# BID BULLETIN NO. 03

Date: **22 April 2024**

ITB No.: **PB-04-03-2024-07**

Project Name: **DESIGN AND BUILD SERVICES DEMOLITION OF EXISTING STRUCTURES WITHIN PASIG CITY HALL COMPOUND AND CONSTRUCTION OF THE NEW PASIG CITY HALL**

ABC: **Php 9,644,918,000.00**

**To all prospective bidders:**

This Bid Bulletin is issued to clarify, supplement, modify and/or revise the particular sections in the Bid and Contract Documents as stipulated in the Bidding Documents issued on 15 March 2024. The Bidders shall take note of the following items carefully and consider them in the preparation of their bid proposals, as they shall form part of the CONTRACT DOCUMENTS.

<table>
<tr><th>Item</th><th>Previous Specification/ Bid Bulletin</th><th>Amendment/Clarification</th></tr>
<tr><td>1</td><td>SECTION III. BID DATA SHEET<br><br><table><tr><td>ITB Clause</td><td></td></tr><tr><td>10.1</td><td>1. PhilGEPS Certificate of Registration and membership in accordance with Section 8.5.2 of this IRR. For procurement to be performed overseas, it shall be subject to the Guidelines to be issued by the GPPB.<br>2. PCAB License and Registration <u>or</u> Special PCAB License in case of Joint Ventures. Bidders must have a valid Philippine Contractors Accreditation Board (PCAB) license and registration for Size Range – <u>Large B- Building & Industrial Plant</u> and License Category of at least: <u>General Building- AAA</u><br>3. Statement of all Ongoing Government and Private Contracts;<br>4. Statement of SLCC;<br>5. NFCC Computation;<br>6. JVA, if applicable;<br>7. Bid security in the prescribed form, amount and validity period;<br>8. Project Requirements, which shall include the following:<br>(1) Organizational chart for the contract to be bid;<br>(2) List of contractor’s personnel (e.g., Project Manager, Project Engineers,</td></tr></table></td><td>AMENDMENT TO SECTION III. BID DATA SHEET<br><br><table><tr><td>ITB Clause</td><td></td></tr><tr><td>10.1</td><td>1. PhilGEPS Certificate of Registration and membership in accordance with Section 8.5.2 of this IRR. For procurement to be performed overseas, it shall be subject to the Guidelines to be issued by the GPPB.<br>2. PCAB License and Registration <u>or</u> Special PCAB License in case of Joint Ventures. Bidders must have a valid Philippine Contractors Accreditation Board (PCAB) license and registration for Size Range – <u>Large B- Building & Industrial Plant</u> and License Category of at least: <u>General Building- AAA</u><br>3. Statement of all Ongoing Government and Private Contracts;<br>4. Statement of SLCC;<br>5. NFCC Computation;<br>6. JVA, if applicable;<br>7. Bid security in the prescribed form, amount and validity period;<br>8. Project Requirements, which shall include the following:<br>(1) Organizational chart for the contract to be bid;<br>(2) List of contractor’s personnel (e.g., Project Manager, Project Engineers,</td></tr></table></td></tr>
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| | *Materials Engineers, and Foremen), to be assigned to the contract to be bid, with their complete qualification and experience data;*<br>*(3) List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be;*<br>*(4) Duly signed Manpower Schedule;*<br>*(5) Equipment utilization schedule;*<br>*(6) Duly signed Construction Schedule (PERT/CPM) and S-curve;*<br>*(7) Duly signed Construction Method in narrative form;*<br>*(8) Construction Safety and Health Program; and*<br>*(9) Additional documents pursuant to Annex G:*<br>*(9.1) Preliminary Conceptual Design Plans in accordance with the degree of details specified by the procuring entity;*<br>*> Cover Sheet*<br>*> General Index*<br>*> Vicinity and Key Map*<br>*> Location plan/ Lay out*<br>*> Legend, Abbreviation and Symbols*<br>*> General Notes*<br>*> Perspective Views*<br>*> Building Design Plan including floor plans, sections, and elevations*<br>*> Site Development Plan*<br>*> Engineering Plans, Layout, and Schematic Diagram*<br>*(9.2) Design and construction methods;*<br>*(9.3) List of design and construction personnel, to be assigned to the contract to be bid, with their complete qualification and experience data;*<br>*(9.4) Value engineering analysis of design and construction method*<br>*(9.5) Relevant statements of all on-going, completed, awarded but not yet started design/design and build related contracts, curriculum vitae of key personnel, staff, partners or principal officers;*<br>*(9.6) Valid licenses issued by the Professional Regulatory Commission (PRC) for design professionals; and*<br>*9. Omnibus Sworn Statement in accordance with Section 25.3 of this IRR* |
| **10.4** | The key personnel must meet the required minimum years of experience set below: |
| **2. CONSTRUCTION PERSONNEL** | |

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| KEY PERSONNEL | QTY | GENERAL EXPERIENCE | RELEVANT EXPERIENCE | QUALIFICATIONS |
|---|---|---|---|---|
| Project Manager | 1 | 15 Years | 10 Years | A licensed Civil Engineer with experience of construction a multi-storey Government Building |
| Project Civil Engineer | 1 | 10 Years | 5 Years | A licensed Civil Engineer |
| Project Architect | 1 | 10 Years | 5 Years | A licensed Architect |
| Electrical and Electronics Engineer | 1 | 10 Years | 5 Years | A licensed Professional Electrical and Electronics Engineer |
| Mechanical Engineer | 1 | 10 Years | 5 Years | A licensed Professional Mechanical Engineer |
| Sanitary/ Plumbing Engineer | 1 | 10 Years | 5 Years | A licensed Sanitary Engineer |
| Health and Safety Engineer | 1 | 10 Years | 5 Years | With COSH Training conducted by DOLE |
| Property Manager | 1 | 10 Years | 10 Years | Must have experience in property management related to property of Government Building with mixed-used developments, buildings, and parks including mechanical, electrical, fire protection system / equipment |

The Bidder shall submit the corresponding Curriculum Vitae (CV) of the above key personnel that includes description of his/her relevant experience. **The CV shall include a statement of availability of the key personnel for the duration of the project**, signed by the named key personnel. The key personnel can be a current or on-call employee, or a consultant of the company.

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| Project Civil Engineer | 1 | 10 Years | 5 Years | A licensed Civil Engineer |
| Project Architect | 1 | 10 Years | 5 Years | A licensed Architect |
| Electrical Engineer | 1 | 10 Years | 5 Years | A licensed Professional Electrical Engineer |
| Electronics Engineer | 1 | 10 Years | 5 Years | A licensed Professional Electronics Engineer |
| Mechanical Engineer | 1 | 10 Years | 5 Years | A licensed Professional Mechanical Engineer |
| Sanitary/ Plumbing Engineer | 1 | 10 Years | 5 Years | A licensed Sanitary Engineer |
| Health and Safety Engineer **or Officer** | 1 | 10 Years | 5 Years | With COSH Training conducted by DOLE |
| Property Manager | 1 | 10 Years | 10 Years | Must have experience in property management related to property of Government Building with mixed-used developments, buildings, and parks including mechanical, electrical, fire protection system / equipment |

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<tr><td>Backhoe with attachment</td><td>0.50 – 1.00 cu.m.</td><td>3</td></tr>
<tr><td>Dump Truck</td><td>9 – 10 cu.m.</td><td>6</td></tr>
<tr><td>Personnel Service Vehicle / Truck</td><td>-</td><td>2</td></tr>
<tr><td>Generator Set</td><td>350 kw</td><td>2</td></tr>
<tr><td>Truck mounted crane</td><td>25 toner</td><td>1</td></tr>
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<td>AMENDMENT SECTION IX. CHECKLIST OF<br>I. TECHNICAL COMPONENT ENVELOPE FOR THE PROCUREMENT OF INFRASTRUCTURE PROJECTS<br><br>Revised Checklist of Technical Component Envelope to reflect the changes in the Bid Data Sheet specifically the project requirements for the Preliminary Conceptual Design.</td>
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<td>TERMS OF REFERENCE<br><br>A. General Information<br><br>This Terms of Reference (TOR) provides interested Bidders/ Contractors the guidelines and standards for the procurement under the design and build arrangement of the Seven (7) Storey with Roof Deck Pasig City Hall building to address the necessity of providing the citizens of Pasig a more conducive, safe, serviceable structure and to construct a building which emphasizes the need for Pasig City to harness technology as a tool for progress. This design and build project is in accordance with the</td>
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| | provisions of the Implementing Rules and Regulations R.A 9184, as amended and its Annex "G" - Guidelines for the Procurement and Implementation of Contracts for Design and Build Infrastructure Projects, as modified.<br><br>**xxx**<br><br>**D. OBJECTIVES**<br><br>1. To replace the aging and dilapidated structure and the outdated IT system posing security, reliable, and efficiency risks.<br>2. To cater to the increase in demand for digital services delivered to Pasig Constituents as infrastructure must scale to meet these needs.<br>3. To develop Pasig City Hall roadmap to Digital Transformation - a global shift towards digital services, requiring LGUs to provide online platforms for constituent engagement and service delivery.<br>4. To maximize data security and compliance. Pasig City Hall must ensure that their IT infrastructure is secure against cyber threats and compliant with data protection regulations.<br>5. To adopt Interoperability. Different Pasig City Hall departments often need to share data, requiring systems that can communicate seamlessly with one another.<br><br>**xxx**<br><br>**G. MINIMUM PERFORMANCE SPECIFICATIONS AND PARAMETERS**<br><br>**I. General Planning Guidelines**<br><br>Proposals shall meet the minimum performance specifications herein set forth. | Hall should embody a sense of local identity, giving emphasis on Filipino architecture, incorporating modern architectural design solutions to establish an iconic presence and elevate people's spirit.<br><br>This design and build project is in accordance with the provisions of the Implementing Rules and Regulations R.A 9184, as amended and its Annex "G" - Guidelines for the Procurement and Implementation of Contracts for Design and Build Infrastructure Projects, as modified.<br><br>**xxx**<br><br>**D. OBJECTIVES**<br><br>1. To replace the aging and dilapidated structure with an iconic presence, incorporating modern architectural design solutions<br>2. To construct a smart, resilient, and green building that can withstand natural disasters and calamities, and ensure continuous public service operations and business continuity for the City.<br>3. To replace the outdated IT system posing security, reliability, and efficiency risks.<br>4. To cater to the increase in demand for public services and provide additional digital services to Pasig Constituents, scaling up the existing infrastructure to meet these needs.<br>5. To develop Pasig City Hall roadmap to Digital Transformation - a global shift towards digital services, requiring LGUs to provide online platforms for constituent engagement and service delivery.<br>6. To maximize data security and compliance. Pasig City Hall must ensure that their IT infrastructure is secure against cyber threats and compliant with data protection regulations.<br>7. To adopt Interoperability. Different Pasig City Hall departments often need to share data, requiring systems that can communicate seamlessly with one another.<br><br>**xxx**<br><br>**G. MINIMUM PERFORMANCE SPECIFICATIONS AND PARAMETERS**<br><br>**I. General Planning Guidelines**<br><br>Proposals shall meet the minimum performance specifications herein set forth. |

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| | 1. The building designs shall conform to the provisions of the National Building Code of the Philippines (PD 1096), Philippine Green Building Code, Accessibility Law (BP 344), the Fire Code of the Philippines, the National Structural Code of the Philippines, Electrical Engineering Code of the Philippines, and the local ordinances of the city.<br>2. Adoption of the green infrastructure and preservation of existing natural assets of the land such as trees, ground cover and vegetation, and natural waterways.<br>3. The Builder shall submit Traffic Impact Report with recommendations on:<br>- Public Transport Facilities;<br>- Pedestrian Facilities/Features; and<br>- Internal Circulations and Parking.<br>4. The Bidder shall prepare the structural design in accordance with the latest National Structural Code of the Philippines.<br>5. Given the scale, material requirements and time frame of the project, the Bidder is required to present a MOA from construction suppliers (Portland cement, structural steel, course and fine aggregates, etc.) to ensure a stable and efficient supply of materials.<br><br>**III. SPECIFICATIONS**<br><br>1. Design Parameters: In accordance with the National Building Code and National Structural Code of the Philippines, Fire code, BP344, and Plumbing Code of the Philippines<br>2. Reinforced Concrete Structure - in accordance with the National Building Codes and Structural Code of the | 1. The building designs shall conform to the provisions of the National Building Code of the Philippines (PD 1096), Philippine Green Building Code, Accessibility Law (BP 344), the Fire Code of the Philippines, the National Structural Code of the Philippines, Electrical Engineering Code of the Philippines, and the local ordinances of the city.<br>2. Adoption of the green infrastructure and preservation of existing natural assets of the land such as trees, ground cover and vegetation, and natural waterways. **Energy efficient solutions such as reusable water systems such as rainwater harvesting should be incorporated. Smart technology fixtures, such as sensor lighting fixtures and water-saving toilet fixtures should be incorporated in the design**.<br>3. The Builder shall submit Traffic Impact Report with recommendations on:<br>- Public Transport Facilities;<br>- Pedestrian Facilities/Features; and<br>- Internal Circulations and Parking.<br>**Considering the existing traffic conditions in the City Hall Complex, the proposal should include internal roads to create alternative access to and from the main roads. The proposed internal roads should help manage traffic flow to and from the new City Hall, avoiding traffic build-up.**<br>**4. Public transportation flow along the proposed internal roads should also be considered, incorporating at least ten (10) dedicated buses for drop-off purposes, with a bypass lane to avoid traffic complications and build-up.**<br>**5.** The Bidder shall prepare the structural design in accordance with the latest National Structural Code of the Philippines. **Additionally, the structure should incorporate seismic-resistive technology to be able to withstand at least an 8 magnitude earthquake.**<br>**6. The proposal for the City Hall Building should also be designed for emergency situations – to serve as temporary staging area and/or evacuation site. A multi-functional open plaza should be integrated into the design adjacent to the structure for use by the public and employees of the City Government.**<br>7. Given the scale, material requirements and time frame of the project, the Bidder is required to present a MOA from construction suppliers (Portland cement, structural steel, course and fine aggregates, etc.) to ensure a stable and efficient supply of materials.<br><br>**III. SPECIFICATIONS**<br><br>1. Design Parameters: In accordance with the National Building Code and National Structural Code of the Philippines, Fire code, BP344, and Plumbing Code of the Philippines<br>2. Reinforced Concrete Structure - in accordance with the |

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| | Philippines<br><br>a) No of Structure - One (1)<br>b) No of floor - 7 storey with roof deck<br>c) Total covered Floor Area - Approximately **46,000 square meters** to accommodate 4,500 seated employees and 15,000 daily foot traffic.<br>d) Protective Seismic System - must provide base isolation which may involve putting flexible bearings or pads made from layers of rubber and lead between the building's foundations and the structure above. These base isolators move and stretch under pressure and absorb much of an earthquake's impact by reducing swaying and shaking during an earthquake.<br>e) Green building or Sustainable Design Solution - in both the structure and the application of processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from planning to design, construction, operation, maintenance, renovation, and demolition. This requires close cooperation of the contractor, the architects, the engineers, and the client at all project stages.<br>f) Parking Area – minimum of 650 parking spaces:<br>- 500 parking spaces for 4 Wheel Vehicle *(intended for VIP, Employees, Public, and Motor Pool)*<br>- 100 Motorcycle<br>- 25 parking spaces for Bicycle<br>- 25 parking spaces for PWD | National Building Codes and Structural Code of the Philippines<br><br>**a) General Design Parameters**<br><br>**Number of Structure:** — **One (1)**<br>**Number of Floors:** — **7-storey with roof deck**<br>**Min. Floor to floor height:** — **Min. floor to floor height: 4.5m**<br>**Total Construction Floor area:** — **65,000 sqm**<br>**Floor area of Offices:** — **46,000 sqm (4,500 seated employees with 15,000 daily foot traffic)**<br>**Total Landscape Area (softscape):** — **3,000sqm**<br>**Flood Level** — **1.5 meters**<br><br>b) Protective Seismic System - must provide base isolation which may involve putting flexible bearings or pads made from layers of rubber and lead between the building's foundations and the structure above. These base isolators move and stretch under pressure and absorb much of an earthquake's impact by reducing swaying and shaking during an earthquake.<br>**c) Proposal should incorporate floor acceleration as a key design parameter for each floor level. No floor level should exceed 0.50g. The structure should be equipped with not less than three (3) Earthquake Recording Instruments (ERI).**<br>d) Green building or Sustainable Design Solution - in both the structure and the application of processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from planning to design, construction, operation, maintenance, renovation, and demolition. This requires close cooperation of the contractor, the architects, the engineers, and the client at all project stages. **Energy efficient solutions, such as tempered double pane glass for the curtain wall and reusable water systems such as rainwater harvesting should be incorporated. Smart technology fixtures, such as sensor lighting fixtures and water-saving toilet fixtures should be incorporated in the design.**<br>e) Parking Area – minimum of 650 parking spaces:<br>- 500 parking spaces for 4 Wheel Vehicle ***(30 spaces for VIP, 250 spaces for Public and Employees, and 220 spaces Motor Pool)***<br>- 100 Motorcycle<br>- 25 parking spaces for Bicycle<br>- 25 parking spaces for **Elderly and** PWD |

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| | | **Vertical Clearance:**<br>- **VIP : 2.5 meters**<br>- **Public and employees : 3.5 meters**<br>- **Motorpool : 3 meters**<br><br>**f) Bus stops - at least ten (10) dedicated buses for drop-off purposes, with a bypass lane to avoid traffic complications and build-up.**<br>**g) Maximum flood level of 1.5 meters** |
| | 3. Finishes<br>a) Exterior - Clear and reflective low-e glass curtain wall system, Plastered CHB exterior wall or pre-cast concrete wall with textured finish, Satin painted finish, or its equivalent.<br>b) Flooring - Homogeneous Porcelain floor tiles for office and public areas, pigmented concrete pavers for outdoor open spaces, polished concrete for utility and service areas<br>c) Partition - Plastered CHB or pre-cast concrete interior wall painted or cladded finish, frameless glass partitions, or its equivalent.<br>d) Interior Partition & Ceiling - Exposed ceiling in painted finish for general office spaces, acoustic board in metal frame for spaces requiring acoustical treatment, gypsum board in metal frame with curtain cove and cove light provisions for major offices, or its equivalent.<br>e) Doors - doors to match the interiors, frameless glass pivot doors for enclosed offices, steel door in painted finish for utilities and service areas, or its equivalent.<br>f) Windows - Reflective and clear glass curtain wall system with operable panels for natural ventilation, or its equivalent.<br>g) Fit-Out - provide office partitions and furniture.<br><br>4. Building Equipment - Elevator (VIP, Private, Public, & Services), Escalators, Generator set, Transformer, Meter Center, Garbage Chute and Garbage Collecting Room (minimum requirement of Mechanical Building Code of the Philippines).<br>5. Telecommunication Room - to accommodate two (2) room provisions<br>6. Sanitary / Plumbing - Provide PWD and Gender-neutral toilets<br>7. Lightning Protection<br>8. Fire Protection System<br>9. Mechanical Works - Air-conditioned offices maintained at least 20 degrees Celsius<br>10. Sewage Treatment Plant<br>11. Landscape & Hardscapes<br>12. Furnishings / Office / Storage / Pantry | 3. Finishes<br>a) Exterior - Clear and reflective low-e glass curtain wall system, Plastered CHB exterior wall or pre-cast concrete wall with textured finish, Satin painted finish, or its equivalent.<br>b) Flooring - Homogeneous Porcelain floor tiles for office and public areas, pigmented concrete pavers for outdoor open spaces, polished concrete for utility and service areas. **Should Floor Tiles be included in the Proposal, they should have at least a minimum size of 600mm x 600mm. Layout of walls shall always be aligned, plumb, level, and square. All edges, corners and intersections of tiles shall consider less tile cuts and proper alignment. Additionally, tile trims shall also be considered to provide clean terminations. Thresholds shall and may be considered (e.g. door thresholds) so as long as it applies.**<br>c) Partition **and/or walls** - Plastered CHB or pre-cast concrete interior wall painted or cladded finish, frameless glass partitions, or its equivalent. **Walls shall be designed and built of proper quality, and shall have insulation coefficient that is appropriate for its use on the Project. Layout of walls shall always be aligned, plumb, level, and square. Interior walls shall be floor-to-floor height to prevent cross contamination and for fire safety compartmentalization. Where wall tiles are to be used, the minimum size to be used shall be 600mm x 600mm. All edges, corners and intersections of tiles shall consider less tile cuts and proper alignment. Additionally, tile trims shall also be considered to provide clean terminations.**<br>d) Interior Partition & Ceiling - Exposed ceiling in painted finish for general office spaces **in the lower and upper ground floor, and storage rooms**. Acoustic board in metal frame for spaces requiring acoustical treatment, and gypsum board in metal frame with curtain cove and cove light provisions for major offices, or its equivalent.<br>e) **Ceilings - Generally, ceiling systems shall be designed and built of proper quality, and shall consider insulation coefficients appropriate for the** |

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| | | **room/area/space it serves. High interior ceiling height is encouraged. 4.5m floor to floor, 3.5m as minimum ceiling height. Exposed ceiling in painted finish in the general areas. Should acoustic ceiling/s with T-runners be included in the Proposal, layout should consider alignment, set-out points and consider less cuts at all times. Ceiling specifications should be appropriate for its function and location.**<br>f) Doors - doors to match the interiors, frameless glass pivot doors for enclosed offices, steel door in painted finish for utilities and service areas, or its equivalent. **Doors and windows should be maximized in height to allow more natural light and ventilation. Additionally, quality of material for the door/s and window/s shall consider its use to avoid easy wear and tear for excessive use, and must also consider water seepage. Glass ratio should have a minimum length of 60% of every exterior partition on each room and an operable window panel should at least be 40% of the total length of projected glass exterior partitions of the rooms/areas provided. Such operable panels shall be required for all exterior partitions for office spaces, and shall be optional for common spaces of the structure.**<br>• **0.90m door leaf minimum size for public and private spaces, and for equipment passage.**<br>• **0.80m door leaf minimum size for service areas**<br>• **Doors and windows shall be durable enough to withstand natural calamities such as earthquakes and typhoons**<br>g) Windows - Reflective and clear glass curtain wall system with operable panels for natural ventilation, or its equivalent.<br>h) Fit-Out - provide office partitions and furniture.<br>**i) Roofing Work - Roofing System/s shall be designed and built in proper quality, and shall also consider its insulation quality that is appropriate for the Project. The design of the roof that is applied in the Proposal shall be designed as to anticipate inconveniences such as clogs, wear and tear of pipes, and others similar to nature. In cases that valley or inside gutters is considered in the roof design of the Project, it shall be in stainless steel or concrete with membrane-type of waterproofing (especially for roof decks/flat roofs) and shall consider storm drainage volume to prevent overflowing or leakage. The slope of the roof shall conform to the design intent of the Proposal at all times. Should the design intent be to create a seamless flat design, parapets may be considered provided that it should conceal the roof until its** |

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| | | **topmost part.**<br><br>**j) Building Protection Works - Building Protection Works shall be designed and built of proper quality, and shall be appropriate to its use may it be thermal, moisture, or other means of protection. Moisture Vapor Barrier Works (wherever applicable) shall be applied for all concrete floor slabs in direct contact with the ground shall provide moisture vapor barrier to stop movement of moisture from the ground.**<br><br>**k) Paintworks - Paint to be used shall be of proper quality and shall consider the proper color, texture and sheen that is intended for the design. Paint to be used shall be appropriate for its function and location and should consider practicality in maintenance.**<br>**l) Lighting Requirements -**<br>**> LED linear lights with square profile shall be used as general lighting and shall be continuous hanging or recessed type depending on design intent in plans. It shall have removable end caps as necessary for approved design intent. LED recessed, directional downlight with slim trim and tiltable up to 30 degree and with MR16/GU fit lamp with shall be provided for areas reflected in plans. LED motion-sensor lights shall also be installed in specified areas.**<br>**> LED exit signages shall be clear acrylic with side-lit green letters. Areas with ceiling shall be recessed-type and areas with exposed slab will be ceiling mounted/hung but with slim profile as specified in plans.**<br>**> Outdoor LED lights shall have minimum of IP65 weather protection. Façade lights shall be slim-type, concealed, LED linear wallwasher. Landscape lights shall be LED spike uplight as approved by Architect.**<br>**> All lighting colors and finishes are to match specifications and shall have uniform daylight/cool white color (4000K) temperature with other lighting unless otherwise instructed/specified. All LED lights shall have 50,000 burning hours.**<br><br>4. Building Equipment - Elevator (VIP, Private, Public, & Services), Escalators, Generator set, Transformer, Meter Center, Garbage Chute and Garbage Collecting Room (minimum requirement of Mechanical Building Code of the Philippines).<br>5. Telecommunication Room - to accommodate two (2) room provisions<br>6. Sanitary / Plumbing - Provide PWD and Gender-neutral |

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| | | toilets<br>7. Lightning Protection<br>8. Fire Protection System<br>9. Mechanical Works - Air-conditioned offices maintained at least 20 degrees Celsius<br>10. Sewage Treatment Plant<br>11. Landscape & Hardscapes<br>12. Technology and systems integration<br>a) On Core and Access Switches<br>• Must be chassis-based with redundant switch processor line cards (must have at least 6 card slots)<br>• Switch must have embedded RFID tag which facilitates easy asset/inventory management using commercial RFID readers.<br>• Switch shall have 24 nos. 10/100/1000M PoE+ ports and at least 4 nos. 1/10G SFP+ uplink ports.<br>b) Indoor / outdoor access points<br>• Access Point shall support WiFi6 with up to 5.38 Gbps throughput.<br>• Access Point shall have the same OS as the campus core, distribution, and access switches.<br>• Access Point shall be able to leverage partnerships for Apple Analytics<br>c) SD Wan Routers<br>• The proposed solution must support an open architecture and flexible management interfaces i.e. on-prem, Cloud hosted controllers, REST API, or SNMP.<br>• The router should have dynamic core allocation architecture that can leverage data plane cores for I/O and service plane as per-user configuration.<br>d) Network Management Appliances<br>• Solution should support Zero-touch deployment of switches and access points to eliminate human intervention.<br>• Proposed solution should allow admin to manage network in a hierarchical fashion by adding areas and buildings on a geographic map based on geo-coordinates.<br>• The proposed solution must have a consolidated compliance audit report that shows the compliance status of individual network devices allowing network operators to quickly assess the devices that do not adhere to corporate standards.<br>• The proposed solution shall provide actionable insights into network, client, and application-related issues eliminating white noise and false positives based on recent and historical data; and provide guided remediation to troubleshoot the issues.<br>13. TECH - SECURITY<br>a) NAC<br>• The NAC solution should be able to block unauthenticated/rogue machine without giving any access to the network. |

| | | |
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| | | • Solution should allow end users to interact with a self-service portal for device on-boarding, providing a registration vehicle for all types of devices as well as automatic supplicant provisioning and certificate enrollment for standard PC and mobile computing platforms.<br>• The solution should support centralized and distributed deployment options with clustering of nodes or cross-site failover for disaster recovery scenarios.<br>b) Anti-Malware<br>• The proposed solution should be able to prevent exploits on popular applications from Adobe, Microsoft, popular browsers without being dependent on commonly known vulnerabilities and exposures.<br>• Proposed solution should support centralized reporting and message tracking after aggregation of data from multiple email security appliances. Message tracking data should be aggregated from multiple email security gateways, including data categorized by sender, recipient, message subject, and other parameters.<br>• The solution should provide the URL defense service to Re-write the original suspicious URL in the mail body to another URL and on clicking the re-written URL, the browser session should pass through a cloud-based Web security scanning infrastructure of the same OEM<br>14. End-user Computing (Desktops and Laptops)<br>• 3000 users - will have access to computing;<br>• 2100 desktops users;<br>• 900 Laptop users;<br>• Proposed Laptop and Desktop must be enterprise grade;<br>• Secures end user credentials in a dedicated security chip, keeping them hidden from malware that looks for and steals credentials;<br>• Device has an off-host BIOS verification that guards the PC BIOS from low-level attacks while giving visibility to unplanned changes and Gain visibility to hidden and lurking attacks with BIOS and Firmware tamper alert through an exclusive off-host BIOS and Firmware verification;<br>• With built-in artificial intelligence that allows the user to predefine applications for faster performance;<br>• With built-in artificial intelligence that allows the machine to automatically improve battery runtime; and<br>• With built-in artificial intelligence that allows enhancement of the audio to adjust to different environments by adjusting loudness, noise level, equalization, and echo elimination to improve sound quality.<br>15. Data Center<br>a) Operating System: At least Windows 2022 DC<br>b) Must support a security feature such as: |

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| | | • Securely erase user data<br>• Checks the cryptographic signatures of UEFI drivers and other code loaded prior to the OS running.<br>c) Embedded Management and Automation,<br>• Out of band port with Lifecycle Controller<br>• Server Management Software<br>• Can use Android and IOS mobile [FR1]<br>16. Data Storage<br>• Must have 120TB raw capacity with min. 7K rpm HDD;<br>• The architecture must support non-disruptive automated re-balance of data across storage pools for optimum performance and capacity efficiency in the event of subsequent expansion of the system;<br>• Must have distributed fully symmetric clustered architecture that combines modular storage with operating system in a single volume, single namespace, and single file system;<br>• Scalable up to 252 nodes and 186PB raw capacity;<br>• Must support to use object storage as external tier for long term retention and scalability;<br>• Must support File system audit capability and STIG hardening to improve security and control of your storage infrastructure and address regulatory compliance requirements; and<br>• Support for Data deduplication which can reduce storage requirements. Inline data reduction and compression.<br>17. Back-up System - Enterprise On-premise Data Backup System<br><br>Specifications:<br>a) Solution must deliver protection storage, protection software, search, advanced monitoring and analytics in a single, easy-to-deploy appliance.<br>b) Solution must be an integrated appliance with the ff. specs.<br>i. 36TB Capacity<br>ii. 2x Intel CPU<br>iii. At least 4x 10GbE<br>c) Solution must include tools for effective management<br>d) Solution must be able to protect both physical and virtual environments<br>e) Solution must support native tiering to public and/or private clouds for long-term retention<br>f) Solution must support an average 55:1 data deduplication rate.<br>18. Structured cabling - Category 6<br>19. Furnishings / Office / Storage / Pantry<br><br>**xxx** |
| | **xxx** | |

## L. ELIGIBILITY CRITERIA, GENERAL TERMS AND CONDITION AND SUBMITTALS ELIGIBILITY REQUIREMENTS:

| ITB Clause | | | |
|---|---|---|---|
| **10.4** | The Funding Source is:<br><br>From the Executive and Supplemental Budget as approved by the Sangguniang Panglungsod in the amount of Nine Billion Six Hundred Forty-Four Million Nine Hundred Eighteen Thousand Pesos (PhP 9,644,918,000.00) inclusive of all applicable taxes and fees.<br><br>The Approved Budget for the Contract (ABC) for the Year 1 of 3 is amounting to PhP 2,000,000,000.00<br><br>Terms of Payment will be composed of:<br><br>15% advance payment<br>1st Billing must be upon submission of 30% Statement of Work Accomplished (SWA) | | |
| **10.4** | The key personnel must meet the required minimum years of experience set below: | | |
| Position | Particular Qualifications | Required Min. Years of Similar Experience | Required Min. Years of Total (Similar + Related Experience) |
| **Design Personnel** | | | |
| Design Architect | ● A Licensed Architect with experience of Designing Government Buildings focusing on the Philippine Architecture with Sustainable Design Solutions<br>● With atleast an Honorary Degree | 10 | 15 |
| Structural Design Engineer | ● A Licensed Civil Engineer<br>● ASEP member<br>● With masteral on Structural Engineering | 5 | 15 |
| Mechanical Design Engineer | A Licensed Professional Mechanical Engineer | 5 | 15 |
| Electrical Design Engineer | A Licensed Professional Electrical | 5 | 15 |

## L. ELIGIBILITY CRITERIA, GENERAL TERMS AND CONDITION AND SUBMITTALS ELIGIBILITY REQUIREMENTS:

| ITB Clause | | | |
|---|---|---|---|
| **10.4** | The Funding Source is:<br><br>From the Executive and Supplemental Budget as approved by the Sangguniang Panglungsod in the amount of Nine Billion Six Hundred Forty-Four Million Nine Hundred Eighteen Thousand Pesos (PhP 9,644,918,000.00) inclusive of all applicable taxes and fees.<br><br>The Approved Budget for the Contract (ABC) for the Year 1 of 3 is amounting to PhP 2,000,000,000.00<br><br>Terms of Payment will be composed of:<br><br>a) 15% advance payment<br>b) Monthly progress payment<br><br>1st Billing must be upon submission of **20%** Statement of Work Accomplished (SWA) **and the succeeding billings will be submitted monthly.**<br><br>*(Note: "Progress Payments" on page 88 of Vol. 3 - Manual of Procedures for the Procurement of Infrastructure Projects)* | | |
| **10.4** | The key personnel must meet the required minimum years of experience set below: | | |
| Position | Particular Qualifications | Required Min. Years of Similar Experience | Required Min. Years of Total (Similar + Related Experience) |
| **Design Personnel** | | | |
| Design Architect | ● A Licensed Architect with experience of Designing Government Buildings focusing on the Philippine Architecture with Sustainable Design Solutions<br>● With atleast an Honorary Degree | 10 | 15 |
| Structural Design Engineer | ● A Licensed Civil Engineer<br>● ASEP member<br>● With masteral on Structural Engineering | 5 | 15 |
| Mechanical | A Licensed | 5 | 15 |

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| | Engineer | | |
| Electronics Design Engineer | A Licensed Professional Electronics Engineer | 5 | 15 |
| Sanitary / Plumbing Design Engineer | A Licensed Sanitary Engineer | 5 | 15 |
| **Construction Personnel** | | | |
| Project Manager | A Licensed Civil Engineer with experience of constructing a multi-storey Government Building | 10 | 15 |
| Project Civil Engineer | A Licensed Civil Engineer | 5 | 10 |
| Project Architect | A Licensed Architect | 5 | 10 |
| Electrical Design Engineer | A Licensed Professional Electrical Engineer | 5 | 10 |
| Electronics Design Engineer | A Licensed Professional Electronics Engineer | 5 | 10 |
| Mechanical Engineer | A Licensed Professional Mechanical Engineer | 5 | 10 |
| Plumbing & Sanitary Engineer | A Licensed Sanitary Engineer | 5 | 10 |
| Health & Safety Engineer | Must be a DOLE Accredited Safety Officer | 5 | 10 |
| Property Manager | Must have experience in property management related to property of a Government Building with mixed-use developments , buildings, and parks including mechanical, electrical, fire protection | 5 | 10 |

| | | | |
|---|---|---|---|
| Design Engineer | Professional Mechanical Engineer | | |
| Electrical Design Engineer | A Licensed Professional Electrical Engineer | 5 | 15 |
| Electronics Design Engineer | A Licensed Professional Electronics Engineer | 5 | 15 |
| Sanitary / Plumbing Design Engineer | A Licensed Sanitary Engineer | 5 | 15 |
| **Construction Personnel** | | | |
| Project Manager | A Licensed Civil Engineer with experience of constructing a multi-storey Government Building | 10 | 15 |
| Project Civil Engineer | A Licensed Civil Engineer | 5 | 10 |
| Project Architect | A Licensed Architect | 5 | 10 |
| Electrical Design Engineer | A Licensed Professional Electrical Engineer | 5 | 10 |
| Electronics Design Engineer | A Licensed Professional Electronics Engineer | 5 | 10 |
| Mechanical Engineer | A Licensed Professional Mechanical Engineer | 5 | 10 |
| Plumbing & Sanitary Engineer | A Licensed Sanitary Engineer | 5 | 10 |
| Health & Safety Engineer **or Officer** | Must be a DOLE Accredited Safety Officer | 5 | 10 |
| Property Manager | Must have experience in property management related to property of a Government Building with mixed-use developments | 5 | 10 |

| | | | |
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| | system / equipment | | |

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**ANNEX "A.2"**

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| | | | |
|---|---|---|---|
| | , buildings, and parks including mechanical, electrical, fire protection system / equipment | | |

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**ANNEX "A.2" (REVISED)**

**Included the changes in the details per floor.**

xxx

**ANNEX "A.4"**

**Addition of Annex A.4 (GEOTECHNICAL INVESTIGATION REPORT)**

Bidders who have already submitted bids are hereby informed that they are allowed to modify or withdraw their bids, if necessary, before the scheduled opening of bid envelopes.

For modifications in your original submitted bid, kindly submit new bidding documents (sealed and marked as "Modified Bid") and have these received at the Office of the Bids and Awards Secretariat. Bid modifications received after the deadline shall not be considered and shall be returned to the bidder unopened.

Conforme:

**ENGR. ARTAXERXES V. GERONIMO**
Officer in Charge, City Engineering Office

**ATTY. JOSEPHINE C. LATI-BAGAOISAN**
Chairperson
Bids and Awards Committee

# The Number of Storeys and Total Floor Area should accommodate the following details:

| FLOOR | DETAILS |
|---|---|
| **Number of Storeys: 7 with roof deck** | 1. 4,176 number of employees;<br>2. Daily foot traffic of approx. 11,000 clients/guests/visitors (note: the daily foot traffic during business permit renewal season reaches up to 15,000);<br>3. City Health Department Ambulatory Services, such as:<br>Drug Testing, Dental Clinic, Radiology, Clinical Laboratory, Areas for Counselling/Family Planning Seminars, Animal Bite Clinic, and a Pharmacy;<br>4. Session Hall, with a gallery that can accommodate approx. 100 pax;<br>5. Large Conference Halls;<br>6. Prayer Rooms;<br>7. Compliant to requirements needed by the DILG (See: Seal of Good Local Governance Requirements);<br>8. Compliant with the National Building Code;<br>9. Compliant with the Zoning Ordinance of the City;<br>10. Swing space for offices that will be affected by Phase II |
| **Lower Ground Floor** | **1. 100 Commercial Spaces**<br>2. Parking Spaces **for VIPs**<br>3. Landbank **– 190sqm**<br>4. Payroll section (Pagador) - 13 employees<br>5. Canteen (low cost hot meals) **– For Public and Employees**<br>6. Public Safety Division - 33 employees<br>7. Utility Office - 9 employees<br>8. PNP Detachment Office - 7 employees<br>**9. Notary Public**<br>**10. Photocopying Service Space** |
| **Upper Ground Floor** | **1. Commercial Space – 25sqm**<br>2. Senior Citizens' Center (with an open space for gatherings, meetings, welfare events)<br>3. Office of Senior Citizens Affairs (OSCA) - 33 employees<br>4. Social Welfare Assistance Center (SWAC) - 30 employees |

| FLOOR | DETAILS |
|---|---|
| | 5. Persons with Disabilities Affairs Office (PDAO) - 23 employees<br>6. Civil Society Organization's (CSO) Desk and Multipurpose Hall - 23 employees<br>7. Local Youth Development Office (LYDO) - 9 employees<br>8. Community Relations and Information Office - 30 employees<br>9. Public Employment Service Office - 17 employees<br>10. Local Economic Development and Investment Office (LEDIO) - 29 employees (and Cooperative Development Office (CDO) - 8 employees)<br>11. COOP Office - 7 employees<br>12. Ugnayan sa Pasig - 23 employees<br>13. Muslim Prayer Rooms<br>14. Ecumenical Chapel<br>15. Child's Daycare / Playroom<br>**16. Breast Feeding Room**<br>17. Gender and Development Office - 42 employees<br>18. Office on Social Welfare Development - 43 employees<br>19. Use of Open Lobby as additional waiting area, especially during January Business Renewal Season **and Information Desk**<br>**20. Photocopying Service Space** |
| **3rd Floor** | 1. Entire Podium parking space to be for Pay Parking<br>2. Ample storage spaces for the City **– 60 Sq.m** |
| **4th Floor** | 1. **Business One Stop Shop Wing**<br>a. City Planning and Development Office (CPDO) - 88 employees;<br>b. Office of the Building Official (OBO) window;<br>c. Sanitary Permit Office window;<br>d. City Environment and Natural Resources Office (CENRO) and Solid Waste Management Office (SWMO) - 44 employees;<br>e. Bureau of Fire Protection window; and<br>f. Business Permit and Licensing Office (BPLD) - 132 employees<br>2. **Construction One Stop Shop Wing**<br>a. City Planning and Development Office (CPDO);<br>b. Office of the Building Official (OBO) - 96 employees;<br>c. Excavation Unit - City Engineering window; |

| FLOOR | DETAILS |
|---|---|
| | 3. **City Health One Stop Shop Wing (must be compliant with DOH standards) -** 459 employees<br>a. City Health Department (CHD)<br>b. Drug Testing<br>c. Dental Clinic<br>d. Radiology<br>e. Clinical Laboratory<br>f. Areas for Counselling/Family Planning Seminars<br>g. Animal Bite Clinic<br>h. Pharmacy<br>i. City Epidemiology and Surveillance Unit (CESU)<br>j. Substance Abuse Treatment Out Patient<br>k. Pasig Blood Center<br>l. Employee's Clinic<br>• Department of Health (DOH) - 5 employees<br>4. **Treasury Wing**<br>a. Treasurer's Office - 88 employees<br>b. Assessor's Office - 75 employees<br>c. Cashiers for All CGP Transactions<br>d. Land Tax - 62 employees<br>5. **Local Civil Registry -** 61 employees<br>6. **Photocopying Service Space**<br>7. **Commercial Space – 25sqm** |
| **5th Floor** | 1. Engineering Department - 264 employees<br>2. Office of the General Services (OGS) - 204 employees<br>3. Commission on Audit (COA) - 33 employees<br>4. Procurement Management Office (PMO) - 78 employees<br>5. Internal Audit Services (IAS) - 13 employees<br>6. Human Resources Development Office (HRDO) - 179 employees<br>7. Management Information Systems Office (MISO) - 109 employees<br>8. Pasig Urban Settlement Office (PUSO) - 35 employees<br>9. City Hall Library (inside: Pasig Research Center) - 7 employees<br>10. Clean and Green Office - 20 employees<br>11. Urban Poor Services Division Office - 14 employees<br>12. Public Information Office (PIO) - 22 employees |

| FLOOR | DETAILS |
|---|---|
| | 13. Education Unit - 25 employees<br>14. City Transport and Development Management Office - 44 employees<br>15. Records Section - 38 employees<br>*should be beside the City Hall Library<br>16. City Disaster Risk Management (Administrative Office)- 49 employees<br>17. Tobacco Unit - 12 employees<br>18. Cultural Affairs and Tourism Office - 12 employees<br>**19. Photocopying Service Space**<br>**20. Commercial Space – 25sqm** |
| **6th Floor** | 1. Office of the Vice Mayor - 34 employees<br>2. Fourteen (14) Offices for Councilors - 18 employees each councilor<br>~~*Anticipate possible addition of district(s) to Pasig that will result to an addition to the number of councilors~~<br>3. Session Hall - Gallery may accommodate 100 pax<br>4. Conference Halls - to accommodate 200 pax that can also be converted to breakout rooms via collapsible walls<br>5. Council Secretariat Office - 20 employees<br>6. City Council Lounge<br>7. Liga ng mga Barangay Office - 12 employees<br>8. Auditorium **– can accommodate 200 pax**<br>**9. Photocopying Service Space**<br>**10. Commercial Space – 25sqm** |
| **7th Floor** | 1. Office of the City Mayor - 57 employees<br>2. Executive Lounge<br>3. People's **Hall** - to accommodate 200 pax<br>4. Office of the City Administrator (OCA) 29 employees<br>5. Office of the City Legal - 20 employees<br>6. Office of the City Budget - 20 employees<br>7. Accounting - 75 employees<br>8. Land Management and Recovery Office - 7 employees<br>9. Office of the Congressman - 72 employees<br>~~*Anticipate possible addition of district(s) to Pasig that will result to an addition to the Congressman(s) or Congresswoman(s)~~ |

| FLOOR | DETAILS |
|---|---|
| | 10. Hearing room(s) for Administrative Hearing Board hearings **– to accommodate 100 pax**<br>**11. Photocopying Service Space**<br>**12. Commercial Space – 25sqm** |

**Republic of the Philippines**
**BIDS AND AWARDS COMMITTEE**
**City Government of Pasig**

Name of Bidder :_____
Name of Contract :_____
_____
Approved Budget Contract :_____
Bidding Date :_____

(Note: Checklist is to be filled up by the BAC only)

## I. TECHNICAL COMPONENT ENVELOPE FOR THE PROCUREMENT OF INFRASTRUCTURE PROJECTS

***- Class "A" Documents -***

*Legal Documents*

| No. | TYPE OF DOCUMENT | PASS/FAIL | REMARKS/FINDINGS |
|---|---|---|---|
| 1. | Valid PhilGEPS Certificate of Platinum Registration and Membership with additional caveat in accordance with Section 8.5.2 of the 2016 Revised IRR of RA 9184 amended through GPPB Resolution No. 15-2021, provided that all of Class "A" eligibility documents submitted to PhilGEPS are maintained and updated | | |

*Technical Documents*

| No. | TYPE OF DOCUMENT | PASS/FAIL | REMARKS/FINDINGS |
|---|---|---|---|
| 2. | A valid Philippine Contractors Accreditation Board (PCAB) License or Special PCAB License in case of Joint Ventures, and registration for the type and cost of the contract to be bid | | |
| 3. | Statement of the bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid. | | |
| 4. | Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules (Contractors under Small A and Small B categories without similar experience on the contract to be bid may be allowed to bid if the cost of such contract is not more than the Allowable Range of Contract Cost (ARCC) of their registration based on the guidelines as prescribed by the PCAB | | |
| 5. | Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;<br>**or**<br>Original copy of Notarized Bid Securing Declaration | | |
| 6. | Project Requirements, which shall include the following: | | |
| | 6.1 Organizational chart for the contract to be bid | | |
| | 6.2 List of contractor's key personnel (*e.g.*, Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to the contract to be bid, with their complete qualification and experience data | | |
| | 6.3 List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be | | |
| | 6.4 Duly signed Manpower Schedule | | |
| | 6.5 Equipment utilization schedule | | |

| | | | |
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| | 6.6 Duly signed Construction Schedule (PERT/CPM) and S-curve | | |
| | 6.7 Duly signed Construction Method in narrative form | | |
| | 6.8 Construction Safety and Health Program | | |
| 7. | Original duly signed Omnibus Sworn Statement (OSS) | | |
| **In addition to the above, the Technical Component shall include the following requirements** | | | |
| 8. | Preliminary Conceptual Design Plans in accordance with the degree of details specified by the procuring entity: | | |
| | > Perspective Views | | |
| | > Floor plans, sections, and elevations | | |
| | > Site Development Plan | | |
| | > Engineering Plans, Layout, and Schematic Diagram | | |
| 9. | Design and Construction Methods which shall conform with the MPSS | | |
| 10. | List of design and construction personnel, to be assigned to the contract to be bid, with their complete qualification and experience data | | |
| 11. | Value Engineering (VE) Analysis of design and construction methods which shall be undertaken in accordance with the DPWH Guidelines for VE given in Appendix 2.1 of the Main Guidelines of the DPM Volume II | | |
| 12. | relevant statements of all on-going, completed, awarded but not yet started design/design and build related contracts, curriculum vitae of key staff, partners or principal officers; | | |
| 13. | valid licenses issued by the Professional Regulatory Commission (PRC) for design professionals | | |

*Financial Documents*

| No. | TYPE OF DOCUMENT | PASS/FAIL | REMARKS/FINDINGS |
|---|---|---|---|
| 14. | The prospective bidder's computation of Net Financial Contracting Capacity (NFCC). | | |

***- Class "B" Documents –***

| No. | TYPE OF DOCUMENT | PASS/FAIL | REMARKS/FINDINGS |
|---|---|---|---|
| 15. | If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence;<br>**or**<br>duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful. | | |

**NOTE**: Any missing document/s on the above mentioned checklist is a ground for outright disqualification/ rejection of the bid.

**REMARKS:** ☐**PASSED** ☐ **FAILED**

**ACKNOWLEDGMENT:** (Please see above "note" Do not fill up/sign if documents are marked passed)
This is to acknowledge receipt of the first and second envelopes which is being returned because of disqualification due to deficiencies and non-compliance with checklist therein.

Signature over printed name/Representative of Bidder

Date Received

**CHECKED AND VERIFIED BY:**

☐ **ATTY. JOSEPHINE C. LATI-BAGAOISAN**
Chairperson

☐ **ATTY. DIEGO LUIS S. SANTIAGO**
Vice Chairperson

☐ **DR. EMMA MEJIA-SANCHEZ**
Member

☐ **DR. JEANNA V. PLES**
Member

☐ **ENGR. JOHNNY L. CALATA**
Member

☐ **DR. STUART G. SANTOS**
Member

☐ **ARCH. LEA V. OLIVAR**
Member

☐ **ATTY. KATHLEEN MAE M. VILLAMIN**
Alternate Member

☐ **MR. JOSE REY Q. ESPINA**
Alternate Member

☐ **ATTY. BERNICE C. MENDOZA**
Alternate Member

☐ **ATTY. RAUL G. CORALDE**
Alternate Member

☐ **ATTY. JOHNSON L. VILLARUEL**
Alternate Member

Attested by:

**ATTY. BEA THERESE P. VILLANUEVA**
Officer in Charge, Procurement Management Office

***ANNEX "A.4"***

# GEOTECHNICAL INVESTIGATION REPORT

## PASIG CITY HALL BUILDING D (EXTENSION BUILDING)

Caruncho Avenue, Brgy. San Nicolas, Pasig City

AS PREPARED FOR

## CITY GOVERNMENT OF PASIG

Pasig City Hall, Caruncho Avenue, Brgy. San Nicolas, Pasig City

BY

**ARS Testing & Inspection, Inc.**
LUPIN II BUILDING, FARADAY COR. P. BINAY STS.,
SAN ISIDRO, MAKATI CITY
TEL. NOS.: 845-1260 * 845-1367 TELEFAX NO.: 949-7605

**ARS Testing & Inspection, Inc.**
LUPIN II BUILDING, FARADAY COR. P. BINAY STS.,
SAN ISIDRO, MAKATI CITY
TEL. NOS.: 845-1260 * 845-1367 TELEFAX NO.: 949-7605

Subsurface Exploration • Foundation Engineering • Evaluation & Engineering Reports • Industrial Inspection • Field & Laboratory Testing • Construction Quality Control

Ref. No.: ARS-13689-26938-21

D a t e : July 14, 2021

**CITY GOVERNMENT OF PASIG**
Pasig City Hall, Caruncho Avenue,
Brgy. San Nicolas, Pasig City

Attention : **ENGR. ALFREDO R. GARIN**
City Engineer

---

Subject : **REPORT – GEOTECHNICAL INVESTIGATION**
**PASIG CITY HALL BUILDING D (EXTENSION BUILDING)**
**LOCATED AT CARUNCHO AVENUE, BRGY. SAN NICOLAS,**
**PASIG CITY**

Dear Sir:

We are pleased to submit herewith five (5) hard copies and one (1) soft copy of our geotechnical investigation report performed for the above subject.

We are very glad to have been of service and look forward to serving you again in the near future.

Should any part of this report needs clarification, please do not hesitate to contact us.

Very truly yours,

**ARS TESTING & INSPECTION, INC.**

**FREDDIE J. ALCARAZ**
President

**ARS Testing & Inspection, Inc.**
LUPIN II BUILDING, FARADAY COR. P. BINAY STS.,
SAN ISIDRO, MAKATI CITY
TEL. NOS.: 845-1260 * 845-1367 TELEFAX NO.: 949-7605

Subsurface Exploration • Foundation Engineering • Evaluation & Engineering Reports • Industrial Inspection • Field & Laboratory Testing • Construction QualityControl

# GEOTECHNICAL INVESTIGATION REPORT

## PASIG CITY HALL BUILDING D (EXTENSION BUILDING)
## CARUNCHO AVENUE, BRGY. SAN NICOLAS, PASIG CITY
## PHILIPPINES

## 1.0 INTRODUCTION

ARS Testing & Inspection, Inc. was contracted by the City Government of Pasig to conduct geotechnical investigation at the site of the Proposed Pasig City Hall Building D – Extension Building project.

This report presents the subsoil conditions of the site in the form of boring logs and soil profile. Summary of laboratory test results and photographs of samples including field works are herewith attached as part of this report.

## 2.0 BRIEF PROJECT DESCRIPTION

The property to be develop is situated inside the Pasig City Hall in Caruncho Avenue, Brgy. San Nicolas as shown on Figure 1, Site Location Map. The ground surface is relatively flat as shown visually on site. The proposed development will be an eight (8) storey building with no basement.


Fig. 1a - Site Location Map

## 3.0 SCOPE OF WORK

### 3.1 Field Works

As outlined in our proposal based on the scope of work provided by the Client, a total of two (2) boreholes were drilled at site to a minimum depth of 30.00 meters each below existing ground level using two (2) hydraulically operated TOHO and EDGE drilling rigs.

The Summary of the boreholes drilled is listed in the Table below:

**Table 1 – SUMMARY OF DRILLED BOREHOLES**

| BH No. | Date Drilled | | Depth, m. | No. of SPT | No. of UDS | Length of Retrieved Cores, m. | Rig Type |
|---|---|---|---|---|---|---|---|
| | Started | Completed | | | | | |
| **1** | 06-18-21 | 06-22-21 | 31.50 | 22 | 1 | 1.54 | TOHO |
| **2** | 06-26-21 | 07-01-21 | 31.50 | 21 | - | 1.68 | EDGE-8 |

The borehole location is shown on Figure 1, Borehole Location Plan. Boring location was measured and staked-out by the ARS team based from the plan provided by the Client.

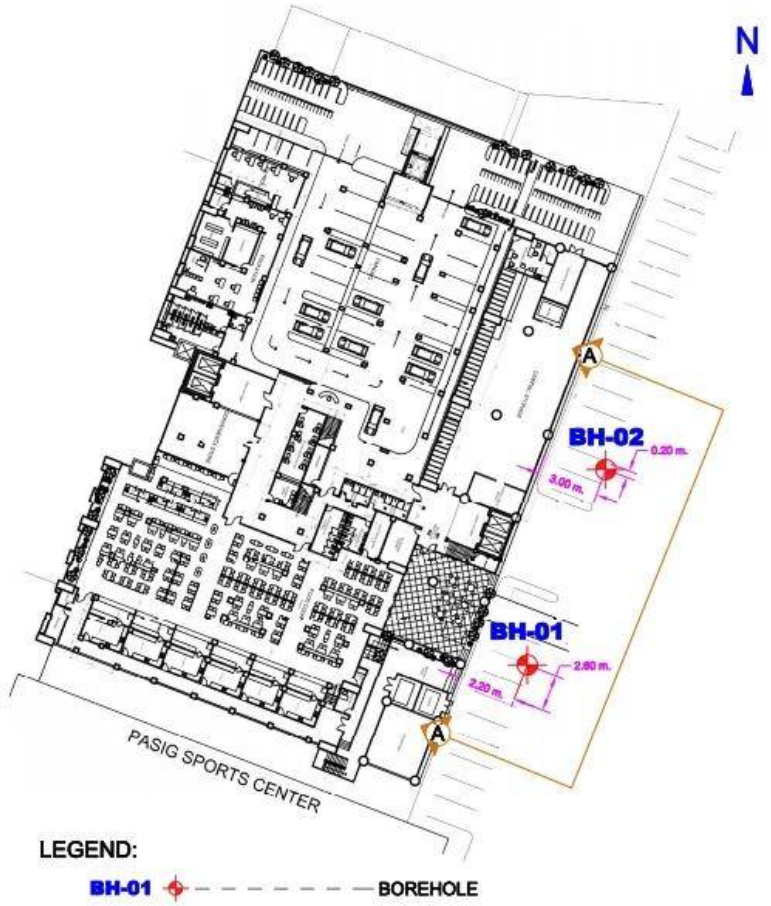



Fig. 1b - Actual Borehole Locations

Standard Penetration Tests using a Donut Type and Automatic Trip Hammer were performed in the borings in conjunction with split-barrel sampling using a 2.0-inch outside diameter and 1-3/8-inch inside diameter split spoon at interval of 1.0 meter from 0m to 6m and 1.50 meters thereafter. The standard penetration value (N) is defined as the number of blows of a 140-pound (63.6 kg) hammer falling freely from a distance of 30 inches (760 mm) required advancing the split-spoon sampler one-foot (300mm) into the soil (ASTM D-1587). The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of the three successive increments of six inches (150mm) penetration. The "N" value is obtained by adding the second and third incremental numbers.

The results of the standard penetration test indicate the relative density and comparative consistency of the soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

In the encountered hard layers, coring with the use of a NMLC triple tube core barrel was performed.

Disturbed samples from SPT were sealed in plastic bags to prevent loss of moisture while core samples were arranged in core boxes, for measurements of Recovery and Rock Quality Designation percentages before being delivered to the laboratory for the necessary test.

Photographs of soil and rock samples were taken prior to testing and are also attached herewith.

## 3.2 Laboratory Test Procedures

Laboratory tests were performed on extracted borehole samples based on the Terms of Reference in order to acquire necessary information with regards to the physical and mechanical properties of the soil and rock layers and further on to evaluate and determine the parameters required for the calculations.

All phases of the laboratory-testing program were performed in accordance with the applicable ASTM Specifications. Summary of laboratory test results are shown on the Appendix.

The following laboratory tests and their brief description were carried out on all samples obtained from the site:

- ASTM D-2487 Standard Classification of Soils for Engineering Purposes (USCS)

  This standard describe a system for classifying mineral and organo-mineral soils for engineering purposes based on laboratory determination of particle size characteristics, liquid limit and plasticity index of soil.

- ASTM D-422 Standard Test Method for Particle Size Analysis of Soils

  This test method covers the quantitative determination of the distribution of particle sizes in soils by sieving. The weight of soil retained on each sieve was obtained and recorded. For each sample analyzed, a gradation curve was drawn based on percent finer by weight.

- ASTM D-4318 Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils

  Liquid Limit is defined as "the moisture content at which soil changes from liquid state to plastic state."

  According to Casagrande, Liquid Limit Test is also defined as "the moisture content at which two sides of a groove come close together for a distance of 12.7 mm under the impact of 25 numbers of blows"

  Plastic Limit is the water content at which the soil begins to crumble when rolled up into threads with 3mm diameter. It is also the water content in percent, of a soil at the boundary between the plastic and semi-solid states.

  Plasticity Index (PI) is a measure of the plasticity of a soil. The plasticity index is the size of the range of water contents where the soil exhibits plastic properties. The PI is the difference between the liquid limit and the plastic limit (PI = LL-PL).

- ASTM D-2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soils and Rock by Mass

  These test methods cover the laboratory determination of the water (moisture) content by mass of soil, rock, and similar materials where the reduction in mass by drying is due to loss of water. It is defined as the ratio expressed as

a percentage of the weight of water in a given mass of soil to the weight of the solid particles.

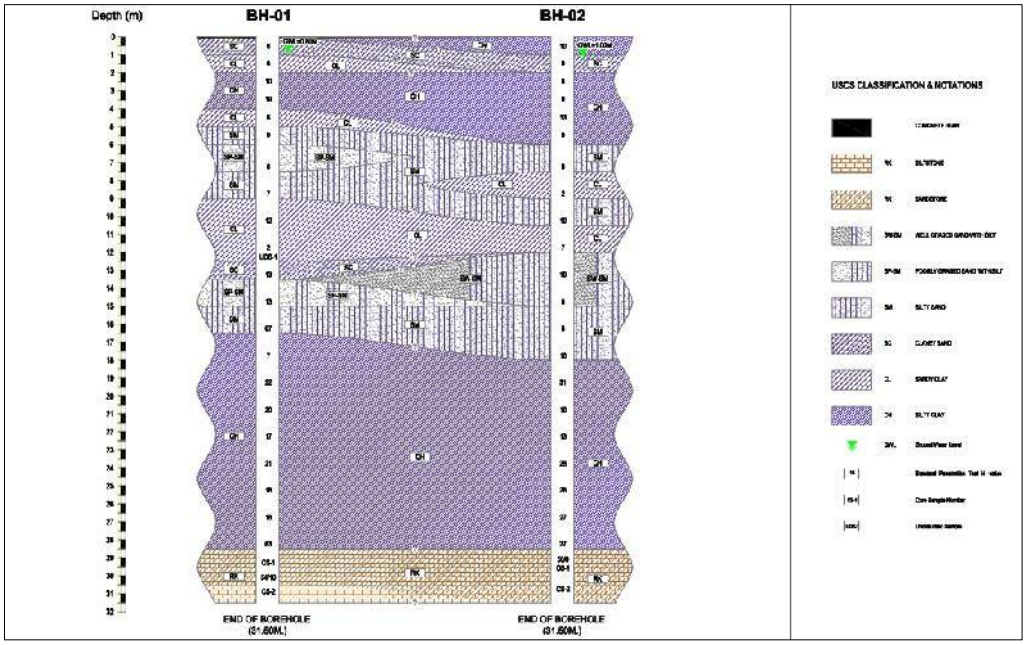
- ASTM D-7012 Standard Test Method for Compressive Strength and Elastic Moduli of Intact Rock Core Specimens Under Varying States of Stress and Temperatures

  This test method (Method C) covers the cutting and testing at rock core specimen. The specimen is placed in a loading frame and axial load is increased continuously on the specimen, and deformation is measured as a function of load until peak load and failure are obtained.

## 4.0 SUBSURFACE CONDITIONS

Idealized subsoil profile was drawn depicting layers of BH to BH and is shown from Figure 2, Idealized Subsoil Profile. The site is mantled by 0.10 meter thick concrete. Underlying this layer is a loose to very dense and medium stiff to hard sand-silt-clay materials up to 28.50 meters. Below this layer is a tuff formation consisting of siltstone and sandstone up to the maximum depth explored of 31.50 meters.

**IDEALIZED SUBSOIL PROFILES**



## 5.0 GROUND WATER TABLE

In general, measurements of water levels below existing ground surface were conducted after the 24-hour elapsed time and were tabulated as follows:

**Table 2 – BOREHOLE GROUND WATER TABLE**

| BH No. | Depth, m. | Water Level, m. | |
|---|---|---|---|
| | | Below Existing Ground Level | With reference to BH Elevation |
| 01 | 31.50 | 0.80 | - |
| 02 | 31.50 | 1.00 | - |

However, this water level may not represent the true ground water in the area and may only be the water trapped during drilling that did not dissipate completely after 24 hours.

Prepared by:

RYAN E. BALIDIO
Acting Head
Geotechnical Section

Noted by:

FREDDIE J. ALCARAZ, CE 31989
President

July 09, 2021

# TECHNICAL EVALUATION
# (ENGR. BRIAN TAN)

## Site Conditions

The site is situated about 600-m north of the Napindan Channel and is bounded by the existing city hall building to the west. The site is currently unoccupied. According to Google Earth, the site has an elevation of about 5-m above mean sea level.

Metro Manila can be divided into four sections based on the ground elevation and underlying soil conditions. The westernmost section is located close to the shoreline of the Manila Bay and has a low elevation. This section is known to be underlain by weak alluvium up to 50-m thick followed by the Guadalupe Tuff Formation (GTF). The elevation of Metro Manila increases moving eastward until the Guadalupe Plateau is reached. This section, is underlain by the GTF that is in turn overlain by a minimally thick layer of residual soils and artificial fills. Moving further east, the elevation drops upon reaching the Marikina Valley Floor and the shoreline of the Laguna Lake. This area, which is where the site is situated, is characterized as having weak alluvium up to 50-m thick, again followed by the GTF. Moving eastward, the elevation rises once again upon reaching the foot of the Sierra Madre Mountain range.

The GTF is composed of alternating layers of late Pliocene to early Pleistocene sandstone, siltstone, and shale. Visual inspections of excavations and open cuts have revealed that the formation is near horizontally layered with individual layers rarely more than 6-m thick. The unconfined compressive strength (UCS) of intact core samples rarely exceeds 100-kg/cm$^2$ and generally ranges between 5-kg/cm$^2$ and 40-kg/cm$^2$. This relatively low UCS means that the GTF is appropriately classified as soft to very soft rock. Nevertheless, the GTF has sufficient strength and stiffness to support the structural loads of high-rise buildings. While the GTF is the underlying bedrock formation throughout Metro Manila and its outlying areas, the thickness of the sediments overlying the GTF varies depending on the elevation of the site and the proximity to major bodies of water. For example, in the high elevation Guadalupe Plateau (e.g., BGC, Ortigas Center, Diliman), the GTF is overlain by a minimally thick residual soil layer that is generally less than 5-m thick. In contrast, the GTF in the low-lying areas close to the Manila Bay, the Marikina Valley floor, and the areas along the major rivers is overlain by weak alluvium up to 50-m thick.

To provide information about the ground conditions, two boreholes were drilled to a depth of 31.5-m. Annex A plots the field and corrected SPT N-values as well as correlations to various engineering parameters. The following stratification can be inferred from the borings:

1) 0-m to 7-m: Medium stiff silt and clay with seams of medium dense silty sand. The field SPT N-values range from 6 to 19 with an average of 9.5. The low SPT N-values are an indication that the formation is lightly overconsolidated and therefore moderate to highly compressible.
2) 7-m to 19-m: Medium dense silty sand with seams of soft to medium stiff clay. The field SPT N-values in the sandy deposits range from 6 to 13 with an average of 9.4. The low SPT N-values suggest that the formation is potentially liquefiable. The liquefaction potential of the site will be assessed in a succeeding section. In the silt/clay layers, the field SPT N-values range from 2 to 12 with an average of 6.0. The silt/clay deposits appear to be highly compressible.
3) 19-m to 28.5-m: Medium stiff to stiff silt and clay. The field SPT N-values range from 10 to 31 with an average of 21.2.
4) >28.5-m: Weathered GTF. The few intact core samples yielded UCS values of 18.27-kg/cm$^2$ and 29.40-kg/cm$^2$.

The groundwater table was encountered 1-m below the ground surface.

## Liquefaction Analysis

Liquefaction is the phenomenon wherein soil loses much of its strength when subjected to large, cyclic loads such as those generated during strong earthquakes. In many cases, the loss in strength is so significant that the soil behaves like a liquid and becomes incapable of supporting applied loads. Damage associated with liquefaction

626 Lee Street, Mandaluyong City
Tel No.: +63(2)87230518 to 20 Cel No.: +63(917)5344116 Fax No.: +63(2)87238402
Email: brain@alum.mit.edu (brain not brian); geotech@brianbtan.com

includes sudden large uniform and differential settlement of structures on shallow foundations, tilting of structures on mat foundations, lateral spreading, sand boils, and buoying of underground structures.

For liquefaction to occur, the following criteria have to be met:

1) Soil consists of loose, fine, uniformly graded sand and silt. Sands are susceptible to liquefaction due to their lack of cohesion and tendency to densify during intense shaking. Silts, even though they have a high fines content, can also liquefy since they typically have a very low cohesion and do not exhibit interparticle forces. Clays do not liquefy since the cohesion and high interparticle forces tend to prevent liquefaction.
2) Shallow water table (< 2-m deep). A shallow water table is necessary since the main cause of liquefaction is the buildup of high excess pore pressures during cyclic loading.
3) Strong, relatively long earthquake.

Since loose sands and a shallow water table are present at the site, the liquefaction potential of the site will have to be assessed.

A widely used procedure that correlates the SPT N-values to the factor of safety of a site against liquefaction is the Japan Road Association (JRA) Procedure. The factor of safety is defined as the ratio between the dynamic shear strength ratio, R, and the seismic shear stress ratio, L. A factor of safety greater than one indicates that the soil is not liquefiable whereas a factor of safety less than one indicates that the soil is liquefiable. The dynamic shear strength ratio, R, is determined from the SPT N-values, the type of earthquake (inter-plate or inland), and the fines content of the soil. The seismic shear stress ratio, L, is calculated from the horizontal seismic coefficient. The JRA procedure provides reduction factors for the soil parameters depending on the R value and the depth of the corresponding layer.

Annex B gives the factor of safety against liquefaction using the Japan Road Association method assuming a peak ground acceleration of 0.5g.

- The PGA was obtained from the Philippine Earthquake Model prepared by Phivolcs (2017).
- The calculations show that various sand layers between a depth of 7-m and 19-m are liquefiable since the factors of safety are below 1.0.
- Referring to the Iwasaki (1982) Liquefaction Potential Index (LPI) procedure, the liquefaction potential of the site is classified as moderate.

## Foundation Solutions

The proposed structure will consist of eight floors without basements. The presence of weak, compressible, and liquefiable soil will require the use of a deep foundation system consisting of precast concrete piles to support the proposed mid-rise structure.

A precast concrete pile may be installed using either a hydraulic impact hammer or the relatively new and recently popular static pile driver. The hydraulic impact hammer is generally faster to use and more cost-effective than the static pile driver. However, the hydraulic impact hammer cannot be used in densely developed areas since the hammer impact generates a significant amount of noise and vibration. In situations where the hydraulic impact hammer cannot be employed, the static pile driver has been used with great success. The drawback to the static pile driver is that piles that derive majority of their capacity from end-bearing as a result of driving refusal will have their capacities limited by the available counterweight of the static pile driver. This means that the allowable pile capacity of a precast concrete pile installed using the static pile driver is generally less than the capacity of a pile installed using the hydraulic impact hammer unless a sufficiently heavy static pile driver is used.

Annex C gives the allowable capacity of a precast concrete pile that will be installed to practical refusal, which is expected to occur 30-m to 31-m below the ground surface.

- The first set of charts in Annex C gives the pile capacities without considering liquefaction in the upper 19-m and therefore may be used when considering gravity loads. This set of charts considers a factor of safety of 2.50.
- The second set of charts in Annex C gives the pile capacities considering fully liquefied soil within the upper 19-m. These charts may be used when analyzing the piles under seismic loads. This set of

charts considers a factor of safety of 1.88. A lower of factor of safety can be accommodated when considering seismic loads due to the transient nature of the loading.

The charts in Annex C also consider the following:

- The tip depth is referenced from the ground surface.
  - The tip depths were limited by the capacities and limits of local pile installation equipment.
  - Since the skin friction within the upper 3-m is minimal, the capacity for a given tip depth would still apply even if the pile head is located up to 3-m below the ground surface.
- To minimize pile wastage, probe piles should be installed across the site to be able to determine the optimum pile casting lengths.

The following pile capacities may be used provided the piles are installed to practical refusal:

Gravity Loads (without effect of liquefaction); Factor of Safety = 2.50

| Pile Size (mm) | Allowable Pile Capacity (kN) | Allowable Pullout Capacity (kN) |
|---|---|---|
| 350 x 350 | 950 | 450 |
| 400 x 400 | 1,125 | 525 |
| 450 x 450 | 1,300 | 600 |

Seismic Loads (with effect of liquefaction); Factor of Safety = 1.88

| Pile Size (mm) | Allowable Pile Capacity (kN) | Allowable Pullout Capacity (kN) |
|---|---|---|
| 350 x 350 | 1,100 | 360 |
| 400 x 400 | 1,300 | 420 |
| 450 x 450 | 1,500 | 480 |

To minimize pile wastage, it is recommended that a series of probe piles be driven across the site to be able to determine the optimum pile casting lengths.

When analyzing the lateral load capacities of the piles, the following subgrade moduli may be employed:

| Depth (m) | Soil Type | Subgrade Modulus (kPa/m) |
|---|---|---|
| 0 to 7 | Compressible clay | 0 to 10,000/B |
| 7 to 19 | Liquefiable sand | 1,500/B |
| 19 to refusal | Stiff clay | 20,000/B |

Ideally, splices should not be employed since splices are a point of structural weakness that could compromise the lateral load capacity of the piles. However, since it appears that splices will have to be employed, they should be detailed such that they will not be damaged during driving and should be able to resist the bending and shear stresses that develop at the splice point.

- The widely used “splice can” detail should not be employed since they are easily damaged during driving and are generally unable to transfer the loads properly across the spliced sections.
- The grouted pocket-and-dowel detail has been used with reasonable success but requires proper implementation to ensure good bonding between the grout and the pocket hole.

  - A better detail would include the addition of a weld plate to ensure a good connection between the two sections.
- Each pile position should not have more than one splice (two sections).
- The splice should be located more than 20-m below the ground surface to prevent the splice from being located within the liquefiable zone.

To avoid reducing the pile group efficiency, it is recommended that the center-to-center spacing be at least 2.5D.

It is essential that a two-phase pile-testing program consisting of static or PDA tests be employed to verify the calculated pile capacities.

- The first phase of testing should be done at the start of the piling works to allow adjustments to be made to the succeeding piles. This is necessary to avoid the situation where the piles are undercapacity (piles are too few or too short) or to be able to optimize the foundation system (piles are overcapacity and therefore too many or too long).
  - The first phase of testing may be performed on the probe piles.
  - Since the piles will not be tested to failure, they may be considered as working piles and need not be abandoned.
  - It is worth constructing sacrificial test piles that will be subjected to a static or bi-directional load test in order to determine the ultimate skin friction of the piles.
- The second phase of the testing involves testing random piles to provide quality assurance of the installed piles.
- If static load tests will be performed, at least 1% of the piles should be tested. If PDA tests will be employed, at least 5% of the piles should be tested. The quantity of the pile tests may be adjusted depending on the results of the initial pile tests.

Most important of all, the pile tests should be performed by an independent third-party testing agency directly engaged by the owner and not under the purview of the piling contractor to ensure the veracity of the test results.

## Seismic Considerations

In the seismic design provisions of the 2015 National Structural Code of the Philippines (NSCP), the three geotechnical inputs are the “near source factors (Table 208-4 and 208-5, NSCP 2015)”, “soil profile type (Table 208-2, NSCP 2015)” and “seismic zone factor (Table 208-3, NSCP 2015)”.

For the seismic zone factor, a value of 0.4 may be employed since the Philippines is classified as seismic zone 4.

For the soil profile type, the presence of liquefiable soil would indicate that the soil profile type should be taken as $S_F$, which means a site response analysis should be performed. However, it is the writer’s opinion that the use of a deep foundation system would allow for the soil profile type to be upgraded to the $S_E$—soft soil profile.

For the near source factors, the two input parameters are the horizontal distance to the vertical projection of the seismic source and the seismic source classification type:

- Based on the Phivolcs VFS Atlas, the site is about 1.5-km to the east of the trace of the West Valley Fault (WVF).
- The code classifies seismic sources based on the strength of the potential earthquake that it could generate, as well as its rate of seismic activity. A type A seismic source is a fault that is capable of generating large magnitude earthquakes ($M > 7$) and has a high rate of seismic activity (slip rate > 5-mm/year). A type B seismic source is a fault that is capable of generating large magnitude earthquakes ($M > 7$) but has a low rate of seismic activity (slip rate < 5-mm/year) or a fault that is capable of moderate magnitude earthquakes ($M < 7$). For the WVF, the earthquake magnitude estimates range from 6.5 to 7.2 while the slip rate, though not well-defined, is believed to range from 2-mm/year to 6-mm/year. It can be seen from the magnitude and slip rate estimates that a type B classification is acceptable. However, it is recommended that the WVF be classified between type A and B to account for uncertainties in the magnitude and slip rate estimates. In fact, a type A classification may also be

considered if a more conservative approach is preferred.

Brian B. Tan, M.Sc.
CE 92215
July 14, 2021

# Annex A: SPT N-Value Correction

Project: Pasig City Hall Building D
Location: Caruncho Avenue, Brgy. San Nicolas, Pasig City

## General Soil Properties:

Unit weight $\gamma = 17$

Water depth $wd = 1$

Water unit weight $\gamma_w = 9.8$

## SPT Details:

Diameter (mm)
Liner? (0 or 1)
Hammer Efficiency
Rod Length

$$Ha = \begin{pmatrix} 100 \\ 0 \\ 1 \\ 15 \end{pmatrix}$$

In columns:
Release type
Hammer efficiency
ER Equivalent

$$HR = \begin{pmatrix} \text{"Automatic Trip with Rope and Pulley"} & 1.25 & 75 \\ \text{"Donut Free Fall-China"} & 1 & 60 \\ \text{"Donut Free Fall-Japan"} & 1.3 & 80 \\ \text{"Donut Rope and Pulley-China"} & 0.83 & 50 \end{pmatrix}$$

$N1_{60a} := N1_{60}(Nt, Ha)$

$SNt := Split(Nt, 0)$
$CNt := Split(Nt, 1)$
$SN1_{60a} := Split(N1_{60a}, 0)$
$CN1_{60a} := Split(N1_{60a}, 1)$
$Ref1 := Ref(Nr)$

$Es1 := Es(Nt, Ha)$
$EsJRA1 := EsJRA(Nt, Ha)$
$EsA1 := EsA(Nt, Ha)$
$khoJRA1 := khoJRA(Nt)$
$EsW1 := EsW(Nt, Ha)$

$\phi 1 := \phi(Nt, Ha)$
$s_{u1} := s_u(Nt, Ha)$
$OCR1 := OCR(Nt, Ha)$
$\phi c1 := \phi c(Nt)$

$DPSF1 := DPSF(Nt, Ha)$
$DPEB1 := DPEB(Nt, Ha)$
$BPSF1 := BPSF(Nt, Ha)$
$BPEB1 := BPEB(Nt, Ha)$
$EsKM1 := EsKM(Nt, Ha)$

Field N-Value: Ave, SD, Max, Min, Num

from 0-m to 7-m: $Ave(Nt, 0, 7, 1, 2)^T = (9.5 \quad 3.5 \quad 19 \quad 6 \quad 12)$

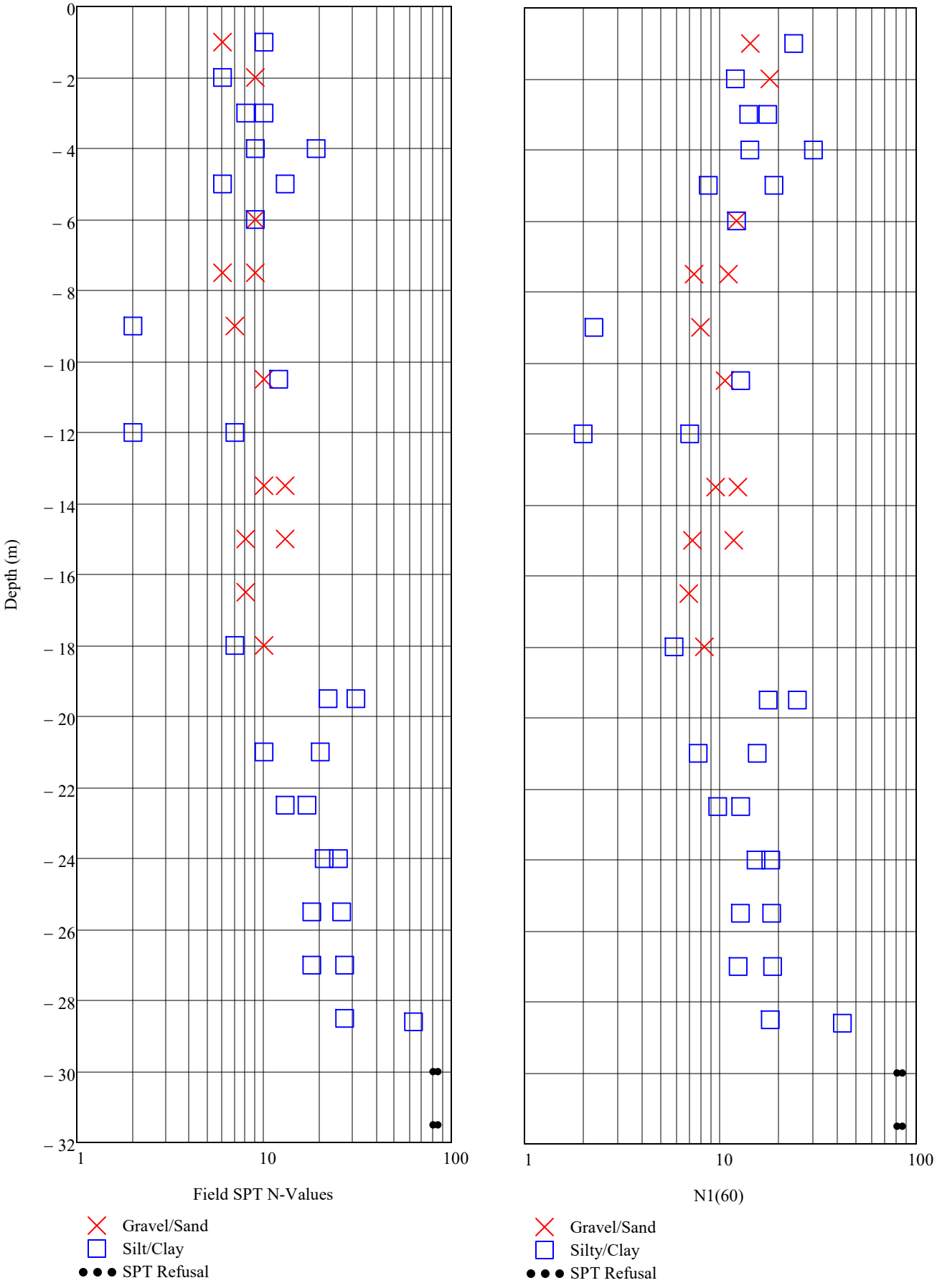
from 7-m to 19-m (Sand): $Ave(Nt, 7, 19, 1, 0)^T = (9.4 \quad 2.2 \quad 13 \quad 6 \quad 10)$

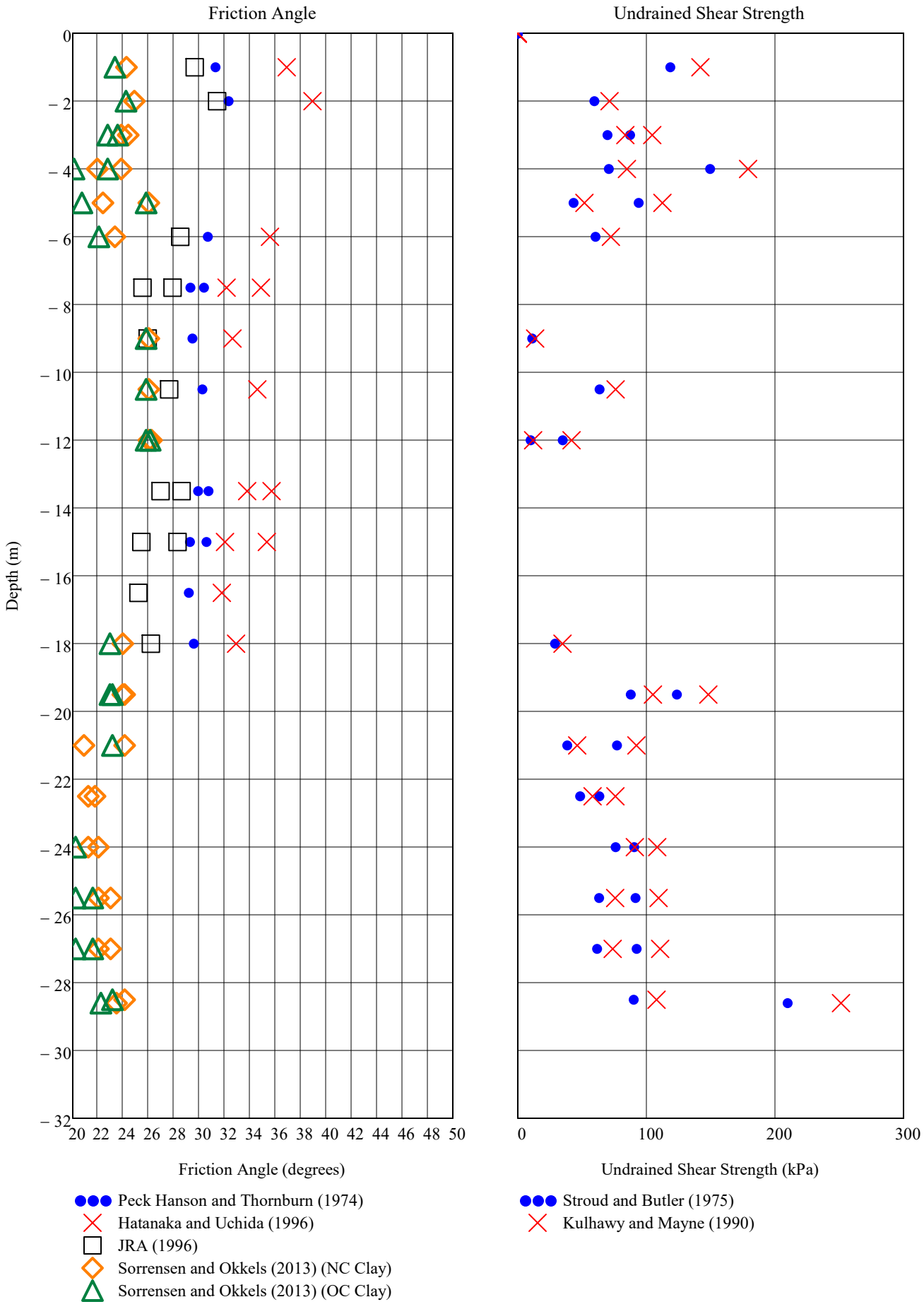
from 7-m to 19-m (Silt): $Ave(Nt, 7, 19, 1, 1)^T = (6 \quad 3.7 \quad 12 \quad 2 \quad 5)$

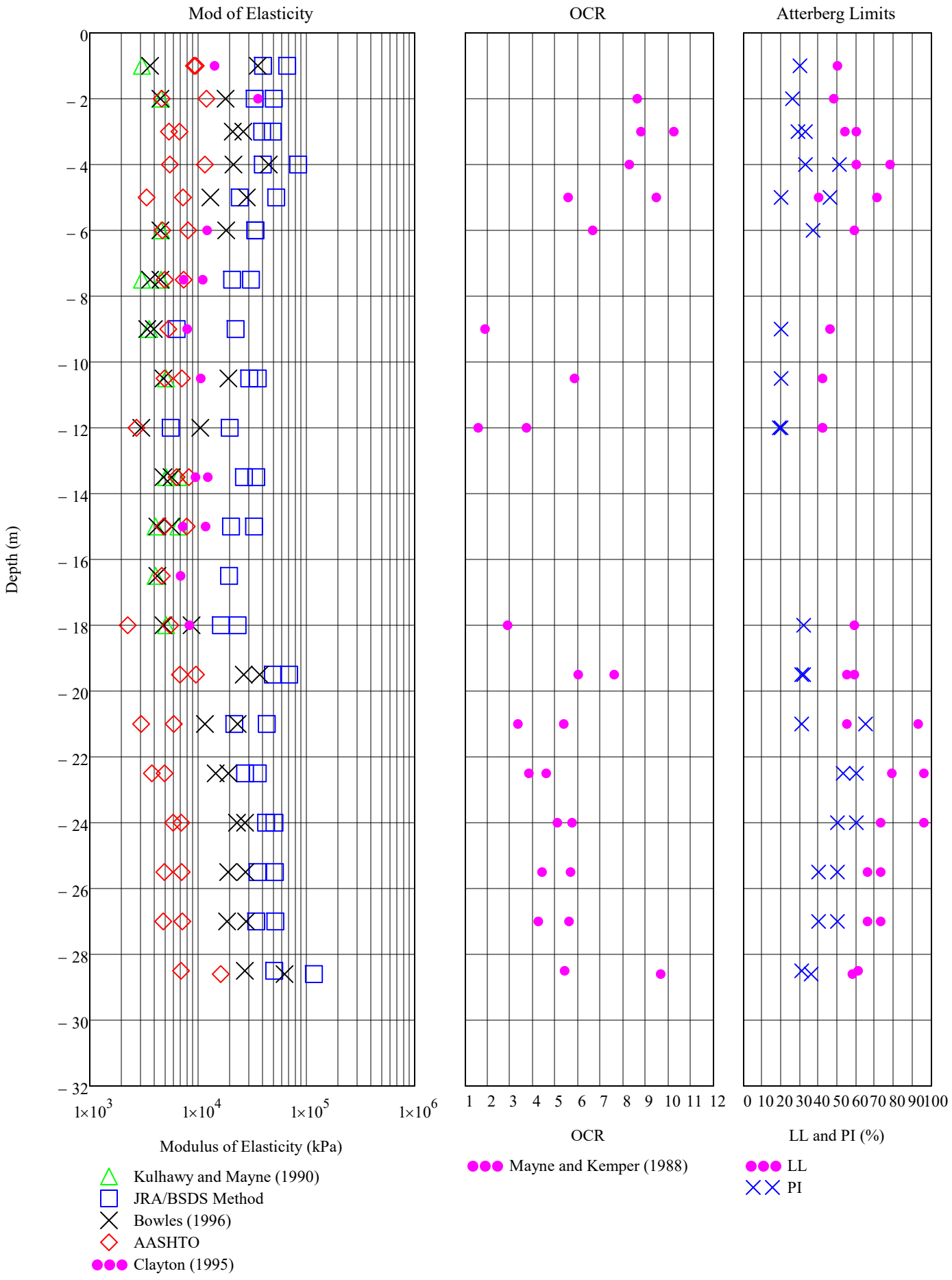
from 19-m to 28.5-m (Silt): $Ave(Nt, 19, 28.5, 1, 1)^T = (21.2 \quad 5.8 \quad 31 \quad 10 \quad 13)$

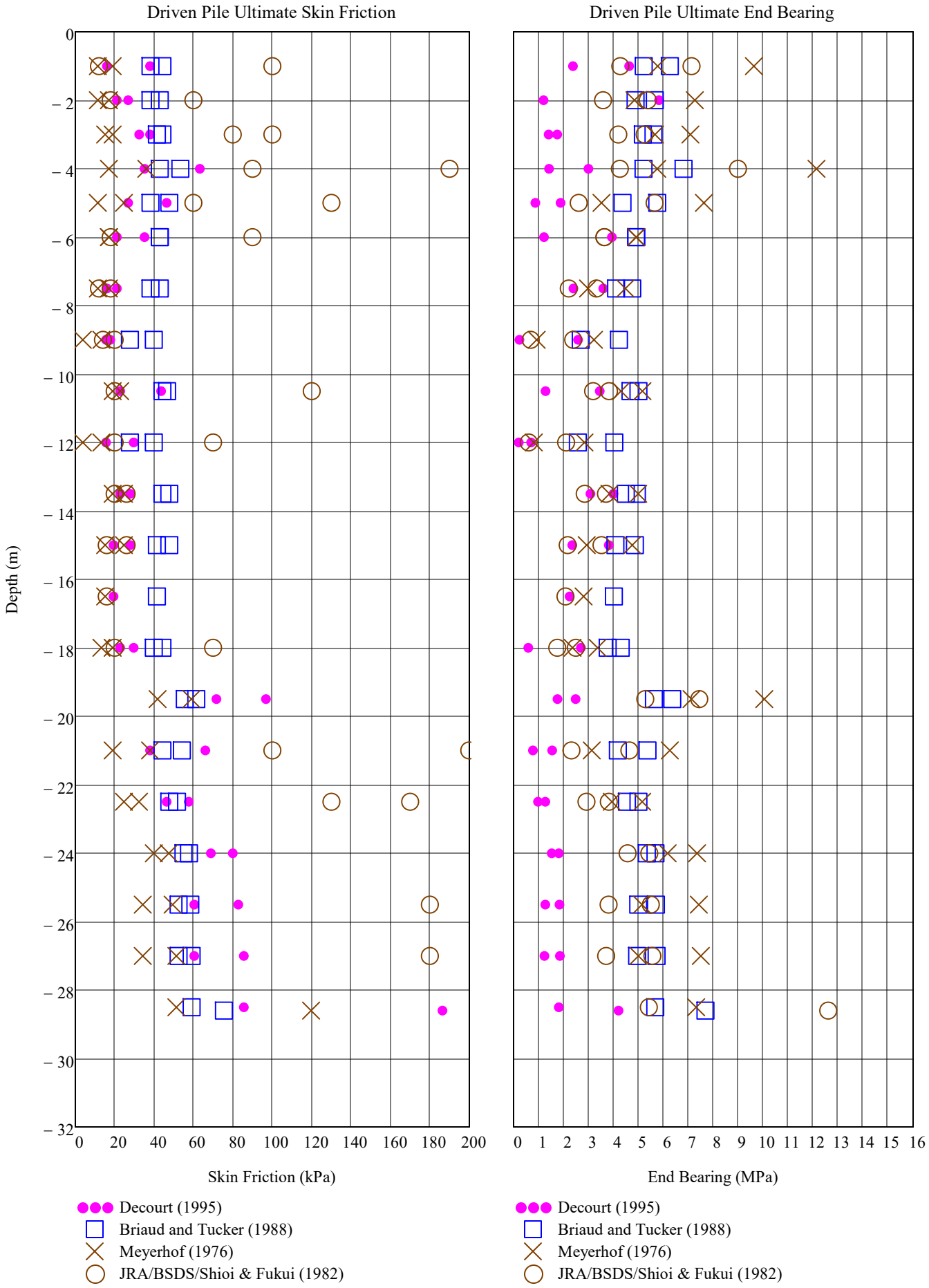
version updated: 2/1/2020

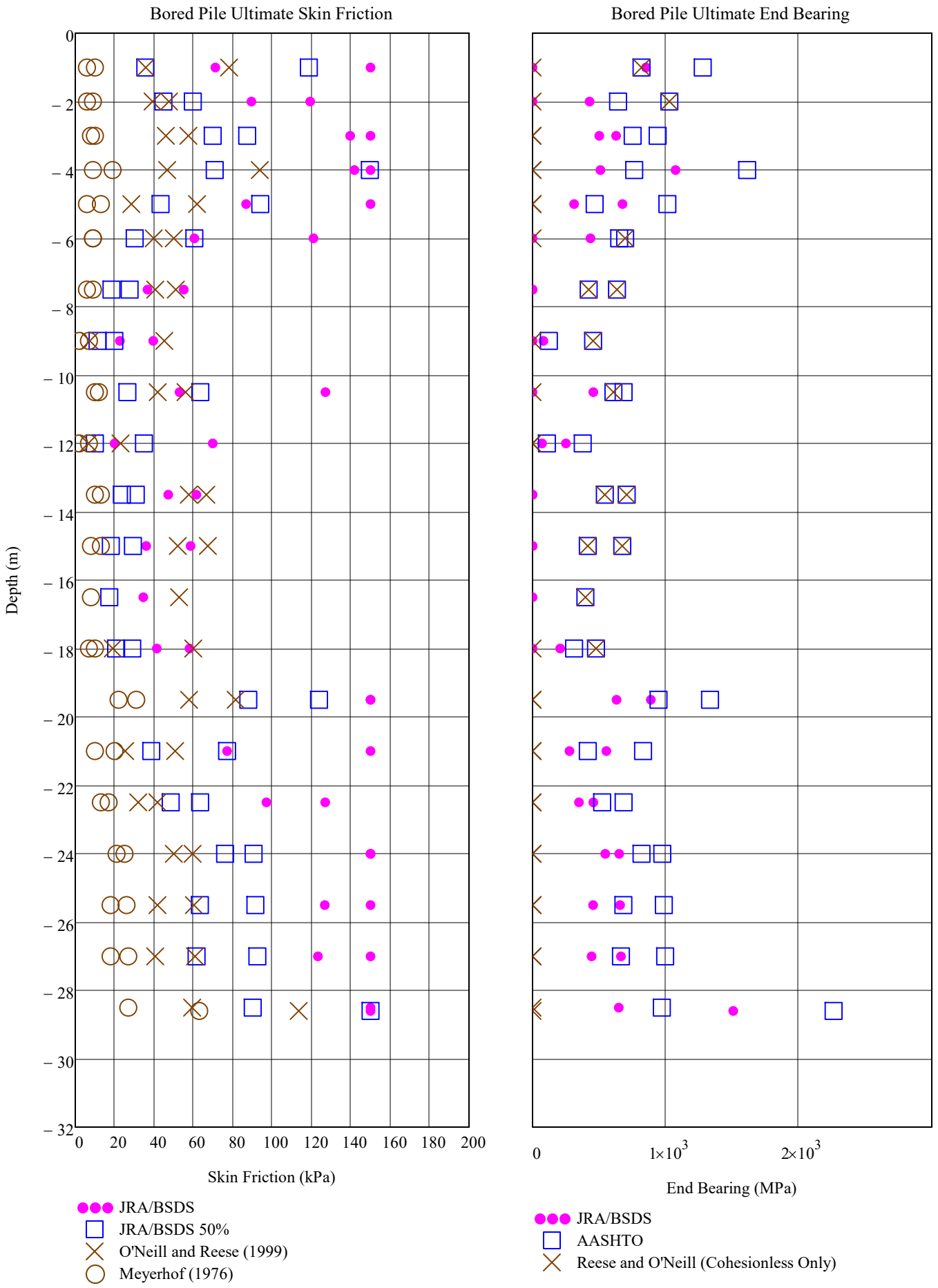
D := 32

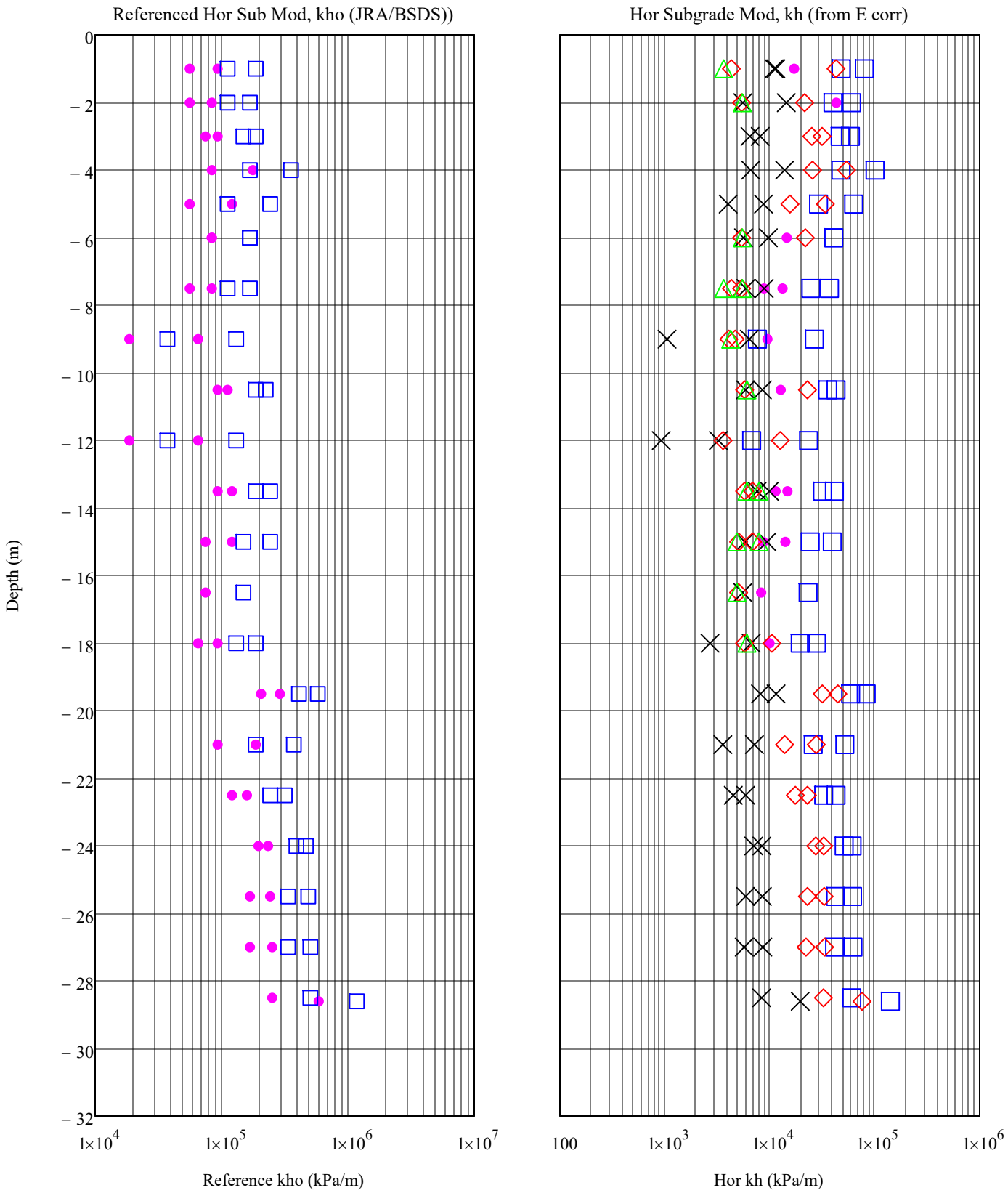

0
– 2
– 4
– 6
– 8
– 10
– 12
– 14
– 16
– 18
– 20
– 22
– 24
– 26
– 28
– 30
– 32
Depth (m)
1
10
100
Field SPT N-Values
Gravel/Sand
Silt/Clay
SPT Refusal
1
10
100
N1(60)
Gravel/Sand
Silty/Clay
SPT Refusal


Friction Angle
Undrained Shear Strength
Depth (m)
0
– 2
– 4
– 6
– 8
– 10
– 12
– 14
– 16
– 18
– 20
– 22
– 24
– 26
– 28
– 30
– 32
20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
0 100 200 300
Friction Angle (degrees)
Undrained Shear Strength (kPa)
Peck Hanson and Thornburn (1974)
Hatanaka and Uchida (1996)
JRA (1996)
Sorrensen and Okkels (2013) (NC Clay)
Sorrensen and Okkels (2013) (OC Clay)
Stroud and Butler (1975)
Kulhawy and Mayne (1990)


Mod of Elasticity
OCR
Atterberg Limits
Depth (m)
0
– 2
– 4
– 6
– 8
– 10
– 12
– 14
– 16
– 18
– 20
– 22
– 24
– 26
– 28
– 30
– 32
1×10^3
1×10^4
1×10^5
1×10^6
Modulus of Elasticity (kPa)
1 2 3 4 5 6 7 8 9 10 11 12
OCR
0 10 20 30 40 50 60 70 80 90 100
LL and PI (%)
Kulhawy and Mayne (1990)
JRA/BSDS Method
Bowles (1996)
AASHTO
Clayton (1995)
Mayne and Kemper (1988)
LL
PI


Driven Pile Ultimate Skin Friction
Driven Pile Ultimate End Bearing
Depth (m)
0
– 2
– 4
– 6
– 8
– 10
– 12
– 14
– 16
– 18
– 20
– 22
– 24
– 26
– 28
– 30
– 32
0 20 40 60 80 100 120 140 160 180 200
Skin Friction (kPa)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
End Bearing (MPa)
Decourt (1995)
Briaud and Tucker (1988)
Meyerhof (1976)
JRA/BSDS/Shioi & Fukui (1982)
Decourt (1995)
Briaud and Tucker (1988)
Meyerhof (1976)
JRA/BSDS/Shioi & Fukui (1982)


Bored Pile Ultimate Skin Friction
Depth (m)
0
– 2
– 4
– 6
– 8
– 10
– 12
– 14
– 16
– 18
– 20
– 22
– 24
– 26
– 28
– 30
– 32
0
20
40
60
80
100
120
140
160
180
200
Skin Friction (kPa)
JRA/BSDS
JRA/BSDS 50%
O'Neill and Reese (1999)
Meyerhof (1976)
Bored Pile Ultimate End Bearing
0
1×10^3
2×10^3
End Bearing (MPa)
JRA/BSDS
AASHTO
Reese and O'Neill (Cohesionless Only)




*values above to be multiplied by (B/0.3)^-.75 to get kh

*values above to be divided by B

# Annex B:
# Liquefaction Analysis
# Japan Road Association Method

| BH | 1 |
|---|---|
| kh | 0.50 |
| WT (m) | 1 |
| EQ Type | 2 |

*Type 1: Large-Scale Interplate EQ; Type 2: Inland Crustal EQ

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | N | Sand (0) Clay and Rock (1) | Unit Weight (kN/m3) | Fines Content | Plasticity Index | N1 | C1 | C2 | Na | RL | Cw | R | L | FS | Reduction Factors | LPI |
| 1 | 6 | 0 | 16 | 24 | 0 | 11.82 | 1.28 | 0.78 | 15.90 | 0.27 | 1.56 | 0.421 | 0.493 | NL -- Above WT | 1.00 | 0 |
| 2 | 6 | 0 | 16 | 96 | 26 | 11.01 | 3.80 | 4.78 | 46.63 | 10.82 | 2.00 | 21.635 | 0.699 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 3 | 10 | 0 | 17 | 98 | 33 | 16.67 | 3.90 | 4.89 | 69.90 | 117.34 | 2.00 | 234.685 | 0.776 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 4 | 19 | 0 | 17 | 98 | 33 | 29.55 | 3.90 | 4.89 | 120.12 | 2091.26 | 2.00 | 4182.523 | 0.829 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 5 | 6 | 0 | 16 | 79 | 20 | 9.14 | 2.95 | 3.83 | 30.81 | 0.90 | 2.00 | 1.798 | 0.908 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 6 | 9 | 0 | 16 | 27 | 0 | 12.98 | 1.34 | 0.94 | 18.34 | 0.29 | 1.63 | 0.474 | 0.930 | 0.51 | 0.67 | 3.4 |
| 7.5 | 6 | 0 | 16 | 6 | 0 | 8.01 | 1.00 | 0.00 | 8.01 | 0.19 | 1.30 | 0.249 | 0.947 | 0.26 | 0.00 | 4.6 |
| 9 | 7 | 0 | 16 | 38 | 0 | 8.70 | 1.56 | 1.56 | 15.13 | 0.26 | 1.54 | 0.405 | 0.951 | 0.43 | 0.67 | 3.2 |
| 10.5 | 12 | 0 | 17 | 94 | 20 | 13.00 | 3.70 | 4.67 | 52.76 | 22.96 | 2.00 | 45.928 | 0.881 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 12 | 2 | 0 | 16 | 98 | 20 | 2.18 | 3.90 | 4.89 | 13.40 | 0.25 | 1.49 | 0.368 | 0.936 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 13.5 | 13 | 0 | 17 | 36 | 0 | 12.35 | 1.52 | 1.44 | 20.22 | 0.31 | 1.69 | 0.525 | 0.856 | 0.61 | 0.67 | 1.3 |
| 15 | 13 | 0 | 17 | 11 | 0 | 11.64 | 1.02 | 0.06 | 11.92 | 0.23 | 1.44 | 0.337 | 0.840 | 0.40 | 0.67 | 1.5 |
| 16.5 | 67 | 0 | 19 | 47 | 0 | 48.56 | 1.74 | 2.06 | 86.54 | 378.05 | 2.00 | 756.099 | 0.731 | 1034.88 | 1.00 | 0 |
| 18 | 7 | 0 | 16 | 77 | 32 | 6.15 | 2.85 | 3.72 | 21.24 | 0.32 | 1.74 | 0.562 | 0.867 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 19.5 | 22 | 0 | 18 | 77 | 32 | 15.40 | 2.85 | 3.72 | 47.62 | 12.32 | 2.00 | 24.648 | 0.732 | NL -- Silt/Clay Soi | 1.00 | 0 |

| LPI | 13.95086531 |
|---|---|
| | Moderate |

| BH | 2 |
|---|---|
| kh | 0.50 |
| WT (m) | 1 |
| EQ Type | 2 |

*Type 1: Large-Scale Interplate EQ; Type 2: Inland Crustal EQ

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | N | Sand (0) Clay and Rock (1) | Unit Weight (kN/m3) | Fines Content | Plasticity Index | N1 | C1 | C2 | Na | RL | Cw | R | L | FS | Reduction Factors | LPI |
| 1 | 10 | 0 | 17 | 95 | 30 | 19.47 | 3.75 | 4.72 | 77.72 | 211.18 | 2.00 | 422.352 | 0.493 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 2 | 9 | 0 | 16 | 35 | 0 | 16.52 | 1.50 | 1.39 | 26.17 | 0.47 | 2.00 | 0.937 | 0.699 | 1.34 | 1.00 | 0 |
| 3 | 8 | 0 | 16 | 98 | 29 | 13.75 | 3.90 | 4.89 | 58.50 | 42.38 | 2.00 | 84.767 | 0.808 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 4 | 9 | 0 | 16 | 99 | 51 | 14.54 | 3.95 | 4.94 | 62.37 | 61.45 | 2.00 | 122.902 | 0.870 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 5 | 13 | 0 | 17 | 100 | 46 | 18.95 | 4.00 | 5.00 | 80.78 | 260.72 | 2.00 | 521.446 | 0.859 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 6 | 9 | 0 | 16 | 97 | 37 | 12.98 | 3.85 | 4.83 | 54.81 | 28.86 | 2.00 | 57.719 | 0.930 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 7.5 | 9 | 0 | 16 | 15 | 0 | 12.02 | 1.10 | 0.28 | 13.50 | 0.25 | 1.49 | 0.370 | 0.947 | 0.39 | 0.67 | 3.8 |
| 9 | 2 | 0 | 16 | 86 | 20 | 2.49 | 3.30 | 4.22 | 12.42 | 0.24 | 1.46 | 0.347 | 0.951 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 10.5 | 10 | 0 | 17 | 42 | 0 | 10.83 | 1.64 | 1.78 | 19.54 | 0.30 | 1.67 | 0.505 | 0.881 | 0.57 | 0.67 | 2 |
| 12 | 7 | 0 | 16 | 91 | 19 | 7.64 | 3.55 | 4.50 | 31.63 | 1.03 | 2.00 | 2.059 | 0.936 | NL -- Silt/Clay Soi | 1.00 | 0 |
| 13.5 | 10 | 0 | 17 | 9 | 0 | 9.50 | 1.00 | 0.00 | 9.50 | 0.21 | 1.36 | 0.283 | 0.856 | 0.33 | 0.33 | 2.2 |
| 15 | 8 | 0 | 16 | 9 | 0 | 7.79 | 1.00 | 0.00 | 7.79 | 0.19 | 1.29 | 0.244 | 0.906 | 0.27 | 0.33 | 1.8 |
| 16.5 | 8 | 0 | 16 | 39 | 0 | 7.39 | 1.58 | 1.61 | 13.28 | 0.25 | 1.48 | 0.366 | 0.887 | 0.41 | 0.67 | 1 |
| 18 | 10 | 0 | 17 | 39 | 0 | 8.02 | 1.58 | 1.61 | 14.29 | 0.26 | 1.51 | 0.387 | 0.802 | 0.48 | 0.67 | 0.5 |
| 19.5 | 31 | 0 | 18 | 98 | 31 | 21.71 | 3.90 | 4.89 | 89.54 | 453.44 | 2.00 | 906.871 | 0.732 | NL -- Silt/Clay Soi | 1.00 | 0 |

| LPI | 11.3832303 |
|---|---|
| | Moderate |

# Annex C: Driven Pile Capacity

Project: Pasig City Hall Building D
Location: Caruncho Avenue, Brgy. San Nicolas, Pasig City

## Soil Parameters:

| | SP1 := | | | | | SP2 := | | | |
|---|---|---|---|---|---|---|---|---|---|
| Layer thickness (m) | 7 | 12 | 10 | 40 | | 7 | 12 | 10 | 40 |
| Soil unit weight (kN/m3) | 17 | 17 | 18 | 19 | | 17 | 17 | 18 | 19 |
| c' (kPa) or H-B $\sigma$'c (kPa) | 0 | 0 | 5 | 1500 | | 0 | 0 | 5 | 1500 |
| K | 1.3 | 1.3 | 1.3 | 1.3 | | 1.3 | 1.3 | 1.3 | 1.3 |
| $\phi$' or H-B rock quality | 22 | 29 | 22 | 1.75 | | 22 | 29 | 22 | 1.75 |
| H-B rock type | 0 | 0 | 0 | 1 | | 0 | 0 | 0 | 1 |
| max skin friction (kPa) | 15 | 15 | 65 | 175 | | 0 | 0 | 65 | 175 |
| max bearing capacity (kPa) | 100 | 150 | 3000 | 6000 | | 100 | 150 | 3000 | 6000 |
| soil (0) or rock (1) | 0 | 0 | 0 | 1 | | 0 | 0 | 0 | 1 |

Hoek-Brown Parameters (M, S): $HB(SP1) = (2 \quad 0.028)$

Groundwater depth: $z_w = 1$

Water unit weight: $\gamma_w = 9.81$

## Analysis Parameters:

Bearing FS: $FS_b = 2.5$

Bearing FS under EQ: $FS_{bEQ} = 1.88$

Uplift FS: $FS_u = 4$

Influence depth: $IF = 2$

## Pile Parameters:

Minimum length:
Maximum length:
Length increment:

$$PL1 := \begin{pmatrix} 29 \\ 31 \\ 1 \end{pmatrix}$$

Pile diameters/widths: $PD1 := (0.35 \quad 0.4 \quad 0.45 \quad 0.5)^T$ $PW1 := (1 \quad 1 \quad 1 \quad 1)^T$

Pile type: $Ptype = \text{"square"}$

Pile unit weight: $\gamma_p = 24$

Cap embedment: $CE = 0$

## Calculations:

$Q := \phi plot(SP1, 500)$ $q_{b1} := q_b(SP1, PL1, PD1)$ $Q_{all1} := Q_{all}(SP1, PL1, PD1, PW1, FS_b)$

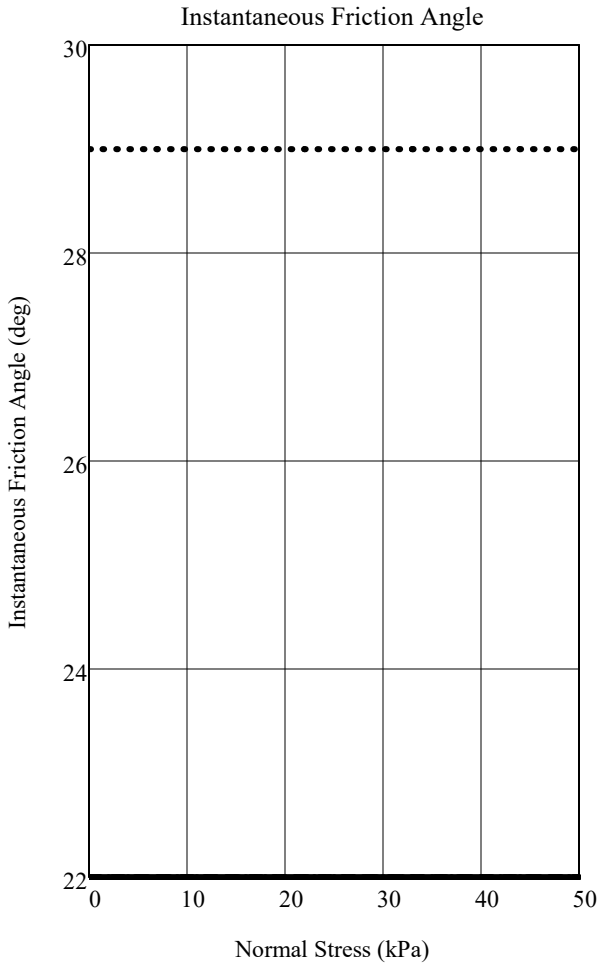
$S := \tau plot(SP1, 500)$ $q_{s1} := q_s(SP1, PL1)$ $Q_{allp1} := Q_p(SP1, PL1, PD1, PW1)$

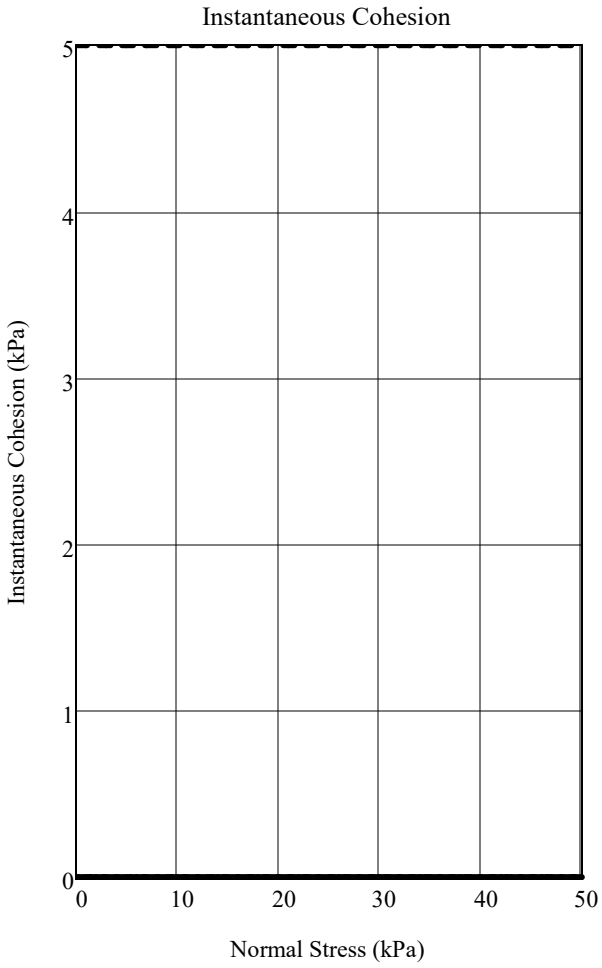
$R := cplot(SP1, 500)$ $q_{b2} := q_b(SP2, PL1, PD1)$ $Q_{all2} := Q_{all}(SP2, PL1, PD1, PW1, FS_{bEQ})$

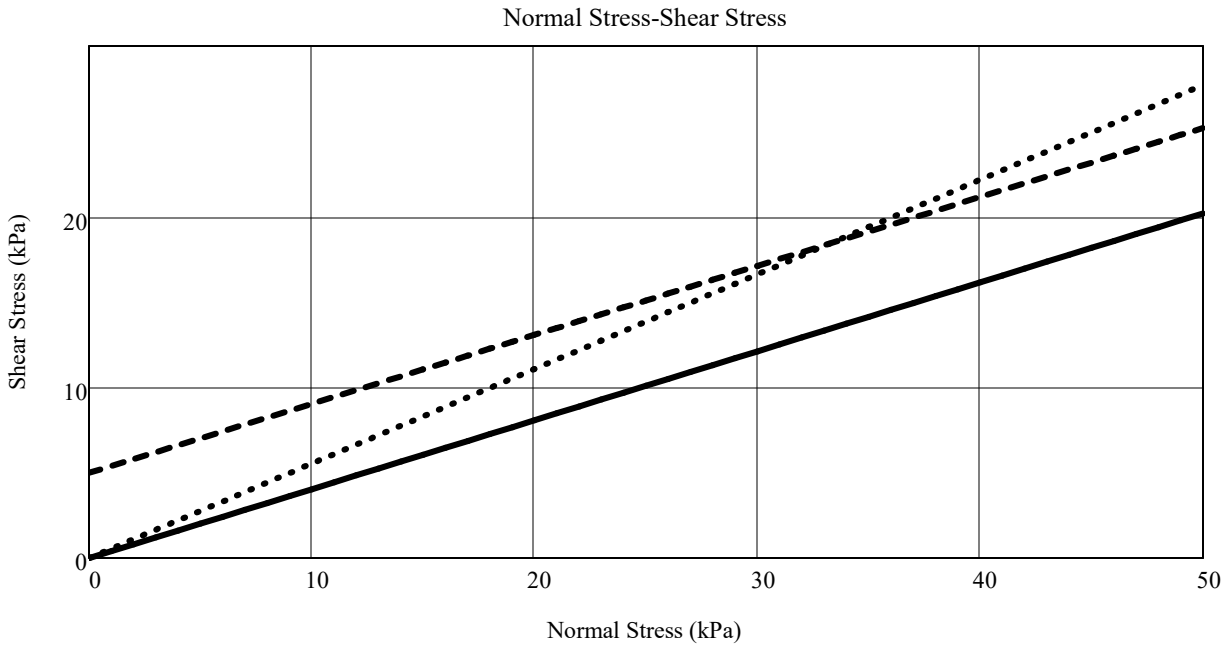
$q_{s2} := q_s(SP2, PL1)$ $Q_{allp2} := Q_p(SP2, PL1, PD1, PW1)$

version updated: 8/31/2018

## Strength Parameter Plots:

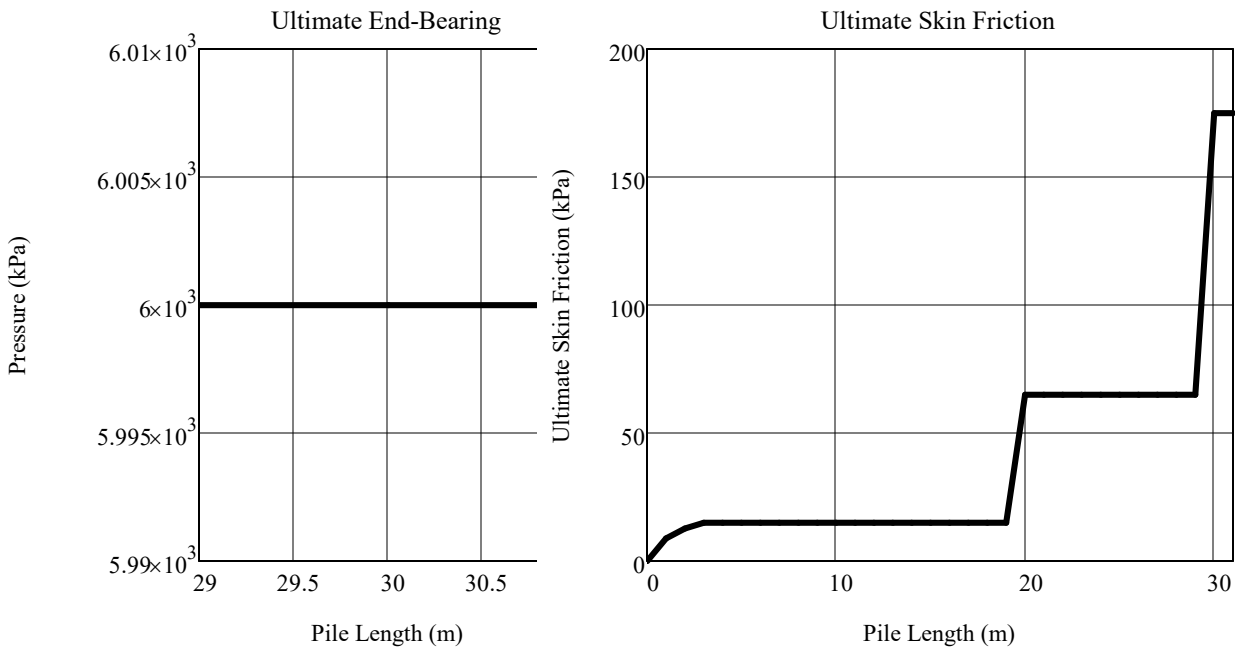


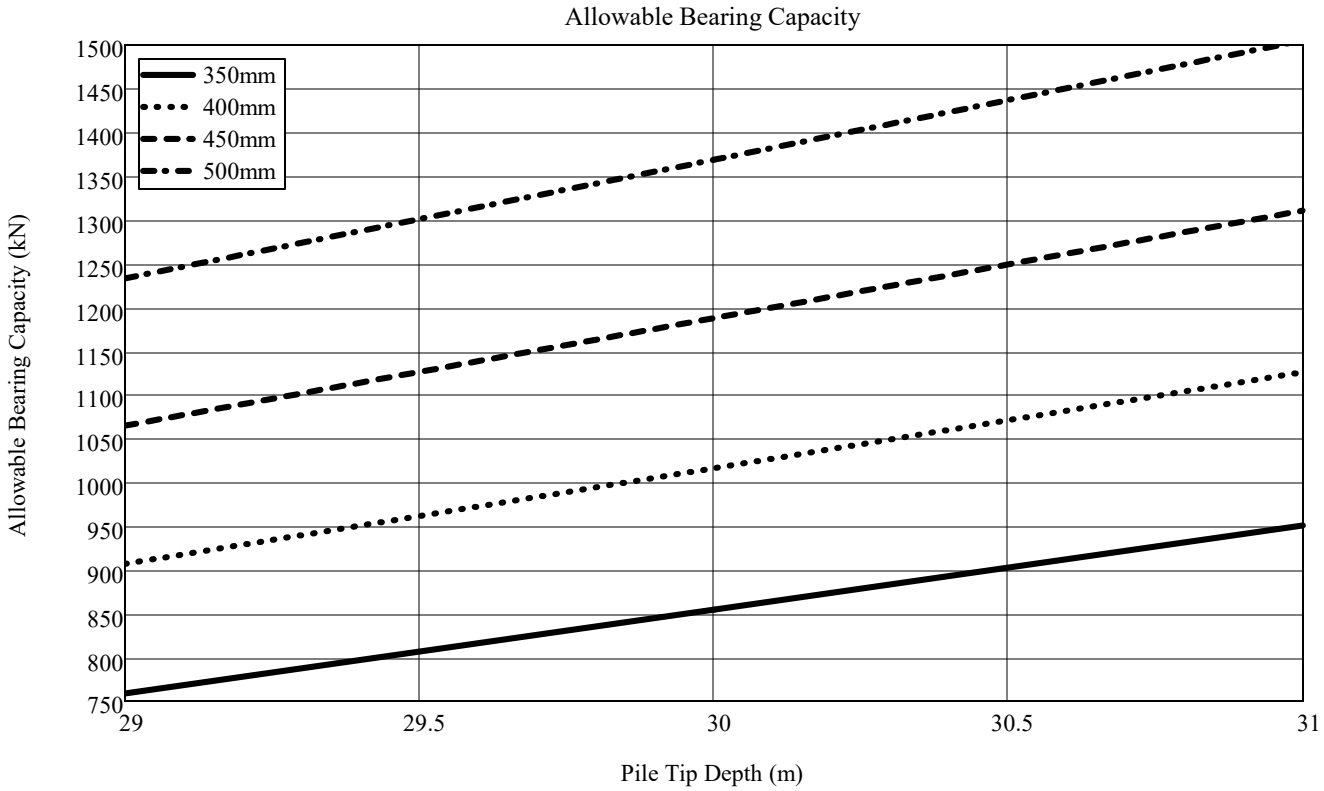



# Gravity Loads (without liquefaction of upper sand layers)

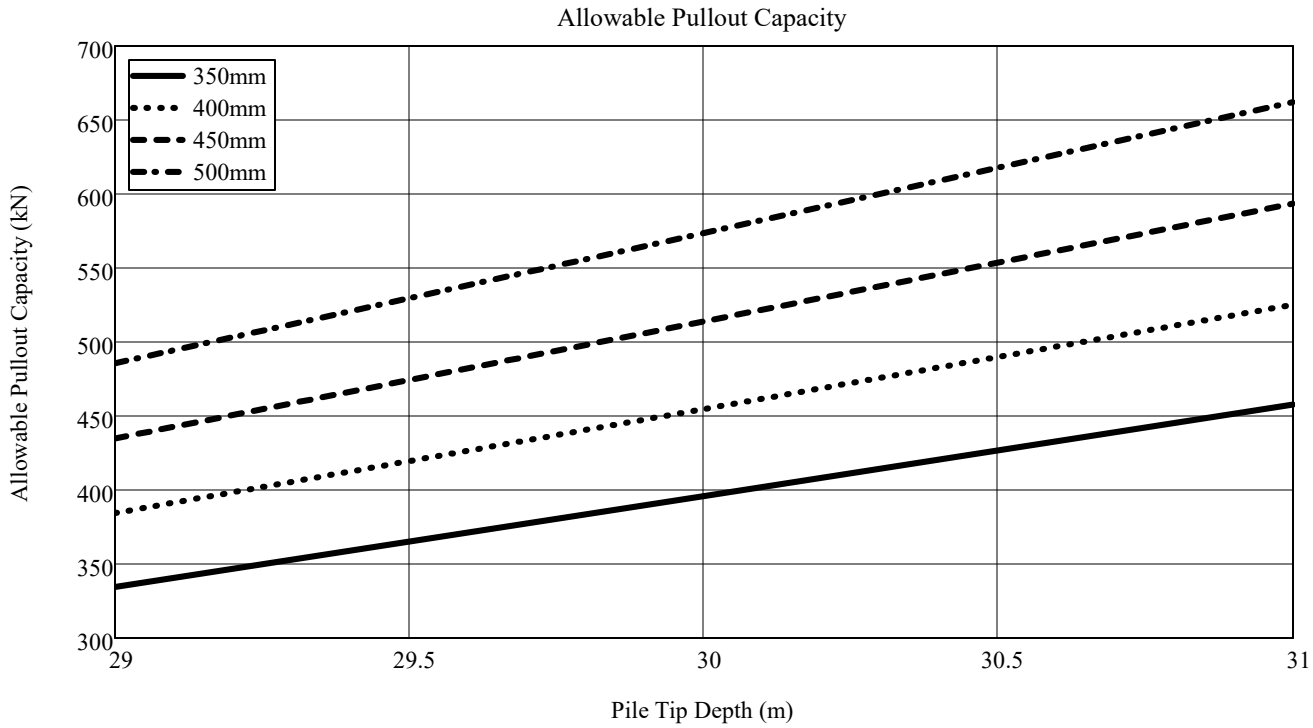
## Ultimate End-Bearing and Skin Friction:




## Allowable Bearing Capacity (Buoyant weight of pile has been deducted):

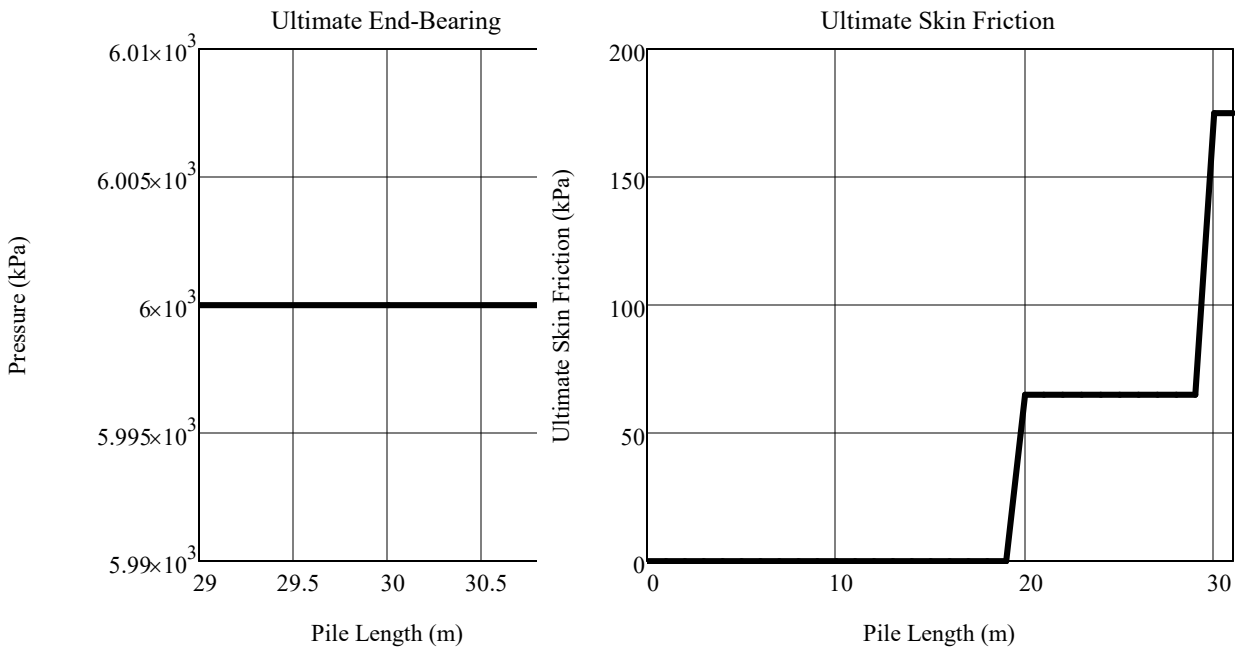


## Allowable Pullout Capacity (Buoyant weight of pile is included):

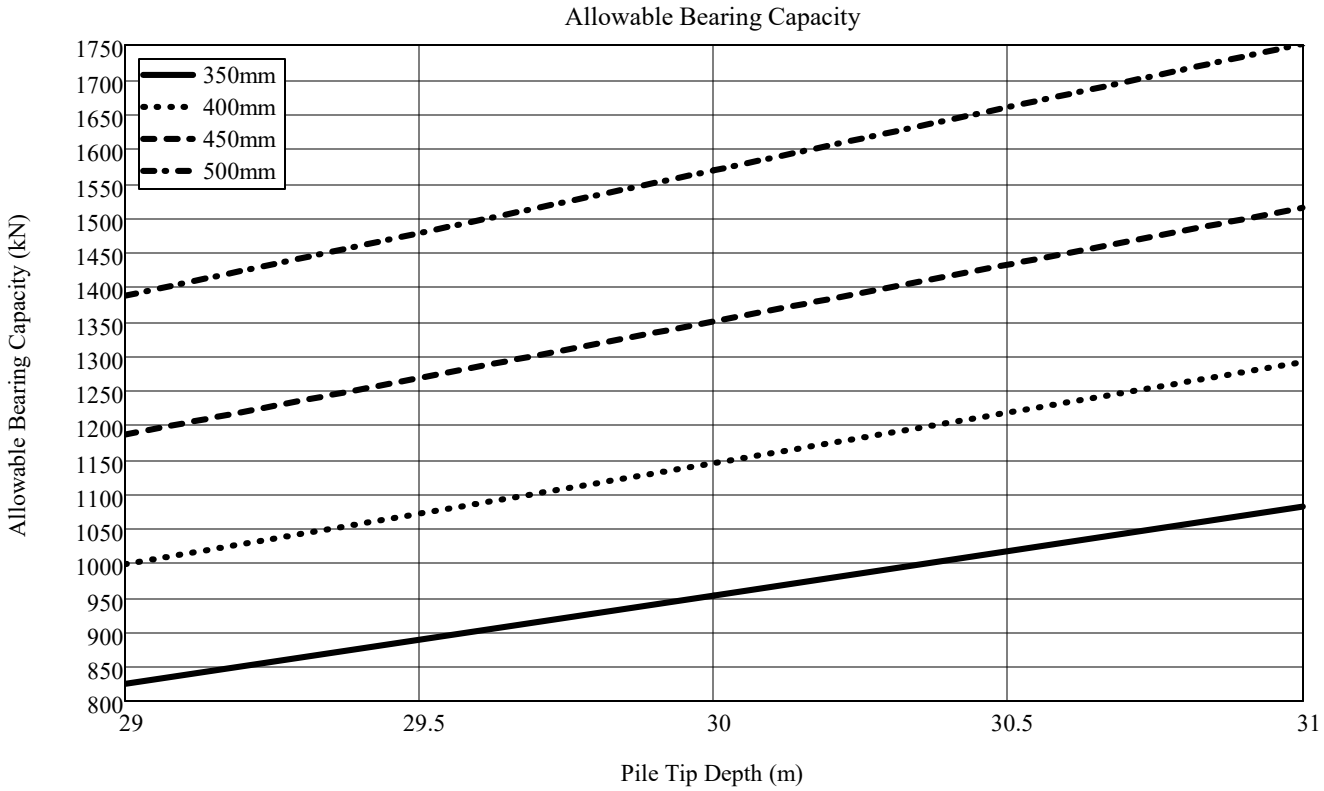


# Transient Loads (with liquefaction of upper sand layers)

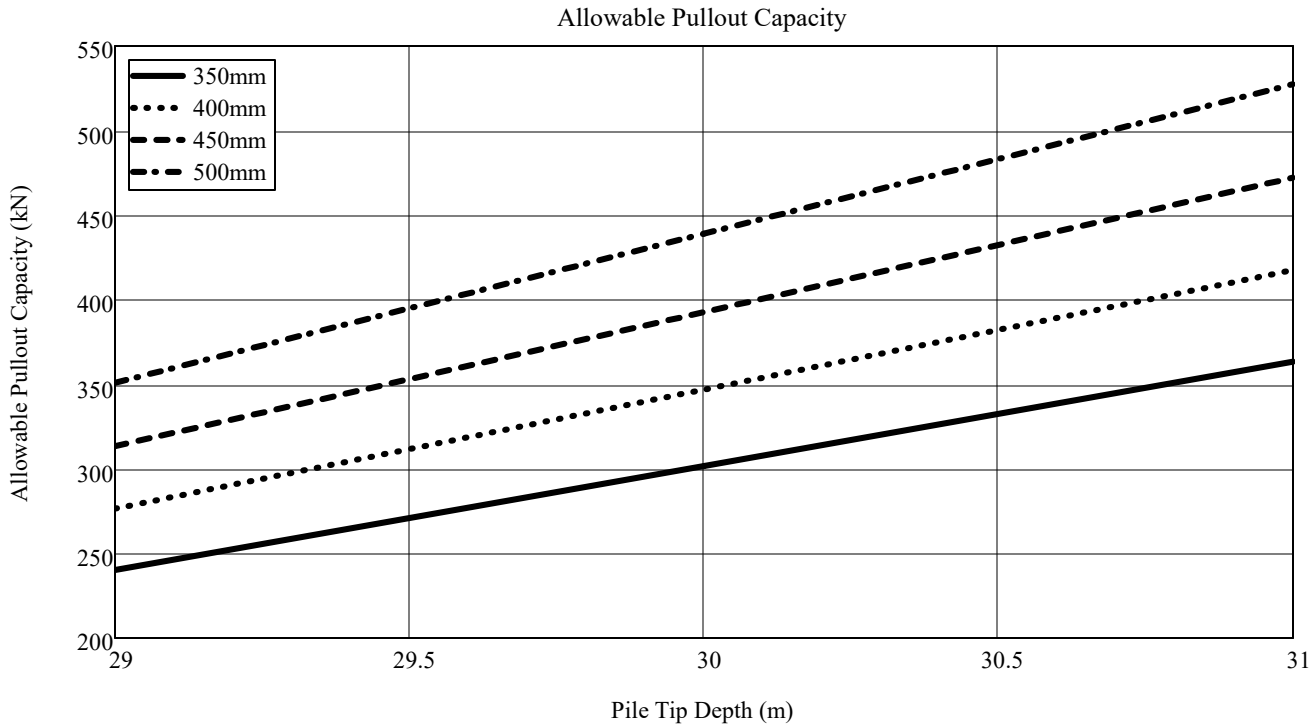
## Ultimate End-Bearing and Skin Friction:



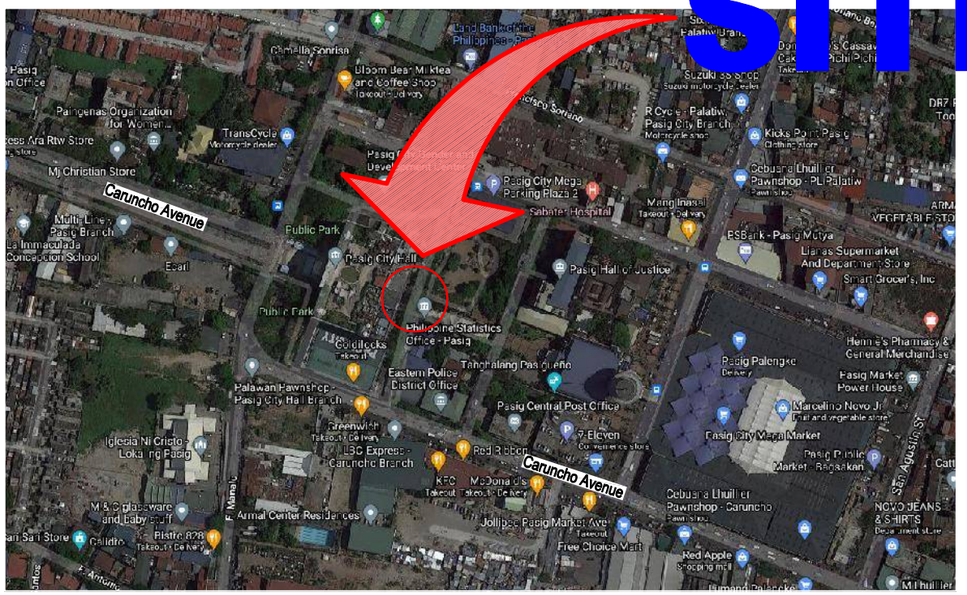

## Allowable Bearing Capacity (Buoyant weight of pile has been deducted):



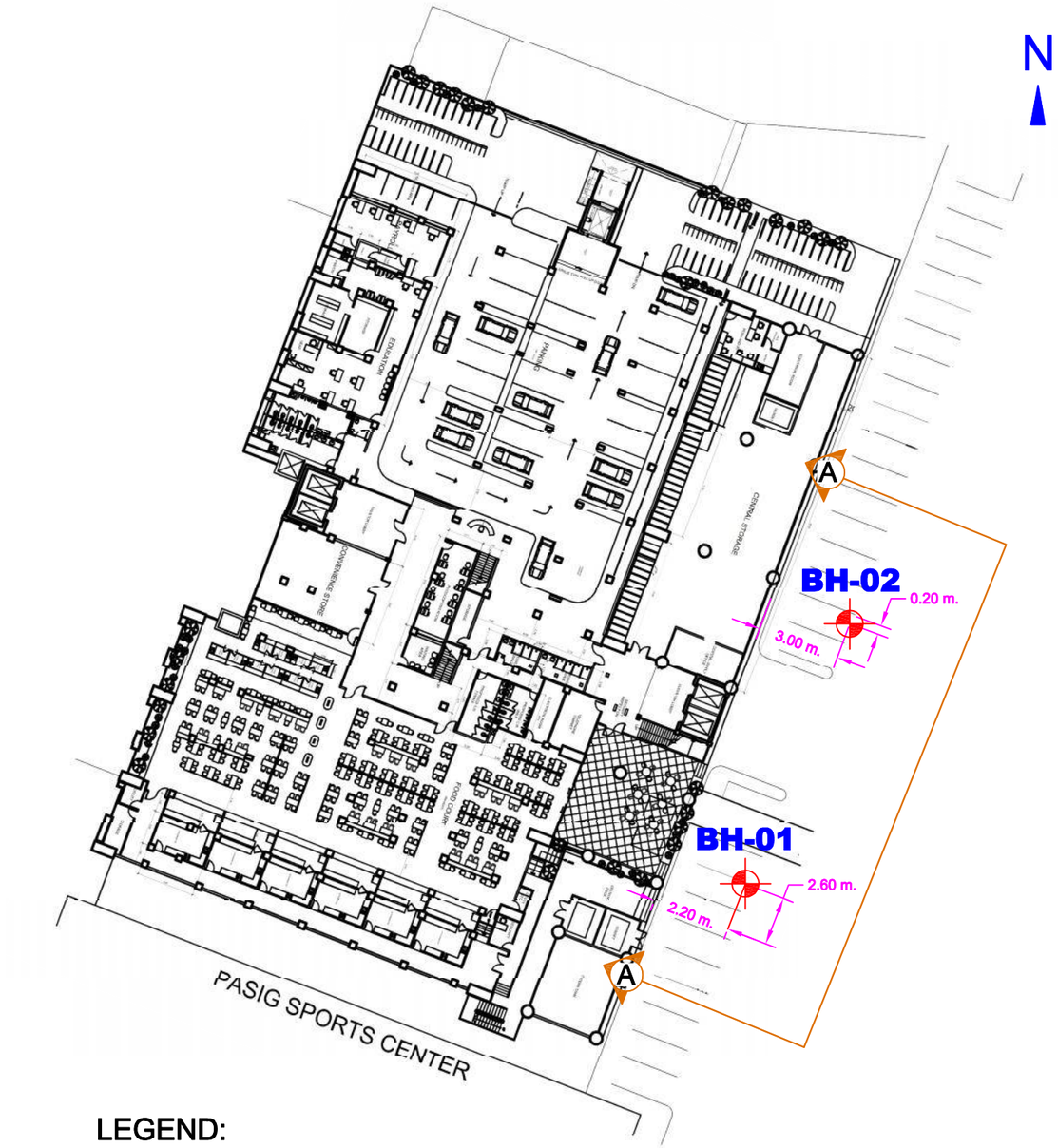
## Allowable Pullout Capacity (Buoyant weight of pile is included):



# FIGURES

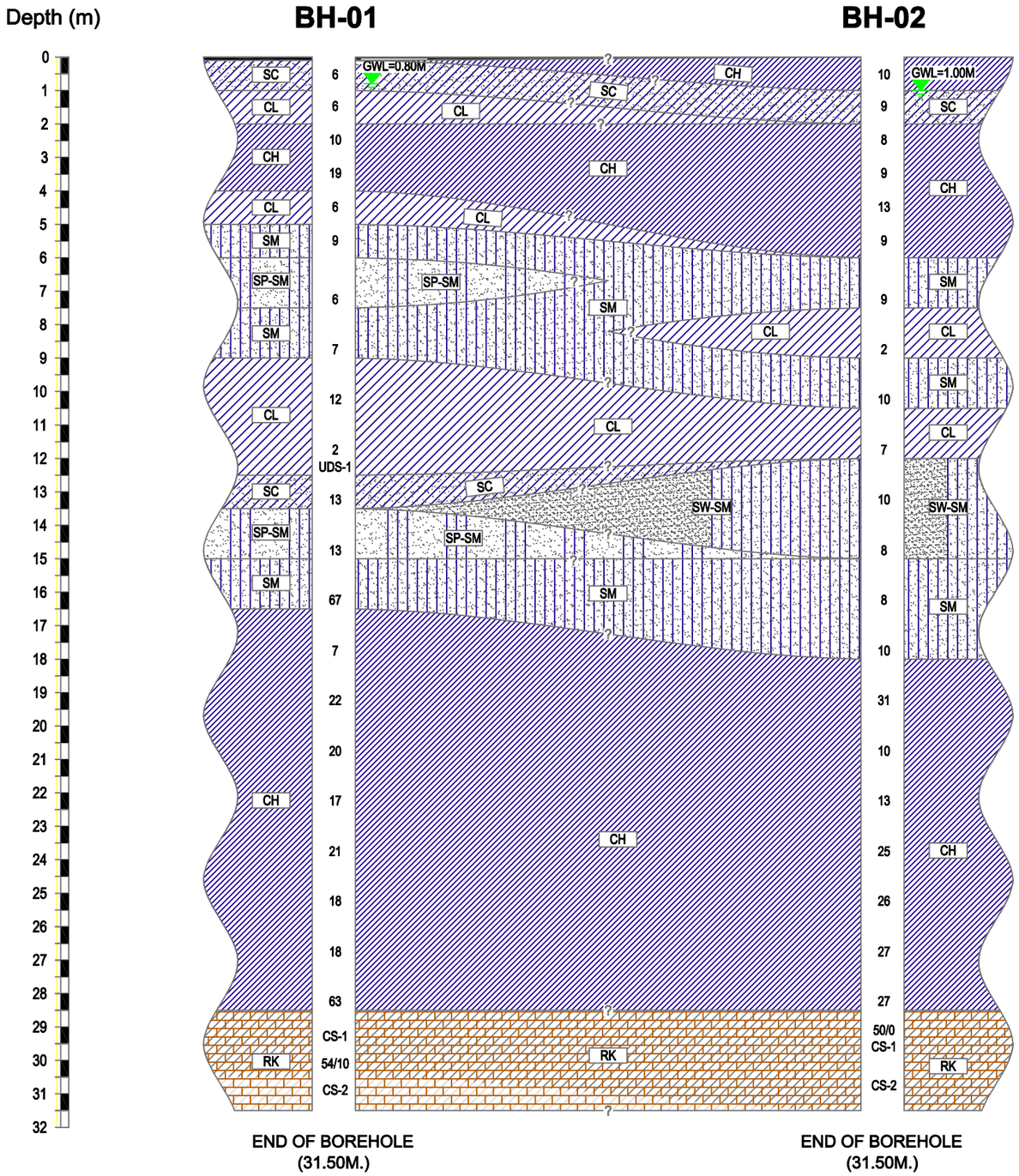



SITE LOCATION MAP




BOREHOLE LOCATION PLAN

| CONTRACTOR: | PROJECT TITLE: | CLIENT: | SHEET CONTENT: | DRAWN BY: | DATE: | FIGURE NO. |
|---|---|---|---|---|---|---|
| **ARS Testing & Inspection, Inc.**<br>LUPIN II BUILDING, FARADAY CORNER<br>P. BINAY STREETS, SAN ISIDRO, MAKATI CITY<br>TEL NOS.: 845-1260 * 845-1367 FAX NO.: 49-7605 | **PASIG CITY HALL BUILDING D (EXTENSION BUILDING)** | **CITY GOVERNMENT OF PASIG** | **SITE LOCATION MAP AND BOREHOLE LOCATION PLAN** | J.D.C. GARCIA | July 9, 2021 | 1 |
| | LOCATION: | ADDRESS: | | NOTED BY: | SCALE: | |
| | Caruncho Avenue, Brgy. San Nicolas, Pasig City | Pasig City Hall, Caruncho Avenue, Brgy. San Nicolas, Pasig City | | ENGR. F.J. ALCARAZ | N T S | |




## USCS CLASSIFICATION & NOTATIONS

| | | |
|---|---|---|
| | | CONCRETE SLAB |
| | RK | SILTSTONE |
| | RK | SANDSTONE |
| | SW-SM | WELL GRADED SAND WITH SILT |
| | SP-SM | POORLY GRADED SAND WITH SILT |
| | SM | SILTY SAND |
| | SC | CLAYEY SAND |
| | CL | SANDY CLAY |
| | CH | SILTY CLAY |
| | GWL | Ground Water Level |
| 16 | | Standard Penetration Test N - value |
| CS-1 | | Core Sample Number |
| UDS-1 | | Undisturbed Sample |

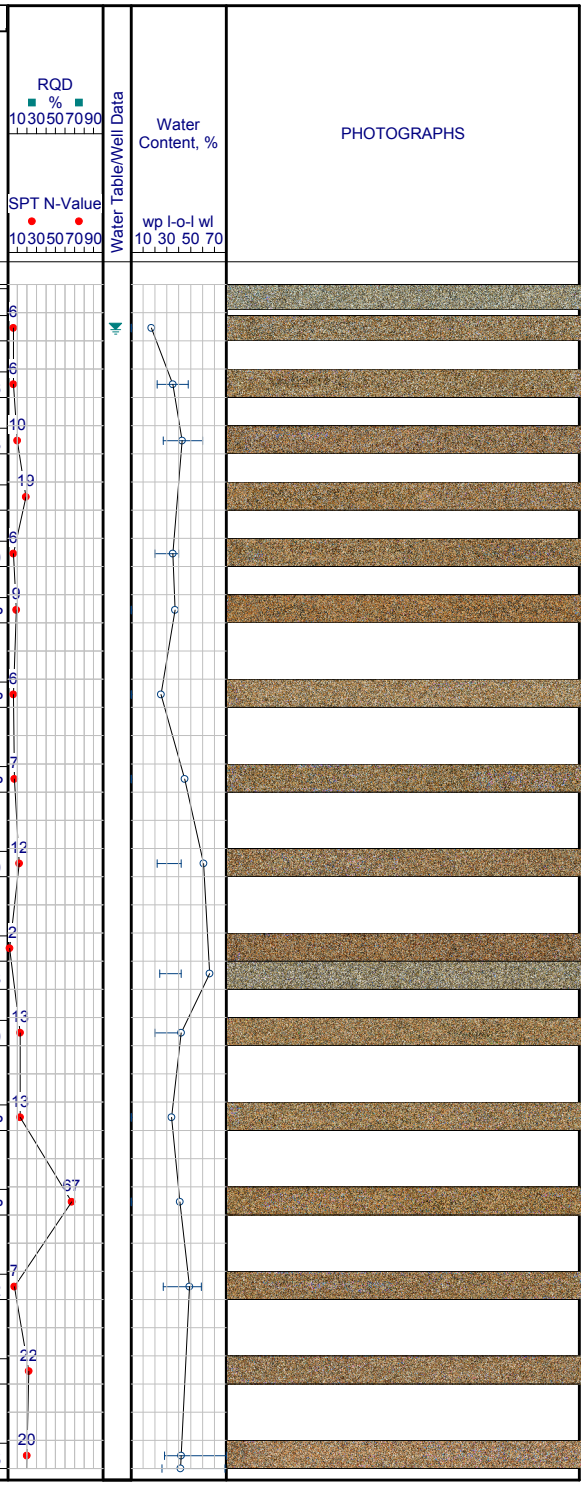
| CONTRACTOR: | PROJECT TITLE: | CLIENT: | SHEET CONTENT: | DRAWN BY: | DATE: | FIGURE NO. |
|---|---|---|---|---|---|---|
| **ARS Testing & Inspection, Inc.**<br>LUPIN II BUILDING, FARADAY CORNER<br>P. BINAY STREETS, SAN ISIDRO, MAKATI CITY<br>TEL NOS.: 845-1260 * 845-1367 FAX NO.: 49-7605 | **PASIG CITY HALL BUILDING D (EXTENSION BUILDING)** | **CITY GOVERNMENT OF PASIG** | **IDEALIZED SUBSOIL PROFILE SECTION 'A-A'** | J.D.C. GARCIA | July 9, 2021 | 2 |
| | LOCATION: | ADDRESS: | | NOTED BY: | SCALE: | |
| | Caruncho Avenue, Brgy. San Nicolas, Pasig City | Pasig City Hall, Caruncho Avenue, Brgy. San Nicolas, Pasig City | | ENGR. F.J. ALCARAZ | N T S | |

# BOREHOLE LOGS

# BOREHOLE LOG

| | | | |
|---|---|---|---|
| Project: PASIG CITY HALL BUILDING D (EXTENSION BUILDING) | | Project No.: 13689-26938-21 | BH NO: 1 |
| Location: Caruncho Avenue, Brgy. San Nicolas, Pasig City | | Site Name: | Final Depth: 31.50 m. |
| Date Started: June 18, 2021 | Date Completed: June 22, 2021 | Surface Elev.: - | Sheet No.: 1 of 2 |
| Type of Sampler Diam./Length: | Water Level Depth: 0.80 m. | Time/Date: 5:00 PM / 06-23-2021 | Rig Type: TOHO |
| Split Spoon: 5 cm. / 51 cm. | Water Level Depth : | Time/Date : | Hole Size: |
| Shelby Tube: | Water Level Depth : | Time/Date : | Depth of Casing: 3.00 m. |
| Core Barrel: 73 mm. / 1.5 m. | Hammer Type: Donut | Hammer Weigth: 64 kg. | Hammer Drop: 76 cm. |

| Depth, m. | Symbol/Log | DESCRIPTION | Elevation, m. | Sample Type/ Number | Blows/30 cm. | Recovery, % | RQD, % | qu, kg/cm2 | SpGr | PI |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Concrete Surface | 0 | | | | | | | |
| 0 | | Concrete slab at 0.00-0.07 m. thick | | | | | | | | |
| 1 | | CLAYEY SAND<br>Brown clayey sand, some fine gravel, loose, medium plasticity, (SC) | -1 | SS-1 | 6 | 67 | | | | - |
| 2 | | SANDY CLAY<br>Gray sandy clay, medium stiff, medium plasticity, (CL) | -2 | SS-2 | 6 | 67 | | | | 26 |
| 3 | | SILTY CLAY<br>Light gray silty clay, stiff, high plasticity, (CH) | -3 | SS-3 | 10 | 89 | | | | 33 |
| 4 | | - very stiff | -4 | SS-4 | 19 | 89 | | | | |
| 5 | | SANDY CLAY<br>Gray sandy clay with sandstone fragments, medium stiff, medium plasticity, (CL) | -5 | SS-5 | 6 | 78 | | | | 20 |
| 6 | | SILTY SAND<br>Gray silty sand, loose, non-plastic, (SM) | -6 | SS-6 | 9 | 78 | | | | NP |
| 7 | | POORLY GRADED SAND WITH SILT<br>Gray poorly graded sand with silt and shell fragments, loose, non-plastic, (SP-SM) | -7 | SS-7 | 6 | 78 | | | | NP |
| 8 | | SILTY SAND<br>Gray silty sand with shell fragments, loose, non-plastic, (SM) | -8 | | | | | | | |
| 9 | | SANDY CLAY<br>Gray sandy clay, with shell fragments, medium dense, medium plasticity, (CL) | -9 | SS-8 | 7 | 67 | | | | NP |
| 10 | | | -10 | SS-9 | 12 | 89 | | | | 20 |
| 11 | | | -11 | | | | | | | |
| 12 | | - very soft | -12 | SS-10 | 2 | 100 | | | | |
| | | | | UDS-1 | PRESSED | 100 | | | | 18 |
| 13 | | CLAYEY SAND<br>Gray clayey sand with shell fragments, medium dense, medium plasticity, (SC) | -13 | SS-11 | 13 | 78 | | | | 20 |
| 14 | | POORLY GRADED SAND WITH SILT<br>Light gray poorly graded sand with silt, sandstone and shell fragments, medium dense, non-plastic, (SP-SM) | -14 | | | | | | | |
| 15 | | SILTY SAND<br>Gray silty sand with sandstone fragments, very dense, non-plastic, (SM) | -15 | SS-12 | 13 | 78 | | | | NP |
| 16 | | | -16 | SS-13 | 67 | 89 | | | | NP |
| 17 | | SILTY CLAY<br>Gray silty clay with sand and shell fragments, medium stiff, high plasticity, (CH) | -17 | | | | | | | |
| 18 | | | -18 | SS-14 | 7 | 100 | | | | 32 |
| 19 | | - very stiff | -19 | SS-15 | 22 | 100 | | | | |
| 20 | | | -20 | | | | | | | |
| 21 | | | -21 | SS-16 | 20 | 89 | | | | 65 |




| | |
|---|---|
| Driller: LBarbo | Drafted by: REBalidio |
| Logged by: AMongas, Jr. | Encoded by: KJSanquilos |
| Inspected by: WCetron | Noted by: FJAlcaraz |

# BOREHOLE LOG

| | | | |
|---|---|---|---|
| Project: PASIG CITY HALL BUILDING D (EXTENSION BUILDING) | | Project No.: 13689-26938-21 | BH NO: 1 |
| Location: Caruncho Avenue, Brgy. San Nicolas, Pasig City | | Site Name: | Final Depth: 31.50 m. |
| Date Started: June 18, 2021 | Date Completed: June 22, 2021 | Surface Elev.: - | Sheet No.: 2 of 2 |
| Type of Sampler Diam./Length: | Water Level Depth: 0.80 m. | Time/Date: 5:00 PM / 06-23-2021 | Rig Type: TOHO |
| Split Spoon: 5 cm. / 51 cm. | Water Level Depth : | Time/Date : | Hole Size: |
| Shelby Tube: | Water Level Depth : | Time/Date : | Depth of Casing: 3.00 m. |
| Core Barrel: 73 mm. / 1.5 m. | Hammer Type: Donut | Hammer Weigth: 64 kg. | Hammer Drop: 76 cm. |

| Depth, m. | Symbol/Log | DESCRIPTION | Elevation, m. | Sample Type/ Number | Blows/30 cm. | Recovery, % | RQD, % | qu, kg/cm2 | SpGr | PI |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | | SILTY CLAY<br>Light gray silty clay, very stiff, high plasticity, (CH) | -22 | SS-17 | 17 | 100 | | | | 53 |
| 23 | | | -23 | | | | | | | |
| 24 | | - gray | -24 | SS-18 | 21 | 100 | | | | 50 |
| 25 | | | -25 | SS-19 | 18 | 100 | | | | |
| 26 | | | -26 | | | | | | | |
| 27 | | - brown | -27 | SS-20 | 18 | 100 | | | | |
| 28 | | - with sand and siltstone fragments, hard | -28 | SS-21 | 63 | 89 | | | | 36 |
| 29 | | SANDSTONE / SILTSTONE<br>Gray sandstone, completely weathered, with fine to coarse gravel, (RK) | -29 | CS-1 | - | 9 | 0 | - | | |
| 30 | | | -30 | SS-22 | 54\10 | 100 | | | | NP |
| 31 | | - brown siltstone, moderately weathered | -31 | CS-2 | - | 100 | 29 | 18.272 | | |
| 32 | | End of Log | -32 | | | | | | | |
| 33 | | | -33 | | | | | | | |
| 34 | | | -34 | | | | | | | |
| 35 | | | -35 | | | | | | | |
| 36 | | | -36 | | | | | | | |
| 37 | | | -37 | | | | | | | |
| 38 | | | -38 | | | | | | | |
| 39 | | | -39 | | | | | | | |
| 40 | | | -40 | | | | | | | |
| 41 | | | -41 | | | | | | | |
| 42 | | | -42 | | | | | | | |

RQD % 10 30 50 70 90

SPT N-Value 10 30 50 70 90

Water Table/Well Data

Water Content, % wp I-o-I wl 10 30 50 70

PHOTOGRAPHS

| | |
|---|---|
| Driller: LBarbo | Drafted by: REBalidio |
| Logged by: AMongas, Jr. | Encoded by: KJSanquilos |
| Inspected by: WCetron | Noted by: FJAlcaraz |

# BOREHOLE LOG

| | | | |
|---|---|---|---|
| Project: PASIG CITY HALL BUILDING D (EXTENSION BUILDING) | | Project No.: 13689-26938-21 | BH NO: 2 |
| Location: Caruncho Avenue, Brgy. San Nicolas, Pasig City | | Site Name: | Final Depth: 31.50 m. |
| Date Started: June 26, 2021 | Date Completed: July 01, 2021 | Surface Elev.: - | Sheet No.: 1 of 2 |
| Type of Sampler Diam./Length: | Water Level Depth: 1.00 m. | Time/Date: 10:30 AM / 07-02-2021 | Rig Type: EDGE #8 |
| Split Spoon: 5 cm. / 51 cm. | Water Level Depth : | Time/Date : | Hole Size: |
| Shelby Tube: | Water Level Depth : | Time/Date : | Depth of Casing: 18.00 m. |
| Core Barrel: 73 mm. / 1.5 m. | Hammer Type: Donut | Hammer Weigth: 64 kg. | Hammer Drop: 76 cm. |

| Depth, m. | Symbol/Log | DESCRIPTION | Elevation, m. | Sample Type/ Number | Blows/30 cm. | Recovery, % | RQD, % | qu, kg/cm2 | SpGr | PI | RQD % / SPT N-Value | Water Table/Well Data | Water Content, % (wp l-o-l wl) | PHOTOGRAPHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ground Surface | 0 | | | | | | | | | | | |
| 0 | | SILTY CLAY<br>Gray silty clay, stiff, medium plasticity, (CH) | | | | | | | | | | | | |
| 1 | | | -1 | SS-1 | 10 | 89 | | | | 30 | 10 | | | |
| | | CLAYEY SAND<br>Gray clayey sand with sandstone fragments, some fine gravel, loose, medium plasticity, (SC) | | | | | | | | | | | | |
| 2 | | | -2 | SS-2 | 9 | 89 | | | | 15 | 9 | | | |
| | | SILTY CLAY<br>Gray silty clay, medium stiff, medium plasticity, (CH) | | | | | | | | | | | | |
| 3 | | | -3 | SS-3 | 8 | 100 | | | | 29 | 8 | | | |
| | | - light gray, stiff, high plasticity | | | | | | | | | | | | |
| 4 | | | -4 | SS-4 | 9 | 100 | | | | 51 | 9 | | | |
| | | - gray | | | | | | | | | | | | |
| 5 | | | -5 | SS-5 | 13 | 100 | | | | 46 | 13 | | | |
| 6 | | | -6 | SS-6 | 9 | 89 | | | | 37 | 9 | | | |
| | | SILTY SAND<br>Gray silty sand, with shell fragments, loose, non-plastic, (SM) | | | | | | | | | | | | |
| 7 | | | -7 | SS-7 | 9 | 78 | | | | NP | 9 | | | |
| | | SANDY CLAY<br>Gray sandy clay, very stiff, medium plasticity, (CL) | | | | | | | | | | | | |
| 8 | | | -8 | SS-8 | 2 | 100 | | | | 20 | 2 | | | |
| 9 | | SILTY SAND<br>Gray silty sand, loose, non-plastic, (SM) | -9 | | | | | | | | | | | |
| 10 | | | -10 | SS-9 | 10 | 89 | | | | NP | 10 | | | |
| | | SANDY CLAY<br>Gray sandy clay, medium stiff, medium plasticity, (CL) | | | | | | | | | | | | |
| 11 | | | -11 | SS-10 | 7 | 78 | | | | 19 | 7 | | | |
| 12 | | WELL GRADED SAND WITH SILT<br>Light gray well-graded sand with silt and shell fragments, loose, non-plastic, (SW-SM) | -12 | | | | | | | | | | | |
| 13 | | | -13 | SS-11 | 10 | 56 | | | | NP | 10 | | | |
| 14 | | | -14 | SS-12 | 8 | 44 | | | | | 8 | | | |
| 15 | | SILTY SAND<br>Dark gray silty sand, with shell and coral fragments, loose, non-plastic, (SM) | -15 | | | | | | | | | | | |
| 16 | | | -16 | SS-13 | 8 | 78 | | | | NP | 8 | | | |
| 17 | | | -17 | | | | | | | | | | | |
| 18 | | SILTY CLAY<br>Gray silty clay, hard, high plasticity, (CH) | -18 | SS-14 | 10 | 44 | | | | | 10 | | | |
| 19 | | | -19 | SS-15 | 31 | 78 | | | | 31 | 31 | | | |
| 20 | | | -20 | | | | | | | | | | | |
| 21 | | - stiff | -21 | SS-16 | 10 | 67 | | | | | 10 | | | |

| | |
|---|---|
| Driller: RCanta | Drafted by: REBalidio |
| Logged by: JALozano | Encoded by: KJSanquilos |
| Inspected by: WCetron | Noted by: FJAlcaraz |

# BOREHOLE LOG

| | | | |
|---|---|---|---|
| Project: PASIG CITY HALL BUILDING D (EXTENSION BUILDING) | | Project No.: 13689-26938-21 | BH NO: 2 |
| Location: Caruncho Avenue, Brgy. San Nicolas, Pasig City | | Site Name: | Final Depth: 31.50 m. |
| Date Started: June 26, 2021 | Date Completed: July 01, 2021 | Surface Elev.: - | Sheet No.: 2 of 2 |
| Type of Sampler Diam./Length: | Water Level Depth: 1.00 m. | Time/Date: 10:30 AM / 07-02-2021 | Rig Type: EDGE #8 |
| Split Spoon: 5 cm. / 51 cm. | Water Level Depth : | Time/Date : | Hole Size: |
| Shelby Tube: | Water Level Depth : | Time/Date : | Depth of Casing: 18.00 m. |
| Core Barrel: 73 mm. / 1.5 m. | Hammer Type: Donut | Hammer Weigth: 64 kg. | Hammer Drop: 76 cm. |

| SUBSURFACE PROFILE | | | | SAMPLE | | | | | | | | | | | PHOTOGRAPHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth, m. | Symbol/Log | DESCRIPTION | Elevation, m. | Sample Type/ Number | Blows/30 cm. | Recovery, % | RQD, % | qu, kg/cm2 | SpGr | PI | RQD % 10 30 50 70 90 / SPT N-Value 10 30 50 70 90 | Water Table/Well Data | Water Content, % wp I-o-I wl 10 30 50 70 | | |
| 22 | | SILTY CLAY<br>Light gray silty clay, with sandstone fragments, stiff, high plasticity, (CH) | -22 | SS-17 | 13 | 100 | | | | 60 | 13 | | | | |
| 23 | | | -23 | | | | | | | | | | | | |
| 24 | | - very stiff | -24 | SS-18 | 25 | 100 | | | | | 25 | | | | |
| 25 | | - gray | -25 | SS-19 | 26 | 100 | | | | 40 | 26 | | | | |
| 26 | | | -26 | | | | | | | | | | | | |
| 27 | | | -27 | SS-20 | 27 | 100 | | | | | 27 | | | | |
| 28 | | - brown | -28 | SS-21 | 27 | 100 | | | | 31 | 27 | | | | |
| 29 | | SANDSTONE<br>Gray sandstone, moderately weathered, (RK) | -29 | SS-22 | 50\0 | 0 | | | | | 100 | | | | |
| | | | | CS-1 | - | 70 | 21 | 29.398 | | | 21 | | | | |
| 30 | | | -30 | | | | | | | | | | | | |
| 31 | | | -31 | CS-2 | - | 65 | 7 | Broken during transport. | | | 7 | | | | |
| | | End of Log | | | | | | | | | | | | | |
| 32 | | | -32 | | | | | | | | | | | | |
| 33 | | | -33 | | | | | | | | | | | | |
| 34 | | | -34 | | | | | | | | | | | | |
| 35 | | | -35 | | | | | | | | | | | | |
| 36 | | | -36 | | | | | | | | | | | | |
| 37 | | | -37 | | | | | | | | | | | | |
| 38 | | | -38 | | | | | | | | | | | | |
| 39 | | | -39 | | | | | | | | | | | | |
| 40 | | | -40 | | | | | | | | | | | | |
| 41 | | | -41 | | | | | | | | | | | | |
| 42 | | | -42 | | | | | | | | | | | | |

| | |
|---|---|
| Driller: RCanta | Drafted by: REBalidio |
| Logged by: JALozano | Encoded by: KJSanquilos |
| Inspected by: WCetron | Noted by: FJAlcaraz |

# SUMMARY OF RECOVERY, RQD AND Qu

ARS

# SUMMARY OF RECOVERIES, RQD AND UNCONFINED COMPRESSIVE STRENGTHS

**BH-1**

| SAMPLE NO. | DEPTH m. | RECOVERY % | RQD % | $q_u$ kg/cm$^2$ |
|---|---|---|---|---|
| CS-1 | 28.50 - 30.00 | 9 | 0 | - |
| CS-2 | 30.10 - 31.50 | 100 | 29 | 18.272 |

**BH-2**

| SAMPLE NO. | DEPTH m. | RECOVERY % | RQD % | $q_u$ kg/cm$^2$ |
|---|---|---|---|---|
| CS-1 | 29.00 - 30.00 | 70 | 21 | 29.398 |
| CS-2 | 30.00 - 31.50 | 65 | 7 | BROKEN |

# SUMMARY OF SOIL TEST RESULTS

ARS

# SUMMARY OF SOIL TEST RESULTS

PROJECT : PASIG CITY HALL BUILDING D (EXTENSION BUILDING), Brgy. San Nicolas, Pasig City

BOREHOLE NO. : 1

| SAMPLE NO. | | | SS-1 | SS-2 | SS-3 | SS-5 | SS-6 | SS-7 |
|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH (m) | | | 0.55 1.00 | 1.55 2.00 | 2.55 3.00 | 4.55 5.00 | 5.55 6.00 | 7.05 7.50 |
| **GRAIN SIZE ANALYSIS** | % PASSING SIEVE 1½ ” | | | | | | | |
| | 1” | | | | | | | |
| | ¾” | | 100 | | | | | |
| | 3/8” | | 90 | | | 100 | | 100 |
| | # 4 | | 73 | | | 99 | | 89 |
| | # 10 | | 57 | 100 | 100 | 98 | | 80 |
| | # 40 | | 38 | 98 | 99 | 97 | 100 | 40 |
| | #200 | | 24 | 96 | 98 | 79 | 27 | 6 |
| **HYDROMETER TEST** | @ 0.075 | | - | - | - | - | - | - |
| | @ 0.005 | | - | - | - | - | - | - |
| | @ 0.001 | | - | - | - | - | - | - |
| **CONSISTENCY** | Liquid Limit, LL (%) | | - | 48 | 60 | 40 | NIL | NIL |
| | Plastic Limit, PL (%) | | - | 22 | 27 | 20 | NIL | NIL |
| | Plasticity Index, PI | | - | 26 | 33 | 20 | NP | NP |
| | Shrinkage Limit, SL, % | | | | | | | |
| Soil Classification (A S T M) | | | SC | CL | CH | CL | SM | SP-SM |
| Specific Gravity, Gs | | | | | | | | |
| Natural Moisture Content, % | | | 17.0 | 35.0 | 43.0 | 35.0 | 37.0 | 25.0 |
| Organic Content, % | | | | | | | | |
| Wet Unit Weight, $\delta$ (g/cm$^3$) | | | | | | | | |
| Dry Unit Weight, $\delta$ (g/cm$^3$) | | | | | | | | |
| Natural Void Ratio, $e_o$ | | | | | | | | |
| Degree of Saturation, Sr (%) | | | | | | | | |
| **CONSOLIDATION TEST** | Preconsolidation Pressure, Pc (kPA) | | | | | | | |
| | Compression Index, Cc | | | | | | | |
| **TRIAXIAL COMPRESSION TEST, (uu)** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ | | | | | | | |
| **DIRECT SHEAR TEST** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ 0º | | | | | | | |
| **UNCONFINED COMPRESSION TEST** | Unconfined Compressive Strength, qu (kg/cm2), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| | Strain, (%), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| **REMARKS:** | | | | | | | | |

ARS

# SUMMARY OF SOIL TEST RESULTS

PROJECT : PASIG CITY HALL BUILDING D (EXTENSION BUILDING), Brgy. San Nicolas, Pasig City
BOREHOLE NO. : 1

| SAMPLE NO. | | | SS-8 | SS-9 | UDS-11 | SS-11 | SS-12 | SS-13 |
|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH (m) | | | 8.55<br>9.00 | 10.05<br>10.50 | 12.00<br>12.45 | 13.05<br>13.50 | 14.55<br>15.00 | 16.05<br>16.50 |
| **GRAIN SIZE ANALYSIS** | % PASSING SIEVE 1½ ” | | | | | | | |
| | 1” | | | | | | | |
| | ¾” | | | | | 100 | 100 | |
| | 3/8” | | | 100 | | 99 | 99 | |
| | # 4 | | 100 | 99 | | 94 | 91 | 100 |
| | # 10 | | 99 | 98 | | 78 | 66 | 99 |
| | # 40 | | 90 | 98 | 100 | 49 | 31 | 95 |
| | #200 | | 38 | 94 | 98 | 36 | 11 | 47 |
| **HYDROMETER TEST** | @ 0.075 | | - | - | - | - | - | - |
| | @ 0.005 | | - | - | - | - | - | - |
| | @ 0.001 | | - | - | - | - | - | - |
| **CONSISTENCY** | Liquid Limit, LL (%) | | NIL | 42 | 42 | 40 | NIL | NIL |
| | Plastic Limit, PL (%) | | NIL | 22 | 24 | 20 | NIL | NIL |
| | Plasticity Index, PI | | NP | 20 | 18 | 20 | NP | NP |
| | Shrinkage Limit, SL, % | | | | | | | |
| Soil Classification (A S T M) | | | SM | CL | CL | SC | SP-SM | SM |
| Specific Gravity, Gs | | | | | | | | |
| Natural Moisture Content, % | | | 45.0 | 61.0 | 66.0 | 42.0 | 34.0 | 41.0 |
| Organic Content, % | | | | | | | | |
| Wet Unit Weight, δ ($g/cm^3$) | | | | | | | | |
| Dry Unit Weight, δ ($g/cm^3$) | | | | | | | | |
| Natural Void Ratio, $e_o$ | | | | | | | | |
| Degree of Saturation, Sr (%) | | | | | | | | |
| **CONSOLIDATION TEST** | Preconsolidation Pressure, Pc (kPA) | | | | | | | |
| | Compression Index, Cc | | | | | | | |
| **TRIAXIAL COMPRESSION TEST, (uu)** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ | | | | | | | |
| **DIRECT SHEAR TEST** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ 0º | | | | | | | |
| **UNCONFINED COMPRESSION TEST** | Unconfined Compressive Strength, qu (kg/cm2), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| | Strain, (%), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| **REMARKS:** | | | | | | | | |

ARS

# SUMMARY OF SOIL TEST RESULTS

PROJECT : PASIG CITY HALL BUILDING D (EXTENSION BUILDING), Brgy. San Nicolas, Pasig City
BOREHOLE NO. : 1

| SAMPLE NO. | | | SS-14 | SS-16 | SS-17 | SS-18 | SS-21 | SS-22 |
|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH (m) | | | 17.55 18.00 | 20.55 21.00 | 22.05 22.50 | 23.55 24.00 | 28.05 28.50 | 30.00 30.10 |
| **GRAIN SIZE ANALYSIS** | % PASSING SIEVE 1½ ” | | | | | | | |
| | 1” | | | | | | | 100 |
| | ¾” | | | | | | 100 | 53 |
| | 3/8” | | 100 | | | | 96 | 39 |
| | # 4 | | 93 | | | | 95 | 36 |
| | # 10 | | 88 | 100 | 100 | 100 | 93 | 34 |
| | # 40 | | 84 | 99 | 99 | 99 | 91 | 25 |
| | #200 | | 77 | 97 | 98 | 95 | 80 | 13 |
| **HYDROMETER TEST** | @ 0.075 | | - | - | - | - | - | - |
| | @ 0.005 | | - | - | - | - | - | - |
| | @ 0.001 | | - | - | - | - | - | - |
| **CONSISTENCY** | Liquid Limit, LL (%) | | 59 | 93 | 79 | 73 | 58 | NIL |
| | Plastic Limit, PL (%) | | 27 | 28 | 26 | 23 | 22 | NIL |
| | Plasticity Index, PI | | 32 | 65 | 53 | 50 | 36 | NP |
| | Shrinkage Limit, SL, % | | | | | | | |
| Soil Classification (A S T M) | | | CH | CH | CH | CH | CH | GM |
| Specific Gravity, Gs | | | | | | | | |
| Natural Moisture Content, % | | | 49.0 | 42.0 | 38.0 | 39.0 | 57.0 | 47.0 |
| Organic Content, % | | | | | | | | |
| Wet Unit Weight, $\delta$ (g/cm$^3$) | | | | | | | | |
| Dry Unit Weight, $\delta$ (g/cm$^3$) | | | | | | | | |
| Natural Void Ratio, $e_o$ | | | | | | | | |
| Degree of Saturation, Sr (%) | | | | | | | | |
| **CONSOLIDATION TEST** | Preconsolidation Pressure, Pc (kPA) | | | | | | | |
| | Compression Index, Cc | | | | | | | |
| **TRIAXIAL COMPRESSION TEST, (uu)** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ | | | | | | | |
| **DIRECT SHEAR TEST** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ 0º | | | | | | | |
| **UNCONFINED COMPRESSION TEST** | Unconfined Compressive Strength, qu (kg/cm2), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| | Strain, (%), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| **REMARKS:** | | | | | | | | |

ARS

# SUMMARY OF SOIL TEST RESULTS

PROJECT : PASIG CITY HALL BUILDING D (EXTENSION BUILDING), Brgy. San Nicolas, Pasig City

BOREHOLE NO. : 2

| SAMPLE NO. | | | SS-1 | SS-2 | SS-3 | SS-4 | SS-5 | SS-6 |
|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH (m) | | | 0.55 1.00 | 1.55 2.00 | 2.55 3.00 | 3.55 4.00 | 4.55 5.00 | 5.55 6.00 |
| **GRAIN SIZE ANALYSIS** | % PASSING SIEVE 1½ ” | | | | | | | |
| | 1” | | | | | | | |
| | ¾” | | | 100 | | | | |
| | 3/8” | | | 78 | | | | |
| | # 4 | | 100 | 70 | | | | |
| | # 10 | | 99 | 63 | 100 | | | |
| | # 40 | | 97 | 49 | 99 | 100 | | 100 |
| | #200 | | 95 | 35 | 98 | 99 | 100 | 97 |
| **HYDROMETER TEST** | @ 0.075 | | - | - | - | - | - | - |
| | @ 0.005 | | - | - | - | - | - | - |
| | @ 0.001 | | - | - | - | - | - | - |
| **CONSISTENCY** | Liquid Limit, LL (%) | | 50 | 36 | 54 | 78 | 71 | 59 |
| | Plastic Limit, PL (%) | | 20 | 21 | 25 | 27 | 25 | 22 |
| | Plasticity Index, PI | | 30 | 15 | 29 | 51 | 46 | 37 |
| | Shrinkage Limit, SL, % | | | | | | | |
| Soil Classification (A S T M) | | | CH | SC | CH | CH | CH | CH |
| Specific Gravity, Gs | | | | | | | | |
| Natural Moisture Content, % | | | 37.0 | 27.0 | 36.0 | 45.0 | 43.0 | 48.0 |
| Organic Content, % | | | | | | | | |
| Wet Unit Weight, δ ($g/cm^3$) | | | | | | | | |
| Dry Unit Weight, δ ($g/cm^3$) | | | | | | | | |
| Natural Void Ratio, $e_o$ | | | | | | | | |
| Degree of Saturation, Sr (%) | | | | | | | | |
| **CONSOLIDATION TEST** | Preconsolidation Pressure, Pc (kPA) | | | | | | | |
| | Compression Index, Cc | | | | | | | |
| **TRIAXIAL COMPRESSION TEST, (uu)** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ | | | | | | | |
| **DIRECT SHEAR TEST** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ 0º | | | | | | | |
| **UNCONFINED COMPRESSION TEST** | Unconfined Compressive Strength, qu (kg/cm2), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| | Strain, (%), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| **REMARKS:** | | | | | | | | |

# SUMMARY OF SOIL TEST RESULTS

PROJECT : PASIG CITY HALL BUILDING D (EXTENSION BUILDING), Brgy. San Nicolas, Pasig City

BOREHOLE NO. : 2

| SAMPLE NO. | | | SS-7 | SS-8 | SS-9 | SS-10 | SS-11 | SS-13 |
|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH (m) | | | 7.05 7.50 | 8.55 9.00 | 10.05 10.50 | 11.55 12.00 | 13.05 13.50 | 16.05 16.50 |
| **GRAIN SIZE ANALYSIS** | % PASSING SIEVE 1½ ” | | | | | | | |
| | 1” | | | | | | | |
| | ¾” | | | | | | 100 | |
| | 3/8” | | 100 | | | | 98 | 100 |
| | # 4 | | 97 | | | 100 | 93 | 97 |
| | # 10 | | 92 | 100 | 100 | 99 | 69 | 94 |
| | # 40 | | 61 | 99 | 99 | 98 | 28 | 87 |
| | #200 | | 15 | 86 | 42 | 91 | 9 | 39 |
| **HYDROMETER TEST** | @ 0.075 | | - | - | - | - | - | - |
| | @ 0.005 | | - | - | - | - | - | - |
| | @ 0.001 | | - | - | - | - | - | - |
| **CONSISTENCY** | Liquid Limit, LL (%) | | NIL | 46 | NIL | 42 | NIL | NIL |
| | Plastic Limit, PL (%) | | NIL | 26 | NIL | 23 | NIL | NIL |
| | Plasticity Index, PI | | NP | 20 | NP | 19 | NP | NP |
| | Shrinkage Limit, SL, % | | | | | | | |
| Soil Classification (A S T M) | | | SM | CL | SM | CL | SW-SM | SM |
| Specific Gravity, Gs | | | | | | | | |
| Natural Moisture Content, % | | | 47.0 | 62.0 | 49.0 | 61.0 | 28.0 | 36.0 |
| Organic Content, % | | | | | | | | |
| Wet Unit Weight, δ ($g/cm^3$) | | | | | | | | |
| Dry Unit Weight, δ ($g/cm^3$) | | | | | | | | |
| Natural Void Ratio, $e_o$ | | | | | | | | |
| Degree of Saturation, Sr (%) | | | | | | | | |
| **CONSOLIDATION TEST** | Preconsolidation Pressure, Pc (kPA) | | | | | | | |
| | Compression Index, Cc | | | | | | | |
| **TRIAXIAL COMPRESSION TEST, (uu)** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ | | | | | | | |
| **DIRECT SHEAR TEST** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ 0º | | | | | | | |
| **UNCONFINED COMPRESSION TEST** | Unconfined Compressive Strength, qu (kg/cm2), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| | Strain, (%), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| **REMARKS:** | | | | | | | | |

ARS

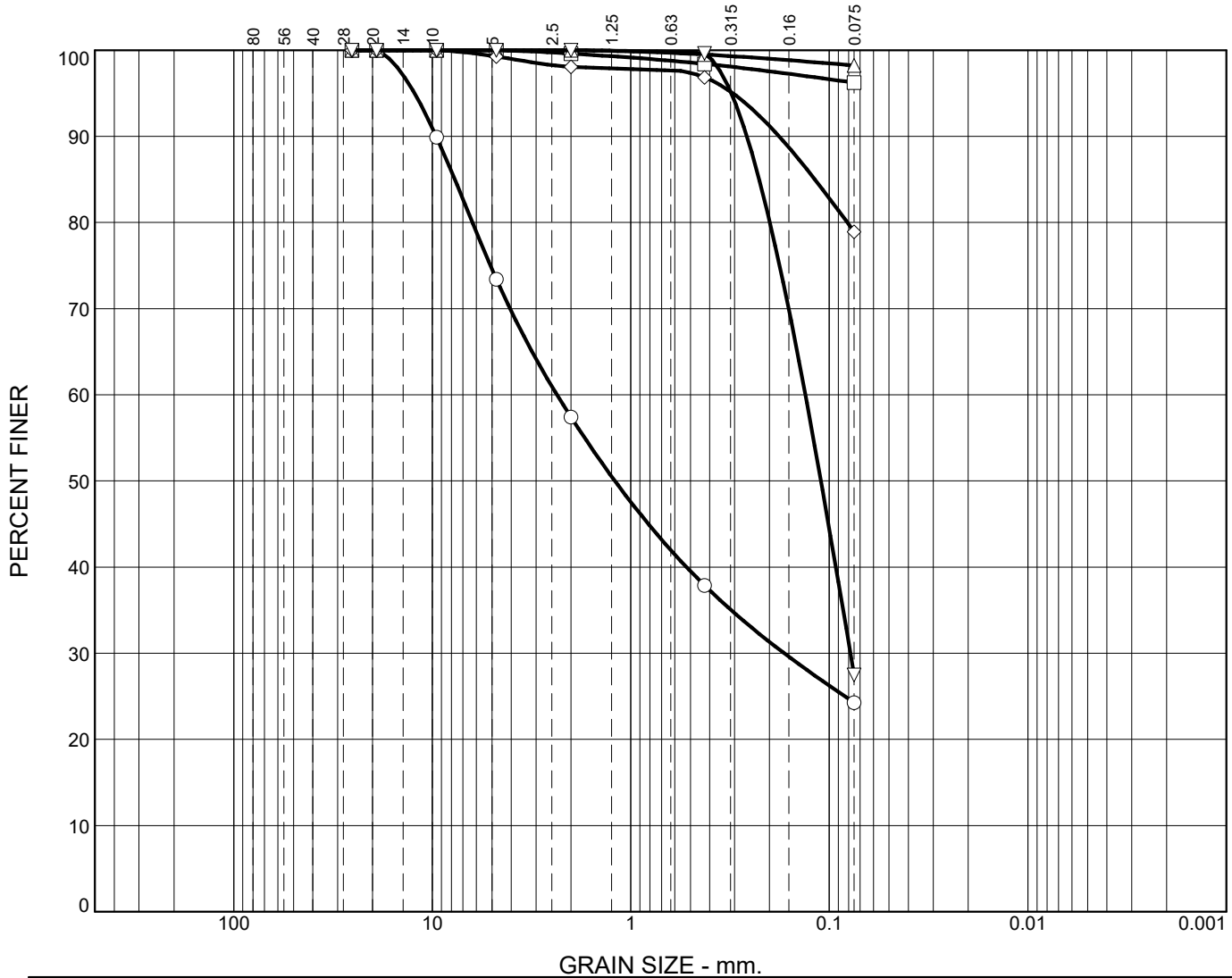
# SUMMARY OF SOIL TEST RESULTS

PROJECT : PASIG CITY HALL BUILDING D (EXTENSION BUILDING), Brgy. San Nicolas, Pasig City
BOREHOLE NO. : 2

| SAMPLE NO. | | | SS-15 | SS-17 | SS-19 | SS-21 | | |
|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH (m) | | | 19.05<br>19.50 | 22.05<br>22.50 | 25.05<br>25.50 | 28.05<br>28.50 | | |
| **GRAIN SIZE ANALYSIS** | % PASSING SIEVE 1½ ” | | | | | | | |
| | 1” | | | | | | | |
| | ¾” | | | | | | | |
| | 3/8” | | | | | | | |
| | # 4 | | | 100 | | | | |
| | # 10 | | 100 | 99 | 100 | | | |
| | # 40 | | 99 | 99 | 99 | 100 | | |
| | #200 | | 98 | 95 | 97 | 99 | | |
| **HYDROMETER TEST** | @ 0.075 | | - | - | - | - | | |
| | @ 0.005 | | - | - | - | - | | |
| | @ 0.001 | | - | - | - | - | | |
| **CONSISTENCY** | Liquid Limit, LL (%) | | 55 | 96 | 66 | 61 | | |
| | Plastic Limit, PL (%) | | 24 | 36 | 26 | 30 | | |
| | Plasticity Index, PI | | 31 | 60 | 40 | 31 | | |
| | Shrinkage Limit, SL, % | | | | | | | |
| Soil Classification (A S T M) | | | CH | CH | CH | CH | | |
| Specific Gravity, Gs | | | | | | | | |
| Natural Moisture Content, % | | | 42.0 | 38.0 | 38.0 | 46.0 | | |
| Organic Content, % | | | | | | | | |
| Wet Unit Weight, δ ($g/cm^3$) | | | | | | | | |
| Dry Unit Weight, δ ($g/cm^3$) | | | | | | | | |
| Natural Void Ratio, $e_o$ | | | | | | | | |
| Degree of Saturation, Sr (%) | | | | | | | | |
| **CONSOLIDATION TEST** | Preconsolidation Pressure, Pc (kPA) | | | | | | | |
| | Compression Index, Cc | | | | | | | |
| **TRIAXIAL COMPRESSION TEST, (uu)** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ | | | | | | | |
| **DIRECT SHEAR TEST** | Cohesion, c (kPA) | | | | | | | |
| | Friction Angle, ∅ 0º | | | | | | | |
| **UNCONFINED COMPRESSION TEST** | Unconfined Compressive Strength, qu (kg/cm2), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| | Strain, (%), Ave. | 1 | | | | | | |
| | | 2 | | | | | | |
| **REMARKS:** | | | | | | | | |

# WORKSHEETS OF LABORATORY TEST RESULTS

# Particle Size Distribution Report




| | % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|---|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| ○ | 0 | 0 | 27 | 16 | 19 | 14 | 24 | |
| □ | 0 | 0 | 0 | 0 | 2 | 2 | 96 | |
| △ | 0 | 0 | 0 | 0 | 1 | 1 | 98 | |
| ◇ | 0 | 0 | 1 | 1 | 1 | 18 | 79 | |
| ▽ | 0 | 0 | 0 | 0 | 0 | 73 | 27 | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (m.) | Material Description | USCS |
|---|---|---|---|---|---|
| ○ | BH-1 | SS-1 | 0.55-1.00 | Brown clayey sand | SC |
| □ | BH-1 | SS-2 | 1.55-2.00 | Gray lean clay | CL |
| △ | BH-1 | SS-3 | 2.55-3.00 | Light gray fat clay | CH |
| ◇ | BH-1 | SS-5 | 4.55-5.00 | Gray lean clay with sand | CL |
| ▽ | BH-1 | SS-6 | 5.55-6.00 | Gray silty sand | SM |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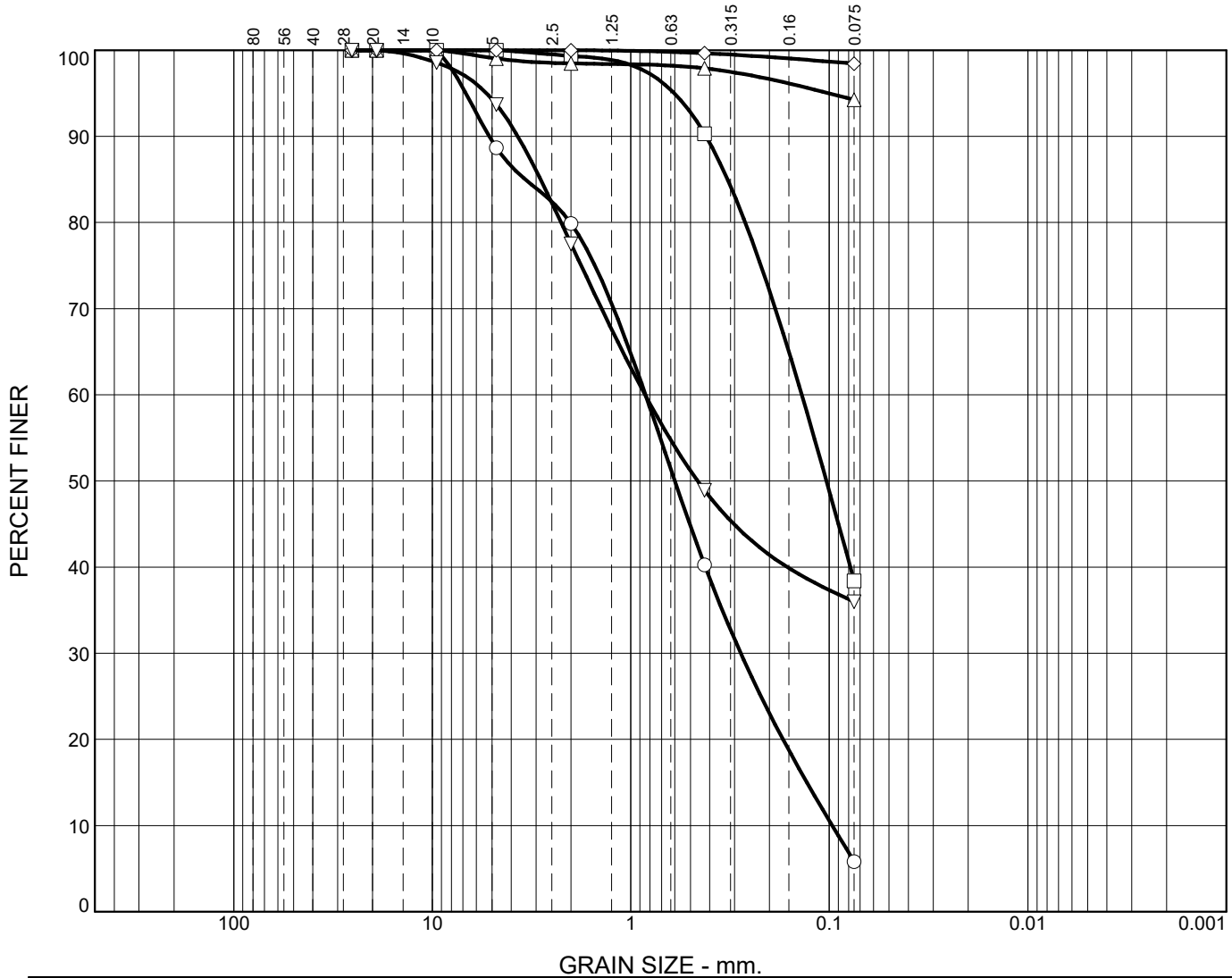
SAN ISIDRO, MAKATI CITY


**Client:** CITY GOVERNMENT OF PASIG

**Project:** PASIG CITY HALL BUILDING D (EXTENSION BUILDING)
Brgy. San Nicolas, Pasig City

**Project No.:** 13689-26938-21 **Figure**

# Particle Size Distribution Report




| | % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|---|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| ○ | 0 | 0 | 11 | 9 | 40 | 34 | 6 | |
| □ | 0 | 0 | 0 | 1 | 9 | 52 | 38 | |
| △ | 0 | 0 | 1 | 1 | 0 | 4 | 94 | |
| ◇ | 0 | 0 | 0 | 0 | 0 | 2 | 98 | |
| ▽ | 0 | 0 | 6 | 16 | 29 | 13 | 36 | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (m.) | Material Description | USCS |
|---|---|---|---|---|---|
| ○ | BH-1 | SS-7 | 7.05-7.50 | Gray poorly graded sand with silt | SP-SM |
| □ | BH-1 | SS-8 | 8.55-9.00 | Gray silty sand | SM |
| △ | BH-1 | SS-9 | 10.05-10.50 | Gray lean clay | CL |
| ◇ | BH-1 | UDS-1 | 12.00-12.45 | Gray lean clay | CL |
| ▽ | BH-1 | SS-11 | 13.05-13.50 | Gray clayey sand | SC |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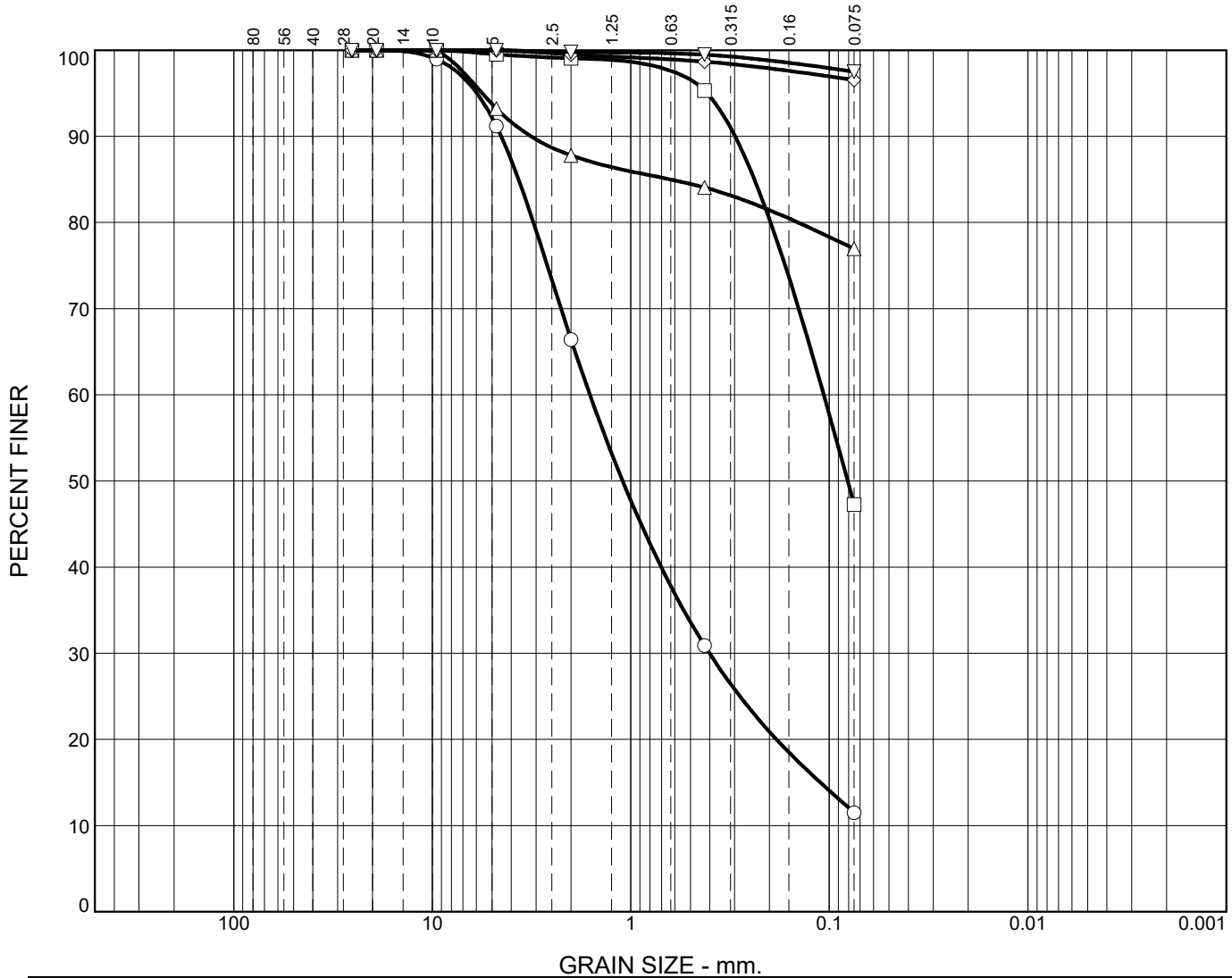
Brgy. San Nicolas, Pasig City

**Project No.:** 13689-26938-21 **Figure**

# Particle Size Distribution Report




| | % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|---|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| ○ | 0 | 0 | 9 | 25 | 35 | 20 | 11 | |
| □ | 0 | 0 | 0 | 1 | 4 | 48 | 47 | |
| △ | 0 | 0 | 7 | 5 | 4 | 7 | 77 | |
| ◇ | 0 | 0 | 0 | 0 | 1 | 2 | 97 | |
| ▽ | 0 | 0 | 0 | 0 | 1 | 1 | 98 | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (m.) | Material Description | USCS |
|---|---|---|---|---|---|
| ○ | BH-1 | SS-12 | 14.55-15.00 | Light gray poorly graded sand with silt | SP-SM |
| □ | BH-1 | SS-13 | 16.05-16.50 | Gray silty sand | SM |
| △ | BH-1 | SS-14 | 17.55-18.00 | Gray fat clay with sand | CH |
| ◇ | BH-1 | SS-16 | 20.55-21.00 | Gray fat clay | CH |
| ▽ | BH-1 | SS-17 | 22.05-22.50 | Light gray fat clay | CH |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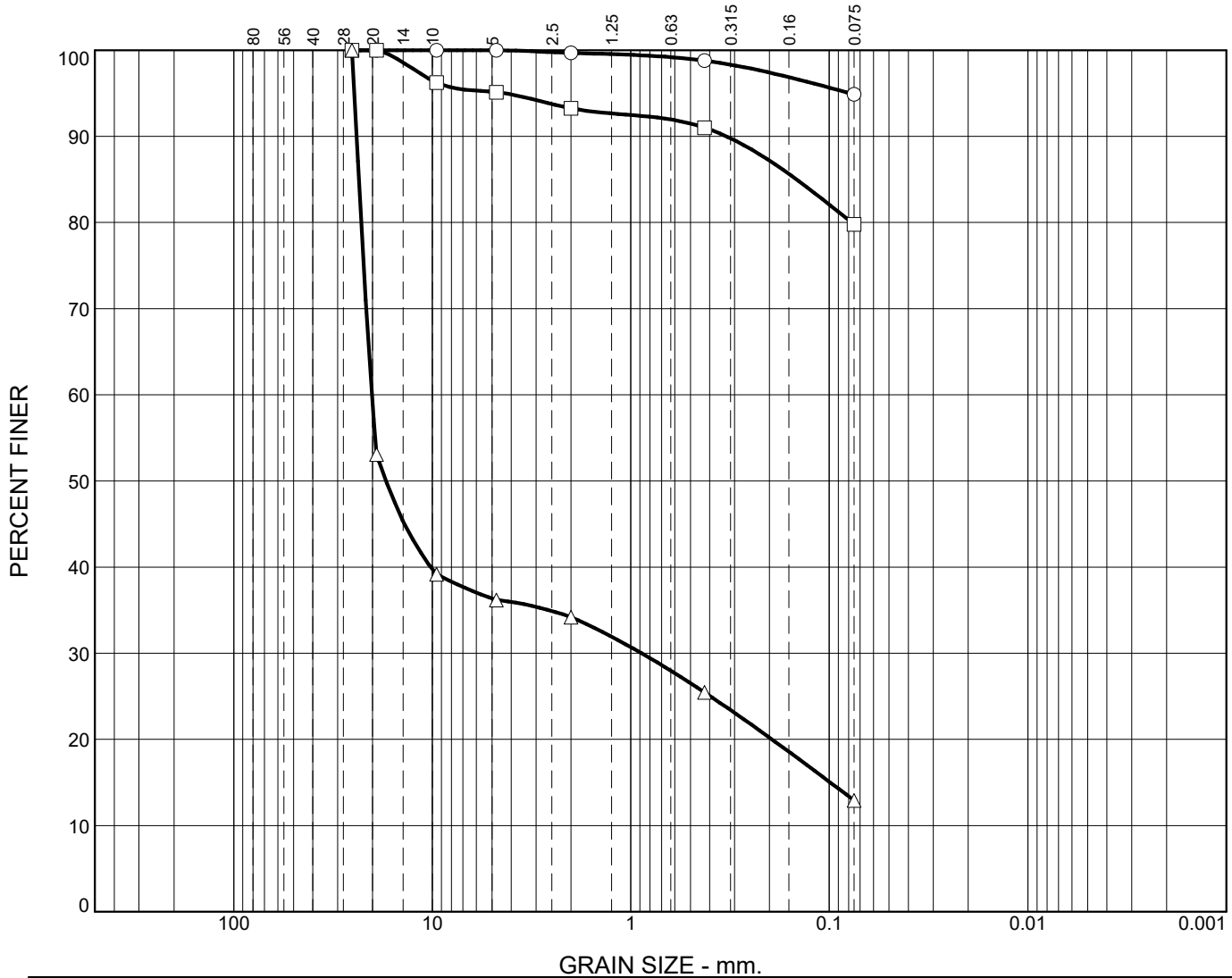
**Project No.:** 13689-26938-21 **Figure**

# Particle Size Distribution Report




| | % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|---|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| ○ | 0 | 0 | 0 | 0 | 1 | 4 | 95 | |
| □ | 0 | 0 | 5 | 2 | 2 | 11 | 80 | |
| △ | 0 | 47 | 17 | 2 | 9 | 12 | 13 | |
| | | | | | | | | |
| | | | | | | | | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (m.) | Material Description | USCS |
|---|---|---|---|---|---|
| ○ | BH-1 | SS-18 | 23.55-24.00 | Gray fat clay | CH |
| □ | BH-1 | SS-21 | 28.05-28.50 | Brown fat clay with sand | CH |
| △ | BH-1 | SS-22 | 30.00-30.10 | Gray silty gravel with sand | GM |
| | | | | | |
| | | | | | |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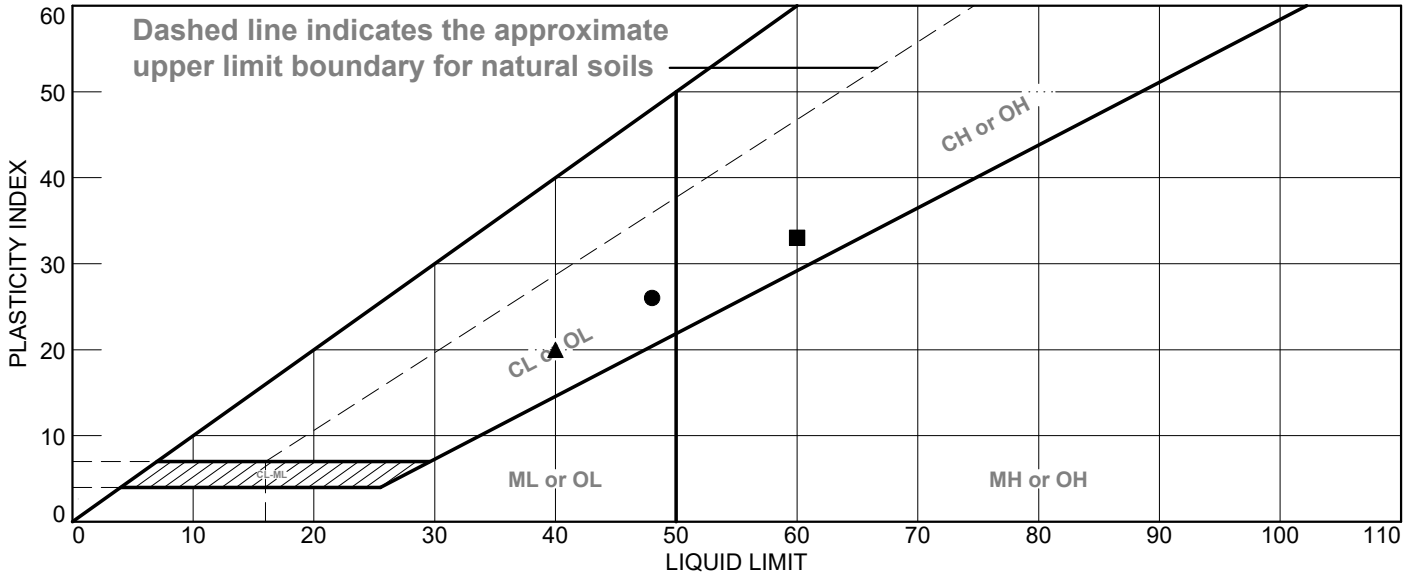
Brgy. San Nicolas, Pasig City

**Project No.:** 13689-26938-21 **Figure**

# LIQUID AND PLASTIC LIMITS TEST REPORT





| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Gray lean clay | 48 | 22 | 26 | 98 | 96 | CL |
| ■ | Light gray fat clay | 60 | 27 | 33 | 99 | 98 | CH |
| ▲ | Gray lean clay with sand | 40 | 20 | 20 | 97 | 79 | CL |
| ◆ | Gray silty sand | NV | NP | NP | 100 | 27 | SM |
| ▼ | Gray poorly graded sand with silt | NV | NP | NP | 40 | 6 | SP-SM |

**Project No.** 26938-21 **Client:** CITY GOVERNMENT OF PASIG

**Project:** PASIG CITY HALL BUILDING D (EXTENSION BUILDING)

Brgy. San Nicolas, Pasig City

● **Source of Sample:** BH-1 **Depth:** 1.55-2.00 **Sample Number:** SS-2

■ **Source of Sample:** BH-1 **Depth:** 2.55-3.00 **Sample Number:** SS-3

▲ **Source of Sample:** BH-1 **Depth:** 4.55-5.00 **Sample Number:** SS-5

◆ **Source of Sample:** BH-1 **Depth:** 5.55-6.00 **Sample Number:** SS-6

▼ **Source of Sample:** BH-1 **Depth:** 7.05-7.50 **Sample Number:** SS-7

**Remarks:**

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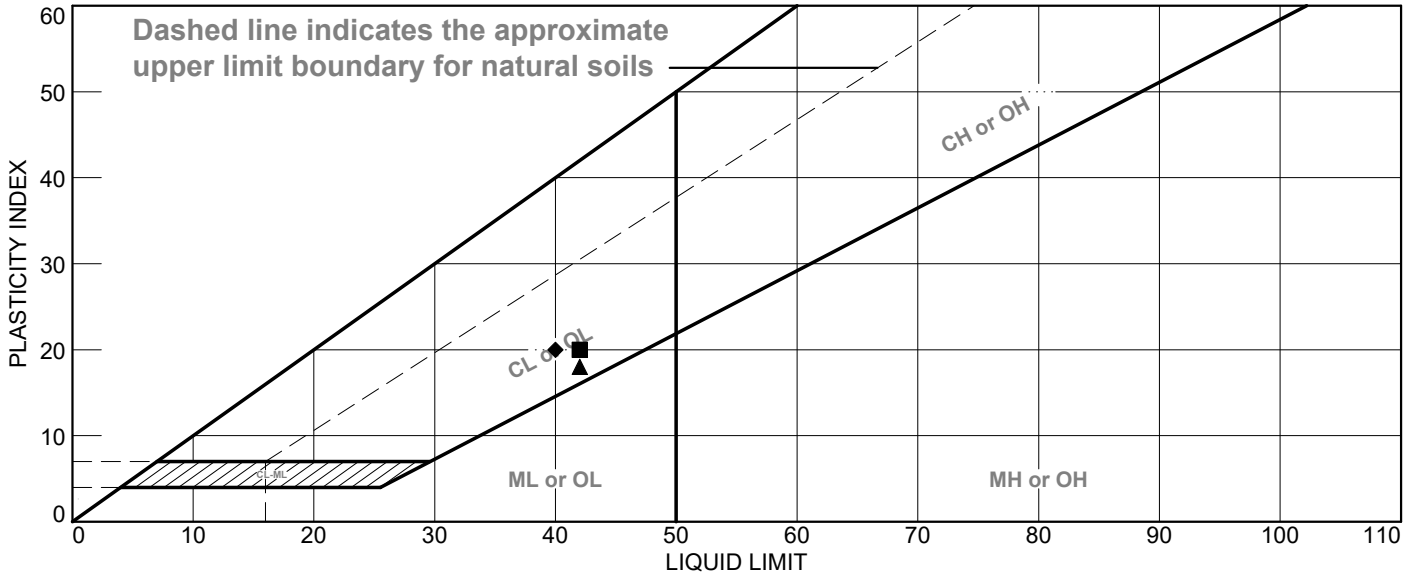
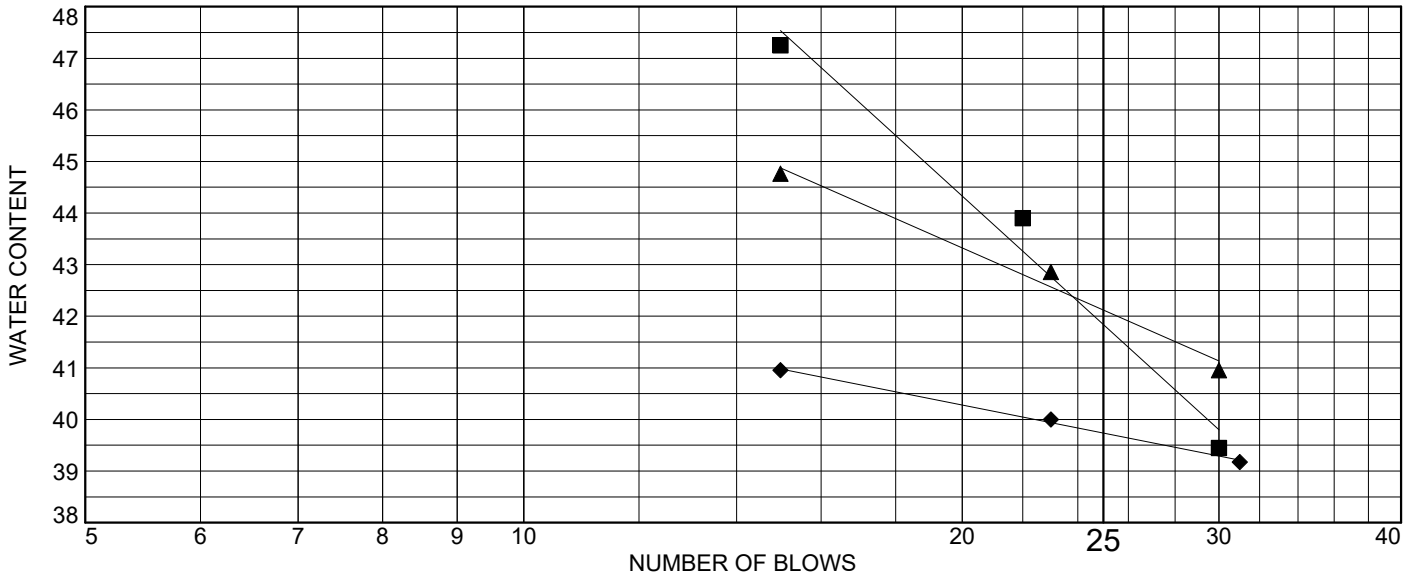
SAN ISIDRO, MAKATI CITY

**Figure**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Gray silty sand | NV | NP | NP | 90 | 38 | SM |
| ■ | Gray lean clay | 42 | 22 | 20 | 98 | 94 | CL |
| ▲ | Gray lean clay | 42 | 24 | 18 | 100 | 98 | CL |
| ◆ | Gray clayey sand | 40 | 20 | 20 | 49 | 36 | SC |
| ▼ | Light gray poorly graded sand with silt | NV | NP | NP | 31 | 11 | SP-SM |

**Project No.** 26938-21 **Client:** CITY GOVERNMENT OF PASIG

**Project:** PASIG CITY HALL BUILDING D (EXTENSION BUILDING)

Brgy. San Nicolas, Pasig City

● **Source of Sample:** BH-1 **Depth:** 8.55-9.00 **Sample Number:** SS-8

■ **Source of Sample:** BH-1 **Depth:** 10.05-10.50 **Sample Number:** SS-9

▲ **Source:** BH-1 **Depth:** 12.00-12.45 **Sample No.:** UDS-1

◆ **Source:** BH-1 **Depth:** 13.05-13.50 **Sample No.:** SS-11

▼ **Source:** BH-1 **Depth:** 14.55-15.00 **Sample No.:** SS-12

**Remarks:**


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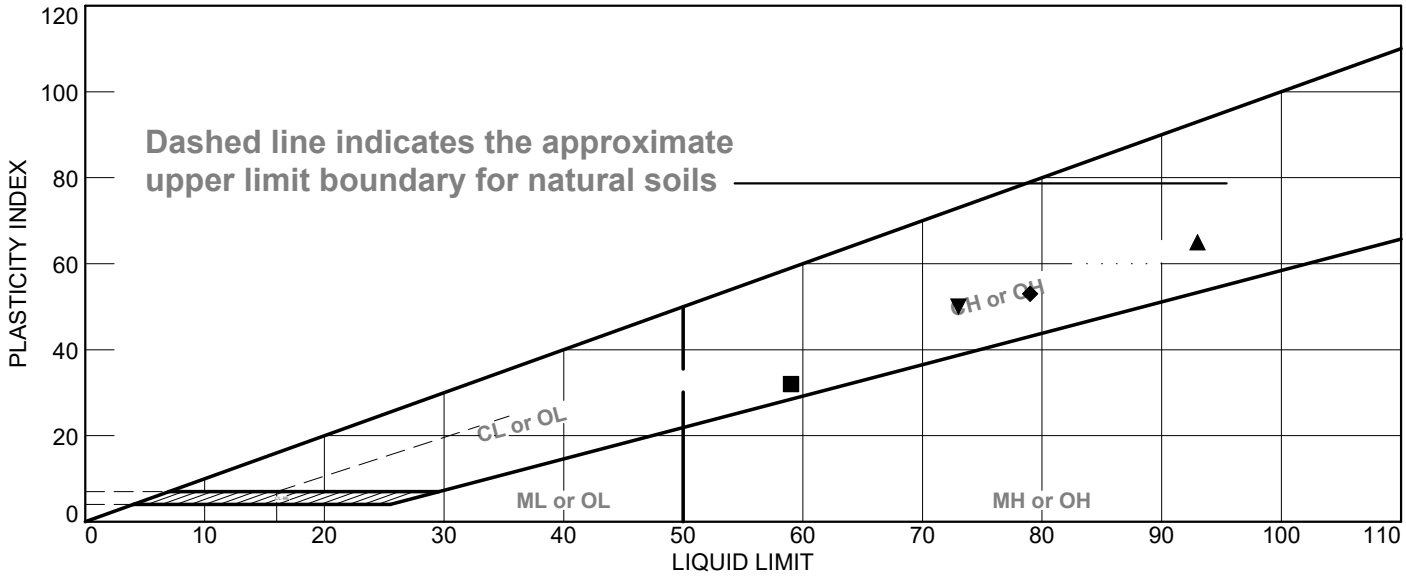
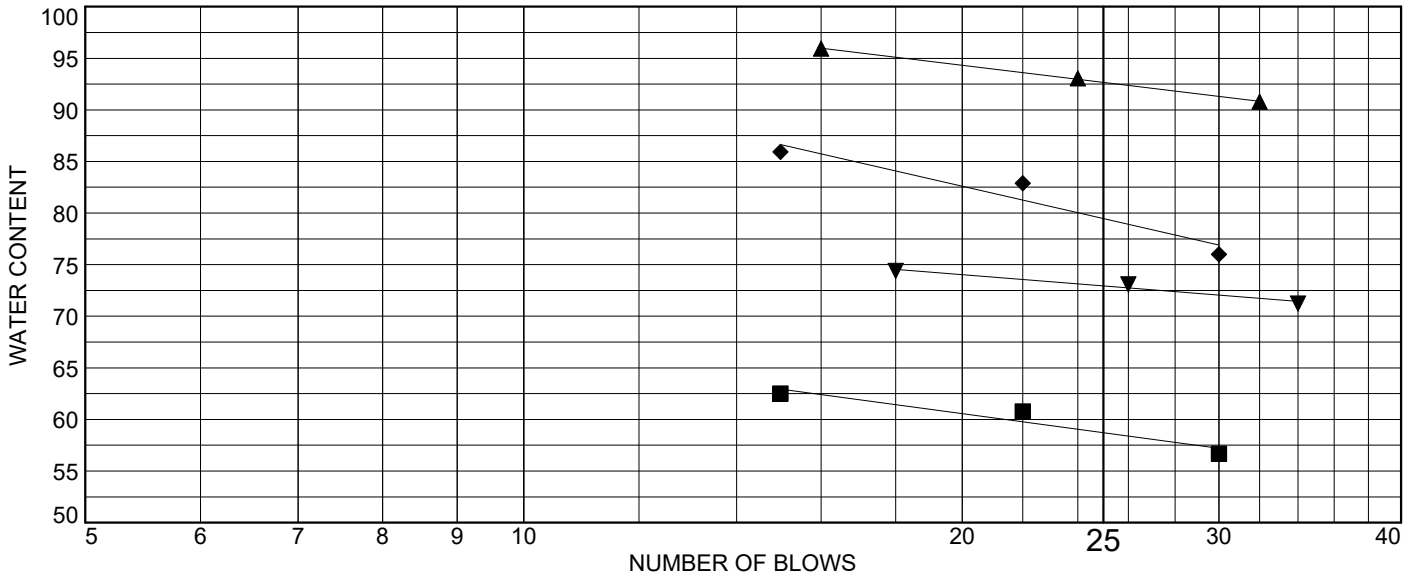
**Figure**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Gray silty sand | NV | NP | NP | 95 | 47 | SM |
| ■ | Gray fat clay with sand | 59 | 27 | 32 | 84 | 77 | CH |
| ▲ | Gray fat clay | 93 | 28 | 65 | 99 | 97 | CH |
| ◆ | Light gray fat clay | 79 | 26 | 53 | 99 | 98 | CH |
| ▼ | Gray fat clay | 73 | 23 | 50 | 99 | 95 | CH |

**Project No.** 26938-21 **Client:** CITY GOVERNMENT OF PASIG

**Project:** PASIG CITY HALL BUILDING D (EXTENSION BUILDING)

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● **Source:** BH-1 **Depth:** 16.05-16.50 **Sample No.:** SS-13

■ **Source:** BH-1 **Depth:** 17.55-18.00 **Sample No.:** SS-14

▲ **Source:** BH-1 **Depth:** 20.55-21.00 **Sample No.:** SS-16

◆ **Source:** BH-1 **Depth:** 22.05-22.50 **Sample No.:** SS-17

▼ **Source:** BH-1 **Depth:** 23.55-24.00 **Sample No.:** SS-18

**Remarks:**

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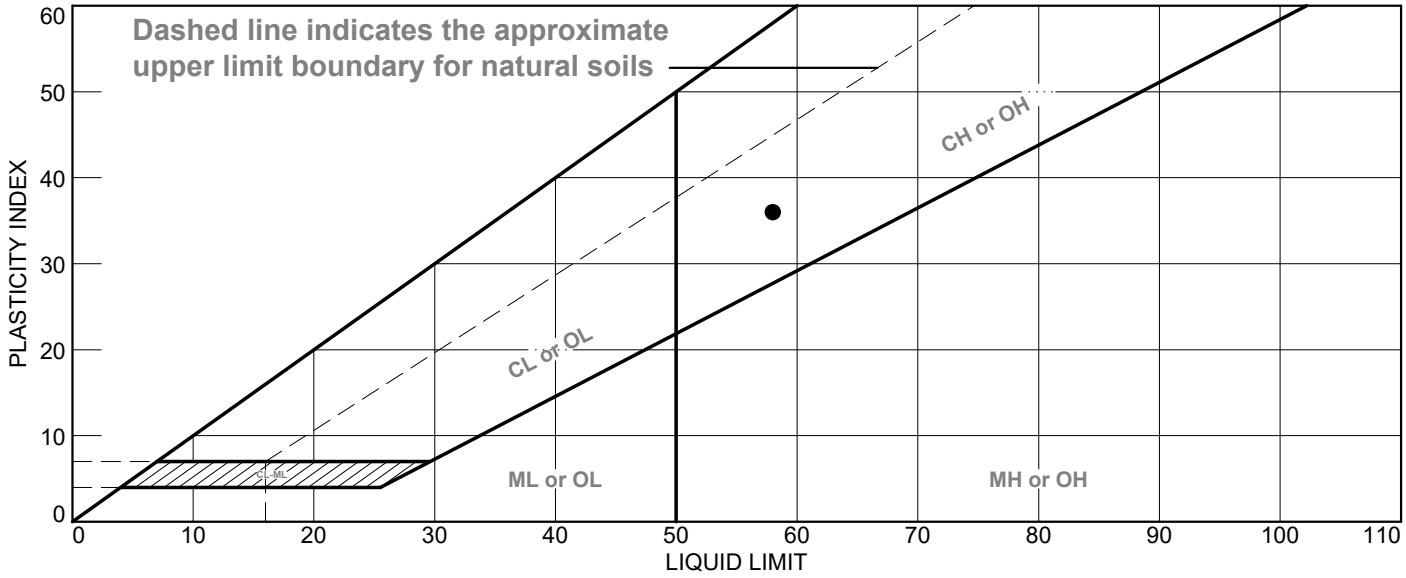
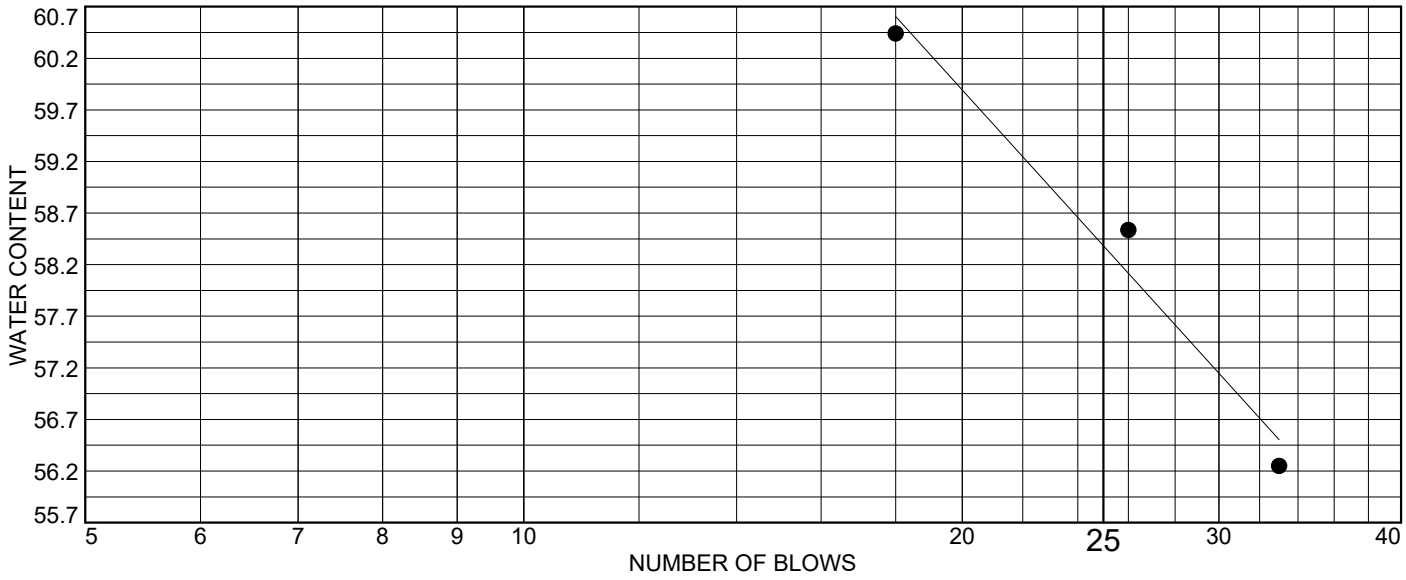
**Figure**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Brown fat clay with sand | 58 | 22 | 36 | 91 | 80 | CH |
| ■ | Gray silty gravel with sand | NV | NP | NP | 25 | 13 | GM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 26938-21 **Client:** CITY GOVERNMENT OF PASIG

**Project:** PASIG CITY HALL BUILDING D (EXTENSION BUILDING)

Brgy. San Nicolas, Pasig City

● **Source:** BH-1 **Depth:** 28.05-28.50 **Sample No.:** SS-21

■ **Source:** BH-1 **Depth:** 30.00-30.10 **Sample No.:** SS-22

**Remarks:**


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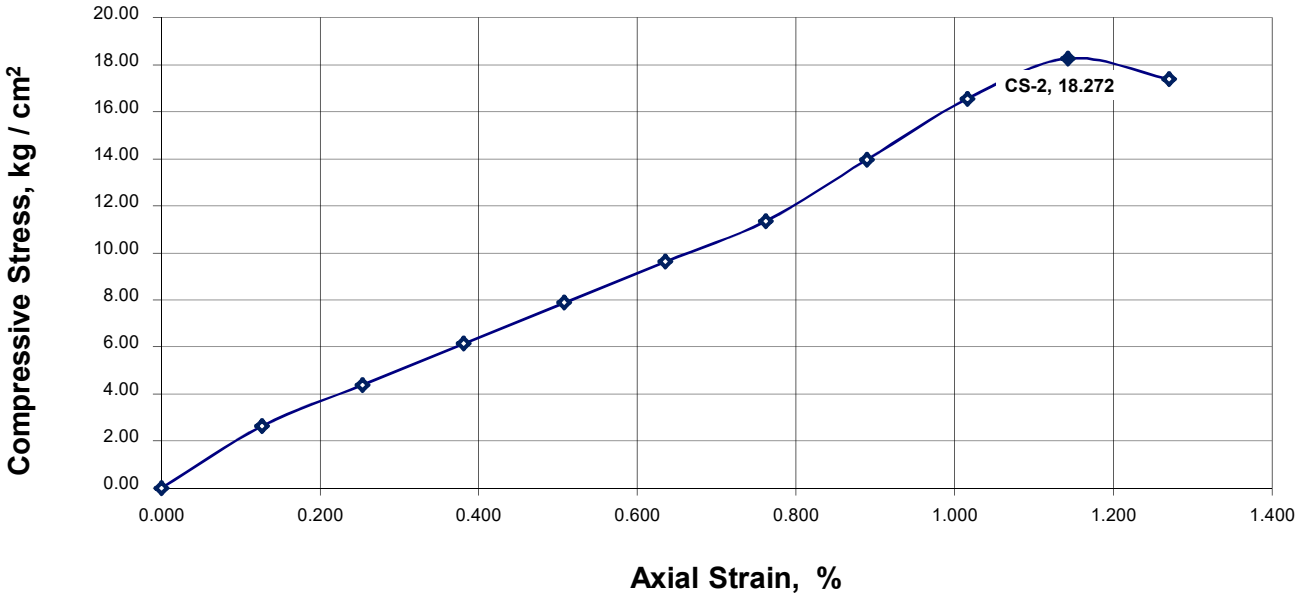
**Figure**

# Unconfined Compression Test

ASTM D2166




| | | | | |
|---|---|---|---|---|
| SAMPLE NO. | **CS-2** | | | |
| Depth, m | 30.10-31.50 | | | |
| **Unconfined Compressive Strength, kg/cm²** | **18.272** | | | |
| **Failure Strain, %** | **1.143** | | | |
| Sample Condition | CORING | | | |
| Diameter, cm | 5.00 | | | |
| Height, cm | 10.00 | | | |
| Height - Diameter Ratio | 2.00 | | | |
| Weight of Sample, g ( wet ) | 297.00 | | | |
| Area, cm² | 19.64 | | | |
| Volume, cm³ | 196.35 | | | |
| Wet Density, g/cm³ | 1.513 | | | |
| Dry Density, g/cm³ | 1.166 | | | |
| Moisture Content, % | 29.69 | | | |
| Description | Brown Siltstone | | | |

Tested by: G.G.PARAGAS
Date Tested: June 30, 2021

Encoded by: A.J.D.CRUZ

Certified by: R.E.BALIDIO/Head, Geotechnical Section
D a t e : July 2, 2021

Client: PASIG CITY HALL

Project: **PROPOSED PASIG CITY HALL BUILDING D**
Location: **Brgy. San Nicolas, Pasig City**

Sample Source: **BH-1**

**ARS Testing & Inspection, Inc.**
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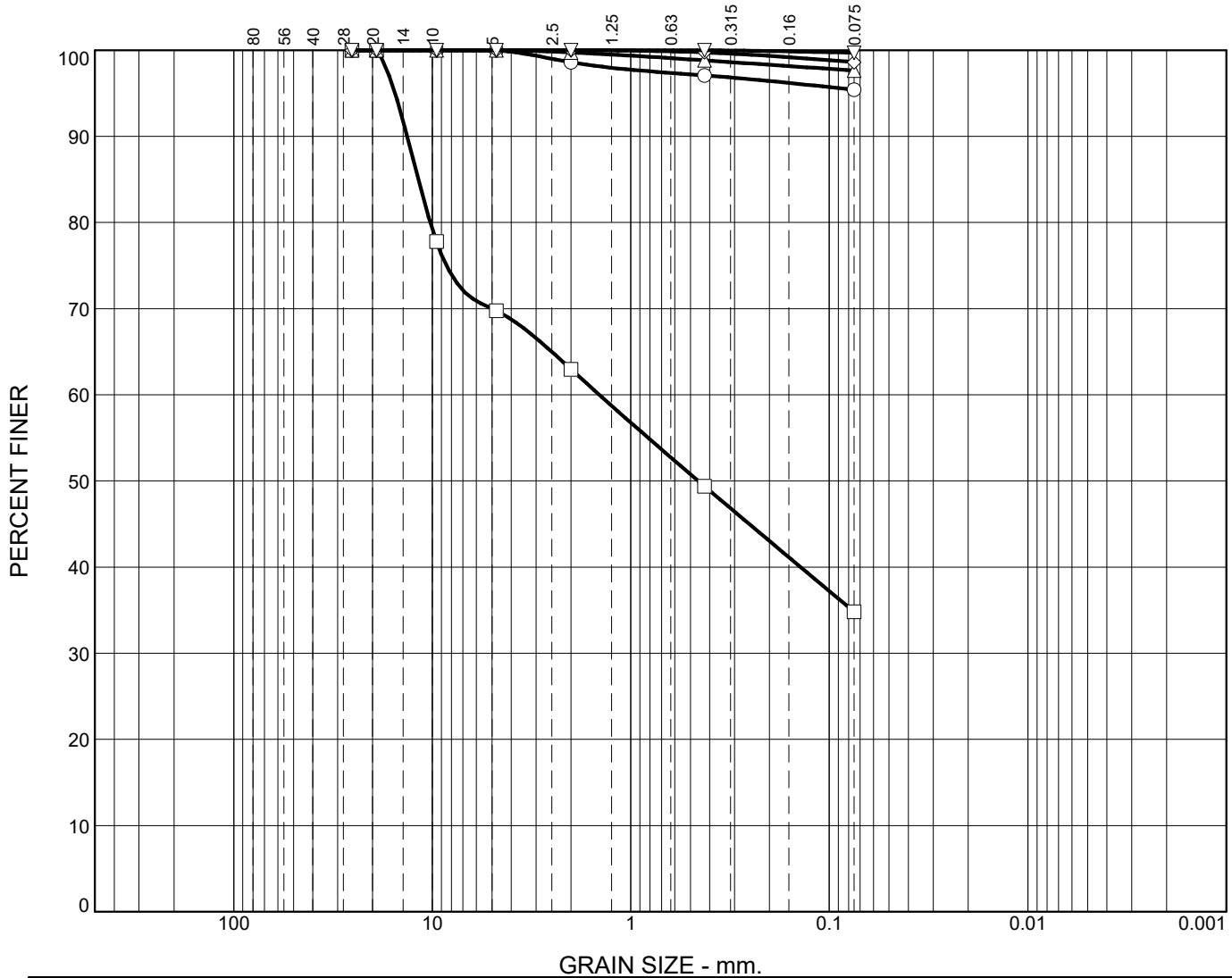
SAN ISIDRO, MAKATI CITY
TEL. NOS.: 845-1260 * 845-1367 TELEFAX NO.: 949-7605

# Particle Size Distribution Report




| | % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|---|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| ○ | 0 | 0 | 0 | 1 | 2 | 2 | 95 | |
| □ | 0 | 0 | 30 | 7 | 14 | 14 | 35 | |
| △ | 0 | 0 | 0 | 0 | 1 | 1 | 98 | |
| ◇ | 0 | 0 | 0 | 0 | 0 | 1 | 99 | |
| ▽ | 0 | 0 | 0 | 0 | 0 | 0 | 100 | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (m.) | Material Description | USCS |
|---|---|---|---|---|---|
| ○ | BH-2 | SS-1 | 0.55-1.00 | Gray fat clay | CH |
| □ | BH-2 | SS-2 | 1.55-2.00 | Gray clayey sand with gravel | SC |
| △ | BH-2 | SS-3 | 2.55-3.00 | Gray fat clay | CH |
| ◇ | BH-2 | SS-4 | 3.55-4.00 | Light gray fat clay | CH |
| ▽ | BH-2 | SS-5 | 4.55-5.00 | Gray fat clay | CH |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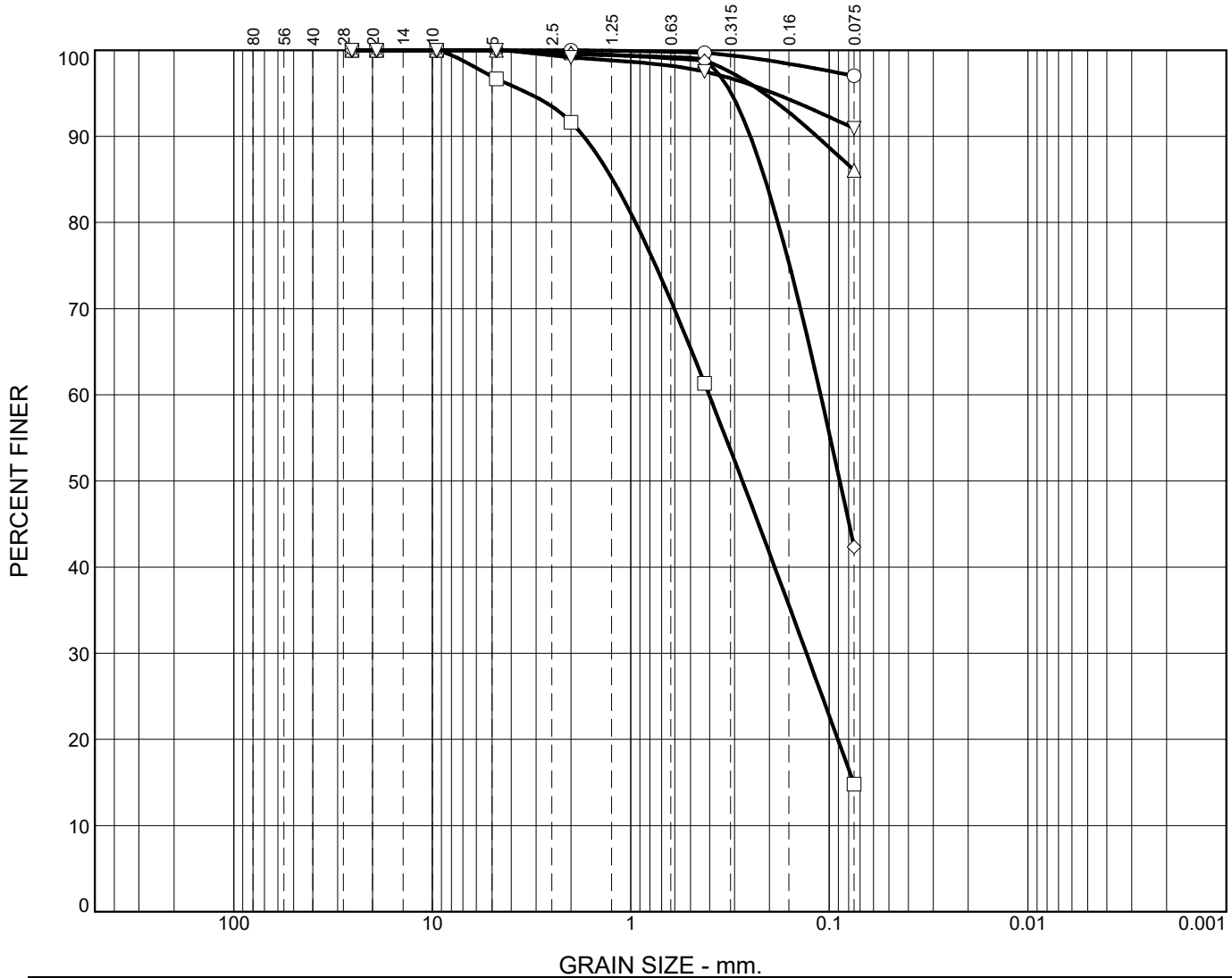
Brgy. San Nicolas, Pasig City

**Project No.:** 13689-26938-21 **Figure**

# Particle Size Distribution Report




| | % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|---|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| ○ | 0 | 0 | 0 | 0 | 0 | 3 | 97 | |
| □ | 0 | 0 | 3 | 5 | 31 | 46 | 15 | |
| △ | 0 | 0 | 0 | 0 | 1 | 13 | 86 | |
| ◇ | 0 | 0 | 0 | 0 | 1 | 57 | 42 | |
| ▽ | 0 | 0 | 0 | 1 | 1 | 7 | 91 | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (m.) | Material Description | USCS |
|---|---|---|---|---|---|
| ○ | BH-2 | SS-6 | 5.55-6.00 | Gray fat clay | CH |
| □ | BH-2 | SS-7 | 7.05-7.50 | Gray silty sand | SM |
| △ | BH-2 | SS-8 | 8.55-9.00 | Gray lean clay | CL |
| ◇ | BH-2 | SS-9 | 10.05-10.50 | Gray silty sand | SM |
| ▽ | BH-2 | SS-10 | 11.55-12.00 | Gray lean clay | CL |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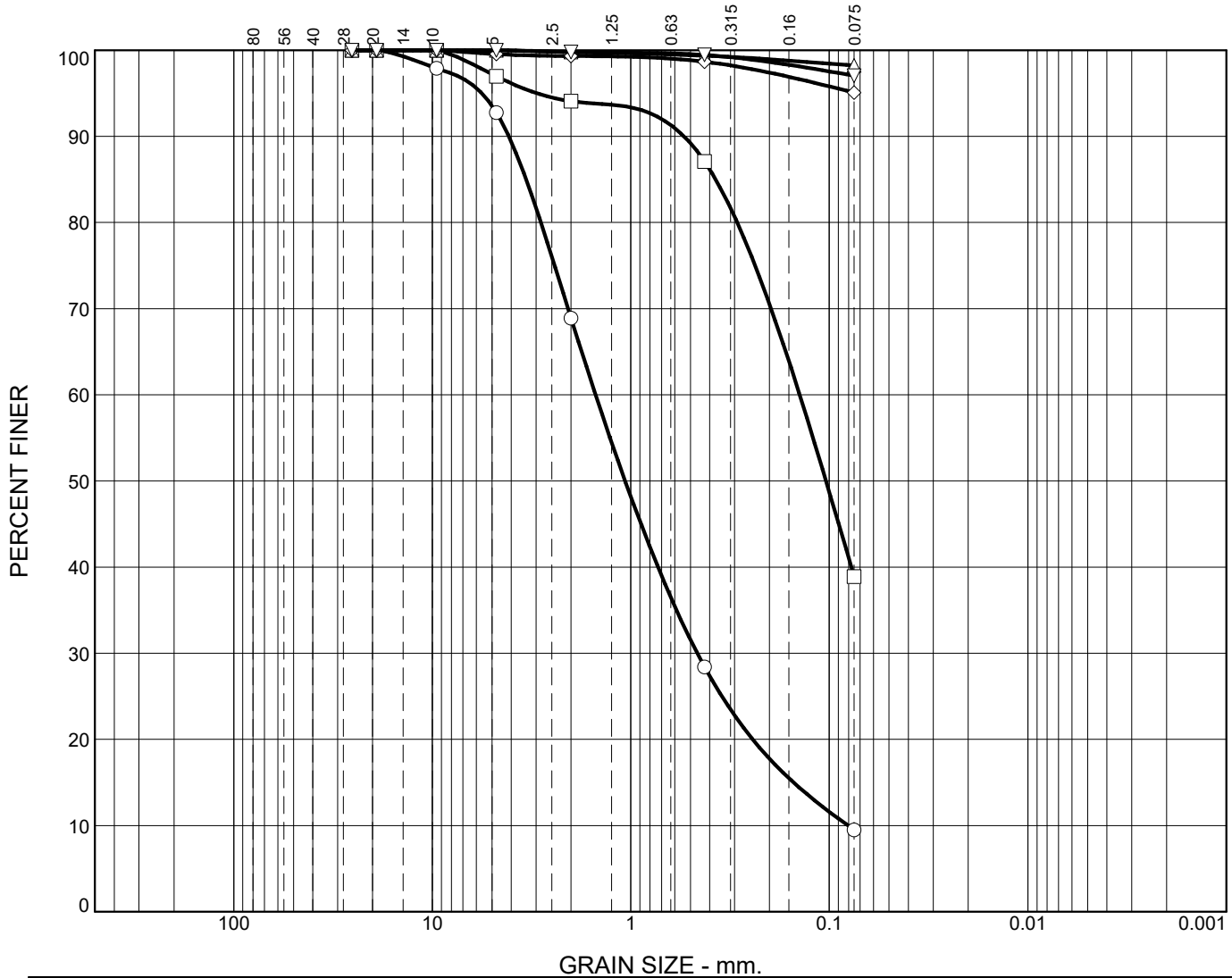
**Project No.:** 13689-26938-21 **Figure**

# Particle Size Distribution Report




| | % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|---|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| ○ | 0 | 0 | 7 | 24 | 41 | 19 | 9 | |
| □ | 0 | 0 | 3 | 3 | 7 | 48 | 39 | |
| △ | 0 | 0 | 0 | 0 | 1 | 1 | 98 | |
| ◇ | 0 | 0 | 0 | 1 | 0 | 4 | 95 | |
| ▽ | 0 | 0 | 0 | 0 | 1 | 2 | 97 | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (m.) | Material Description | USCS |
|---|---|---|---|---|---|
| ○ | BH-2 | SS-11 | 13.05-13.50 | Light gray well-graded sand with silt | SW-SM |
| □ | BH-2 | SS-13 | 16.05-16.50 | Dark gray silty sand | SM |
| △ | BH-2 | SS-15 | 19.05-19.50 | Gray fat clay | CH |
| ◇ | BH-2 | SS-17 | 22.05-22.50 | Light gray fat clay | CH |
| ▽ | BH-2 | SS-19 | 25.05-25.50 | Gray fat clay | CH |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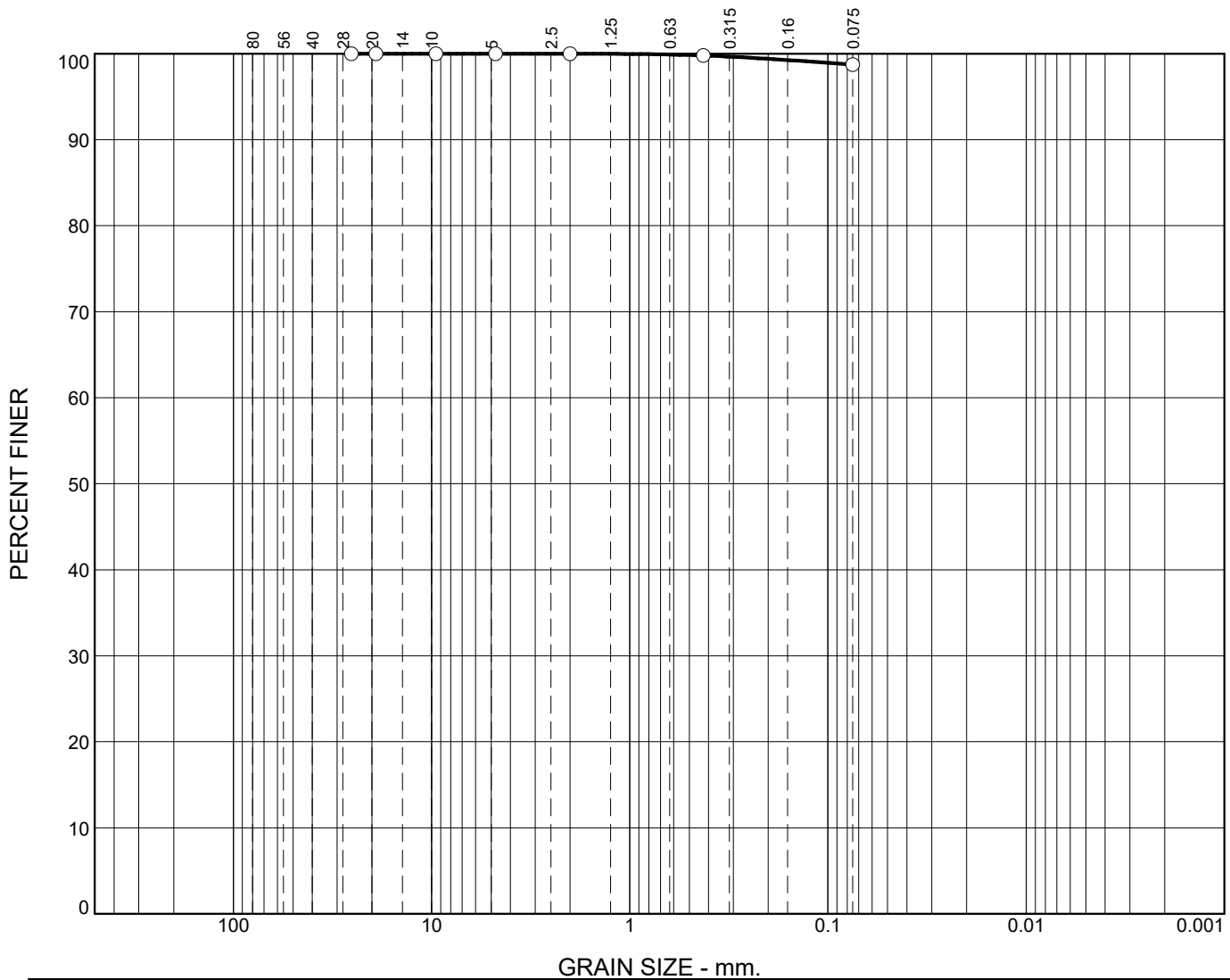
**Project No.:** 13689-26938-21 **Figure**

# Particle Size Distribution Report




| | % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|---|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| ○ | 0 | 0 | 0 | 0 | 0 | 1 | 99 | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (m.) | Material Description | USCS |
|---|---|---|---|---|---|
| ○ | BH-2 | SS-21 | 28.05-28.50 | Brown fat clay | CH |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |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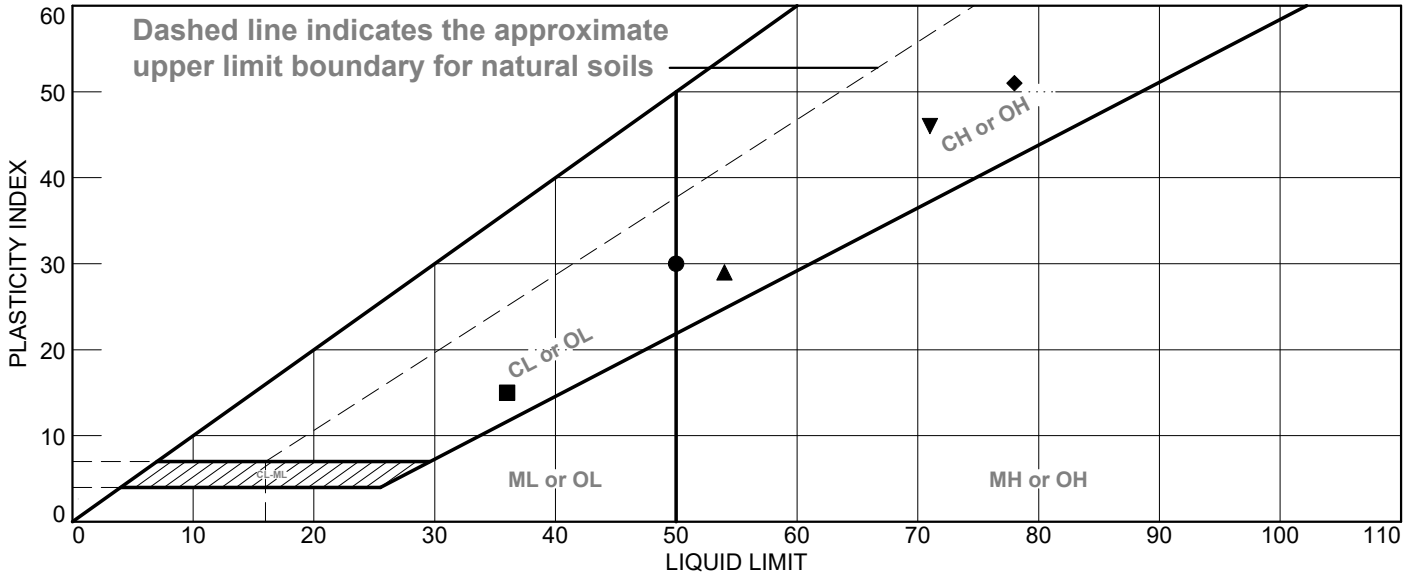
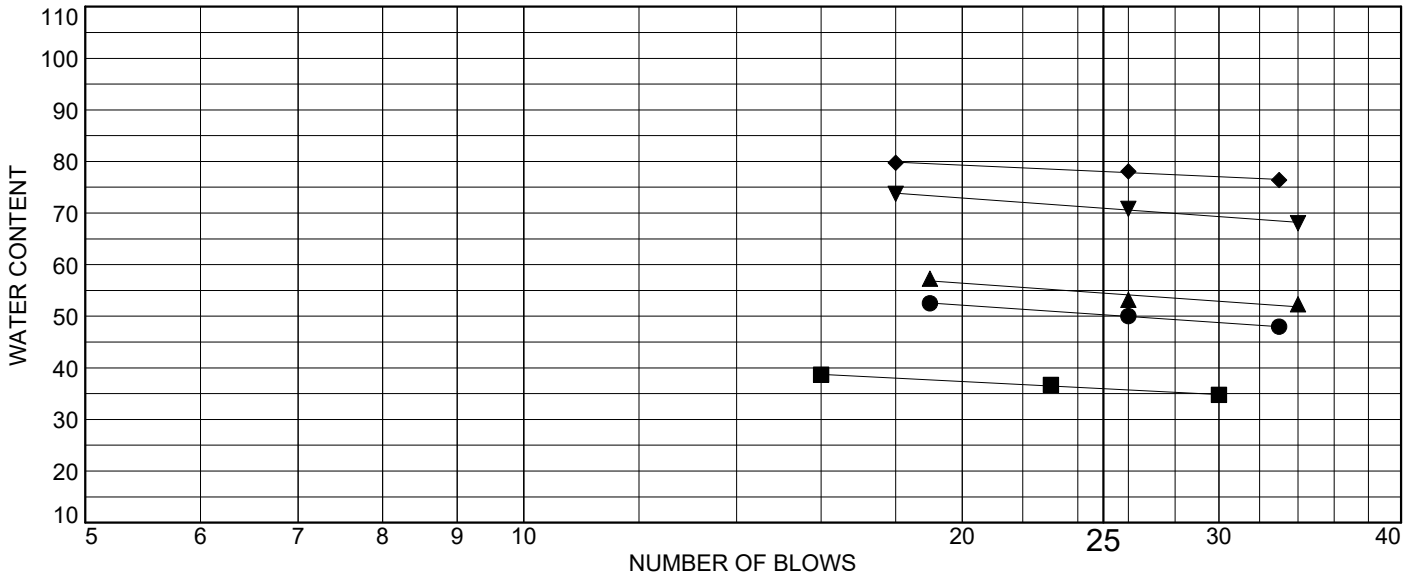
**Project No.:** 13689-26938-21 **Figure**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Gray fat clay | 50 | 20 | 30 | 97 | 95 | CH |
| ■ | Gray clayey sand with gravel | 36 | 21 | 15 | 49 | 35 | SC |
| ▲ | Gray fat clay | 54 | 25 | 29 | 99 | 98 | CH |
| ◆ | Light gray fat clay | 78 | 27 | 51 | 100 | 99 | CH |
| ▼ | Gray fat clay | 71 | 25 | 46 | 100 | 100 | CH |

**Project No.** 26938-21 **Client:** CITY GOVERNMENT OF PASIG

**Project:** PASIG CITY HALL BUILDING D (EXTENSION BUILDING)

Brgy. San Nicolas, Pasig City

● **Source of Sample:** BH-2 **Depth:** 0.55-1.00 **Sample Number:** SS-1

■ **Source of Sample:** BH-2 **Depth:** 1.55-2.00 **Sample Number:** SS-2

▲ **Source of Sample:** BH-2 **Depth:** 2.55-3.00 **Sample Number:** SS-3

◆ **Source of Sample:** BH-2 **Depth:** 3.55-4.00 **Sample Number:** SS-4

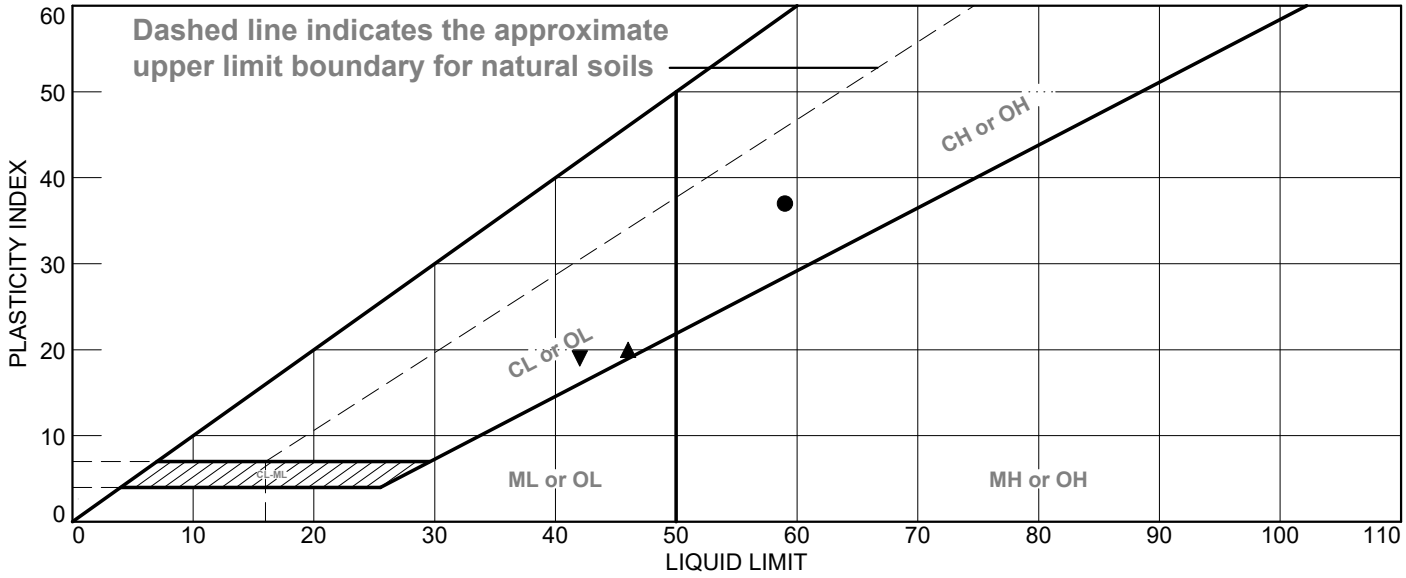
▼ **Source of Sample:** BH-2 **Depth:** 4.55-5.00 **Sample Number:** SS-5

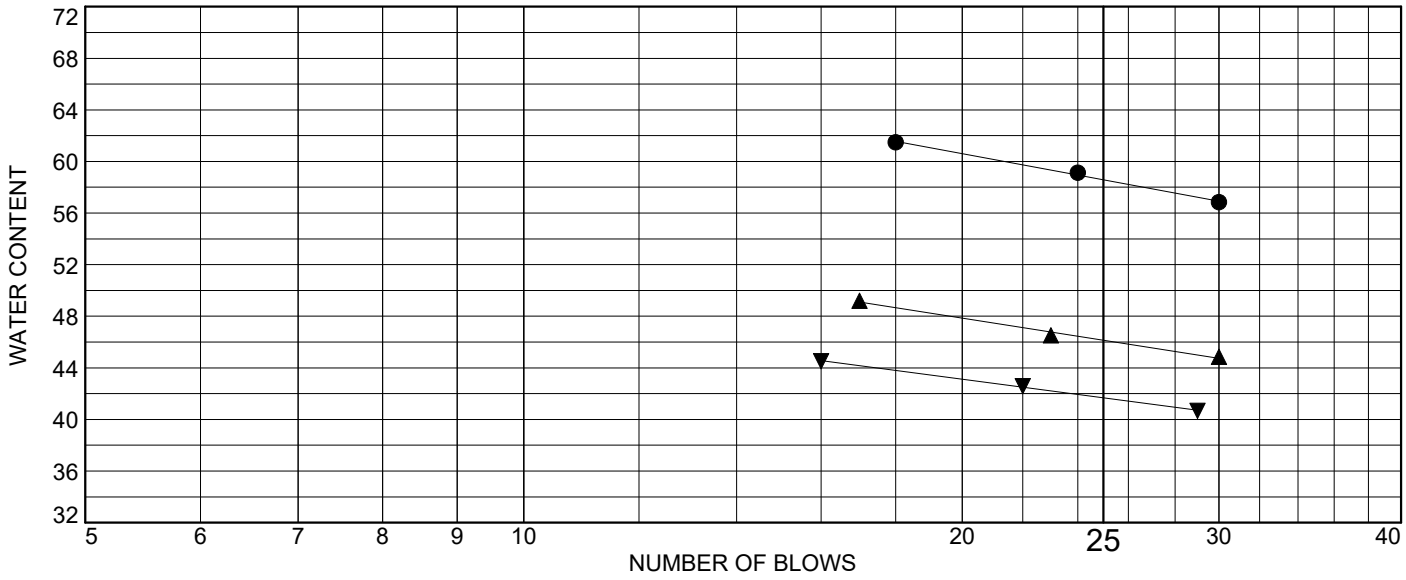
**Remarks:**

**ARS Testing & Inspection, Inc.**
LUPIN II BUILDING, FARADAY COR. P. BINAY STS.,
SAN ISIDRO, MAKATI CITY

**Figure**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Gray fat clay | 59 | 22 | 37 | 100 | 97 | CH |
| ■ | Gray silty sand | NV | NP | NP | 61 | 15 | SM |
| ▲ | Gray lean clay | 46 | 26 | 20 | 99 | 86 | CL |
| ◆ | Gray silty sand | NV | NP | NP | 99 | 42 | SM |
| ▼ | Gray lean clay | 42 | 23 | 19 | 98 | 91 | CL |

**Project No.** 26938-21 **Client:** CITY GOVERNMENT OF PASIG

**Project:** PASIG CITY HALL BUILDING D (EXTENSION BUILDING)

Brgy. San Nicolas, Pasig City

● **Source of Sample:** BH-2 **Depth:** 5.55-6.00 **Sample Number:** SS-6

■ **Source of Sample:** BH-2 **Depth:** 7.05-7.50 **Sample Number:** SS-7

▲ **Source of Sample:** BH-2 **Depth:** 8.55-9.00 **Sample Number:** SS-8

◆ **Source of Sample:** BH-2 **Depth:** 10.05-10.50 **Sample Number:** SS-9

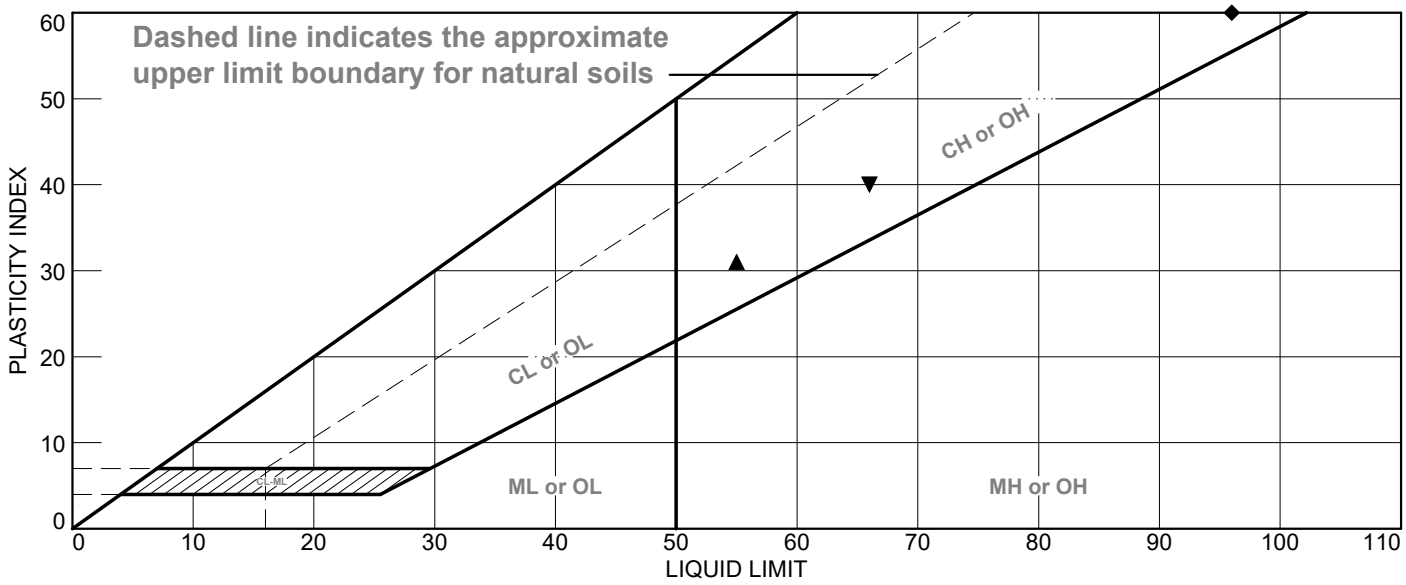
▼ **Source:** BH-2 **Depth:** 11.55-12.00 **Sample No.:** SS-10

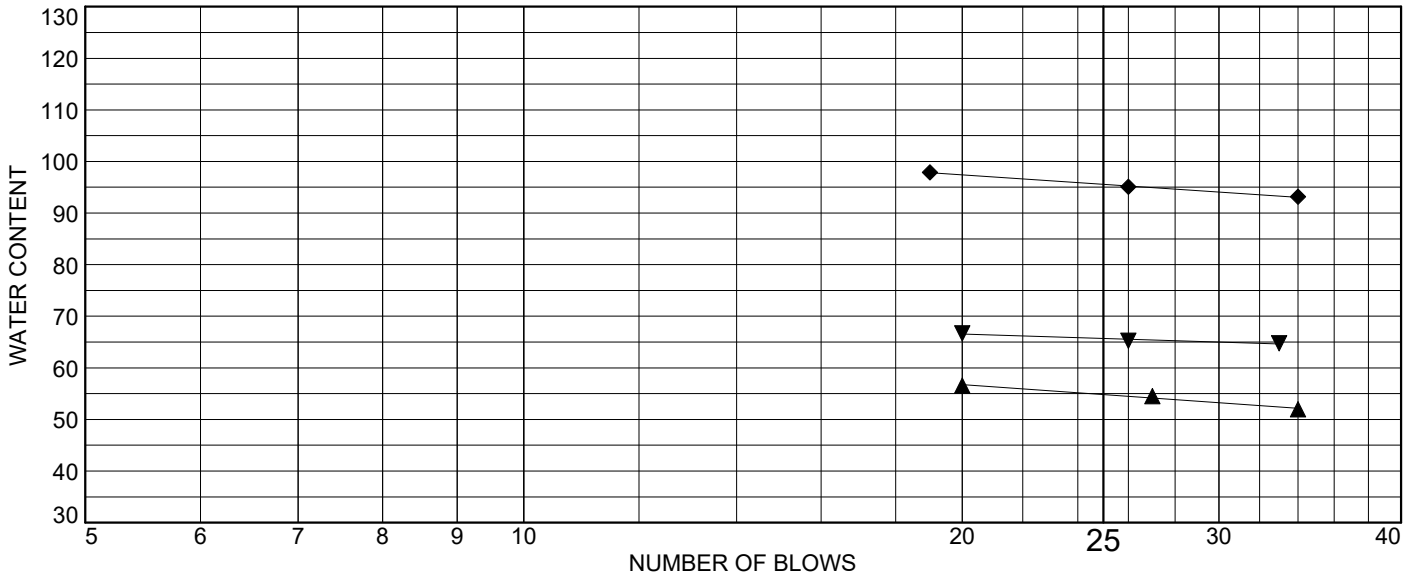
**Remarks:**

**ARS Testing & Inspection, Inc.**
LUPIN II BUILDING, FARADAY COR. P. BINAY STS.,
SAN ISIDRO, MAKATI CITY

**Figure**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Light gray well-graded sand with silt | NV | NP | NP | 28 | 9 | SW-SM |
| ■ | Dark gray silty sand | NV | NP | NP | 87 | 39 | SM |
| ▲ | Gray fat clay | 55 | 24 | 31 | 99 | 98 | CH |
| ◆ | Light gray fat clay | 96 | 36 | 60 | 99 | 95 | CH |
| ▼ | Gray fat clay | 66 | 26 | 40 | 99 | 97 | CH |

**Project No.** 26938-21 **Client:** CITY GOVERNMENT OF PASIG

**Project:** PASIG CITY HALL BUILDING D (EXTENSION BUILDING)

Brgy. San Nicolas, Pasig City

● **Source:** BH-2 **Depth:** 13.05-13.50 **Sample No.:** SS-11

■ **Source:** BH-2 **Depth:** 16.05-16.50 **Sample No.:** SS-13

▲ **Source:** BH-2 **Depth:** 19.05-19.50 **Sample No.:** SS-15

◆ **Source:** BH-2 **Depth:** 22.05-22.50 **Sample No.:** SS-17

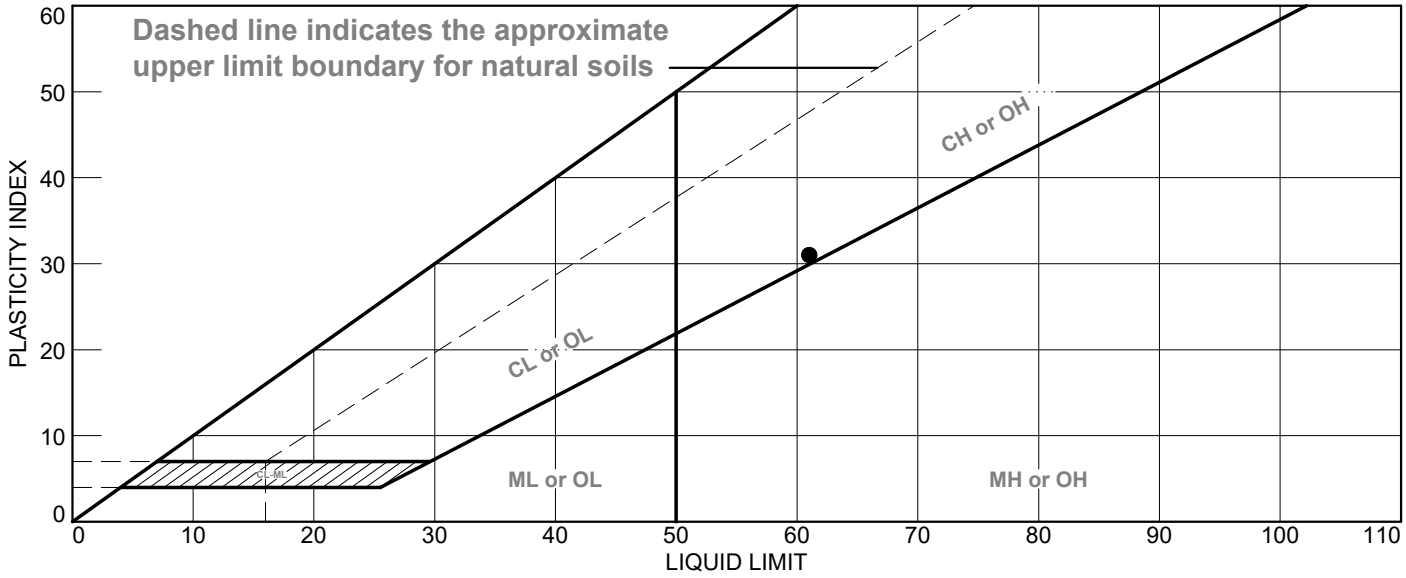
▼ **Source:** BH-2 **Depth:** 25.05-25.50 **Sample No.:** SS-19

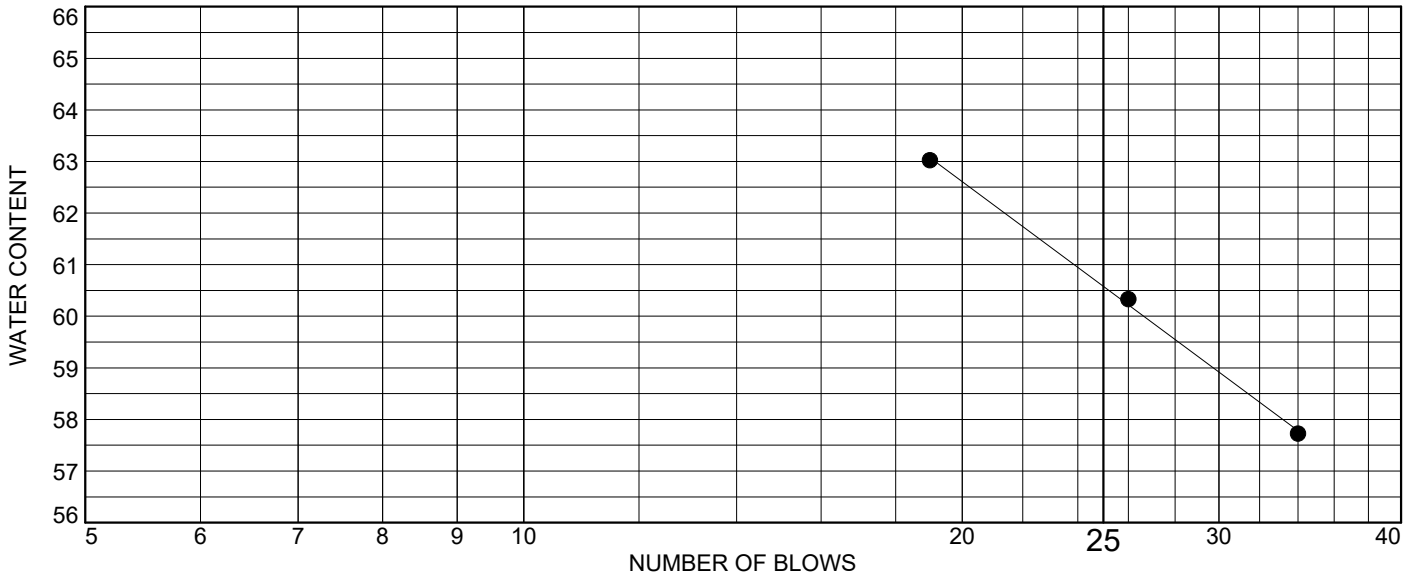
**Remarks:**

**ARS Testing & Inspection, Inc.**
LUPIN II BUILDING, FARADAY COR. P. BINAY STS.,
SAN ISIDRO, MAKATI CITY

**Figure**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Brown fat clay | 61 | 30 | 31 | 100 | 99 | CH |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 26938-21 **Client:** CITY GOVERNMENT OF PASIG

**Project:** PASIG CITY HALL BUILDING D (EXTENSION BUILDING)

Brgy. San Nicolas, Pasig City

● **Source:** BH-2 **Depth:** 28.05-28.50 **Sample No.:** SS-21

**Remarks:**

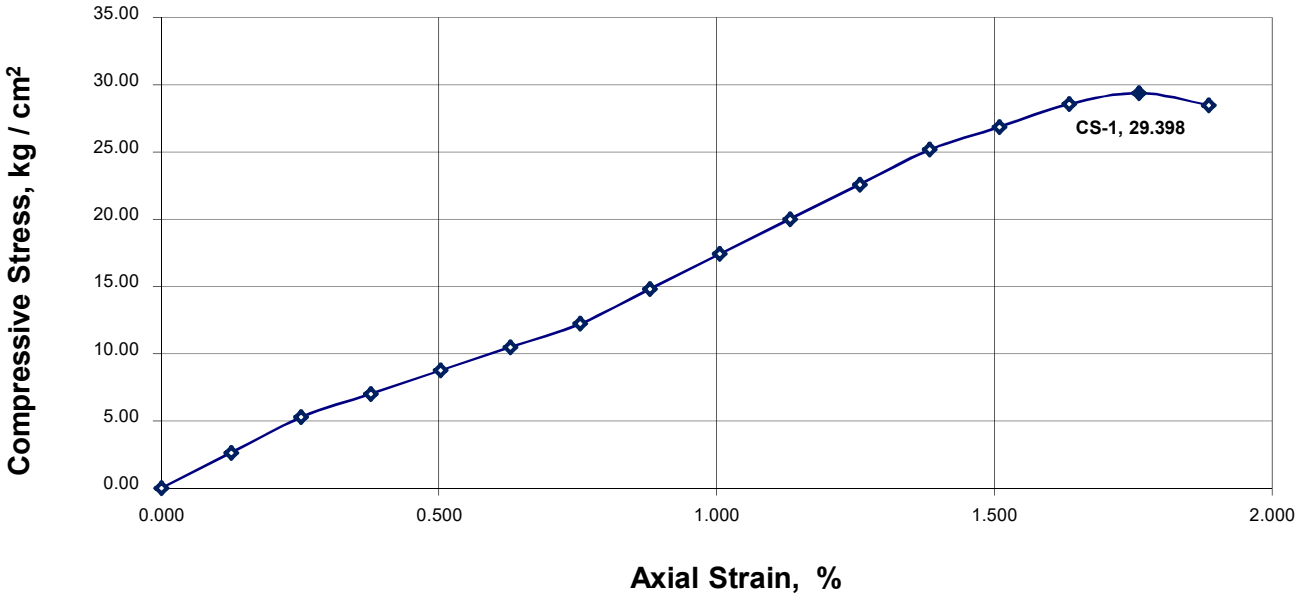

**ARS Testing & Inspection, Inc.**

LUPIN II BUILDING, FARADAY COR. P. BINAY STS.,
SAN ISIDRO, MAKATI CITY


**Figure**

# Unconfined Compression Test

ASTM D2166




| | | | | |
|---|---|---|---|---|
| SAMPLE NO. | **CS-1** | | | |
| Depth, m | 29.00-30.00 | | | |
| **Unconfined Compressive Strength, kg/cm$^2$** | **29.398** | | | |
| **Failure Strain, %** | **1.760** | | | |
| Sample Condition | CORING | | | |
| Diameter, cm | 5.00 | | | |
| Height, cm | 10.10 | | | |
| Height - Diameter Ratio | 2.02 | | | |
| Weight of Sample, g ( wet ) | 317.00 | | | |
| Area, cm$^2$ | 19.64 | | | |
| Volume, cm$^3$ | 198.31 | | | |
| Wet Density, g/cm$^3$ | 1.598 | | | |
| Dry Density, g/cm$^3$ | 1.286 | | | |
| Moisture Content, % | 24.31 | | | |
| Description | Brown Sandstone | | | |

Tested by: G.G.PARAGAS
Date Tested: July 2, 2021

Encoded by: A.J.D.CRUZ

Certified by: R.E.BALIDIO/Head, Geotechnical Section
D a t e : July 5, 2021

Client: PASIG CITY HALL

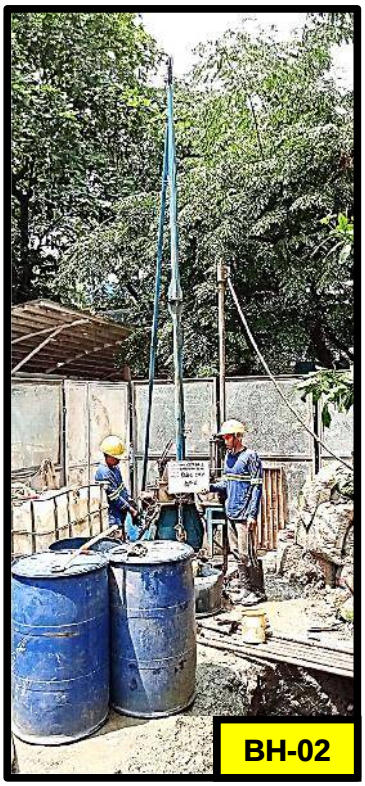
Project: **PROPOSED PASIG CITY HALL BUILDING D**
Location: **Brgy. San Nicolas, Pasig City**

Sample Source: **BH-2**

**ARS Testing & Inspection, Inc.**
LUPIN II BUILDING, FARADAY COR. P. BINAY STS.,
SAN ISIDRO, MAKATI CITY
TEL. NOS.: 845-1260 * 845-1367 TELEFAX NO.: 949-7605

# PHOTOGRAPHS





**SITE CONDITION AND DRILLING OPERATION**

**PASIG CITY HALL BUILDING D (EXTENSION BUILDING)**
Caruncho Avenue, Brgy. San Nicolas, Pasig City




**BH-1**
**SPT SOIL AND ROCK CORE SAMPLES**

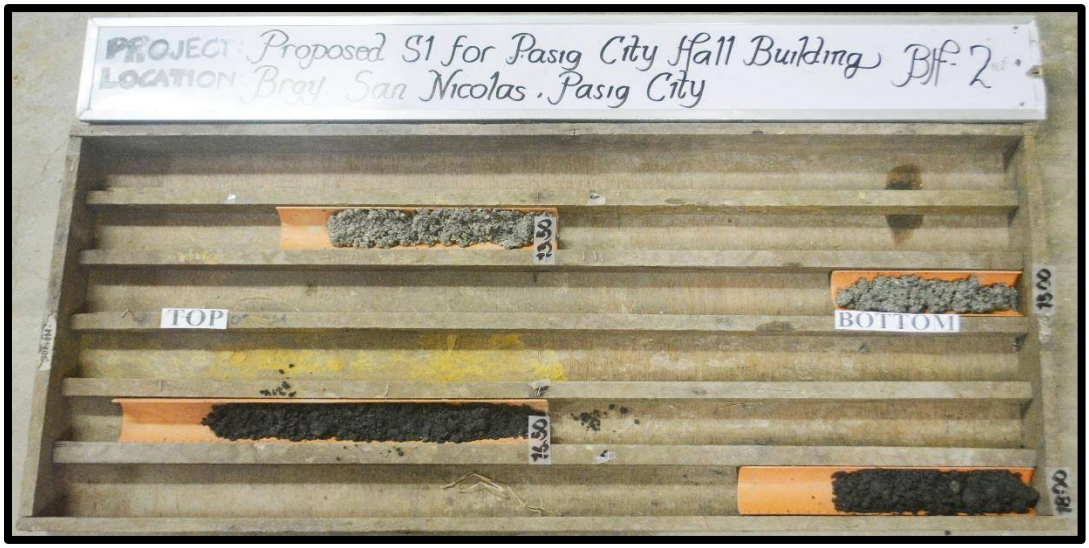
PASIG CITY HALL BUILDING D (EXTENSION BUILDING)
Caruncho Avenue, Brgy. San Nicolas, Pasig City




**BH-1**
**SPT SOIL AND ROCK CORE SAMPLES**

PASIG CITY HALL BUILDING D (EXTENSION BUILDING)
Caruncho Avenue, Brgy. San Nicolas, Pasig City






**BH-2**
**SPT SOIL AND ROCK CORE SAMPLES**

PASIG CITY HALL BUILDING D (EXTENSION BUILDING)
Caruncho Avenue, Brgy. San Nicolas, Pasig City




**BH-2**
**SPT SOIL AND ROCK CORE SAMPLES**

PASIG CITY HALL BUILDING D (EXTENSION BUILDING)
Caruncho Avenue, Brgy. San Nicolas, Pasig City