550	1.390	11.10	11	7	silty sand to sandy silt
51.02	27.9	0.400	1.436	11.40	11	7	silty sand to sandy silt
51.18	33.5	0.340	1.016	12.50	11	6	sandy silt to clayey silt
51.35	26.3	0.530	2.017	12.70	11	6	sandy silt to clayey silt
51.51	23.0	0.400	1.739	14.10	9	6	sandy silt to clayey silt
51.67	21.2	0.530	2.498	14.80	9	5	clayey silt to silty clay
51.84	15.0	0.640	4.254	16.90	11	4	silty clay to clay
52.00	15.4	0.670	4.358	19.10	14	3	clay
52.17	15.0	0.680	4.533	21.00	15	3	clay
52.33	17.1	0.630	3.675	37.60	11	4	silty clay to clay
52.49	17.7	0.540	3.059	38.30	8	5	clayey silt to silty clay
52.66	15.7	0.420	2.681	39.20	8	5	clayey silt to silty clay
52.82	14.9	0.340	2.284	40.90	7	5	clayey silt to silty clay
52.99	12.3	0.300	2.436	42.80	6	5	clayey silt to silty clay
53.15	12.2	0.240	1.960	44.90	6	5	clayey silt to silty clay
53.31	11.6	0.230	1.986	47.10	6	5	clayey silt to silty clay
53.48	11.4	0.210	1.841	49.30	5	5	clayey silt to silty clay
53.64	11.2	0.220	1.957	51.40	5	5	clayey silt to silty clay
53.81	11.8	0.280	2.379	53.40	6	5	clayey silt to silty clay
53.97	13.9	0.330	2.375	55.30	6	5	clayey silt to silty clay
54.13	13.7	0.350	2.553	56.20	7	5	clayey silt to silty clay
54.30	13.7	0.390	2.842	57.20	7	5	clayey silt to silty clay
54.46	16.3	0.430	2.631	58.70	7	5	clayey silt to silty clay
54.63	15.1	0.420	2.778	56.80	7	5	clayey silt to silty clay
54.79	14.7	0.340	2.314	55.10	7	5	clayey silt to silty clay
54.95	13.5	0.280	2.073	55.90	6	5	clayey silt to silty clay
55.12	12.3	0.250	2.026	58.40	6	5	clayey silt to silty clay
55.28	12.2	0.280	2.298	61.30	6	5	clayey silt to silty clay
55.45	11.7	0.290	2.475	63.60	6	5	clayey silt to silty clay
55.61	12.8	0.310	2.416	64.60	6	5	clayey silt to silty clay
55.77	12.8	0.320	2.495	71.10	6	5	clayey silt to silty clay
55.94	13.1	0.320	2.449	74.20	6	5	clayey silt to silty clay
56.10	12.6	0.320	2.544	75.00	6	5	clayey silt to silty clay
56.27	12.2	0.300	2.464	74.80	6	5	clayey silt to silty clay
56.43	12.0	0.290	2.422	74.50	6	5	clayey silt to silty clay
56.59	13.0	0.320	2.461	76.60	6	5	clayey silt to silty clay
56.76	13.9	0.360	2.598	80.50	6	5	clayey silt to silty clay
56.92	13.1	0.390	2.973	77.60	7	5	clayey silt to silty clay
57.09	15.6	0.320	2.053	75.70	7	5	clayey silt to silty clay
57.25	13.4	0.310	2.311	70.30	7	5	clayey silt to silty clay
57.41	13.1	0.250	1.915	73.30	6	5	clayey silt to silty clay
57.58	12.4	0.250	2.020	74.70	6	5	clayey silt to silty clay
57.74	12.1	0.280	2.312	77.10	6	5	clayey silt to silty clay
57.91	13.0	0.290	2.234	75.10	6	5	clayey silt to silty clay
58.07	12.6	0.270	2.141	70.00	6	5	clayey silt to silty clay
58.23	11.8	0.230	1.951	68.80	6	5	clayey silt to silty clay
58.40	11.5	0.210	1.826	69.40	6	5	clayey silt to silty clay
58.56	11.3	0.180	1.587	72.30	6	5	clayey silt to silty clay

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
58.73	11.8	0.220	1.869	74.30	6	5	clayey silt to silty clay
58.89	12.6	0.250	1.978	78.90	6	5	clayey silt to silty clay
59.06	12.2	0.290	2.373	78.00	6	5	clayey silt to silty clay
59.22	14.2	0.200	1.412	74.10	6	5	clayey silt to silty clay
59.38	13.4	0.080	0.599	53.10	5	6	sandy silt to clayey silt
59.55	10.7	0.060	0.563	60.10	4	6	sandy silt to clayey silt
59.71	10.9	0.170	1.561	68.90	6	5	clayey silt to silty clay
59.88	14.3	0.280	1.953	72.20	6	5	clayey silt to silty clay
60.04	12.7	0.270	2.126	62.40	6	5	clayey silt to silty clay
60.20	12.2	0.230	1.879	65.40	6	5	clayey silt to silty clay
60.37	13.7	0.190	1.391	66.60	7	6	sandy silt to clayey silt
60.53	29.8	0.350	1.176	52.90	9	6	sandy silt to clayey silt
60.70	29.4	0.610	2.076	33.30	10	6	sandy silt to clayey silt
60.86	21.8	0.600	2.757	39.00	10	6	sandy silt to clayey silt
61.02	29.2	0.540	1.849	41.50	11	6	sandy silt to clayey silt
61.19	36.1	0.540	1.495	28.70	12	6	sandy silt to clayey silt
61.35	32.1	0.840	2.615	22.10	12	6	sandy silt to clayey silt
61.52	29.3	0.710	2.423	28.20	15	6	sandy silt to clayey silt
61.68	56.6	0.930	1.644	25.00	18	6	sandy silt to clayey silt
61.84	53.5	0.960	1.796	18.00	17	7	silty sand to sandy silt
62.01	51.9	0.970	1.869	20.00	19	7	silty sand to sandy silt
62.17	73.0	0.750	1.028	18.20	21	7	silty sand to sandy silt
62.34	69.4	0.810	1.167	7.90	21	7	silty sand to sandy silt
62.50	58.4	1.280	2.191	8.40	19	7	silty sand to sandy silt
62.66	50.0	1.150	2.299	8.80	18	7	silty sand to sandy silt
62.83	61.6	0.770	1.249	9.90	18	7	silty sand to sandy silt
62.99	60.8	1.070	1.760	7.60	18	7	silty sand to sandy silt
63.16	47.4	1.350	2.847	7.70	18	7	silty sand to sandy silt
63.32	61.7	0.920	1.490	9.80	23	7	silty sand to sandy silt
63.48	109.3	1.230	1.125	7.60	23	8	sand to silty sand
63.65	111.3	1.560	1.402	6.50	26	8	sand to silty sand
63.81	102.3	1.740	1.701	7.20	32	7	silty sand to sandy silt
63.98	87.9	1.730	1.968	7.60	28	7	silty sand to sandy silt
64.14	72.5	1.570	2.165	8.10	23	7	silty sand to sandy silt
64.30	57.5	1.460	2.538	8.70	22	6	sandy silt to clayey silt
64.47	40.0	1.220	3.048	9.10	16	6	sandy silt to clayey silt
64.63	26.2	0.640	2.439	10.10	14	5	clayey silt to silty clay
64.80	18.5	0.420	2.273	12.10	10	5	clayey silt to silty clay
64.96	14.9	0.300	2.012	14.60	8	5	clayey silt to silty clay
65.12	15.7	0.350	2.223	17.20	7	5	clayey silt to silty clay
65.29	14.2	0.490	3.455	19.50	9	5	clayey silt to silty clay
65.45	25.0	0.300	1.200	41.00	10	6	sandy silt to clayey silt
65.62	38.7	0.750	1.939	39.70	12	6	sandy silt to clayey silt
65.78	30.2	0.860	2.846	36.10	17	6	sandy silt to clayey silt
65.94	66.4	1.310	1.974	33.30	22	7	silty sand to sandy silt
66.11	114.2	1.210	1.059	22.60	24	8	sand to silty sand
66.27	124.2	1.330	1.071	10.90	27	8	sand to silty sand
66.44	101.6	1.600	1.575	11.20	25	8	sand to silty sand
66.60	87.6	1.600	1.827	11.60	30	7	silty sand to sandy silt
66.77	97.5	1.330	1.364	12.40	23	8	sand to silty sand
66.93	106.4	1.150	1.081	10.80	24	8	sand to silty sand
67.09	97.0	1.250	1.288	10.40	24	8	sand to silty sand
67.26	94.3	1.300	1.378	21.40	23	8	sand to silty sand
67.42	95.2	1.410	1.481	21.30	31	7	silty sand to sandy silt
67.59	100.4	1.620	1.613	21.80	32	7	silty sand to sandy silt
67.75	108.2	1.750	1.617	22.30	33	7	silty sand to sandy silt
67.91	103.2	1.810	1.754	22.30	31	7	silty sand to sandy silt
68.08	76.0	1.730	2.276	21.80	27	7	silty sand to sandy silt
68.24	77.3	1.360	1.759	22.30	26	7	silty sand to sandy silt
68.41	90.4	0.950	1.051	19.10	20	8	sand to silty sand
68.57	86.8	0.800	0.922	18.60	21	8	sand to silty sand
68.73	83.4	1.030	1.236	10.60	25	7	silty sand to sandy silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
68.90	64.7	1.190	1.840	11.30	24	7	silty sand to sandy silt
69.06	75.7	0.890	1.176	12.90	24	7	silty sand to sandy silt
69.23	86.1	1.410	1.637	9.70	25	7	silty sand to sandy silt
69.39	72.4	1.230	1.698	9.30	19	7	silty sand to sandy silt
69.55	20.0	0.850	4.250	13.80	14	6	sandy silt to clayey silt
69.72	17.5	0.290	1.659	19.80	8	5	clayey silt to silty clay
69.88	14.8	0.250	1.692	26.00	6	6	sandy silt to clayey silt
70.05	16.7	0.230	1.379	33.50	7	5	clayey silt to silty clay
70.21	15.2	0.290	1.910	40.40	8	5	clayey silt to silty clay
70.37	17.3	0.320	1.853	46.70	8	5	clayey silt to silty clay
70.54	17.2	0.390	2.271	53.70	9	5	clayey silt to silty clay
70.70	19.0	0.440	2.317	61.70	9	5	clayey silt to silty clay
70.87	18.7	0.460	2.462	68.10	9	5	clayey silt to silty clay
71.03	18.6	0.310	1.668	75.60	9	5	clayey silt to silty clay
71.19	17.9	0.380	2.126	81.40	9	5	clayey silt to silty clay
71.36	17.7	0.370	2.095	87.40	8	5	clayey silt to silty clay
71.52	17.5	0.330	1.885	90.50	8	5	clayey silt to silty clay
71.69	15.4	0.330	2.149	94.30	8	5	clayey silt to silty clay
71.85	15.5	0.340	2.195	96.70	8	5	clayey silt to silty clay
72.01	17.1	0.360	2.105	90.70	8	5	clayey silt to silty clay
72.18	16.7	0.400	2.399	88.50	8	5	clayey silt to silty clay
72.34	18.5	0.370	2.003	88.30	8	5	clayey silt to silty clay
72.51	17.1	0.380	2.223	75.80	9	5	clayey silt to silty clay
72.67	18.8	0.360	1.918	81.00	9	5	clayey silt to silty clay
72.83	17.4	0.360	2.065	78.80	7	6	sandy silt to clayey silt
73.00	20.6	0.370	1.799	80.90	9	5	clayey silt to silty clay
73.16	18.7	0.400	2.139	76.40	8	6	sandy silt to clayey silt
73.33	19.7	0.360	1.826	77.80	9	5	clayey silt to silty clay
73.49	17.0	0.290	1.707	75.50	7	6	sandy silt to clayey silt
73.65	15.1	0.270	1.786	77.70	8	5	clayey silt to silty clay
73.82	16.1	0.370	2.304	80.40	9	5	clayey silt to silty clay
73.98	22.2	0.470	2.117	83.60	9	5	clayey silt to silty clay
74.15	21.0	0.510	2.431	81.80	8	6	sandy silt to clayey silt
74.31	20.7	0.380	1.832	79.00	9	5	clayey silt to silty clay
74.48	15.9	0.440	2.775	80.30	9	5	clayey silt to silty clay
74.64	18.8	0.470	2.504	88.00	9	5	clayey silt to silty clay
74.80	21.5	0.470	2.183	64.50	9	5	clayey silt to silty clay
74.97	18.2	0.610	3.354	68.50	10	5	clayey silt to silty clay
75.13	24.3	0.530	2.180	77.30	10	6	sandy silt to clayey silt
75.30	35.4	0.340	0.960	49.80	12	6	sandy silt to clayey silt
75.46	34.0	0.320	0.943	38.20	10	7	silty sand to sandy silt
75.62	27.2	0.370	1.360	42.60	10	6	sandy silt to clayey silt
75.79	21.0	0.280	1.332	50.50	9	6	sandy silt to clayey silt
75.95	19.8	0.330	1.666	56.50	8	6	sandy silt to clayey silt
76.12	19.3	0.330	1.706	65.30	8	6	sandy silt to clayey silt
76.28	20.9	0.330	1.583	66.10	8	6	sandy silt to clayey silt
76.44	19.8	0.360	1.818	69.90	8	6	sandy silt to clayey silt
76.61	22.4	0.440	1.960	72.70	9	6	sandy silt to clayey silt
76.77	27.3	0.410	1.502	68.80	10	6	sandy silt to clayey silt
76.94	27.9	0.390	1.396	58.40	10	6	sandy silt to clayey silt
77.10	22.7	0.430	1.891	57.90	10	6	sandy silt to clayey silt
77.26	24.8	0.410	1.655	67.90	10	6	sandy silt to clayey silt
77.43	27.5	0.350	1.272	56.80	10	6	sandy silt to clayey silt
77.59	23.6	0.370	1.571	59.10	11	6	sandy silt to clayey silt
77.76	34.0	0.740	2.178	60.80	14	6	sandy silt to clayey silt
77.92	51.1	0.780	1.527	47.70	15	7	silty sand to sandy silt
78.08	59.6	0.940	1.577	22.60	17	7	silty sand to sandy silt
78.25	47.0	0.720	1.530	17.20	16	7	silty sand to sandy silt
78.41	42.6	0.660	1.548	15.60	14	7	silty sand to sandy silt
78.58	41.1	0.890	2.168	17.50	15	7	silty sand to sandy silt
78.74	54.6	0.820	1.502	21.10	17	7	silty sand to sandy silt
78.90	68.3	1.070	1.568	17.80	18	7	silty sand to sandy silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
79.07	44.9	1.140	2.541	18.90	19	6	sandy silt to clayey silt
79.23	36.2	0.910	2.513	21.30	15	6	sandy silt to clayey silt
79.40	36.3	0.890	2.455	24.70	15	6	sandy silt to clayey silt
79.56	42.2	0.860	2.038	27.60	16	7	silty sand to sandy silt
79.72	75.7	1.040	1.374	18.80	21	7	silty sand to sandy silt
79.89	75.3	1.100	1.461	19.50	24	7	silty sand to sandy silt
80.05	71.1	1.410	1.983	21.10	22	7	silty sand to sandy silt
80.22	58.3	1.380	2.366	21.90	22	7	silty sand to sandy silt
80.38	75.7	0.950	1.254	22.90	24	7	silty sand to sandy silt
80.54	88.1	1.010	1.146	14.90	27	7	silty sand to sandy silt
80.71	89.1	1.360	1.527	12.20	27	7	silty sand to sandy silt
80.87	79.8	1.520	1.905	14.20	26	7	silty sand to sandy silt
81.04	75.4	1.530	2.029	14.90	25	7	silty sand to sandy silt
81.20	84.0	1.740	2.071	22.40	26	7	silty sand to sandy silt
81.36	87.5	1.680	1.920	21.80	26	7	silty sand to sandy silt
81.53	74.1	1.750	2.360	23.90	25	7	silty sand to sandy silt
81.69	75.2	1.390	1.849	24.80	24	7	silty sand to sandy silt
81.86	80.6	1.150	1.426	24.10	25	7	silty sand to sandy silt
82.02	75.8	1.070	1.412	17.70	25	7	silty sand to sandy silt
82.19	75.5	1.140	1.510	19.60	24	7	silty sand to sandy silt
82.35	75.1	1.080	1.439	19.00	25	7	silty sand to sandy silt
82.51	84.4	1.010	1.197	19.70	26	7	silty sand to sandy silt
82.68	86.0	1.300	1.511	15.60	25	7	silty sand to sandy silt
82.84	67.2	1.470	2.186	16.30	23	7	silty sand to sandy silt
83.01	65.0	1.300	2.001	17.90	22	7	silty sand to sandy silt
83.17	74.4	1.010	1.358	18.30	22	7	silty sand to sandy silt
83.33	69.5	1.050	1.511	12.90	23	7	silty sand to sandy silt
83.50	75.4	0.800	1.062	11.30	23	7	silty sand to sandy silt
83.66	75.5	1.280	1.694	10.10	20	7	silty sand to sandy silt
83.83	37.4	1.110	2.966	9.00	17	6	sandy silt to clayey silt
83.99	22.9	0.820	3.586	11.40	13	5	clayey silt to silty clay
84.15	19.2	0.300	1.561	14.80	9	5	clayey silt to silty clay
84.32	17.3	0.250	1.447	19.10	7	6	sandy silt to clayey silt
84.48	16.9	0.290	1.712	23.30	7	6	sandy silt to clayey silt
84.65	17.7	0.310	1.754	74.70	7	6	sandy silt to clayey silt
84.81	17.7	0.270	1.528	81.60	7	6	sandy silt to clayey silt
84.97	16.7	0.250	1.499	88.40	7	6	sandy silt to clayey silt
85.14	18.2	0.200	1.098	90.90	6	6	sandy silt to clayey silt
85.30	15.5	0.180	1.162	97.00	6	6	sandy silt to clayey silt
85.47	17.1	0.200	1.170	103.30	6	6	sandy silt to clayey silt
85.63	15.3	0.220	1.442	107.80	6	6	sandy silt to clayey silt
85.79	16.1	0.250	1.551	112.70	6	6	sandy silt to clayey silt
85.96	16.4	0.250	1.520	114.10	6	6	sandy silt to clayey silt
86.12	17.2	0.250	1.457	115.00	6	6	sandy silt to clayey silt
86.29	16.5	0.260	1.577	117.00	6	6	sandy silt to clayey silt
86.45	17.1	0.270	1.580	117.50	6	6	sandy silt to clayey silt
86.61	16.6	0.260	1.569	116.20	6	6	sandy silt to clayey silt
86.78	16.8	0.250	1.491	115.80	7	6	sandy silt to clayey silt
86.94	18.0	0.280	1.558	115.90	7	6	sandy silt to clayey silt
87.11	17.6	0.270	1.532	113.00	7	6	sandy silt to clayey silt
87.27	17.0	0.240	1.415	108.00	7	6	sandy silt to clayey silt
87.43	16.7	0.240	1.440	108.70	6	6	sandy silt to clayey silt
87.60	15.7	0.190	1.207	113.60	6	6	sandy silt to clayey silt
87.76	17.3	0.230	1.326	114.00	6	6	sandy silt to clayey silt
87.93	16.7	0.250	1.497	110.90	7	6	sandy silt to clayey silt
88.09	17.5	0.230	1.318	115.00	6	6	sandy silt to clayey silt
88.25	16.0	0.240	1.502	116.80	6	6	sandy silt to clayey silt
88.42	16.7	0.260	1.557	117.90	6	6	sandy silt to clayey silt
88.58	17.9	0.290	1.621	117.60	7	6	sandy silt to clayey silt
88.75	17.5	0.290	1.660	116.00	7	6	sandy silt to clayey silt
88.91	17.2	0.280	1.629	117.20	8	5	clayey silt to silty clay
89.07	16.1	0.330	2.050	117.80	8	5	clayey silt to silty clay

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
89.24	18.3	0.350	1.916	115.60	8	5	clayey silt to silty clay
89.40	16.2	0.310	1.909	114.10	8	5	clayey silt to silty clay
89.57	14.1	0.210	1.492	109.30	7	5	clayey silt to silty clay
89.73	14.0	0.190	1.356	97.70	7	5	clayey silt to silty clay
89.90	13.2	0.240	1.813	106.70	7	5	clayey silt to silty clay
90.06	17.8	0.260	1.461	110.70	6	6	sandy silt to clayey silt
90.22	17.7	0.250	1.410	99.00	7	6	sandy silt to clayey silt
90.39	15.6	0.190	1.218	103.90	6	6	sandy silt to clayey silt
90.55	16.3	0.170	1.043	104.10	6	6	sandy silt to clayey silt
90.72	14.7	0.060	0.407	106.10	6	6	sandy silt to clayey silt
90.88	16.3	0.030	0.184	103.90	6	6	sandy silt to clayey silt
91.04	12.2	0.030	0.246	90.10	5	6	sandy silt to clayey silt
91.21	14.0	0.090	0.642	106.00	5	6	sandy silt to clayey silt
91.37	16.0	0.130	0.812	112.20	6	6	sandy silt to clayey silt
91.54	15.8	0.160	1.011	106.10	6	6	sandy silt to clayey silt
91.70	15.9	0.110	0.690	107.50	6	6	sandy silt to clayey silt
91.86	15.7	0.080	0.511	108.60	6	6	sandy silt to clayey silt
92.03	16.2	0.080	0.493	112.10	6	6	sandy silt to clayey silt
92.19	15.7	0.130	0.826	113.70	6	6	sandy silt to clayey silt
92.36	15.7	0.190	1.211	110.80	6	6	sandy silt to clayey silt
92.52	18.6	0.150	0.805	106.00	7	6	sandy silt to clayey silt
92.68	21.3	0.170	0.798	84.20	8	6	sandy silt to clayey silt
92.85	21.6	0.140	0.647	93.70	7	7	silty sand to sandy silt
93.01	26.9	0.120	0.447	94.40	9	6	sandy silt to clayey silt
93.18	21.5	0.370	1.721	89.80	16	7	silty sand to sandy silt
93.34	97.4	0.950	0.976	54.50	24	7	silty sand to sandy silt
93.50	107.8	1.530	1.420	18.40	31	7	silty sand to sandy silt
93.67	90.9	2.040	2.244	22.60	29	7	silty sand to sandy silt
93.83	73.3	2.230	3.044	25.70	27	6	sandy silt to clayey silt
94.00	47.9	2.170	4.529	28.40	26	5	clayey silt to silty clay
94.16	39.1	1.360	3.475	44.50	26	6	sandy silt to clayey silt
94.32	115.3	1.440	1.249	33.80	29	7	silty sand to sandy silt
94.49	116.3	1.490	1.281	27.20	27	8	sand to silty sand
94.65	103.8	1.540	1.484	28.10	26	8	sand to silty sand
94.82	105.6	1.730	1.639	32.70	32	7	silty sand to sandy silt
94.98	91.1	1.540	1.691	32.90	25	8	sand to silty sand
95.14	111.5	1.140	1.023	33.40	26	8	sand to silty sand
95.31	123.3	0.730	0.592	18.90	28	8	sand to silty sand
95.47	117.3	1.060	0.903	17.30	29	8	sand to silty sand
95.64	119.3	1.190	0.998	17.60	27	8	sand to silty sand
95.80	96.9	1.710	1.765	19.40	29	7	silty sand to sandy silt
95.96	61.1	1.790	2.930	20.20	25	6	sandy silt to clayey silt
96.13	36.5	1.460	3.996	23.10	19	6	sandy silt to clayey silt
96.29	52.7	1.030	1.954	34.70	20	6	sandy silt to clayey silt
96.46	67.4	1.320	1.959	25.60	21	6	sandy silt to clayey silt
96.62	41.9	1.480	3.533	26.90	17	6	sandy silt to clayey silt
96.78	25.4	1.050	4.141	31.80	15	5	clayey silt to silty clay
96.95	27.8	0.630	2.268	40.10	13	5	clayey silt to silty clay
97.11	28.3	0.590	2.085	41.30	10	6	sandy silt to clayey silt
97.28	25.6	0.480	1.873	43.60	10	6	sandy silt to clayey silt
97.44	21.2	0.340	1.605	47.70	9	6	sandy silt to clayey silt
97.60	21.3	0.280	1.315	55.10	8	6	sandy silt to clayey silt
97.77	20.5	0.680	3.324	59.70	10	5	clayey silt to silty clay
97.93	21.0	0.610	2.899	65.50	15	6	sandy silt to clayey silt
98.10	75.8	0.750	0.989	24.30	20	7	silty sand to sandy silt
98.26	93.8	1.210	1.289	17.00	25	7	silty sand to sandy silt
98.43	66.6	1.650	2.476	17.20	25	6	sandy silt to clayey silt
98.59	34.0	1.350	3.972	19.70	16	6	sandy silt to clayey silt
98.75	22.8	0.690	3.031	25.30	12	5	clayey silt to silty clay
98.92	19.1	0.380	1.989	34.80	10	5	clayey silt to silty clay
99.08	19.9	0.380	1.907	43.40	8	6	sandy silt to clayey silt
99.25	21.0	0.200	0.951	51.10	8	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
109.58	18.7	0.170	0.909	139.10	7	6	sandy silt to clayey silt
109.74	18.5	0.190	1.028	137.60	7	6	sandy silt to clayey silt
109.91	18.7	0.210	1.124	137.30	7	6	sandy silt to clayey silt
110.07	18.2	0.240	1.321	136.30	7	6	sandy silt to clayey silt
110.24	19.4	0.420	2.167	130.80	9	6	sandy silt to clayey silt
110.40	36.3	0.680	1.874	123.40	14	6	sandy silt to clayey silt
110.56	56.0	0.710	1.269	59.80	15	7	silty sand to sandy silt
110.73	53.3	1.280	2.401	34.90	19	6	sandy silt to clayey silt
110.89	39.7	1.160	2.919	44.20	20	6	sandy silt to clayey silt
111.06	66.6	1.060	1.592	46.90	19	7	silty sand to sandy silt
111.22	76.8	0.850	1.107	26.10	23	7	silty sand to sandy silt
111.38	76.0	1.160	1.526	30.20	23	7	silty sand to sandy silt
111.55	61.6	1.390	2.258	18.40	22	7	silty sand to sandy silt
111.71	68.9	0.930	1.349	16.60	22	7	silty sand to sandy silt
111.88	78.8	1.310	1.663	13.10	21	7	silty sand to sandy silt
112.04	49.2	1.550	3.152	12.00	20	6	sandy silt to clayey silt
112.20	26.1	1.200	4.593	15.60	16	5	clayey silt to silty clay
112.37	23.2	0.640	2.756	22.60	13	6	sandy silt to clayey silt
112.53	52.5	0.930	1.770	29.70	16	6	sandy silt to clayey silt
112.70	51.7	1.250	2.417	22.70	17	6	sandy silt to clayey silt
112.86	30.6	1.190	3.894	24.90	13	6	sandy silt to clayey silt
113.02	23.0	0.450	1.959	32.70	12	5	clayey silt to silty clay
113.19	19.5	0.340	1.743	42.10	8	6	sandy silt to clayey silt
113.35	21.0	0.440	2.099	52.90	8	6	sandy silt to clayey silt
113.52	22.5	0.550	2.447	60.60	10	5	clayey silt to silty clay
113.68	21.6	0.480	2.226	66.70	8	6	sandy silt to clayey silt
113.85	18.7	0.230	1.229	70.60	7	6	sandy silt to clayey silt
114.01	16.3	0.060	0.368	75.70	7	6	sandy silt to clayey silt
114.17	15.9	0.010	0.063	84.40	6	6	sandy silt to clayey silt
114.34	16.5	0.030	0.182	94.00	6	6	sandy silt to clayey silt
114.50	16.2	0.130	0.802	105.10	6	6	sandy silt to clayey silt
114.67	17.0	0.060	0.353	112.20	6	6	sandy silt to clayey silt
114.83	17.2	0.060	0.348	119.50	7	6	sandy silt to clayey silt
114.99	17.3	0.070	0.406	128.60	7	6	sandy silt to clayey silt
115.16	18.1	0.070	0.386	128.40	7	6	sandy silt to clayey silt
115.32	17.6	0.070	0.398	130.00	7	6	sandy silt to clayey silt
115.49	18.5	0.060	0.325	129.40	7	6	sandy silt to clayey silt
115.65	18.0	0.080	0.445	129.50	7	6	sandy silt to clayey silt
115.81	18.3	0.090	0.493	129.60	7	6	sandy silt to clayey silt
115.98	19.1	0.140	0.731	127.80	7	6	sandy silt to clayey silt
116.14	18.6	0.170	0.912	127.30	7	6	sandy silt to clayey silt
116.31	17.8	0.200	1.126	122.10	7	6	sandy silt to clayey silt
116.47	17.2	0.240	1.397	123.40	17	3	clay
116.63	17.4	3.200	18.389	125.10	24	5	clayey silt to silty clay
116.80	116.4	2.760	2.371	56.40	31	4	silty clay to clay
116.96	12.1	1.050	8.683	89.80	30	8	sand to silty sand
117.13	244.2	1.080	0.442	55.60	38	9	sand
117.29	340.0	1.080	0.318	43.00	49	10	gravelly sand to sand
117.45	345.7	1.050	0.304	44.10	55	10	gravelly sand to sand
117.62	342.5	0.560	0.163	44.50	54	10	gravelly sand to sand
117.78	332.4	0.430	0.129	44.90	56	10	gravelly sand to sand
117.95	382.0	0.520	0.136	69.10	62	10	gravelly sand to sand
118.11	410.5	-32768	-32768	36.90	0	0	<out of range>
118.27	371.4	-32768	-32768	25.60	0	0	<out of range>

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

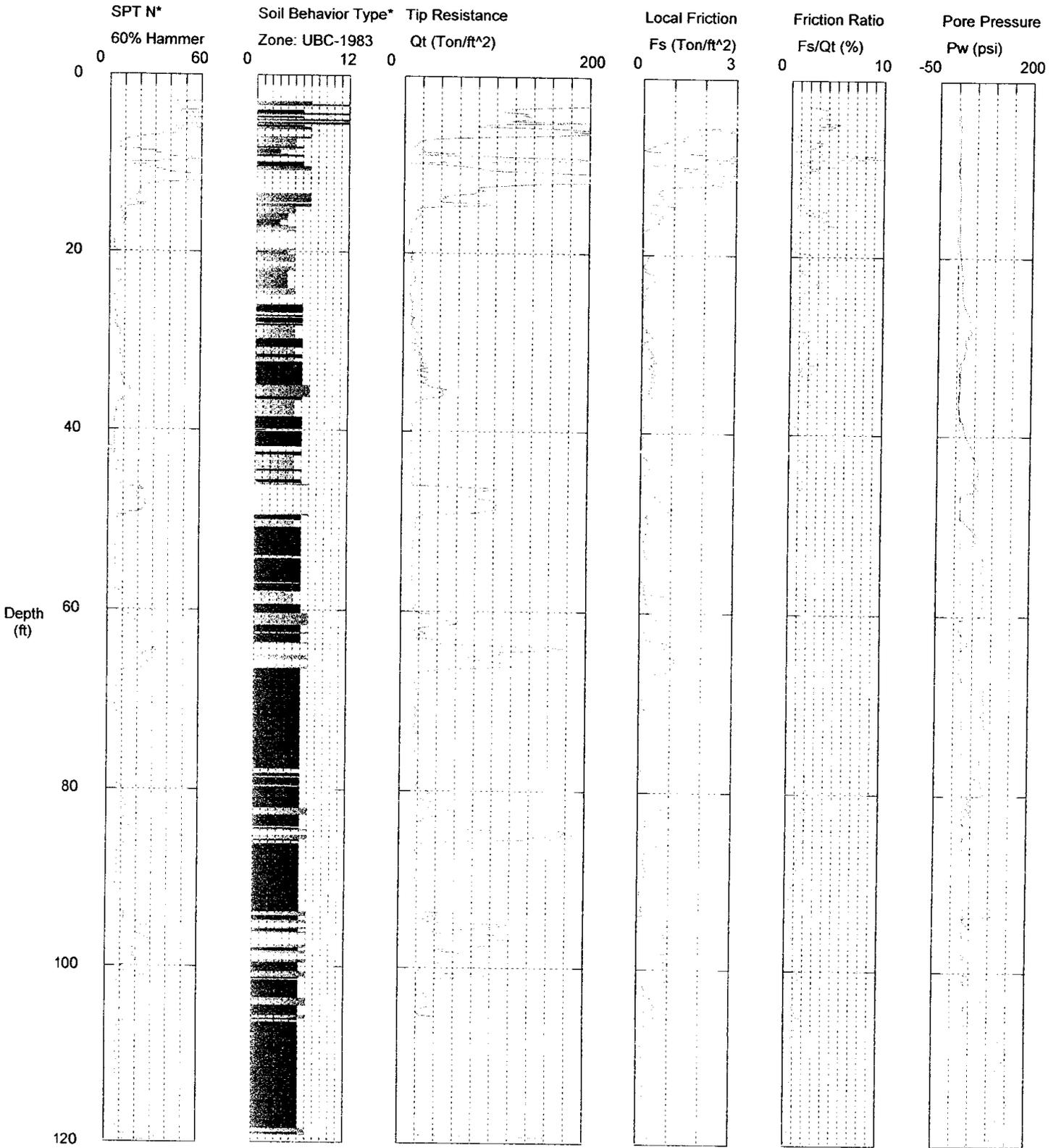
Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
99.41	23.7	0.290	1.223	56.80	8	6	sandy silt to clayey silt
99.57	19.9	0.410	2.065	66.00	8	6	sandy silt to clayey silt
99.74	22.8	0.430	1.884	71.50	12	6	sandy silt to clayey silt
99.90	51.6	0.810	1.571	80.90	15	6	sandy silt to clayey silt
100.07	44.0	0.970	2.203	29.50	16	6	sandy silt to clayey silt
100.23	26.8	0.810	3.018	37.20	12	6	sandy silt to clayey silt
100.39	25.1	0.850	3.391	46.40	14	6	sandy silt to clayey silt
100.56	61.0	1.060	1.738	54.30	20	7	silty sand to sandy silt
100.72	98.9	1.590	1.608	26.60	27	7	silty sand to sandy silt
100.89	91.0	1.870	2.055	34.90	30	7	silty sand to sandy silt
101.05	88.2	1.680	1.905	35.50	27	7	silty sand to sandy silt
101.21	75.3	1.840	2.444	26.40	27	6	sandy silt to clayey silt
101.38	51.4	1.430	2.781	22.50	22	6	sandy silt to clayey silt
101.54	46.5	1.170	2.517	34.10	17	6	sandy silt to clayey silt
101.71	34.6	0.780	2.254	35.20	14	6	sandy silt to clayey silt
101.87	26.7	0.370	1.387	46.60	11	6	sandy silt to clayey silt
102.03	24.1	0.410	1.699	57.70	9	6	sandy silt to clayey silt
102.20	20.8	0.410	1.971	69.40	9	6	sandy silt to clayey silt
102.36	24.7	0.360	1.457	84.00	9	6	sandy silt to clayey silt
102.53	25.1	0.640	2.553	88.00	15	6	sandy silt to clayey silt
102.69	67.0	0.970	1.448	103.00	18	7	silty sand to sandy silt
102.85	73.2	1.480	2.021	22.40	23	6	sandy silt to clayey silt
103.02	40.6	1.450	3.574	25.50	18	6	sandy silt to clayey silt
103.18	24.3	0.940	3.868	34.80	14	5	clayey silt to silty clay
103.35	21.6	0.600	2.782	53.10	11	5	clayey silt to silty clay
103.51	23.2	0.450	1.944	66.00	9	6	sandy silt to clayey silt
103.67	25.9	0.410	1.581	71.90	9	6	sandy silt to clayey silt
103.84	21.1	0.300	1.425	80.50	9	6	sandy silt to clayey silt
104.00	19.9	0.280	1.405	92.20	8	6	sandy silt to clayey silt
104.17	17.9	0.270	1.506	106.40	7	6	sandy silt to clayey silt
104.33	19.9	0.280	1.408	109.90	7	6	sandy silt to clayey silt
104.49	19.7	0.280	1.425	114.90	8	6	sandy silt to clayey silt
104.66	20.0	0.260	1.299	112.60	7	6	sandy silt to clayey silt
104.82	18.7	0.240	1.286	122.50	7	6	sandy silt to clayey silt
104.99	19.0	0.210	1.107	130.00	7	6	sandy silt to clayey silt
105.15	18.7	0.220	1.174	135.20	7	6	sandy silt to clayey silt
105.32	18.4	0.220	1.198	136.80	7	6	sandy silt to clayey silt
105.48	18.4	0.210	1.143	137.20	7	6	sandy silt to clayey silt
105.64	18.5	0.210	1.134	140.00	7	6	sandy silt to clayey silt
105.81	18.4	0.200	1.089	143.70	7	6	sandy silt to clayey silt
105.97	18.3	0.210	1.146	147.80	7	6	sandy silt to clayey silt
106.14	18.9	0.220	1.166	150.00	7	6	sandy silt to clayey silt
106.30	18.7	0.250	1.337	152.50	7	6	sandy silt to clayey silt
106.46	18.9	0.250	1.321	154.30	7	6	sandy silt to clayey silt
106.63	18.6	0.260	1.396	154.50	7	6	sandy silt to clayey silt
106.79	18.8	0.240	1.278	151.50	7	6	sandy silt to clayey silt
106.96	18.7	0.240	1.283	146.10	7	6	sandy silt to clayey silt
107.12	18.4	0.240	1.303	147.10	7	6	sandy silt to clayey silt
107.28	18.2	0.210	1.152	148.10	7	6	sandy silt to clayey silt
107.45	18.0	0.240	1.333	146.10	7	6	sandy silt to clayey silt
107.61	18.2	0.220	1.206	142.10	7	6	sandy silt to clayey silt
107.78	17.9	0.180	1.006	138.60	7	6	sandy silt to clayey silt
107.94	17.7	0.210	1.184	134.20	7	6	sandy silt to clayey silt
108.10	17.8	0.200	1.124	131.70	7	6	sandy silt to clayey silt
108.27	18.1	0.220	1.218	136.00	7	6	sandy silt to clayey silt
108.43	18.8	0.190	1.010	139.70	7	6	sandy silt to clayey silt
108.60	18.9	0.190	1.003	134.70	7	6	sandy silt to clayey silt
108.76	17.8	0.170	0.957	136.90	7	6	sandy silt to clayey silt
108.92	18.3	0.180	0.985	136.60	7	6	sandy silt to clayey silt
109.09	17.9	0.210	1.171	141.60	7	6	sandy silt to clayey silt
109.25	19.1	0.190	0.994	139.30	7	6	sandy silt to clayey silt
109.42	18.2	0.190	1.042	134.10	7	6	sandy silt to clayey silt

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

# GEO PACIFIC ENG. / CPT-2 / EXPO BLD E

Operator: JSP/SVAN/VAN EXP  
 Sounding: FILR34  
 Cone Used: 4CH

CPT Date/Time: 09-03-10 12:58  
 Location: CPT-2 EXPO BLD E  
 Job Number: GEO PAC/N MARINE



Maximum Depth = 119.91 feet

Depth Increment = 0.164 feet

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

RFB 12-2004

ATTACHMENT B

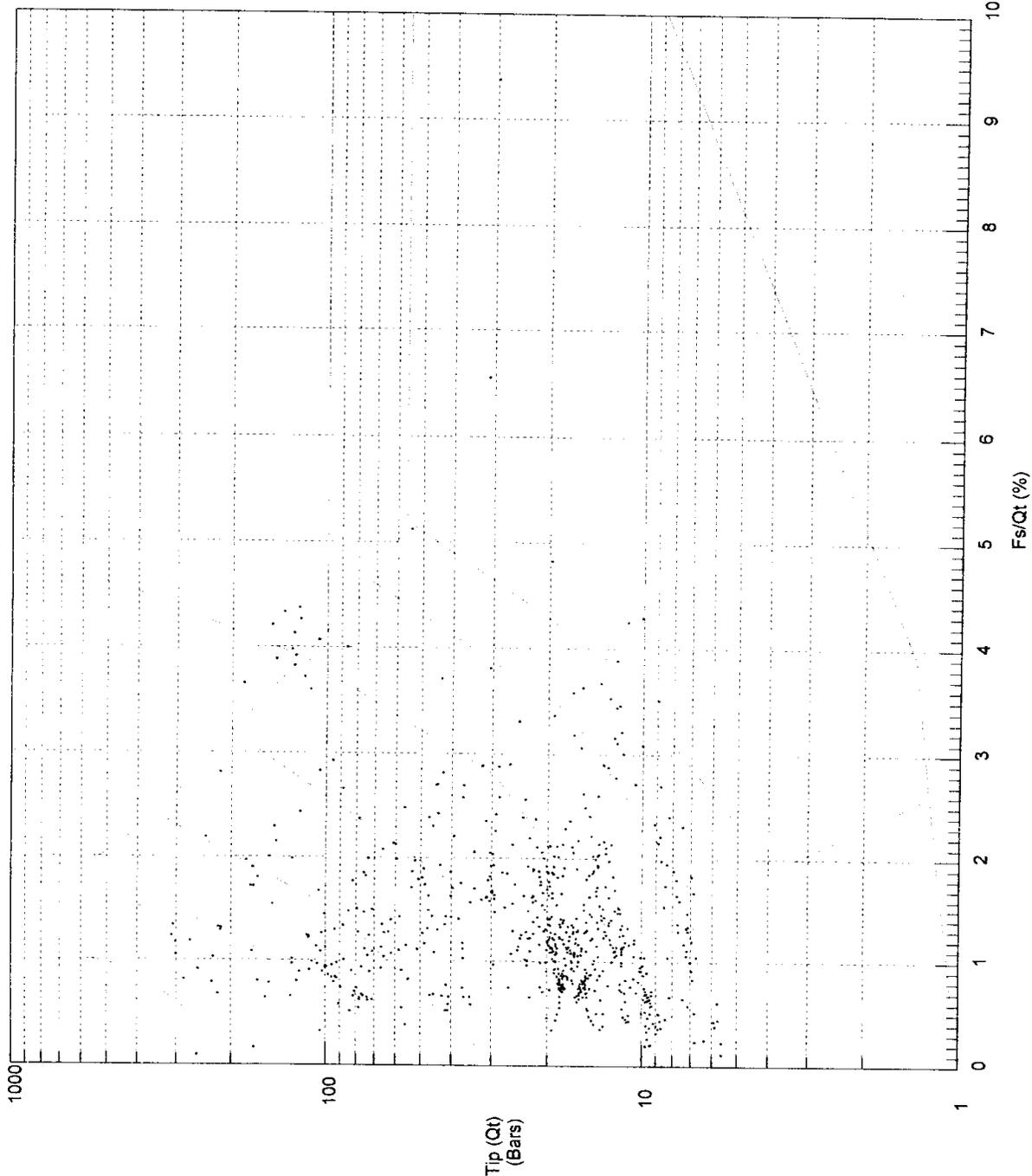
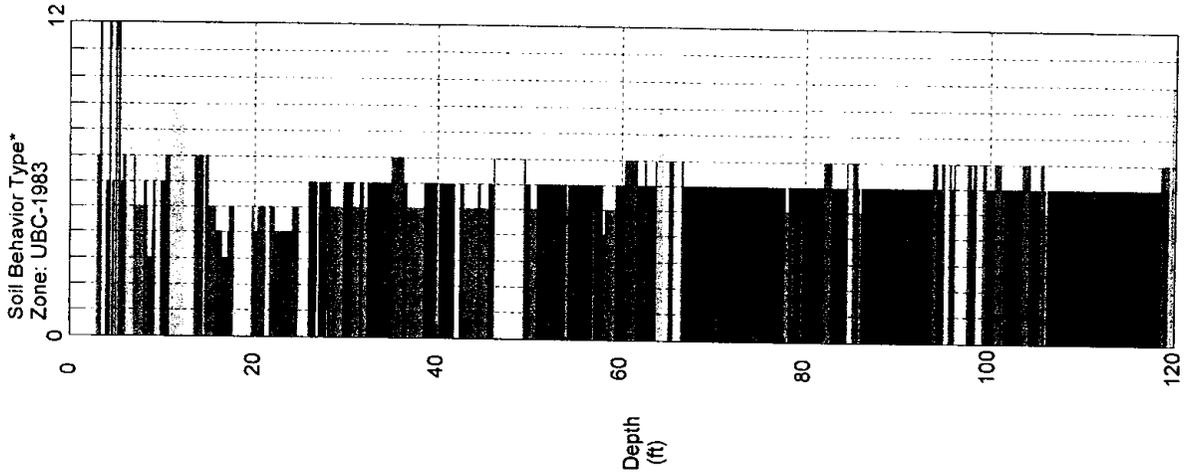
October 28, 2011

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# GEO PACIFIC ENG. / CPT-2 / EXPO BLDE

Operator: JSP/SVAN/VAN EXP  
 Sounding: FILR34  
 Cone Used: 4CH  
 CPT Date/Time: 09-03-10 12:58  
 Location: CPT-2 EXPO BLDE  
 Job Number: GEO PAC/N MARINE

Classification Data:  
 Robertson and Campanella UBC-1983



- 10 gravelly sand to sand
- 11 very stiff fine grained (\*)
- 12 sand to clayey sand (\*)

- 7 silty sand to sandy silt
- 8 sand to silty sand
- 9 sand

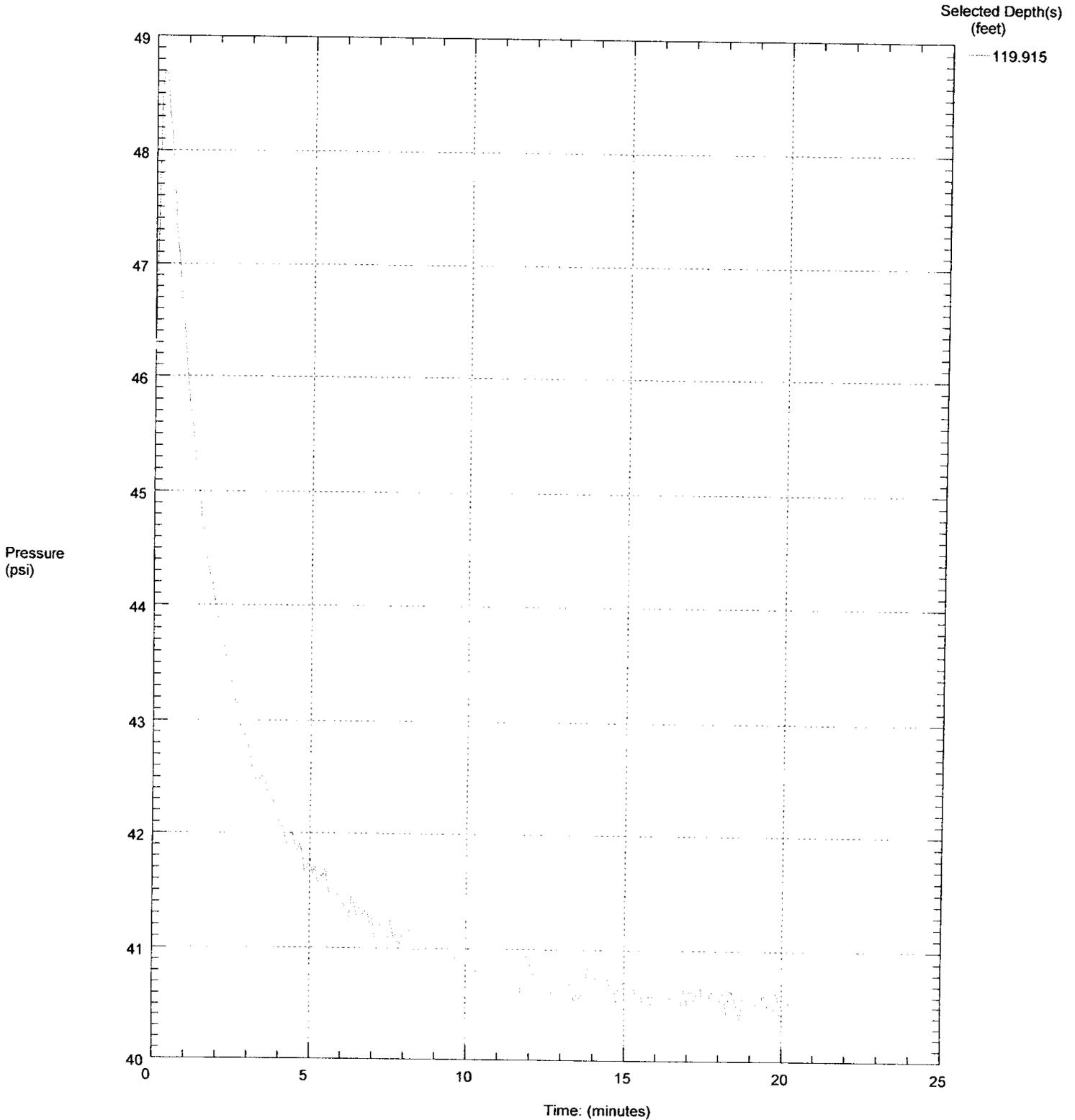
- 4 silty clay to clay
- 5 clayey silt to silty clay
- 6 sandy silt to clayey silt

- 1 sensitive fine grained
- 2 organic material
- 3 clay

# GEO PACIFIC ENG. / CPT-2 / EXPO BLD E

Operator JSP/SVAN/VAN EXP  
Sounding: FILR34  
Cone Used: 4CH

CPT Date/Time: 09-03-10 12:58  
Location: CPT-2 EXPO BLD E  
Job Number: GEO PAC/N MARINE



Maximum Pressure = 48.716 psi  
Hydrostatic Pressure = 43.927 psi

Data File: FILLR34  
 Operator: JSP/SVAN/VAN EXP  
 Cone ID: 4CH  
 Customer: CPT-2 / EXPO BLD E

09-03-10 12:58  
 Location: CPT-2 EXPO BLD E  
 Job Number: GEO PAC/N MARINE  
 Units: English

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
2.79	274.3	5.020	1.830	2.00	43	8	sand to silty sand
2.95	262.9	5.170	1.966	2.10	81	7	silty sand to sandy silt
3.12	220.1	6.370	2.893	3.40	73	7	silty sand to sandy silt
3.28	200.0	7.650	3.826	3.70	92	12	sand to clayey sand (*)
3.44	155.4	6.980	4.493	4.50	150	11	very stiff fine grained (*)
3.61	114.9	5.140	4.475	4.60	122	11	very stiff fine grained (*)
3.77	112.4	4.170	3.711	4.70	107	11	very stiff fine grained (*)
3.94	107.2	4.290	4.003	4.80	45	6	sandy silt to clayey silt
4.10	133.6	4.240	3.175	4.40	47	6	sandy silt to clayey silt
4.27	128.8	5.190	4.031	4.30	64	12	sand to clayey sand (*)
4.43	136.6	5.800	4.247	4.70	128	11	very stiff fine grained (*)
4.59	135.4	5.550	4.100	5.00	52	6	sandy silt to clayey silt
4.76	134.7	4.820	3.579	4.80	123	11	very stiff fine grained (*)
4.92	116.7	6.520	5.588	5.00	73	12	sand to clayey sand (*)
5.09	203.6	6.320	3.105	5.00	137	11	very stiff fine grained (*)
5.25	110.0	5.770	5.247	4.90	63	12	sand to clayey sand (*)
5.41	82.4	3.410	4.139	5.60	43	5	clayey silt to silty clay
5.58	79.0	1.670	2.114	6.10	42	6	sandy silt to clayey silt
5.74	167.6	4.220	2.518	6.60	49	7	silty sand to sandy silt
5.91	211.3	4.620	2.187	5.40	60	7	silty sand to sandy silt
6.07	183.1	2.220	1.213	5.50	43	9	sand
6.23	281.4	1.990	0.707	5.60	46	9	sand
6.40	258.1	1.460	0.566	5.30	44	9	sand
6.56	152.8	1.220	0.799	4.90	33	9	sand
6.73	105.5	1.450	1.375	5.00	25	8	sand to silty sand
6.89	55.9	1.330	2.381	4.80	20	7	silty sand to sandy silt
7.05	25.7	0.930	3.623	4.80	16	5	clayey silt to silty clay
7.22	19.3	0.650	3.373	4.80	10	5	clayey silt to silty clay
7.38	15.4	0.450	2.928	4.60	8	5	clayey silt to silty clay
7.55	14.7	0.410	2.795	4.70	7	5	clayey silt to silty clay
7.71	13.4	0.270	2.020	4.70	6	5	clayey silt to silty clay
7.87	11.3	0.160	1.420	4.70	6	5	clayey silt to silty clay
8.04	12.3	0.030	0.245	4.60	6	6	sandy silt to clayey silt
8.20	19.9	0.170	0.856	4.10	8	5	clayey silt to silty clay
8.37	20.4	0.910	4.469	4.20	20	3	clay
8.53	21.8	1.910	8.779	4.00	31	3	clay
8.69	55.7	3.590	6.440	3.20	30	3	clay
8.86	15.8	3.240	20.569	3.60	36	4	silty clay to clay
9.02	99.2	1.920	1.935	1.20	38	6	sandy silt to clayey silt
9.19	183.9	3.590	1.952	0.70	44	9	sand
9.35	406.1	3.540	0.872	2.30	60	9	sand
9.51	352.6	2.730	0.774	3.50	51	9	sand
9.68	41.4	1.000	2.413	3.20	32	8	sand to silty sand
9.84	7.1	0.330	4.624	2.60	12	6	sandy silt to clayey silt
10.01	42.6	0.880	2.064	2.70	15	6	sandy silt to clayey silt
10.17	65.2	1.890	2.897	2.50	24	6	sandy silt to clayey silt
10.33	80.5	1.240	1.540	2.70	24	7	silty sand to sandy silt
10.50	84.0	1.440	1.713	2.80	27	7	silty sand to sandy silt
10.66	92.6	1.880	2.029	2.70	35	7	silty sand to sandy silt
10.83	153.7	2.210	1.437	3.00	37	8	sand to silty sand
10.99	216.9	3.080	1.420	3.50	43	9	sand
11.15	308.3	3.430	1.113	3.50	54	9	sand
11.32	323.7	3.490	1.078	3.80	61	9	sand
11.48	330.8	5.910	1.787	5.00	62	9	sand
11.65	318.8	2.560	0.803	4.80	60	9	sand
11.81	294.9	2.500	0.848	6.10	57	9	sand
11.98	274.5	2.170	0.791	7.00	46	9	sand

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
12.14	145.8	2.640	1.811	6.30	34	9	sand
12.30	117.8	1.010	0.857	6.40	28	8	sand to silty sand
12.47	92.9	0.740	0.797	6.10	23	8	sand to silty sand
12.63	77.8	0.640	0.823	6.10	20	8	sand to silty sand
12.80	79.4	0.460	0.579	6.10	19	8	sand to silty sand
12.96	87.2	0.470	0.539	6.00	20	8	sand to silty sand
13.12	78.5	0.600	0.764	6.00	19	8	sand to silty sand
13.29	75.0	0.560	0.747	6.00	17	8	sand to silty sand
13.45	55.6	0.780	1.403	5.60	19	7	silty sand to sandy silt
13.62	43.4	0.650	1.498	5.80	15	7	silty sand to sandy silt
13.78	45.3	0.630	1.392	4.90	13	7	silty sand to sandy silt
13.94	36.7	0.500	1.364	4.70	13	7	silty sand to sandy silt
14.11	37.1	0.540	1.457	4.60	12	7	silty sand to sandy silt
14.27	41.9	0.250	0.597	4.60	18	7	silty sand to sandy silt
14.44	92.3	0.620	0.672	4.60	18	8	sand to silty sand
14.60	93.0	1.160	1.248	4.60	24	7	silty sand to sandy silt
14.76	43.1	1.050	2.438	4.50	16	7	silty sand to sandy silt
14.93	17.4	0.690	3.974	4.40	12	5	clayey silt to silty clay
15.09	13.6	0.160	1.179	5.10	7	5	clayey silt to silty clay
15.26	15.2	0.260	1.713	5.20	7	5	clayey silt to silty clay
15.42	15.9	0.420	2.645	5.30	8	5	clayey silt to silty clay
15.58	17.4	0.590	3.397	4.80	8	5	clayey silt to silty clay
15.75	18.9	0.650	3.444	5.10	11	4	silty clay to clay
15.91	16.3	0.640	3.934	4.70	10	4	silty clay to clay
16.08	13.7	0.480	3.512	4.60	9	4	silty clay to clay
16.24	12.9	0.450	3.496	5.10	8	4	silty clay to clay
16.40	13.4	0.480	3.590	5.00	12	3	clay
16.57	11.9	0.550	4.633	4.90	11	3	clay
16.73	10.1	0.470	4.668	4.80	10	3	clay
16.90	9.8	0.340	3.484	4.00	9	3	clay
17.06	8.4	0.180	2.154	4.00	5	4	silty clay to clay
17.22	7.7	0.100	1.306	4.00	4	5	clayey silt to silty clay
17.39	8.3	0.120	1.453	4.10	4	5	clayey silt to silty clay
17.55	8.3	0.110	1.332	4.00	4	5	clayey silt to silty clay
17.72	7.6	0.080	1.059	4.00	4	1	sensitive fine grained
17.88	6.8	0.060	0.888	3.80	3	1	sensitive fine grained
18.04	7.4	0.040	0.544	3.90	3	1	sensitive fine grained
18.21	7.3	0.010	0.138	4.10	3	1	sensitive fine grained
18.37	6.7	0.000	0.000	3.90	3	1	sensitive fine grained
18.54	6.0	0.040	0.672	3.90	3	1	sensitive fine grained
18.70	6.0	0.040	0.672	3.90	3	1	sensitive fine grained
18.86	6.2	0.030	0.486	5.10	3	1	sensitive fine grained
19.03	5.9	0.010	0.170	5.10	3	1	sensitive fine grained
19.19	5.5	0.000	0.000	5.50	3	1	sensitive fine grained
19.36	6.2	0.010	0.162	6.20	3	1	sensitive fine grained
19.52	6.7	0.060	0.896	6.60	3	1	sensitive fine grained
19.69	8.2	0.150	1.828	7.20	4	5	clayey silt to silty clay
19.85	9.5	0.230	2.417	8.00	6	4	silty clay to clay
20.01	9.8	0.230	2.342	8.50	6	4	silty clay to clay
20.18	9.3	0.210	2.252	8.70	6	4	silty clay to clay
20.34	8.7	0.160	1.833	9.10	4	5	clayey silt to silty clay
20.51	8.1	0.140	1.721	9.20	4	5	clayey silt to silty clay
20.67	8.0	0.170	2.115	9.60	4	5	clayey silt to silty clay
20.83	10.2	0.150	1.464	10.00	4	5	clayey silt to silty clay
21.00	8.3	0.090	1.078	10.40	4	5	clayey silt to silty clay
21.16	7.4	0.030	0.408	10.50	4	1	sensitive fine grained
21.33	7.6	0.030	0.397	11.20	4	1	sensitive fine grained
21.49	7.5	0.070	0.937	12.00	4	1	sensitive fine grained
21.65	7.7	0.140	1.823	12.50	4	5	clayey silt to silty clay
21.82	7.3	0.080	1.098	13.00	4	5	clayey silt to silty clay
21.98	8.8	0.160	1.812	16.00	4	5	clayey silt to silty clay
22.15	11.1	0.300	2.692	17.00	7	4	silty clay to clay

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
22.31	13.1	0.440	3.349	16.60	8	4	silty clay to clay
22.47	12.4	0.440	3.545	14.80	8	4	silty clay to clay
22.64	12.5	0.430	3.446	12.50	8	4	silty clay to clay
22.80	12.4	0.420	3.393	12.30	8	4	silty clay to clay
22.97	13.8	0.370	2.685	12.40	8	4	silty clay to clay
23.13	11.8	0.390	3.311	12.40	8	4	silty clay to clay
23.29	10.7	0.330	3.090	12.40	7	4	silty clay to clay
23.46	9.0	0.250	2.784	12.40	6	4	silty clay to clay
23.62	7.8	0.160	2.057	12.40	5	4	silty clay to clay
23.79	6.6	0.130	1.975	12.60	5	4	silty clay to clay
23.95	7.5	0.110	1.469	13.00	5	4	silty clay to clay
24.11	7.4	0.120	1.623	13.50	4	5	clayey silt to silty clay
24.28	7.6	0.100	1.315	14.10	4	5	clayey silt to silty clay
24.44	7.7	0.080	1.037	14.70	4	5	clayey silt to silty clay
24.61	7.1	0.120	1.686	15.20	4	5	clayey silt to silty clay
24.77	8.2	0.070	0.850	16.30	3	1	sensitive fine grained
24.93	6.4	0.070	1.087	16.60	4	1	sensitive fine grained
25.10	7.4	0.080	1.088	17.60	3	1	sensitive fine grained
25.26	8.1	0.050	0.620	18.40	4	1	sensitive fine grained
25.43	10.2	0.040	0.393	18.90	4	1	sensitive fine grained
25.59	9.2	0.030	0.326	21.40	5	1	sensitive fine grained
25.75	8.8	0.020	0.226	23.70	4	1	sensitive fine grained
25.92	9.8	0.050	0.511	26.10	4	6	sandy silt to clayey silt
26.08	10.9	0.080	0.734	28.20	4	6	sandy silt to clayey silt
26.25	9.4	0.070	0.743	29.50	4	6	sandy silt to clayey silt
26.41	10.0	0.060	0.603	31.80	4	6	sandy silt to clayey silt
26.57	10.8	0.060	0.558	31.90	4	6	sandy silt to clayey silt
26.74	9.3	0.020	0.216	32.90	5	1	sensitive fine grained
26.90	8.2	0.030	0.366	33.80	4	1	sensitive fine grained
27.07	8.9	0.070	0.784	36.60	4	6	sandy silt to clayey silt
27.23	12.1	0.110	0.908	29.00	5	5	clayey silt to silty clay
27.40	9.1	0.090	0.984	31.00	4	6	sandy silt to clayey silt
27.56	10.9	0.060	0.551	33.50	4	6	sandy silt to clayey silt
27.72	9.2	0.050	0.545	32.70	4	6	sandy silt to clayey silt
27.89	8.7	0.010	0.115	35.00	4	1	sensitive fine grained
28.05	9.3	0.040	0.428	37.60	4	6	sandy silt to clayey silt
28.22	9.8	0.090	0.921	39.40	5	5	clayey silt to silty clay
28.38	11.7	0.190	1.628	39.40	5	5	clayey silt to silty clay
28.54	13.0	0.120	0.925	33.00	6	5	clayey silt to silty clay
28.71	12.7	0.240	1.884	30.30	7	5	clayey silt to silty clay
28.87	16.5	0.250	1.518	32.50	7	5	clayey silt to silty clay
29.04	14.2	0.260	1.826	23.50	8	5	clayey silt to silty clay
29.20	16.5	0.340	2.064	25.90	7	5	clayey silt to silty clay
29.36	14.2	0.310	2.177	23.50	7	5	clayey silt to silty clay
29.53	13.4	0.230	1.711	23.70	6	5	clayey silt to silty clay
29.69	12.2	0.110	0.898	24.30	5	6	sandy silt to clayey silt
29.86	12.0	0.060	0.502	25.10	4	6	sandy silt to clayey silt
30.02	9.9	0.090	0.911	26.30	5	6	sandy silt to clayey silt
30.18	18.3	0.160	0.874	28.70	6	6	sandy silt to clayey silt
30.35	16.7	0.190	1.138	20.80	6	6	sandy silt to clayey silt
30.51	14.9	0.230	1.541	22.30	6	6	sandy silt to clayey silt
30.68	16.3	0.300	1.842	20.10	7	5	clayey silt to silty clay
30.84	12.1	0.310	2.561	21.00	7	5	clayey silt to silty clay
31.00	14.6	0.310	2.125	20.00	7	5	clayey silt to silty clay
31.17	18.9	0.390	2.067	18.40	8	5	clayey silt to silty clay
31.33	16.7	0.390	2.333	14.80	9	5	clayey silt to silty clay
31.50	19.9	0.280	1.408	13.40	7	6	sandy silt to clayey silt
31.66	21.7	0.390	1.801	11.10	8	6	sandy silt to clayey silt
31.82	20.1	0.400	1.987	9.10	9	5	clayey silt to silty clay
31.99	11.6	0.470	4.068	10.60	8	5	clayey silt to silty clay
32.15	16.1	0.320	1.991	11.90	8	5	clayey silt to silty clay
32.32	24.4	0.280	1.149	11.90	9	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
32.48	26.9	0.360	1.336	10.10	9	6	sandy silt to clayey silt
32.64	18.2	0.240	1.316	9.10	9	6	sandy silt to clayey silt
32.81	27.0	0.280	1.036	8.90	8	6	sandy silt to clayey silt
32.97	19.9	0.490	2.460	8.30	8	6	sandy silt to clayey silt
33.14	15.0	0.330	2.195	9.10	8	6	sandy silt to clayey silt
33.30	27.4	0.340	1.243	10.50	8	6	sandy silt to clayey silt
33.46	23.5	0.480	2.041	8.40	8	6	sandy silt to clayey silt
33.63	15.5	0.390	2.512	8.90	8	6	sandy silt to clayey silt
33.79	20.9	0.240	1.146	9.70	8	6	sandy silt to clayey silt
33.96	26.0	0.250	0.960	9.40	9	6	sandy silt to clayey silt
34.12	26.8	0.260	0.969	9.20	10	6	sandy silt to clayey silt
34.28	23.0	0.440	1.910	9.20	9	6	sandy silt to clayey silt
34.45	18.4	0.390	2.115	9.90	9	6	sandy silt to clayey silt
34.61	25.2	0.420	1.664	9.60	9	6	sandy silt to clayey silt
34.78	25.9	0.330	1.272	9.60	10	6	sandy silt to clayey silt
34.94	29.5	0.290	0.982	8.60	10	7	silty sand to sandy silt
35.10	37.0	0.270	0.730	7.70	12	7	silty sand to sandy silt
35.27	48.1	0.190	0.395	6.40	14	7	silty sand to sandy silt
35.43	43.6	0.220	0.505	5.10	14	7	silty sand to sandy silt
35.60	39.2	0.280	0.715	5.10	14	7	silty sand to sandy silt
35.76	45.4	0.250	0.551	5.10	14	7	silty sand to sandy silt
35.93	43.5	0.310	0.713	4.90	14	7	silty sand to sandy silt
36.09	41.4	0.440	1.064	4.70	12	7	silty sand to sandy silt
36.25	30.8	0.600	1.951	4.00	12	6	sandy silt to clayey silt
36.42	22.2	0.540	2.436	4.70	9	6	sandy silt to clayey silt
36.58	18.6	0.430	2.315	4.90	9	5	clayey silt to silty clay
36.75	15.5	0.230	1.486	5.20	7	5	clayey silt to silty clay
36.91	12.2	0.190	1.560	5.40	6	5	clayey silt to silty clay
37.07	10.5	0.150	1.430	6.10	6	5	clayey silt to silty clay
37.24	12.1	0.120	0.992	6.80	5	5	clayey silt to silty clay
37.40	10.5	0.130	1.237	7.40	5	5	clayey silt to silty clay
37.57	10.6	0.100	0.942	8.10	5	5	clayey silt to silty clay
37.73	10.5	0.100	0.950	8.80	5	5	clayey silt to silty clay
37.89	10.6	0.090	0.846	9.50	5	5	clayey silt to silty clay
38.06	10.6	0.110	1.043	10.50	5	5	clayey silt to silty clay
38.22	10.1	0.100	0.994	11.10	5	5	clayey silt to silty clay
38.39	10.5	0.090	0.855	15.80	5	5	clayey silt to silty clay
38.55	10.4	0.080	0.766	16.90	4	6	sandy silt to clayey silt
38.71	9.9	0.060	0.609	17.70	4	6	sandy silt to clayey silt
38.88	9.6	0.060	0.627	18.80	4	6	sandy silt to clayey silt
39.04	10.0	0.060	0.601	19.70	4	6	sandy silt to clayey silt
39.21	10.0	0.070	0.700	20.70	4	6	sandy silt to clayey silt
39.37	10.6	0.060	0.566	21.50	4	6	sandy silt to clayey silt
39.53	10.4	0.070	0.671	22.60	4	6	sandy silt to clayey silt
39.70	10.3	0.030	0.290	23.40	4	6	sandy silt to clayey silt
39.86	9.6	0.020	0.207	24.30	5	1	sensitive fine grained
40.03	9.6	0.010	0.104	25.70	5	1	sensitive fine grained
40.19	10.1	0.030	0.297	27.60	4	6	sandy silt to clayey silt
40.35	10.5	0.060	0.570	30.00	4	6	sandy silt to clayey silt
40.52	10.0	0.070	0.702	32.70	4	6	sandy silt to clayey silt
40.68	10.2	0.080	0.784	34.70	4	6	sandy silt to clayey silt
40.85	10.3	0.070	0.677	37.00	4	6	sandy silt to clayey silt
41.01	9.9	0.060	0.608	39.10	4	6	sandy silt to clayey silt
41.17	9.6	0.060	0.626	40.90	4	6	sandy silt to clayey silt
41.34	9.9	0.050	0.504	42.70	4	6	sandy silt to clayey silt
41.50	9.6	0.060	0.623	44.00	4	6	sandy silt to clayey silt
41.67	10.1	0.000	0.000	45.20	4	6	sandy silt to clayey silt
41.83	10.9	0.000	0.000	45.30	0	0	<out of range>
41.99	8.5	0.000	0.000	44.40	0	0	<out of range>
42.16	9.1	0.000	0.000	46.00	0	0	<out of range>
42.32	9.4	0.000	0.000	47.70	5	1	sensitive fine grained
42.49	9.8	0.010	0.102	50.50	4	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
42.65	10.9	0.070	0.645	52.60	4	6	sandy silt to clayey silt
42.81	12.0	0.150	1.251	54.80	6	5	clayey silt to silty clay
42.98	12.6	0.200	1.589	54.40	6	5	clayey silt to silty clay
43.14	12.7	0.220	1.732	55.50	6	5	clayey silt to silty clay
43.31	12.9	0.230	1.778	58.00	6	5	clayey silt to silty clay
43.47	13.2	0.260	1.977	59.10	6	5	clayey silt to silty clay
43.64	13.9	0.300	2.163	60.50	7	5	clayey silt to silty clay
43.80	13.9	0.300	2.161	61.30	7	5	clayey silt to silty clay
43.96	13.8	0.300	2.177	61.10	7	5	clayey silt to silty clay
44.13	13.3	0.240	1.807	61.40	7	5	clayey silt to silty clay
44.29	13.9	0.170	1.224	61.40	6	5	clayey silt to silty clay
44.46	12.0	0.140	1.164	57.70	5	6	sandy silt to clayey silt
44.62	11.9	0.120	1.010	60.90	6	5	clayey silt to silty clay
44.78	11.5	0.160	1.391	62.50	6	5	clayey silt to silty clay
44.95	13.2	0.200	1.519	60.20	6	5	clayey silt to silty clay
45.11	12.0	0.180	1.495	44.50	6	5	clayey silt to silty clay
45.28	11.8	0.180	1.528	54.30	6	5	clayey silt to silty clay
45.44	12.5	0.130	1.040	55.70	6	5	clayey silt to silty clay
45.60	11.5	0.100	0.871	53.80	5	6	sandy silt to clayey silt
45.77	11.3	0.060	0.531	55.40	4	6	sandy silt to clayey silt
45.93	10.5	0.120	1.138	58.90	5	5	clayey silt to silty clay
46.10	11.3	0.210	1.857	63.20	9	7	silty sand to sandy silt
46.26	61.2	0.290	0.474	50.80	14	8	sand to silty sand
46.42	107.3	0.490	0.457	19.40	21	8	sand to silty sand
46.59	94.1	0.580	0.616	16.30	23	8	sand to silty sand
46.75	82.8	0.590	0.713	13.90	20	8	sand to silty sand
46.92	79.1	0.520	0.657	13.10	19	8	sand to silty sand
47.08	76.7	0.470	0.613	12.70	18	8	sand to silty sand
47.24	74.5	0.440	0.591	12.50	18	8	sand to silty sand
47.41	72.0	0.490	0.681	12.50	18	8	sand to silty sand
47.57	85.0	0.570	0.671	12.70	20	8	sand to silty sand
47.74	96.8	0.720	0.744	12.70	22	8	sand to silty sand
47.90	99.8	0.820	0.822	13.00	24	8	sand to silty sand
48.06	98.5	0.800	0.812	13.20	24	8	sand to silty sand
48.23	101.4	0.890	0.878	13.30	24	8	sand to silty sand
48.39	107.1	0.950	0.887	13.20	25	8	sand to silty sand
48.56	105.3	1.070	1.016	13.50	25	8	sand to silty sand
48.72	101.7	0.940	0.924	13.50	24	8	sand to silty sand
48.88	92.4	0.840	0.909	13.50	22	8	sand to silty sand
49.05	86.8	0.300	0.346	13.50	20	8	sand to silty sand
49.21	66.6	0.210	0.315	13.20	14	8	sand to silty sand
49.38	21.6	0.170	0.789	24.60	12	7	silty sand to sandy silt
49.54	20.9	0.260	1.246	25.70	7	6	sandy silt to clayey silt
49.70	16.3	0.210	1.289	27.50	7	6	sandy silt to clayey silt
49.87	14.7	0.200	1.356	30.90	6	6	sandy silt to clayey silt
50.03	14.2	0.240	1.688	35.90	7	5	clayey silt to silty clay
50.20	14.8	0.280	1.895	40.10	7	5	clayey silt to silty clay
50.36	14.2	0.310	2.176	44.80	7	5	clayey silt to silty clay
50.52	14.1	0.290	2.056	48.80	7	5	clayey silt to silty clay
50.69	15.1	0.280	1.859	53.00	7	5	clayey silt to silty clay
50.85	16.0	0.270	1.690	54.00	6	6	sandy silt to clayey silt
51.02	17.0	0.200	1.179	53.40	6	6	sandy silt to clayey silt
51.18	14.1	0.180	1.272	52.00	6	6	sandy silt to clayey silt
51.35	13.9	0.170	1.223	55.20	6	6	sandy silt to clayey silt
51.51	15.5	0.150	0.969	53.90	6	6	sandy silt to clayey silt
51.67	15.1	0.130	0.863	53.50	6	6	sandy silt to clayey silt
51.84	13.5	0.130	0.961	57.40	5	6	sandy silt to clayey silt
52.00	13.0	0.120	0.926	59.50	5	6	sandy silt to clayey silt
52.17	12.7	0.140	1.103	62.00	5	6	sandy silt to clayey silt
52.33	12.6	0.140	1.110	63.60	5	6	sandy silt to clayey silt
52.49	12.7	0.140	1.099	65.10	5	6	sandy silt to clayey silt
52.66	13.0	0.140	1.080	66.60	5	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
52.82	12.7	0.140	1.103	69.20	5	6	sandy silt to clayey silt
52.99	12.5	0.140	1.119	70.20	5	6	sandy silt to clayey silt
53.15	13.2	0.140	1.057	72.30	5	6	sandy silt to clayey silt
53.31	13.0	0.160	1.235	73.10	5	6	sandy silt to clayey silt
53.48	13.2	0.160	1.215	74.00	5	6	sandy silt to clayey silt
53.64	13.5	0.160	1.186	75.90	5	6	sandy silt to clayey silt
53.81	14.0	0.190	1.355	77.80	5	6	sandy silt to clayey silt
53.97	14.5	0.240	1.650	79.40	7	5	clayey silt to silty clay
54.13	14.1	0.230	1.628	78.60	7	5	clayey silt to silty clay
54.30	14.0	0.190	1.357	76.40	5	6	sandy silt to clayey silt
54.46	13.0	0.110	0.845	70.50	5	6	sandy silt to clayey silt
54.63	12.0	0.090	0.753	66.40	5	6	sandy silt to clayey silt
54.79	11.9	0.070	0.588	69.50	5	6	sandy silt to clayey silt
54.95	11.7	0.090	0.767	72.00	5	6	sandy silt to clayey silt
55.12	12.7	0.100	0.785	72.50	5	6	sandy silt to clayey silt
55.28	12.3	0.100	0.811	71.30	5	6	sandy silt to clayey silt
55.45	11.7	0.070	0.597	71.00	5	6	sandy silt to clayey silt
55.61	11.2	0.050	0.445	71.10	4	6	sandy silt to clayey silt
55.77	11.6	0.050	0.429	72.70	4	6	sandy silt to clayey silt
55.94	11.6	0.050	0.429	72.80	4	6	sandy silt to clayey silt
56.10	11.8	0.050	0.425	74.80	5	6	sandy silt to clayey silt
56.27	11.9	0.060	0.504	76.50	5	6	sandy silt to clayey silt
56.43	12.2	0.060	0.490	78.80	5	6	sandy silt to clayey silt
56.59	12.1	0.080	0.664	80.10	5	6	sandy silt to clayey silt
56.76	12.1	0.210	1.741	80.70	5	6	sandy silt to clayey silt
56.92	12.1	0.120	0.993	81.90	6	5	clayey silt to silty clay
57.09	11.8	0.120	1.019	81.60	5	6	sandy silt to clayey silt
57.25	12.5	0.120	0.962	81.80	5	6	sandy silt to clayey silt
57.41	12.2	0.160	1.317	80.10	5	6	sandy silt to clayey silt
57.58	11.8	0.130	1.098	79.50	5	6	sandy silt to clayey silt
57.74	12.3	0.120	0.977	75.40	5	6	sandy silt to clayey silt
57.91	12.3	0.140	1.141	81.20	8	4	silty clay to clay
58.07	13.6	0.800	5.891	81.90	9	4	silty clay to clay
58.23	14.5	0.220	1.521	73.70	7	5	clayey silt to silty clay
58.40	13.7	0.190	1.389	74.90	7	5	clayey silt to silty clay
58.56	13.2	0.180	1.364	76.00	6	5	clayey silt to silty clay
58.73	13.1	0.170	1.297	76.60	6	5	clayey silt to silty clay
58.89	13.6	0.200	1.474	74.20	7	5	clayey silt to silty clay
59.06	14.9	0.260	1.746	75.80	7	5	clayey silt to silty clay
59.22	15.3	0.280	1.828	63.80	7	5	clayey silt to silty clay
59.38	15.8	0.210	1.332	66.70	6	6	sandy silt to clayey silt
59.55	14.9	0.180	1.210	67.70	6	6	sandy silt to clayey silt
59.71	12.8	0.210	1.635	72.40	5	6	sandy silt to clayey silt
59.88	13.7	0.120	0.873	72.30	6	6	sandy silt to clayey silt
60.04	16.6	0.240	1.445	62.90	6	6	sandy silt to clayey silt
60.20	20.4	0.360	1.765	75.80	10	6	sandy silt to clayey silt
60.37	44.4	0.270	0.607	17.10	12	7	silty sand to sandy silt
60.53	51.0	0.228	0.447	13.00	15	7	silty sand to sandy silt
60.70	47.2	0.470	0.996	13.40	15	7	silty sand to sandy silt
60.86	43.6	0.830	1.903	14.20	15	7	silty sand to sandy silt
61.02	48.0	0.500	1.041	15.30	17	7	silty sand to sandy silt
61.19	69.1	0.450	0.651	12.00	19	7	silty sand to sandy silt
61.35	62.8	0.680	1.083	11.40	19	7	silty sand to sandy silt
61.52	51.3	0.880	1.716	11.90	16	7	silty sand to sandy silt
61.68	34.1	0.650	1.907	12.40	14	6	sandy silt to clayey silt
61.84	20.8	0.280	1.345	15.00	9	6	sandy silt to clayey silt
62.01	14.9	0.170	1.143	19.20	7	6	sandy silt to clayey silt
62.17	15.2	0.150	0.984	23.60	7	6	sandy silt to clayey silt
62.34	24.0	0.140	0.583	27.90	8	6	sandy silt to clayey silt
62.50	27.0	0.210	0.778	26.80	8	7	silty sand to sandy silt
62.66	20.4	0.120	0.587	29.80	8	6	sandy silt to clayey silt
62.83	17.6	0.130	0.740	32.80	7	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
62.99	16.0	0.200	1.247	37.80	9	6	sandy silt to clayey silt
63.16	37.7	0.450	1.195	38.60	12	6	sandy silt to clayey silt
63.32	37.8	0.700	1.850	30.60	15	6	sandy silt to clayey silt
63.48	41.7	0.910	2.184	31.80	16	6	sandy silt to clayey silt
63.65	43.8	1.110	2.535	26.50	18	7	silty sand to sandy silt
63.81	82.1	0.850	1.035	20.30	22	8	sand to silty sand
63.98	147.6	0.790	0.535	12.40	26	9	sand
64.14	175.8	1.030	0.586	11.30	31	9	sand
64.30	164.5	1.310	0.796	12.20	30	9	sand
64.47	134.6	1.370	1.018	12.10	32	8	sand to silty sand
64.63	102.1	1.190	1.165	14.50	28	8	sand to silty sand
64.80	109.9	0.860	0.782	14.80	25	8	sand to silty sand
64.96	99.7	0.870	0.873	14.20	23	8	sand to silty sand
65.12	78.9	1.080	1.369	14.10	26	7	silty sand to sandy silt
65.29	68.4	1.190	1.740	14.20	24	7	silty sand to sandy silt
65.45	75.6	1.070	1.415	14.40	25	7	silty sand to sandy silt
65.62	92.5	1.210	1.308	12.20	22	8	sand to silty sand
65.78	107.8	1.400	1.299	12.50	26	8	sand to silty sand
65.94	122.8	1.460	1.189	13.10	28	8	sand to silty sand
66.11	125.8	1.470	1.169	13.50	29	8	sand to silty sand
66.27	112.1	1.530	1.365	13.80	25	8	sand to silty sand
66.44	78.1	1.560	1.998	13.70	25	7	silty sand to sandy silt
66.60	44.1	1.180	2.675	14.20	19	6	sandy silt to clayey silt
66.77	25.9	0.800	3.087	15.10	11	6	sandy silt to clayey silt
66.93	19.4	0.330	1.704	18.20	9	6	sandy silt to clayey silt
67.09	24.4	0.180	0.738	20.10	8	6	sandy silt to clayey silt
67.26	19.3	0.190	0.983	22.20	8	6	sandy silt to clayey silt
67.42	15.6	0.180	1.156	25.40	7	6	sandy silt to clayey silt
67.59	16.5	0.190	1.149	29.90	6	6	sandy silt to clayey silt
67.75	15.3	0.020	0.131	75.30	6	6	sandy silt to clayey silt
67.91	14.6	0.180	1.235	81.60	6	6	sandy silt to clayey silt
68.08	16.1	0.200	1.245	87.60	6	6	sandy silt to clayey silt
68.24	16.2	0.230	1.416	79.50	6	6	sandy silt to clayey silt
68.41	15.5	0.180	1.161	83.70	6	6	sandy silt to clayey silt
68.57	17.0	0.140	0.822	78.80	6	6	sandy silt to clayey silt
68.73	17.6	0.180	1.025	81.00	7	6	sandy silt to clayey silt
68.90	18.0	0.210	1.169	81.10	7	6	sandy silt to clayey silt
69.06	17.2	0.100	0.583	80.10	7	6	sandy silt to clayey silt
69.23	16.8	0.100	0.594	78.50	6	6	sandy silt to clayey silt
69.39	15.8	0.120	0.761	81.50	6	6	sandy silt to clayey silt
69.55	15.7	0.100	0.638	81.50	6	6	sandy silt to clayey silt
69.72	15.5	0.090	0.582	80.60	6	6	sandy silt to clayey silt
69.88	15.8	0.070	0.443	82.20	6	6	sandy silt to clayey silt
70.05	14.9	0.060	0.401	79.70	6	6	sandy silt to clayey silt
70.21	14.7	0.070	0.477	80.90	6	6	sandy silt to clayey silt
70.37	14.0	0.090	0.643	83.00	5	6	sandy silt to clayey silt
70.54	14.0	0.210	1.503	81.50	5	6	sandy silt to clayey silt
70.70	15.1	0.150	0.995	82.10	6	6	sandy silt to clayey silt
70.87	16.6	0.190	1.143	85.40	6	6	sandy silt to clayey silt
71.03	17.2	0.200	1.163	83.50	7	6	sandy silt to clayey silt
71.19	18.6	0.130	0.700	73.60	7	6	sandy silt to clayey silt
71.36	16.6	0.100	0.602	77.50	7	6	sandy silt to clayey silt
71.52	16.1	0.110	0.684	81.60	6	6	sandy silt to clayey silt
71.69	15.7	0.180	1.146	84.00	6	6	sandy silt to clayey silt
71.85	17.2	0.230	1.333	86.70	6	6	sandy silt to clayey silt
72.01	17.6	0.240	1.364	82.90	7	6	sandy silt to clayey silt
72.18	17.0	0.220	1.296	82.00	7	6	sandy silt to clayey silt
72.34	17.4	0.200	1.148	84.50	6	6	sandy silt to clayey silt
72.51	16.4	0.200	1.219	83.70	6	6	sandy silt to clayey silt
72.67	16.3	0.130	0.796	86.10	6	6	sandy silt to clayey silt
72.83	14.7	0.110	0.751	87.10	6	6	sandy silt to clayey silt
73.00	14.6	0.160	1.095	91.30	6	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
73.16	18.0	0.250	1.391	95.40	7	6	sandy silt to clayey silt
73.33	19.8	0.300	1.512	93.20	7	6	sandy silt to clayey silt
73.49	19.6	0.230	1.175	88.50	7	6	sandy silt to clayey silt
73.65	17.5	0.230	1.311	86.30	7	6	sandy silt to clayey silt
73.82	21.5	0.450	2.097	94.20	8	6	sandy silt to clayey silt
73.98	21.6	0.450	2.079	72.60	8	6	sandy silt to clayey silt
74.15	21.6	0.180	0.832	71.50	8	6	sandy silt to clayey silt
74.31	23.2	0.140	0.604	74.70	8	6	sandy silt to clayey silt
74.48	17.0	0.130	0.765	75.20	7	6	sandy silt to clayey silt
74.64	16.1	0.130	0.809	74.40	6	6	sandy silt to clayey silt
74.80	16.3	0.130	0.799	74.20	6	6	sandy silt to clayey silt
74.97	15.8	0.130	0.825	74.10	6	6	sandy silt to clayey silt
75.13	16.2	0.130	0.804	73.80	6	6	sandy silt to clayey silt
75.30	15.7	0.130	0.830	73.80	6	6	sandy silt to clayey silt
75.46	16.6	0.130	0.785	73.10	6	6	sandy silt to clayey silt
75.62	16.3	0.120	0.738	73.40	6	6	sandy silt to clayey silt
75.79	16.8	0.130	0.776	73.00	6	6	sandy silt to clayey silt
75.95	16.3	0.120	0.734	72.60	6	6	sandy silt to clayey silt
76.12	16.8	0.120	0.712	72.40	6	6	sandy silt to clayey silt
76.28	15.9	0.120	0.753	72.30	6	6	sandy silt to clayey silt
76.44	16.8	0.110	0.653	72.10	6	6	sandy silt to clayey silt
76.61	16.8	0.120	0.713	71.70	6	6	sandy silt to clayey silt
76.77	16.2	0.120	0.739	71.60	6	6	sandy silt to clayey silt
76.94	15.9	0.110	0.690	71.60	6	6	sandy silt to clayey silt
77.10	16.7	0.120	0.718	71.10	6	6	sandy silt to clayey silt
77.26	17.1	0.110	0.643	70.80	6	6	sandy silt to clayey silt
77.43	16.6	0.110	0.662	70.80	6	6	sandy silt to clayey silt
77.59	16.8	0.090	0.535	70.50	6	6	sandy silt to clayey silt
77.76	16.6	0.450	2.709	70.20	8	6	sandy silt to clayey silt
77.92	17.1	0.420	2.456	69.30	9	5	clayey silt to silty clay
78.08	21.4	0.390	1.827	59.10	9	5	clayey silt to silty clay
78.25	19.6	0.360	1.840	67.00	8	6	sandy silt to clayey silt
78.41	19.0	0.400	2.110	73.50	8	6	sandy silt to clayey silt
78.58	21.3	0.450	2.112	77.10	10	5	clayey silt to silty clay
78.74	21.5	0.460	2.139	77.10	8	6	sandy silt to clayey silt
78.90	21.7	0.380	1.750	77.10	8	6	sandy silt to clayey silt
79.07	19.7	0.340	1.724	78.20	8	6	sandy silt to clayey silt
79.23	19.1	0.290	1.514	79.80	7	6	sandy silt to clayey silt
79.40	17.6	0.310	1.756	79.80	7	6	sandy silt to clayey silt
79.56	19.3	0.430	2.226	84.60	9	5	clayey silt to silty clay
79.72	21.6	0.500	2.313	84.80	9	6	sandy silt to clayey silt
79.89	26.9	0.500	1.861	80.90	10	6	sandy silt to clayey silt
80.05	31.0	0.390	1.258	62.20	12	6	sandy silt to clayey silt
80.22	34.2	0.590	1.726	40.80	12	6	sandy silt to clayey silt
80.38	26.7	0.530	1.983	43.80	12	6	sandy silt to clayey silt
80.54	36.7	0.460	1.255	45.90	12	6	sandy silt to clayey silt
80.71	33.9	0.590	1.741	40.20	12	6	sandy silt to clayey silt
80.87	23.0	0.510	2.214	43.90	11	6	sandy silt to clayey silt
81.04	27.3	0.460	1.686	47.80	11	6	sandy silt to clayey silt
81.20	36.7	0.650	1.769	51.00	12	6	sandy silt to clayey silt
81.36	32.2	0.610	1.894	35.20	12	6	sandy silt to clayey silt
81.53	26.0	0.470	1.808	41.80	12	6	sandy silt to clayey silt
81.69	35.1	0.820	2.336	48.50	12	6	sandy silt to clayey silt
81.86	30.6	0.784	2.560	36.30	14	6	sandy silt to clayey silt
82.02	41.0	0.590	1.439	48.20	13	7	silty sand to sandy silt
82.19	53.2	0.760	1.429	32.90	16	7	silty sand to sandy silt
82.35	54.9	0.600	1.092	31.20	21	7	silty sand to sandy silt
82.51	86.1	0.710	0.825	28.00	22	7	silty sand to sandy silt
82.68	67.6	1.040	1.539	19.40	21	7	silty sand to sandy silt
82.84	41.0	0.960	2.342	20.70	17	6	sandy silt to clayey silt
83.01	27.9	0.630	2.262	24.40	12	6	sandy silt to clayey silt
83.17	25.8	0.230	0.891	29.10	10	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
83.33	27.1	0.400	1.474	30.50	9	6	sandy silt to clayey silt
83.50	19.0	0.440	2.316	34.40	9	6	sandy silt to clayey silt
83.66	24.0	0.300	1.247	38.10	9	6	sandy silt to clayey silt
83.83	26.6	0.220	0.827	41.50	10	6	sandy silt to clayey silt
83.99	25.7	0.410	1.593	43.90	10	6	sandy silt to clayey silt
84.15	22.9	1.170	5.115	46.80	15	5	clayey silt to silty clay
84.32	47.4	2.070	4.370	60.10	31	6	sandy silt to clayey silt
84.48	175.6	2.600	1.481	45.40	43	7	silty sand to sandy silt
84.65	179.4	3.320	1.850	30.90	42	8	sand to silty sand
84.81	176.7	3.220	1.822	29.00	43	8	sand to silty sand
84.97	187.7	2.820	1.502	28.10	41	8	sand to silty sand
85.14	152.5	3.280	2.151	25.40	51	7	silty sand to sandy silt
85.30	135.2	3.420	2.530	24.70	48	7	silty sand to sandy silt
85.47	165.2	3.040	1.840	26.60	40	7	silty sand to sandy silt
85.63	79.3	2.780	3.508	24.60	35	6	sandy silt to clayey silt
85.79	32.5	1.540	4.740	20.10	22	5	clayey silt to silty clay
85.96	24.4	0.720	2.956	24.80	12	5	clayey silt to silty clay
86.12	20.8	0.310	1.488	29.70	8	6	sandy silt to clayey silt
86.29	18.1	0.190	1.047	37.70	7	6	sandy silt to clayey silt
86.45	16.7	0.150	0.899	47.90	7	6	sandy silt to clayey silt
86.61	17.5	0.150	0.859	59.40	7	6	sandy silt to clayey silt
86.78	17.4	0.170	0.977	69.30	7	6	sandy silt to clayey silt
86.94	18.1	0.250	1.380	77.90	7	6	sandy silt to clayey silt
87.11	21.8	0.280	1.284	83.70	8	6	sandy silt to clayey silt
87.27	22.1	0.310	1.402	84.00	8	6	sandy silt to clayey silt
87.43	19.6	0.240	1.223	85.00	8	6	sandy silt to clayey silt
87.60	17.6	0.200	1.138	95.70	7	6	sandy silt to clayey silt
87.76	16.5	0.170	1.032	102.70	7	6	sandy silt to clayey silt
87.93	17.4	0.180	1.035	110.10	7	6	sandy silt to clayey silt
88.09	17.6	0.190	1.077	113.90	7	6	sandy silt to clayey silt
88.25	17.6	0.200	1.138	116.20	7	6	sandy silt to clayey silt
88.42	17.9	0.200	1.120	115.50	7	6	sandy silt to clayey silt
88.58	18.0	0.240	1.336	115.80	7	6	sandy silt to clayey silt
88.75	18.7	0.260	1.389	112.50	7	6	sandy silt to clayey silt
88.91	19.4	0.270	1.393	110.30	7	6	sandy silt to clayey silt
89.07	18.7	0.270	1.442	105.90	7	6	sandy silt to clayey silt
89.24	17.6	0.240	1.362	105.80	7	6	sandy silt to clayey silt
89.40	17.5	0.210	1.197	107.00	7	6	sandy silt to clayey silt
89.57	18.1	0.210	1.163	108.10	7	6	sandy silt to clayey silt
89.73	19.0	0.200	1.055	108.40	7	6	sandy silt to clayey silt
89.90	17.3	0.200	1.153	100.40	7	6	sandy silt to clayey silt
90.06	17.8	0.190	1.070	108.30	7	6	sandy silt to clayey silt
90.22	16.5	0.160	0.972	107.90	6	6	sandy silt to clayey silt
90.39	16.0	0.130	0.811	106.00	6	6	sandy silt to clayey silt
90.55	16.3	0.110	0.675	104.10	6	6	sandy silt to clayey silt
90.72	15.4	0.140	0.906	100.50	6	6	sandy silt to clayey silt
90.88	15.7	0.160	1.019	104.10	6	6	sandy silt to clayey silt
91.04	15.8	0.120	0.760	103.50	6	6	sandy silt to clayey silt
91.21	16.1	0.080	0.495	100.60	6	6	sandy silt to clayey silt
91.37	14.7	0.050	0.341	102.00	6	6	sandy silt to clayey silt
91.54	13.9	0.050	0.360	102.30	5	6	sandy silt to clayey silt
91.70	13.9	0.050	0.359	105.00	5	6	sandy silt to clayey silt
91.86	13.8	0.060	0.434	106.90	5	6	sandy silt to clayey silt
92.03	13.8	0.100	0.723	105.90	5	6	sandy silt to clayey silt
92.19	14.7	0.110	0.751	107.80	6	6	sandy silt to clayey silt
92.36	15.6	0.110	0.704	105.80	6	6	sandy silt to clayey silt
92.52	15.7	0.120	0.763	105.80	6	6	sandy silt to clayey silt
92.68	15.9	0.100	0.628	106.30	6	6	sandy silt to clayey silt
92.85	15.3	0.110	0.718	105.60	6	6	sandy silt to clayey silt
93.01	16.2	0.140	0.866	108.20	6	6	sandy silt to clayey silt
93.18	15.9	0.120	0.754	105.40	6	6	sandy silt to clayey silt
93.34	16.0	0.100	0.625	104.50	6	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
93.50	15.3	0.180	1.174	106.30	6	6	sandy silt to clayey silt
93.67	15.9	0.330	2.069	107.40	10	6	sandy silt to clayey silt
93.83	46.5	0.350	0.752	29.90	12	7	silty sand to sandy silt
94.00	47.5	0.041	0.086	31.30	14	7	silty sand to sandy silt
94.16	40.2	0.500	1.243	30.40	12	7	silty sand to sandy silt
94.32	27.6	0.640	2.319	34.80	12	6	sandy silt to clayey silt
94.49	25.4	0.430	1.693	55.80	12	6	sandy silt to clayey silt
94.65	39.8	0.720	1.810	40.10	12	6	sandy silt to clayey silt
94.82	30.0	0.800	2.667	41.50	13	7	silty sand to sandy silt
94.98	56.0	0.530	0.946	56.20	22	7	silty sand to sandy silt
95.14	118.9	0.790	0.664	30.40	23	8	sand to silty sand
95.31	116.4	1.130	0.971	29.00	27	8	sand to silty sand
95.47	98.2	1.290	1.314	28.50	23	8	sand to silty sand
95.64	78.7	1.380	1.753	29.10	25	7	silty sand to sandy silt
95.80	59.9	1.710	2.853	29.90	23	6	sandy silt to clayey silt
95.96	38.0	1.290	3.392	29.90	18	6	sandy silt to clayey silt
96.13	41.5	0.770	1.857	39.40	19	7	silty sand to sandy silt
96.29	103.0	0.540	0.524	37.20	21	8	sand to silty sand
96.46	114.9	1.020	0.888	28.20	26	8	sand to silty sand
96.62	103.3	1.300	1.259	27.10	25	8	sand to silty sand
96.78	96.1	1.220	1.270	27.00	26	8	sand to silty sand
96.95	126.2	1.010	0.800	28.70	28	8	sand to silty sand
97.11	131.1	0.980	0.747	30.60	31	8	sand to silty sand
97.28	130.8	1.120	0.856	27.40	30	8	sand to silty sand
97.44	118.6	1.280	1.079	27.00	27	8	sand to silty sand
97.60	86.4	1.400	1.621	26.90	28	7	silty sand to sandy silt
97.77	59.9	1.240	2.070	27.40	20	7	silty sand to sandy silt
97.93	45.2	1.450	3.206	29.50	18	6	sandy silt to clayey silt
98.10	35.3	1.100	3.118	32.90	18	6	sandy silt to clayey silt
98.26	57.9	0.810	1.399	42.60	17	7	silty sand to sandy silt
98.43	65.9	0.940	1.425	31.00	21	7	silty sand to sandy silt
98.59	74.8	0.780	1.042	29.40	18	8	sand to silty sand
98.75	82.1	0.700	0.853	26.40	18	8	sand to silty sand
98.92	73.8	0.930	1.259	23.90	19	8	sand to silty sand
99.08	84.8	0.620	0.731	23.60	19	8	sand to silty sand
99.25	76.7	1.060	1.383	18.80	22	7	silty sand to sandy silt
99.41	45.9	1.110	2.420	18.50	17	7	silty sand to sandy silt
99.57	41.1	1.050	2.555	20.80	15	6	sandy silt to clayey silt
99.74	28.8	0.830	2.879	23.00	13	6	sandy silt to clayey silt
99.90	28.1	0.430	1.530	28.10	10	6	sandy silt to clayey silt
100.07	24.3	0.470	1.938	31.50	10	6	sandy silt to clayey silt
100.23	22.1	0.320	1.447	35.90	9	6	sandy silt to clayey silt
100.39	23.2	0.530	2.282	57.10	9	6	sandy silt to clayey silt
100.56	27.1	0.540	1.996	66.50	14	7	silty sand to sandy silt
100.72	80.1	0.790	0.986	48.50	22	7	silty sand to sandy silt
100.89	97.4	1.260	1.294	31.40	27	7	silty sand to sandy silt
101.05	71.8	1.700	2.369	31.60	22	7	silty sand to sandy silt
101.21	37.8	1.340	3.546	33.70	17	6	sandy silt to clayey silt
101.38	24.4	0.730	2.990	42.50	13	5	clayey silt to silty clay
101.54	20.6	0.330	1.604	53.70	8	6	sandy silt to clayey silt
101.71	20.6	0.290	1.405	65.20	8	6	sandy silt to clayey silt
101.87	20.4	0.210	1.031	74.30	8	6	sandy silt to clayey silt
102.03	21.4	0.220	1.030	80.50	8	6	sandy silt to clayey silt
102.20	19.9	0.240	1.209	87.10	8	6	sandy silt to clayey silt
102.36	20.5	0.300	1.461	92.70	8	6	sandy silt to clayey silt
102.53	20.4	0.330	1.620	95.10	8	6	sandy silt to clayey silt
102.69	23.5	0.200	0.853	94.30	9	6	sandy silt to clayey silt
102.85	29.0	0.170	0.586	76.00	9	6	sandy silt to clayey silt
103.02	20.2	0.360	1.783	75.40	9	6	sandy silt to clayey silt
103.18	24.2	0.410	1.697	94.00	13	6	sandy silt to clayey silt
103.35	56.5	0.840	1.486	58.00	16	6	sandy silt to clayey silt
103.51	45.4	1.100	2.424	47.10	16	7	silty sand to sandy silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
103.67	53.2	0.860	1.617	40.80	16	7	silty sand to sandy silt
103.84	53.6	0.690	1.288	32.10	16	7	silty sand to sandy silt
104.00	47.9	0.400	0.835	36.50	16	7	silty sand to sandy silt
104.17	50.8	0.680	1.338	36.20	14	7	silty sand to sandy silt
104.33	32.5	0.690	2.125	39.20	14	6	sandy silt to clayey silt
104.49	26.2	0.350	1.338	52.50	11	6	sandy silt to clayey silt
104.66	26.6	0.260	0.976	64.70	10	6	sandy silt to clayey silt
104.82	24.5	0.270	1.104	74.00	9	6	sandy silt to clayey silt
104.99	20.1	0.340	1.691	83.70	9	6	sandy silt to clayey silt
105.15	22.1	0.280	1.267	96.60	8	6	sandy silt to clayey silt
105.32	23.7	0.550	2.321	96.90	12	6	sandy silt to clayey silt
105.48	49.4	0.680	1.375	114.30	16	7	silty sand to sandy silt
105.64	75.0	1.190	1.588	31.80	18	7	silty sand to sandy silt
105.81	42.5	1.240	2.919	33.20	18	6	sandy silt to clayey silt
105.97	26.3	0.880	3.344	42.70	14	5	clayey silt to silty clay
106.14	20.9	0.460	2.200	63.00	11	5	clayey silt to silty clay
106.30	21.3	0.290	1.360	77.90	8	6	sandy silt to clayey silt
106.46	21.6	0.210	0.973	89.10	8	6	sandy silt to clayey silt
106.63	19.8	0.240	1.213	96.70	8	6	sandy silt to clayey silt
106.79	19.4	0.240	1.235	106.80	8	6	sandy silt to clayey silt
106.96	20.4	0.240	1.177	111.00	8	6	sandy silt to clayey silt
107.12	19.3	0.200	1.038	115.50	8	6	sandy silt to clayey silt
107.28	20.0	0.160	0.799	119.20	7	6	sandy silt to clayey silt
107.45	19.2	0.140	0.731	121.70	7	6	sandy silt to clayey silt
107.61	18.6	0.150	0.805	126.80	7	6	sandy silt to clayey silt
107.78	18.6	0.140	0.754	129.80	7	6	sandy silt to clayey silt
107.94	18.8	0.140	0.744	133.90	7	6	sandy silt to clayey silt
108.10	18.5	0.140	0.758	136.80	7	6	sandy silt to clayey silt
108.27	18.3	0.130	0.710	139.50	7	6	sandy silt to clayey silt
108.43	18.4	0.140	0.759	141.40	7	6	sandy silt to clayey silt
108.60	18.6	0.140	0.753	144.60	7	6	sandy silt to clayey silt
108.76	18.7	0.140	0.748	146.80	7	6	sandy silt to clayey silt
108.92	18.6	0.140	0.754	149.80	7	6	sandy silt to clayey silt
109.09	18.7	0.160	0.857	151.10	7	6	sandy silt to clayey silt
109.25	18.9	0.170	0.901	151.00	7	6	sandy silt to clayey silt
109.42	18.8	0.170	0.904	152.80	7	6	sandy silt to clayey silt
109.58	18.7	0.160	0.857	151.40	7	6	sandy silt to clayey silt
109.74	18.3	0.150	0.817	149.30	7	6	sandy silt to clayey silt
109.91	18.5	0.170	0.921	150.00	7	6	sandy silt to clayey silt
110.07	18.5	0.250	1.352	145.50	7	6	sandy silt to clayey silt
110.24	19.3	0.260	1.351	135.50	8	6	sandy silt to clayey silt
110.40	23.6	0.180	0.764	102.10	8	6	sandy silt to clayey silt
110.56	20.9	0.190	0.911	108.00	8	6	sandy silt to clayey silt
110.73	18.7	0.200	1.071	122.70	8	6	sandy silt to clayey silt
110.89	20.0	0.160	0.799	127.40	7	6	sandy silt to clayey silt
111.06	18.9	0.150	0.792	121.40	7	6	sandy silt to clayey silt
111.22	18.8	0.150	0.797	126.50	7	6	sandy silt to clayey silt
111.38	19.0	0.140	0.738	130.60	7	6	sandy silt to clayey silt
111.55	19.5	0.160	0.820	125.10	7	6	sandy silt to clayey silt
111.71	18.9	0.160	0.846	133.00	7	6	sandy silt to clayey silt
111.88	19.4	0.130	0.670	132.00	7	6	sandy silt to clayey silt
112.04	19.1	0.130	0.680	132.40	7	6	sandy silt to clayey silt
112.20	18.3	0.150	0.818	134.60	7	6	sandy silt to clayey silt
112.37	18.9	0.140	0.739	134.40	7	6	sandy silt to clayey silt
112.53	19.3	0.140	0.724	134.70	7	6	sandy silt to clayey silt
112.70	18.8	0.140	0.745	139.20	7	6	sandy silt to clayey silt
112.86	19.6	0.150	0.767	143.10	7	6	sandy silt to clayey silt
113.02	19.9	0.170	0.854	146.20	8	6	sandy silt to clayey silt
113.19	20.2	0.210	1.038	148.30	8	6	sandy silt to clayey silt
113.35	20.3	0.240	1.181	147.90	8	6	sandy silt to clayey silt
113.52	19.5	0.210	1.076	147.40	8	6	sandy silt to clayey silt
113.68	19.3	0.180	0.934	143.40	7	6	sandy silt to clayey silt

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

Depth (ft)	Qt (TSF)	Fs (TSF)	Fs/Qt (%)	Pw (PSI)	SPT N* 60% Hammer	Zone	Soil Behavior Type UBC-1983
113.85	19.1	0.150	0.785	146.10	7	6	sandy silt to clayey silt
114.01	19.1	0.150	0.784	147.60	7	6	sandy silt to clayey silt
114.17	19.2	0.170	0.887	149.80	7	6	sandy silt to clayey silt
114.34	19.4	0.190	0.979	152.80	8	6	sandy silt to clayey silt
114.50	20.5	0.230	1.120	155.30	8	6	sandy silt to clayey silt
114.67	20.6	0.260	1.263	151.70	8	6	sandy silt to clayey silt
114.83	21.0	0.260	1.237	153.90	8	6	sandy silt to clayey silt
114.99	21.3	0.230	1.079	153.30	8	6	sandy silt to clayey silt
115.16	19.6	0.220	1.125	156.50	8	6	sandy silt to clayey silt
115.32	19.8	0.210	1.059	155.40	7	6	sandy silt to clayey silt
115.49	19.2	0.200	1.043	158.10	7	6	sandy silt to clayey silt
115.65	19.5	0.250	1.282	152.90	8	6	sandy silt to clayey silt
115.81	20.4	0.240	1.176	146.20	8	6	sandy silt to clayey silt
115.98	20.5	0.250	1.222	143.20	8	6	sandy silt to clayey silt
116.14	20.2	0.290	1.437	151.40	8	6	sandy silt to clayey silt
116.31	21.0	0.330	1.569	134.20	8	6	sandy silt to clayey silt
116.47	20.9	0.400	1.915	138.10	8	6	sandy silt to clayey silt
116.63	20.9	0.340	1.629	123.30	8	6	sandy silt to clayey silt
116.80	18.7	0.240	1.281	120.10	7	6	sandy silt to clayey silt
116.96	17.9	0.130	0.728	129.00	7	6	sandy silt to clayey silt
117.13	18.2	0.160	0.878	126.80	7	6	sandy silt to clayey silt
117.29	18.4	0.180	0.978	124.90	7	6	sandy silt to clayey silt
117.45	19.1	0.170	0.889	119.10	7	6	sandy silt to clayey silt
117.62	19.1	0.140	0.733	117.60	7	6	sandy silt to clayey silt
117.78	19.3	0.120	0.623	116.40	7	6	sandy silt to clayey silt
117.95	18.9	0.120	0.635	117.70	7	6	sandy silt to clayey silt
118.11	19.2	0.110	0.574	116.30	7	6	sandy silt to clayey silt
118.27	19.3	0.090	0.467	115.60	7	6	sandy silt to clayey silt
118.44	19.9	0.090	0.453	116.80	6	7	silty sand to sandy silt
118.60	20.0	0.080	0.400	116.40	6	7	silty sand to sandy silt
118.77	20.9	0.040	0.191	117.60	7	7	silty sand to sandy silt
118.93	22.1	0.170	0.769	119.00	8	6	sandy silt to clayey silt
119.09	23.0	0.440	1.912	111.90	16	7	silty sand to sandy silt
119.26	101.3	0.370	0.365	94.50	21	9	sand
119.42	202.0	0.260	0.129	51.70	34	9	sand
119.59	226.5	0.250	0.110	48.40	43	10	gravelly sand to sand
119.75	285.9	-32768	-32768	45.80	0	0	<out of range>
119.91	293.2	-32768	-32768	46.30	0	0	<out of range>

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