REQUEST FOR INFORMATION (RFI)

OCSD PROJECT 2022-01

HWY 1/ALLEYWAY AT 19TH

1. **RFI received May 27, 2022:**

   - **RFI:** In reviewing the project docs I was unable to locate any details regarding a job walk. Is there one scheduled?

   - **RESPONSE:** In the "Instructions to Bidders" (page 9) it states the District won't be holding a pre-bid conference: https://oceanocsd.org/wp-content/uploads/bsk-pdf-manager/2022/05/4-2022-HWY-1-Alleyway-at-19th-St-Contract-2022-01.pdf

2. JOB SITE AND CONTRACT DOCUMENT EXAMINATION

Bidders are responsible for examining the job site and the Contract Documents, including any Addenda issued prior to the Bid Deadline, and for informing themselves with respect to local labor availability, means of transportation, necessity for security, laws and codes, local permit requirements, wage scales, local tax structure, contractors licensing requirements, availability of required insurance, and other factors that could affect the work. Bidders are responsible for consulting the standards referenced in the Contract Documents.

Submission of a Bid is a bidder's acknowledgment that the bidder has examined the job site and bid documents and is satisfied with:

1. General and local conditions to be encountered
2. Character, quality, and scope of work to be performed
3. Quantities of materials to be furnished
4. Character, quality, and quantity of surface and subsurface materials or obstacles
5. Requirements of the Contract Documents

3. PRE-BID CONFERENCE

A pre-bid conference will not be held for this Contract.

2. **RFI received June 16, 2022:**

   - **RFI:** -The unit pricing sheet (# 16) indicates that there is 1,325 square feet of anticipated pavement restoration. My initial takeoff indicates that there is approximately 940 linear feet of trench without any work in the alleyway off 19th street. The trench widths vary in size per the detail on sheet 2 and the limits of the trench from 3' to 8'. Is the quantity on the sheet what you want pricing on for the bid or the realistic amount?

- What are the road patch back requirements in the alley? Are you seeking asphalt pavement in that location as well?

- **RESPONSE:** This project has been split into two Locations and two separate bid sheets. HWY 1 is Location 1 and 19th St. and the alleyway is Location 2.

  The work at Location 1 requires 7,120 sf of pavement restoration and is under bid item #17 on the Location 1 bid sheet.

  The work at Location 2 requires the 1,325 sf of pavement restoration for the installation of the 265 lf of the 8-inch watermain in the alleyway. The engineers assumed a 5' wide trench with pavement restoration in 19th Street and the alleyway **west** of the intersection. The alleyway **east** of the intersection will be native/base backfill to match existing conditions. Bid quantities are accurate.

  See page 7 for Location 1 and page 8 Location 2 of the bid forms:

  https://oceanocsd.org/wp-content/uploads/bsk-pdf-manager/2022/05/2-2022-HWY-1-Alleyway-at-19th-St-Bid-Forms-Only.pdf

3. **RFI received June 17, 2022:**

   - **RFI:** - Can you provide me any information regarding groundwater elevation at the project site?

   - Also, it seems that there might be some thrust blocks missing on the Alleyway Plan Sheet?

   - **RESPONSE:** The District does not anticipate any groundwater at either Location.

     The thrust blocks or retrained joints shall be installed per District Standard Specifications, whether shown or not shown on the plans. Please bid accordingly. The District Standard Specifications can be found at: https://oceanocsd.org/wp-content/uploads/bsk-pdf-manager/2018/04/1997-22-Standards-Specs.pdf

     See Section 4.5.F for Thrust Block requirements:

F. ***Thrust Blocks***. Thrust block shall be constructed at all pipe bends greater than 5 degrees, at tees, at valves, at dead ends, and at other locations there is the potential for thrust. Thrust block sizing shall conform to Standard Drawing W-4. Concrete for thrust blocks shall conform to State Standard Class B (5-sack) minimum.

With prior approval of the District, alternate thrust restraints may be provided.

Before any thrust block is poured against a waterline or fitting, the fitting shall be wrapped in polyethylene plastic sheets. No concrete shall be poured against bare pipe or fittings.

4. **RFI received June 17, 2022:**

   - **RFI:** - Are there also any bore logs you would be able to provide?

   - **RESPONSE:** See the attached Earth Systems Geotechnical Report that is not specific to this project but was done for another one of our projects in Oceano.

5. **RFI received June 21, 2022:**

   - **RFI:** - I can't find anything regarding construction water. Will Oceano be providing this?

   - **RESPONSE:** Oceano CSD provides construction water through a hydrant meter. The District will waive all fees besides the $500 deposit. See the application: https://oceanocsd.org/wp-content/uploads/bsk-pdf-manager/2020/01/APPLICATION-FOR-WATER-HYDRANT-METER-01232020-1.pdf

6. **RFI received June 20, 2022:**

   - **RFI:** - For the work on location # 2 are we to assume that the existing and new pipe depths are similar to depths on location # 1? I have them at 5' per the profile on sheet 2.

   - **RESPONSE:** Assume 48" min cover over new and existing pipe for both Location 1 and 2.

GEOTECHNICAL ENGINEERING REPORT
OCEANO COMMUNITY SERVICES DISTRICT
REPLACEMENT STANDBY GNERATOR
1687 FRONT STREET
OCEANO, CALIFORNIA

July 26, 2018

Prepared for

Oceano Community Services District

Prepared by

Earth Systems Pacific
4378 Old Santa Fe Road
San Luis Obispo, CA 93401

Earth Systems
4378 Old Santa Fe Road | San Luis Obispo, CA 93401 | Ph: 805.544.3276 | www.earthsystems.com

July 26, 2018

FILE NO.: 302307-001

Mr. Paavo Ogren
Oceano Community Services District
P.O. Box 599
Oceano, CA 93475-6730

PROJECT: OCEANO COMMUNITY SERVICES DISTRICT
REPLACEMENT STANDBY GENERATOR
1687 FRONT STREET
OCEANO, CALIFORNIA

SUBJECT: Geotechnical Engineering Report

CONTRACT REF: Purchase Order #2018-19-02, by Oceano Community Services District, dated July 5, 2018

Dear Mr. Ogren:

As per your authorization of the above referenced purchase order, this geotechnical engineering report has been prepared for use in the development of plans and specifications for the proposed standby generator replacement at 1687 Front Street in Oceano, California. Preliminary geotechnical engineering recommendations for site preparation, grading, utility trenches, foundations, drainage and maintenance, and observation and testing are presented herein. One electronic copy (.pdf format) of this report has been provided to you. Additional electronic copies have been forwarded as indicated below.

We appreciate the opportunity to have provided professional services for this project and look forward to working with you again in the future. If there are any questions concerning this report, please do not hesitate to contact the undersigned.

Sincerely,
Earth Systems Pacific

REGISTERED PROFESSIONAL ENGINEER
KYLE J. MARTINEZ
No. 80666
Exp. _____
CIVIL
STATE OF CALIFORNIA

Kyle Martinez, PE
Project Engineer
7/26/18

REGISTERED PROFESSIONAL ENGINEER
FREDERICK J. POTTHAST
No. GE 2369
Exp. 03/31/20
GEOTECHNICAL
STATE OF CALIFORNIA

Fred J. Potthast, RCE, GEAL
Sr. Vice President/Managing Principal
7/26/18

Copy to: Wilson Engineering, Attn.: Mr. Gary Wilson
Mr. Joshua Moody

Doc. No.: 1807-085.SER/cr

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APPENDICES

1.0 INTRODUCTION AND SITE SETTING

The project addressed herein involves the removal and replacement of the existing emergency standby generator at 1687 Front Street in Oceano, California. The generator will be supported by a mat slab foundation. No grading, other than for preparation of the generator pad, and no retaining walls or other improvements are planned as part of the project. The approximate project location is indicated on Figure 1 – Site Vicinity Map, in Appendix A. The new generator will be located behind the existing fire station practice facility at the northwest corner of Front and 13th Streets. The site is relatively flat and is currently occupied by existing utilities, an equipment shed, the existing generator, fuel tank, transformer, and other equipment. The locations and dispositions of existing utility lines on the site are unknown. It is our understand that this project is considered to be an essential facility.

2.0 SCOPE OF SERVICES

The authorized scope of work included a general site reconnaissance, field exploration, laboratory testing, geotechnical analysis of the data gathered, and preparation of this report. The analysis and subsequent recommendations were based on verbal information provided by Mr. Gary Wilson of Wilson Engineering.

This report and recommendations are intended to comply with the considerations of Sections 1803A.1 through 1803A.7, and J104.3, as applicable, of the 2016 California Building Code (CBC) and common geotechnical engineering practice in this area under similar conditions at this time. The test procedures were accomplished in general conformance with the standards noted, as modified by common geotechnical engineering practice in this area under similar conditions at this time.

Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, drainage and maintenance, and observation and testing are presented to guide the development of project plans and specifications. As there may be geotechnical issues yet to be resolved, the geotechnical engineer should be retained to provide consultation as the design progresses, and to review project plans as they near completion to assist in verifying that pertinent geotechnical issues have been addressed and to aid in conformance with the intent of this report.

It is our intent that this report be used exclusively by the client to form the geotechnical basis of the design of the project and in the preparation of plans and specifications. Application beyond this intent is strictly at the user's risk.

This report does not address issues in the domain of contractors such as, but not limited to, site safety, loss of volume due to stripping of the site, shrinkage of soils during compaction, excavatability, dewatering, temporary slope angles, construction means and methods, etc. Analyses of aerial or site geology, or of the soil for corrosivity, radioisotopes, asbestos (either naturally occurring or in man-made products), lead or mold potential, hydrocarbons, or other chemical properties is beyond the scope of this report. Any ancillary features such as flag or light poles, and nonstructural fills are not within our scope and are also not addressed.

In the event that there are any changes in the nature, design, or location of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified by the geotechnical engineer in writing. The criteria presented in this report are considered preliminary until such time as any peer review or review by any jurisdiction has been completed, conditions have been observed by the geotechnical engineer in the field during construction, and the recommendations have been verified as appropriate, or modified by the geotechnical engineer in writing.

3.0 FIELD INVESTIGATION AND LABORATORY ANALYSIS

On July 13, 2018, two exploratory borings were drilled within the planned vicinity of the standby generator to a maximum depth of 7 feet below the existing ground surface (bgs). Due to limited access with truck mounted drilling equipment, the borings were drilled with hand augering equipment. As the exploratory borings were drilled, ring-lined barrel soil samples were obtained, along with bulk soil samples from the auger cuttings. The approximate locations of the borings are shown on Figure 2 - Exploration Location Map, in Appendix A.

The soils were classified in general accordance with the Unified Soil Classification System and ASTM D 2488-17. The logs of the borings are presented in Appendix A, along with the Boring Log Legend. In reviewing the boring logs and legend, the reader should recognize that the legend is intended as a guideline only, and there are a number of conditions that may influence the characteristics observed during drilling. These include, but are not limited to, the presence of cobbles or boulders, cementation, variations in soil moisture, presence of groundwater, and other factors. Consequently, the logger must exercise judgment in interpreting soil characteristics, possibly resulting in soil descriptions that vary from the legend.

One bulk sample was tested for maximum density and optimum moisture content (ASTM D 1557-12). All ring samples were tested for bulk density (ASTM D 2937-17, modified for rings) and moisture (ASTM D 2216-10). The results of the laboratory tests are presented in Appendix B.

4.0 GENERAL SUBSURFACE PROFILE

In the areas explored, the site was surfaced with approximately 1 foot of poorly graded sand fill. The fill was logged as being loose, and containing trace amounts of gravel and debris. Below the fill, medium dense poorly graded Dune Sand was found. The soil was logged during drilling as being slightly moist. Free subsurface water was not encountered in the borings to the maximum depth explored of 7 feet bgs.

5.0 CONCLUSIONS

In our opinion, the site is suitable, from a geotechnical engineering standpoint, for the proposed standby generator, provided the recommendations contained herein are implemented in the design and construction. From a geotechnical engineering standpoint, the primary concerns at the site are the presence of loose fill and the potential for excessive static settlement, the potential for strong ground shaking during a seismic event, the potential for liquefaction and dry sand settlement, and the erodible nature of the site soils.

Static Settlement

Approximately 1 foot of fill material was found in each boring. To our knowledge, there are no records documenting the proper placement or compaction of the fill during its original placement. Therefore, the fill is considered to be "undocumented" and should not be relied upon, in its current state, for support of foundations. As excessive total and differential settlement could occur. The fill was also logged as being loose. Loose soils are also prone to excessive amounts of static total and differential settlement when subjected to additional loads, such as those imposed by new foundations. This can stress and damage foundations and slabs, often resulting in severe cracks and displacement. To reduce the potential for excessive static settlement, it is recommended that the mat slab bear in recompacted soil, as described in the "Grading" Section of this report.

Strong Ground Shaking

The site is in a region of high seismic activity, with the potential for large seismic events that could generate strong ground shaking. A seismic analysis was undertaken to provide seismic acceleration design parameters. The 2010 ASCE 7 method with 2013 updates, available on the

United States Geological Survey Earthquake Hazards Program website (USGS 2018), was used. The project was considered to be an "essential" facility from the perspective of risk category as described by ASCE 7. Site coordinates of 35.1020 degrees north and 120.6165 degrees west as taken from the Google Earth website (Google 2018) were used in the analysis. Based upon the subsurface conditions encountered during our investigation and two previous investigations performed within a 0.2-mile radius, a Site Class D (Stiff soil) was used. The results of the seismic hazard analysis are presented in the "Foundations" section of this report.

Liquefaction and Dry Sand Settlement

The term "liquefaction" refers to a phenomenon that tends to occur in saturated soils of low density that have grain sizes within a certain range, usually fine to medium-grained poorly graded sands, silty sands, and silts. A sufficiently strong earthquake is also required to cause liquefaction. During liquefaction, the energy from the earthquake causes the water pressure within the pores of the soil to increase. The increase in water pressure decreases the friction between the soil grains, allowing the soil grains to move relative to one another. During this state, the soil will behave as a viscous liquid, temporarily losing its ability to fully support foundations and other improvements. The high pressure water will flow through the soil along the path of least resistance. As the pressure is released, the soils typically settle in a process called "dynamic settlement." Dynamic settlement can cause damage to structures and other surface and subsurface improvements.

Settlement of dry sand soil is a phenomenon that can also occur during an earthquake on sites with loose sandy soils. It essentially occurs due to the sand grains being rearranged to a denser condition as the site shakes, and results in additional dynamic settlement. However, as the name implies, free water is not necessary for dry sand settlement to occur.

Between March 2016 and January 2017, we assessed the potential for dynamic settlement (liquefaction and dry sand settlement) at three different sites; one located approximately 0.5 miles from this project site, and two others about 0.2 miles away. Of the three, the site located 0.5 miles away was determined to have the highest potential for dynamic settlement calculated at 13.5 inches. This site is in close proximity to Arroyo Grande Creek, and free subsurface water was recorded at 3 feet bgs at the time of the investigation. The two sites located 0.2 miles away were assessed as having the potential for 0.75 to 1.75 inches of dynamic settlement. Free subsurface water at these sites ranged from 19.5 to 21.5 feet bgs. Our firm performed a fourth subsurface investigation in January 2013, approximately 280 linear feet from the proposed

generator site; however, an assessment of dynamic settlement was not performed. Free subsurface water was recorded at 14 feet bgs during that investigation.

Based upon the location of this site relative to those previously assessed, we are of the opinion that there is a potential for dynamic settlement to affect this site, along with any existing improvements. Based upon our review and interpretation of the results of the previous sites assessed, we are further of the opinion that total and differential dynamic settlement at this site may be on the order of 6 inches and 3 inches, respectively.

To reduce the effects of dynamic settlement (total and differential), it is recommended that the mat slab supporting the generator be designed with sufficient rigidity, and the site soils be recompacted. Additionally, utilities should be constructed with flexible or articulating connections.

Erosion Potential

The soils are considered *highly* erodible. Caution should be exercised to protect the soil from erosion during and following construction.

6.0 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

These recommendations are applicable for the proposed guesthouse, and other improvements as described in the "Introduction and Site Setting" section of this report. If improvements not previously mentioned are included, the geotechnical engineer should be contacted for revised recommendations.

Unless otherwise noted, the following definitions are used in these recommendations presented below. Where terms are not defined, definitions commonly used in the construction industry are intended.

- **Foundation Area:** The area within the footprint of the mat slab foundation.
- **Grading Area:** The entire area to be graded, including the foundation area, and any areas where surface improvements will be constructed.
- **Moisture Conditioned:** Soil moisture content adjusted to optimum moisture content, or just above, prior to application of compactive effort.
- **Compacted / Recompacted:** Soils placed in level lifts not exceeding 8 inches in loose thickness and compacted to a minimum of 90 percent of maximum dry density, unless specified otherwise. The standard tests used to establish

maximum dry density and field density should be ASTM D 1557-12 and ASTM D 6938-17a, respectively, or other methods acceptable to the geotechnical engineer and jurisdiction.

Site Preparation

1. The ground surface in the grading area should be prepared for construction by removing the existing generator, foundation, concrete, fill, debris, and other deleterious materials. Any existing utility lines that will not remain in service should be either removed or abandoned. The appropriate method of utility abandonment will depend upon the type and depth of the utility. Recommendations for abandonment can be made as necessary.

2. Voids created by the removal of materials or utilities described above should be called to the attention of the geotechnical engineer. No fill should be placed unless the underlying soil has been observed by the geotechnical engineer.

Grading

1. Following site preparation, the soil in the foundation area should be excavated to a level plane a minimum of 1 foot below planned bottom-of-mat slab elevation. The resulting soil surface should then be moisture conditioned, and recompacted to a *minimum of 95 percent of the maximum dry density*.

2. The excavation should then be backfilled with Class 2 Aggregate Base, conforming to the requirements of Section 26 of the Standard Specifications (Caltrans 2015). The aggregate base should be placed in moisture conditioned lifts and compacted to a *minimum of 95 percent of the maximum dry density*.

3. In the remainder of the grading area, the existing soil should be scarified, moisture conditioned, and recompacted prior to the placement of any fill or construction of any improvements.

4. Voids created by dislodging rocks and/or debris during excavation should be backfilled and compacted, and the dislodged materials should be removed from the work area.

5. All materials used as fill should be cleaned of all debris and any rocks larger than 3 inches in maximum dimension. When fill material includes rocks, the rocks should be placed in

a sufficient soil matrix to ensure that voids caused by nesting of the rocks will not occur and that the fill can be properly compacted.

6. If the soils are overly moist so that they become unstable, or if the recommended compaction cannot be readily achieved, drying the soil to optimum moisture content, or just above, may be necessary. Placement of gravel layers or geotextiles may also be necessary to help stabilize unstable soils. Soils that are disturbed in any manner should be removed, moisture conditioned, and recompacted.

Utility Trenches

1. Unless otherwise recommended, utility trenches adjacent to foundations should not be excavated within the zone of foundation influence, as shown in Typical Detail A in Appendix C.

2. Utilities that must pass beneath a foundation should be placed with properly compacted utility trench backfill and the foundation should be designed to span the trench.

3. A select, noncorrosive, granular, sand material should be used as bedding and shading immediately around utilities. The site soil may be used for trench backfill above the select material beyond the foundation area. Class 2 Aggregate Base should be utilized as trench backfill within the foundation area.

4. In general, trench backfill should be compacted to a minimum of 90 percent of maximum dry density; however, trench backfill within the foundation area should be compacted to a *minimum of 95 percent of maximum dry density*.

5. Trench backfill should be placed in level lifts, moisture conditioned, and compacted to the minimums noted above.

6. Compaction of trench backfill by jetting or flooding is not recommended except under extraordinary circumstances. However, to aid in *encasing* utility conduits, particularly corrugated drain pipes, and multiple, closely spaced conduits in a single trench, jetting or flooding may be useful. Flooding or jetting should only be attempted with extreme caution, and any jetting operation should be subject to review by the geotechnical engineer.

7. The recommendations of this section are minimums only, and may be superseded by the requirements of the architect/engineer, the recommendations of pipe manufacturers or utility companies, or the requirements of the governing jurisdiction based upon soil corrosivity or other factors.

8. Due to the potential for dynamic settlement at the site, utilities should be constructed with flexible or articulating connections.

Foundations

1. A mat slab foundation may be used for support of the planned generator. The mat may be designed as a "waffle slab foundation", or a uniform thickness mat foundation. The decision to design the mat to be of uniform thickness or as a "waffle mat slab foundation" is left to the discretion of the architect/engineer.

2. The mat should be constructed on a pad that has been graded in accordance with the recommendations presented in the "Grading" Section above. The mat should be embedded a minimum of 12 inches below lowest adjacent grade around the perimeter of the foundation. The mat foundation should be reinforced per the requirements of the engineer. The mat slab should contain a minimum rebar meeting the criteria of ACI 318, Section 24.4 (ACI 2014).

3. The mat foundation should be designed using maximum allowable bearing capacity of 1,800 psf dead loads plus live loads. A modulus of subgrade reaction (K_{12}) of 200 pci (psi/in) may also be used in the design of the mat foundation.

4. The allowable capacity may be increased by one-third when transient loads such as wind or seismicity are included. Foundations may be designed using the following 2016 CBC seismic parameters:

SEISMIC PARAMETERS

Mapped Spectral Response Acceleration for Site Class B		Site Coefficients for Site Class D		Adjusted MCE Spectral Response Accelerations for Site Class D		Design Spectral Response Accelerations for Site Class D	
Seismic Parameter	Value (g)	Site Coefficient	Value	Seismic Parameter	Value (g)	Seismic Parameter	Value (g)
S_S	1.232	F_a	1.007	S_{MS}	1.241	S_{DS}	0.827

S_1	0.449	F_v	1.551	S_{M1}	0.697	S_{D1}	0.465
Peak Mean Ground Acceleration (PGA_m) : 0.515 g							
Seismic Design Category = D							

5. Assuming the mat foundation is sufficiently rigid and using the above design parameters, maximum settlement and differential settlement under *static conditions* are expected to be on the order of 1/2-inch and 3/8-inch, respectively. Maximum settlement and differential settlement under *seismic conditions* may be on the order of 6 inches and 3 inches, respectively.

6. In calculating resistance to lateral loads, a passive equivalent fluid pressure of 250 pcf and a coefficient of friction of 0.45 may be utilized in the design. Lateral capacity is based on the assumption that the soil adjacent to the foundation is undisturbed. Passive and friction resistance components of resistance may be combined in the analysis without reduction to either value.

7. The foundation excavation should be observed by the geotechnical engineer during excavation and prior to placement of formwork, reinforcing steel or concrete. Soil in foundation excavation should be lightly moistened and no desiccation cracks should be present prior to concrete placement.

Drainage and Maintenance

1. Unpaved ground surfaces should be graded during construction, and per Section 1804A.4 of the 2016 CBC, should be finish graded to direct surface runoff away from foundations and other improvements at a minimum 5 percent grade for a minimum distance of 10 feet. If this is not practicable due to the terrain, proximity of property lines, etc., swales with improved surfaces, area drains, or other drainage features should be provided to divert drainage away from these areas.

2. Finished surfaces should be sloped to freely drain toward appropriate drainage facilities. Water should not be allowed to stand or pond on or adjacent to foundations or improvements.

3. The on-site soils are *highly* erodible. Stabilization of surface soils, particularly those disturbed during construction, by vegetation or other means *during and following construction* is essential to protect the site from erosion damage. Care should be taken to establish and maintain vegetation.

4. Site improvements, particularly drainage improvements, should be inspected and maintained on a regular basis.

5. To reduce the potential for undermining of foundations and other improvements, all rodent activity should be aggressively controlled and kept to an absolute minimum.

Observation and Testing

1. It must be recognized that the recommendations contained in this report are based on a limited number of borings at the site and rely on continuity of the subsurface conditions encountered.

2. At a minimum, the geotechnical engineer should be retained to provide:
   - Review of grading and foundation plans as they near completion
   - Professional observation during grading
   - Oversight of compaction testing during grading and backfill
   - Oversight of soil special inspection during grading and foundation construction

3. Special inspection of grading should be provided as per Section 1705A.6 and Table 1705A.6 of the 2016 CBC; the special inspector should be under the direction of the geotechnical engineer. Special inspection of the following should be provided by the special inspector:
   - Utility trench backfill
   - Verification of proper overexcavation depth
   - Fill quality, placement, moisture conditioning, and compaction
   - Foundation excavation

4. A program of quality control should be developed prior to the beginning of the project. The contractor or project manager should determine any additional inspection items required by the architect/engineer or the governing jurisdiction.

5. Locations and frequency of compaction tests should be as per the recommendation of the geotechnical engineer at the time of construction. The recommended test locations and frequency may be subject to modification by the geotechnical engineer, based upon soil and moisture conditions encountered, size and type of equipment used by the contractor, the general trend of the results of compaction tests, or other factors.

6. A preconstruction site meeting among the district, the geotechnical engineer, the soil special inspector, the architect/engineer, and contractors is recommended to discuss planned construction procedures and quality control requirements.

7. The geotechnical engineer should be notified at least 48 hours prior to beginning construction operations.

7.0 CLOSURE

Our intent was to perform the investigation in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project and under similar conditions. No representation, warranty, or guarantee is either expressed or implied. This report is intended for the exclusive use by the client as discussed in the "Scope of Services" section. Application beyond the stated intent is strictly at the user's risk.

This report is valid for conditions as they exist at this time for the type of project described herein. The conclusions and recommendations contained in this report could be rendered invalid, either in whole or in part, due to changes in building codes, regulations, standards of geotechnical or construction practice, changes in physical conditions, or the broadening of knowledge. If Earth Systems Pacific is not retained to provide construction observation and testing services, it shall not be responsible for the interpretation of the information by others or any consequences arising there from.

If changes with respect to project type or location become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions used in the preparation of this report are not correct, the geotechnical engineer should be notified for modifications to this report. Any items not specifically addressed in this report should comply with the CBC and the requirements of the governing jurisdiction.

The preliminary recommendations of this geotechnical report are based upon the geotechnical conditions encountered at the site and may be augmented by additional requirements of the

architect/engineer, or by additional recommendations provided by the geotechnical engineer based on conditions exposed at the time of construction.

Thank you for this opportunity to have been of service. If you have any questions, please feel free to contact this office at your convenience.

End of Text.

TECHNICAL REFERENCE LIST

ACI (American Concrete Institute). 2014. "Building Code Requirements for Structural Concrete." *Document 318-14*.

ASCE (American Society of Civil Engineers). 2013. *Minimum Design Loads for Buildings and other Structures (7-10, third printing), Standards ASCE/SEI 7-10.*

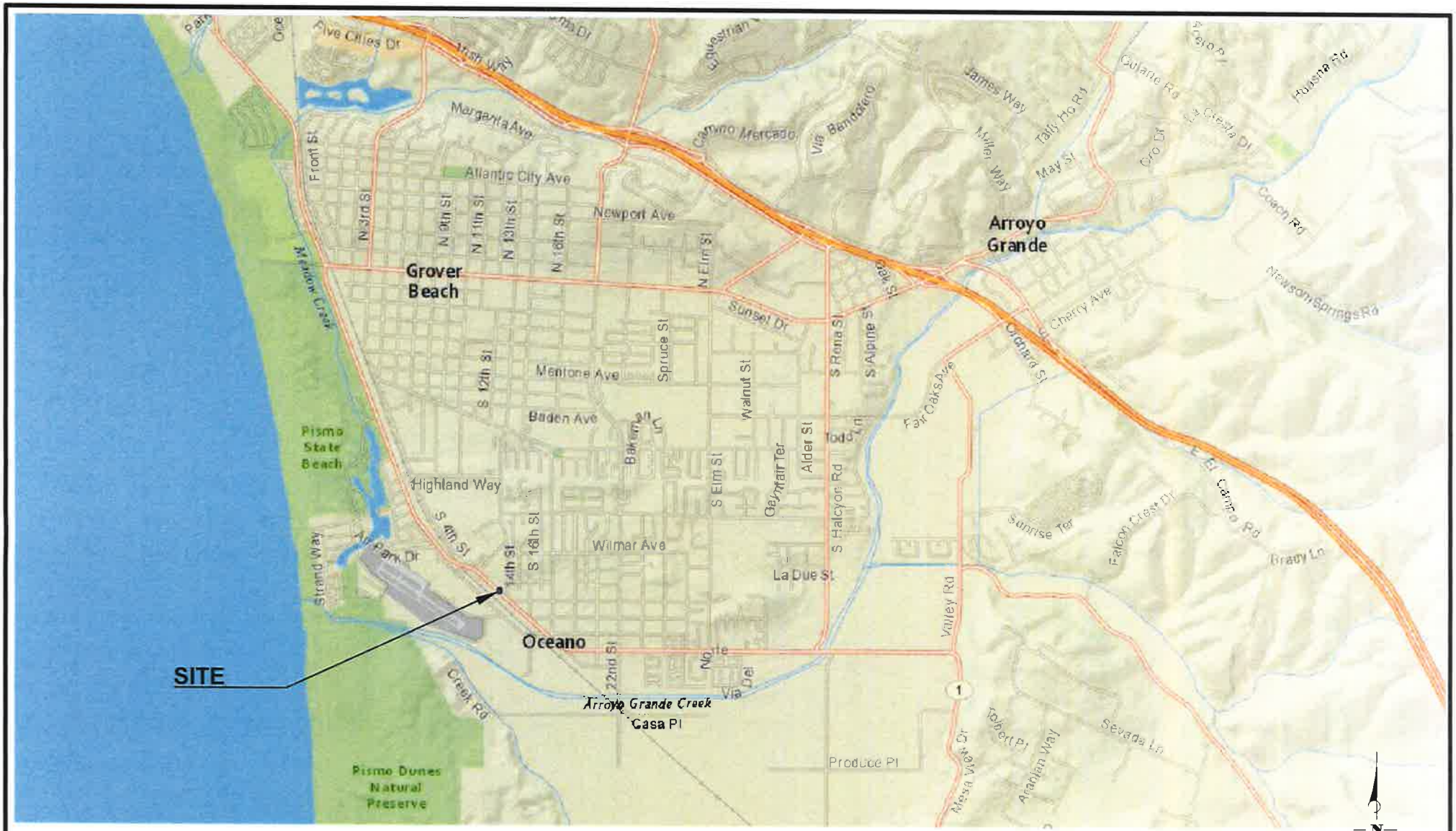
Caltrans (California Department of Transportation). 2015. "Standard Specifications."

Google Earth. 2018. Google Earth [website], retrieved from: http://www.google.com/earth/index.html

USGS (United States Geological Survey). 2018. Earthquake Hazards Program, retrieved from: http://earthquake.usgs.gov/hazards/designmaps/

APPENDIX A

Figure 1 – Site Vicinity Map
Figure 2 - Exploration Location Map
Boring Log Legend
Boring Logs



NOT TO SCALE

Earth Systems Pacific
4378 Old Santa Fe Road, San Luis Obispo, CA 93401
www.earthsystems.com
(805) 544-3276 • Fax (805) 544-1786

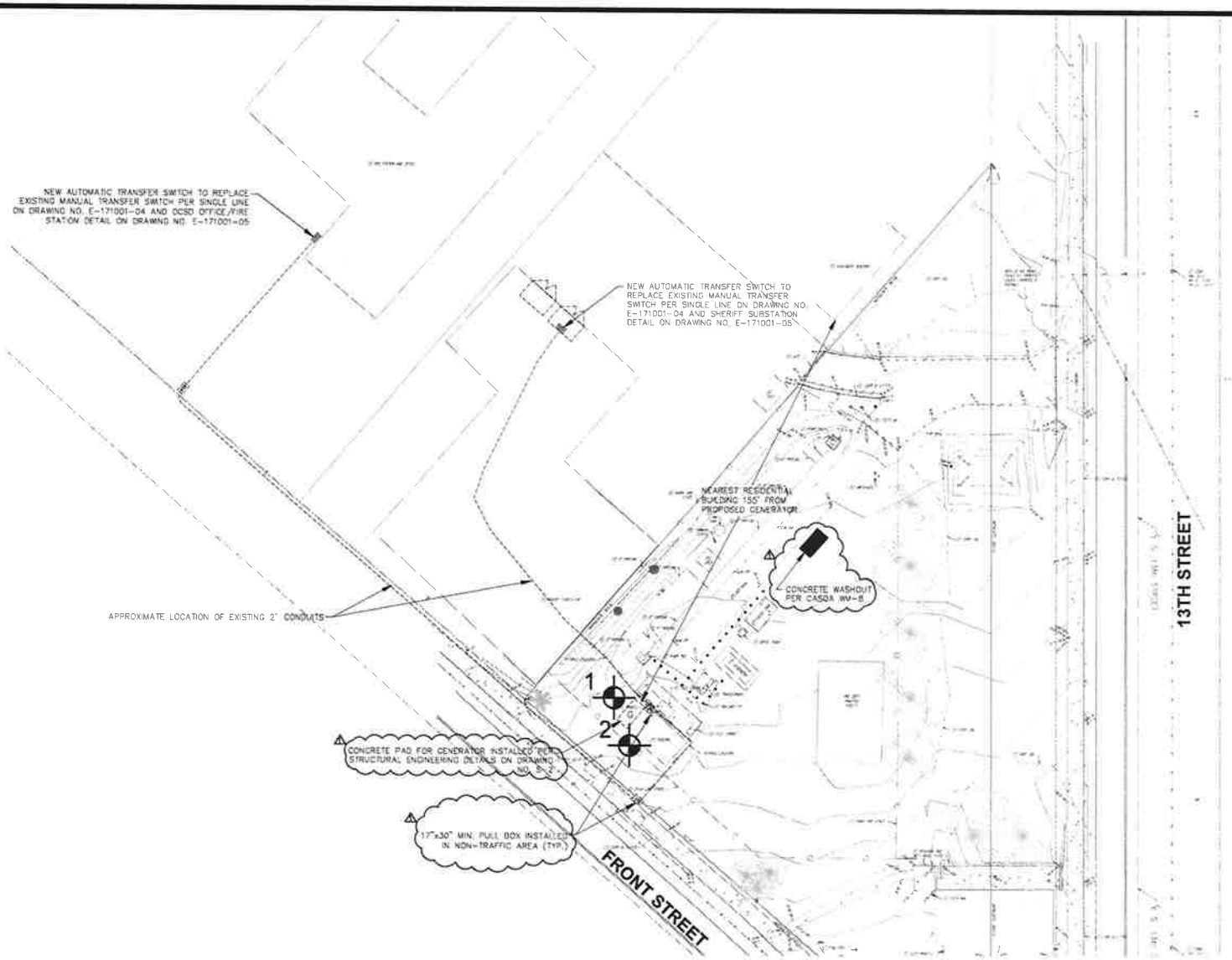
SITE VICINITY MAP

Oceano Community Services District
Replacement Standby Generator
1687 Front Street
Oceano, California

Date
July 2018

Project No.
302307-001

Figure 1



LEGEND

2 Boring Location (Approx.)

BASE MAP PROVIDED BY: WILSON ENGINEERING

N

NOT TO SCALE

Earth Systems Pacific
4378 Old Santa Fe Road, San Luis Obispo, CA 93401
www.earthsystems.com
(805) 544-3276 • Fax (805) 544-1786

EXPLORATION LOCATION MAP

Oceano Community Services District
Replacement Standby Generator
1687 Front Street
Oceano, California

Date
July 2018

Project No.
302307-001

Figure 2
Exhibit H3 - Geotechnical Report

0CEANOCSDGENERATOR072018-maps

Earth Systems Pacific

BORING LOG LEGEND

SAMPLE / SUBSURFACE WATER SYMBOLS	GRAPH. SYMBOL
CALIFORNIA MODIFIED	
STANDARD PENETRATION TEST (SPT)	
SHELBY TUBE	
BULK	
SUBSURFACE WATER DURING DRILLING	
SUBSURFACE WATER AFTER DRILLING	

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

MAJOR DIVISIONS	GROUP SYMBOL	TYPICAL DESCRIPTIONS	GRAPH. SYMBOL
COARSE GRAINED SOILS (MORE THAN HALF OF MATERIAL IS LARGER THAN #200 SIEVE SIZE)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
	GP	POORLY GRADED GRAVELS, OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES	
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES	
	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
	SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES	
	SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES	
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES	
FINE GRAINED SOILS (HALF OR MORE OF MATERIAL IS SMALLER THAN #200 SIEVE SIZE)	ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	

OBSERVED MOISTURE CONDITION

DRY	SLIGHTLY MOIST	MOIST	VERY MOIST	WET (SATURATED)

CONSISTENCY

COARSE GRAINED SOILS

BLOWS/FOOT SPT	BLOWS/FOOT CA SAMPLER	DESCRIPTIVE TERM
0-10	0-16	LOOSE
11-30	17-50	MEDIUM DENSE
31-50	51-83	DENSE
OVER 50	OVER 83	VERY DENSE

FINE GRAINED SOILS

BLOWS/FOOT SPT	BLOWS/FOOT CA SAMPLER	DESCRIPTIVE TERM
0-2	0-3	VERY SOFT
3-4	4-7	SOFT
5-8	8-13	MEDIUM STIFF
9-15	14-25	STIFF
16-30	26-50	VERY STIFF
OVER 30	OVER 50	HARD

GRAIN SIZES

U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENING		
# 200	# 40	# 10	# 4	3/4"	3"	12"

SILT & CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

TYPICAL BEDROCK HARDNESS

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
EXTREMELY HARD	CORE, FRAGMENT, OR EXPOSURE CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK; CAN ONLY BE CHIPPED WITH REPEATED HEAVY HAMMER BLOWS
VERY HARD	CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK; CORE OR FRAGMENT BREAKS WITH REPEATED HEAVY HAMMER BLOWS
HARD	CAN BE SCRATCHED WITH KNIFE OR SHARP PICK WITH DIFFICULTY (HEAVY PRESSURE); HEAVY HAMMER BLOW REQUIRED TO BREAK SPECIMEN
MODERATELY HARD	CAN BE GROOVED 1/16 INCH DEEP BY KNIFE OR SHARP PICK WITH MODERATE OR HEAVY PRESSURE; CORE OR FRAGMENT BREAKS WITH LIGHT HAMMER BLOW OR HEAVY MANUAL PRESSURE
SOFT	CAN BE GROOVED OR GOUGED EASILY BY KNIFE OR SHARP PICK WITH LIGHT PRESSURE, CAN BE SCRATCHED WITH FINGERNAIL; BREAKS WITH LIGHT TO MODERATE MANUAL PRESSURE
VERY SOFT	CAN BE READILY INDENTED, GROOVED OR GOUGED WITH FINGERNAIL, OR CARVED WITH KNIFE; BREAKS WITH LIGHT MANUAL PRESSURE

TYPICAL BEDROCK WEATHERING

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
FRESH	NO DISCOLORATION, NOT OXIDIZED
SLIGHTLY WEATHERED	DISCOLORATION OR OXIDATION IS LIMITED TO SURFACE OF, OR SHORT DISTANCE FROM, FRACTURES; SOME FELDSPAR CRYSTALS ARE DULL
MODERATELY WEATHERED	DISCOLORATION OR OXIDATION EXTENDS FROM FRACTURES, USUALLY THROUGHOUT; Fe-Mg MINERALS ARE "RUSTY", FELDSPAR CRYSTALS ARE "CLOUDY"
INTENSELY WEATHERED	DISCOLORATION OR OXIDATION THROUGHOUT; FELDSPAR AND Fe-Mg MINERALS ARE ALTERED TO CLAY TO SOME EXTENT, OR CHEMICAL ALTERATION PRODUCES IN SITU DISAGGREGATION
DECOMPOSED	DISCOLORATION OR OXIDATION THROUGHOUT, BUT RESISTANT MINERALS SUCH AS QUARTZ MAY BE UNALTERED; FELDSPAR AND Fe-Mg MINERALS ARE COMPLETELY ALTERED TO CLAY

drafting/masters/Boring Log Legend121714.dwg

Earth Systems Pacific

Boring No. 1
PAGE 1 OF 1

LOGGED BY: R. Wagner
DRILL RIG: Hand Auger
AUGER TYPE: 3" Solid Stem Auger

JOB NO.: 302307-001
DATE: 7/13/18

OCEANO COMMUNITY SERVICES DISTRICT
REPLACEMENT STANDBY GENERATOR
1687 Front Street
Oceano, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP		POORLY GRADED SAND: light brown, loose, slightly moist, trace gravel and debris (Fill)	1.0 - 5.0	○			
1	SP		POORLY GRADED SAND: yellow brown, medium dense, slightly moist (Dune Sand)	2.0 - 2.5	■	94.7	3.7	
2								
3								
4								
5				5.0 - 5.5	■	93.5	4.6	
6								
7			End of Boring @ 7.0' No subsurface water encountered					
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 2

LOGGED BY: R. Wagner
DRILL RIG: Hand Auger
AUGER TYPE: 3" Solid Stem Auger

JOB NO.: 302307-001
DATE: 7/13/18

OCEANO COMMUNITY SERVICES DISTRICT
REPLACEMENT STANDBY GENERATOR
1687 Front Street
Oceano, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP		POORLY GRADED SAND: light brown, loose, slightly moist, trace gravel and debris (Fill)					
1	SP		POORLY GRADED SAND: yellow brown, medium dense, slightly moist (Dune Sand)	1.5 - 2.0	■	97.2	4.3	
2								
3								
4				4.5 - 5.0	■	93.0	5.0	
5			End of Boring @ 5.0'					
6			No subsurface water encountered					
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

APPENDIX B

Laboratory Test Results

Oceano Community Services District
Replacement Standby Generator

302307-001

BULK DENSITY TEST RESULTS

ASTM D 2937-17 (modified for ring liners)

July 19, 2018

BORING NO.	DEPTH feet	MOISTURE CONTENT, %	WET DENSITY, pcf	DRY DENSITY, pcf
1	2.0 - 2.5	3.7	98.2	94.7
1	5.0 - 5.5	4.6	97.8	93.5
1	1.5 - 2.0	4.3	101.4	97.2
2	4.5 - 5.0	5.0	97.6	93.0

Oceano Community Services District
Replacement Standby Generator

302307-001

MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-12 (Modified)

PROCEDURE USED: B

PREPARATION METHOD: Moist

RAMMER TYPE: Mechanical

SPECIFIC GRAVITY: 2.65 (assumed)

July 19, 2018

Boring #1 @ 1.0 - 5.0'

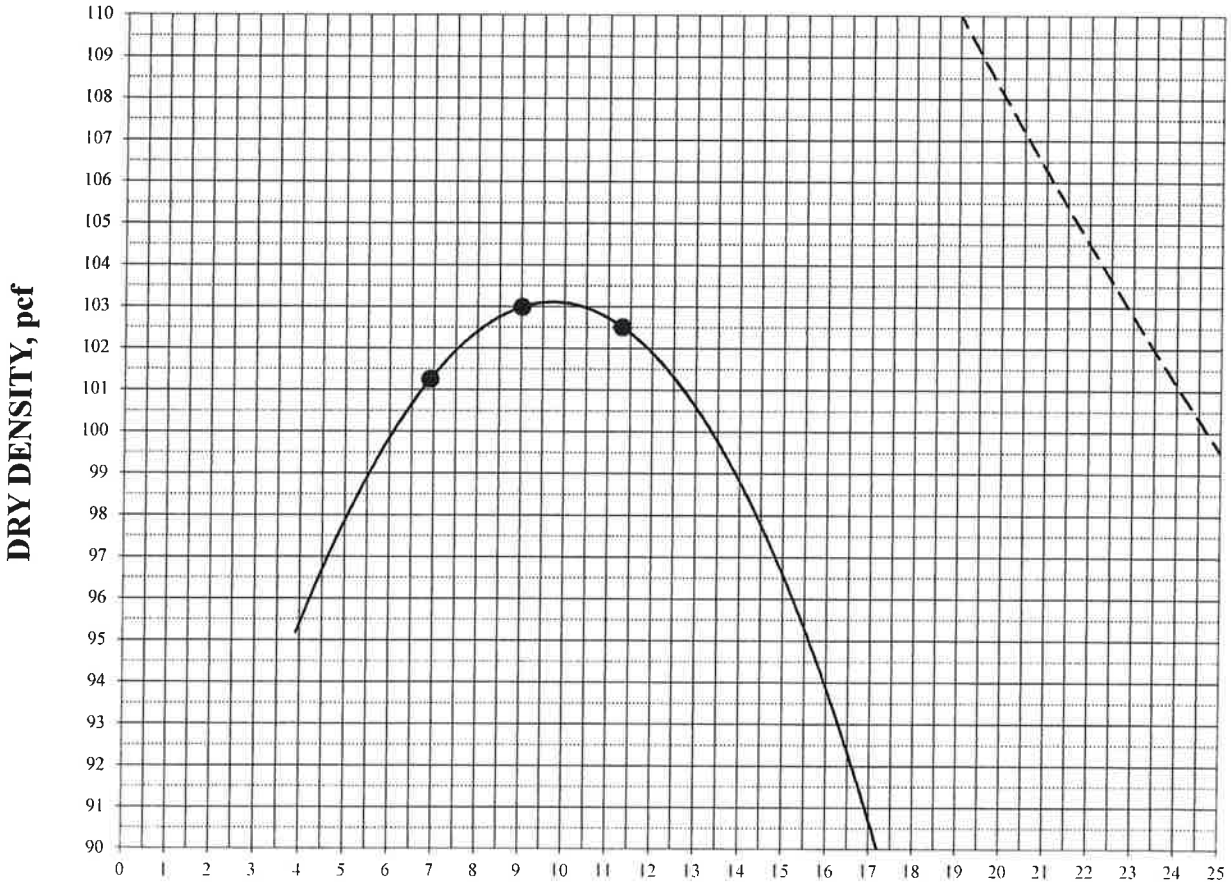
Light Brown Poorly Graded Sand (SP)

SIEVE DATA:

Sieve Size	% Retained (Cumulative)
3/4"	0
3/8"	2
#4	2

MAXIMUM DRY DENSITY: 103.1 pcf

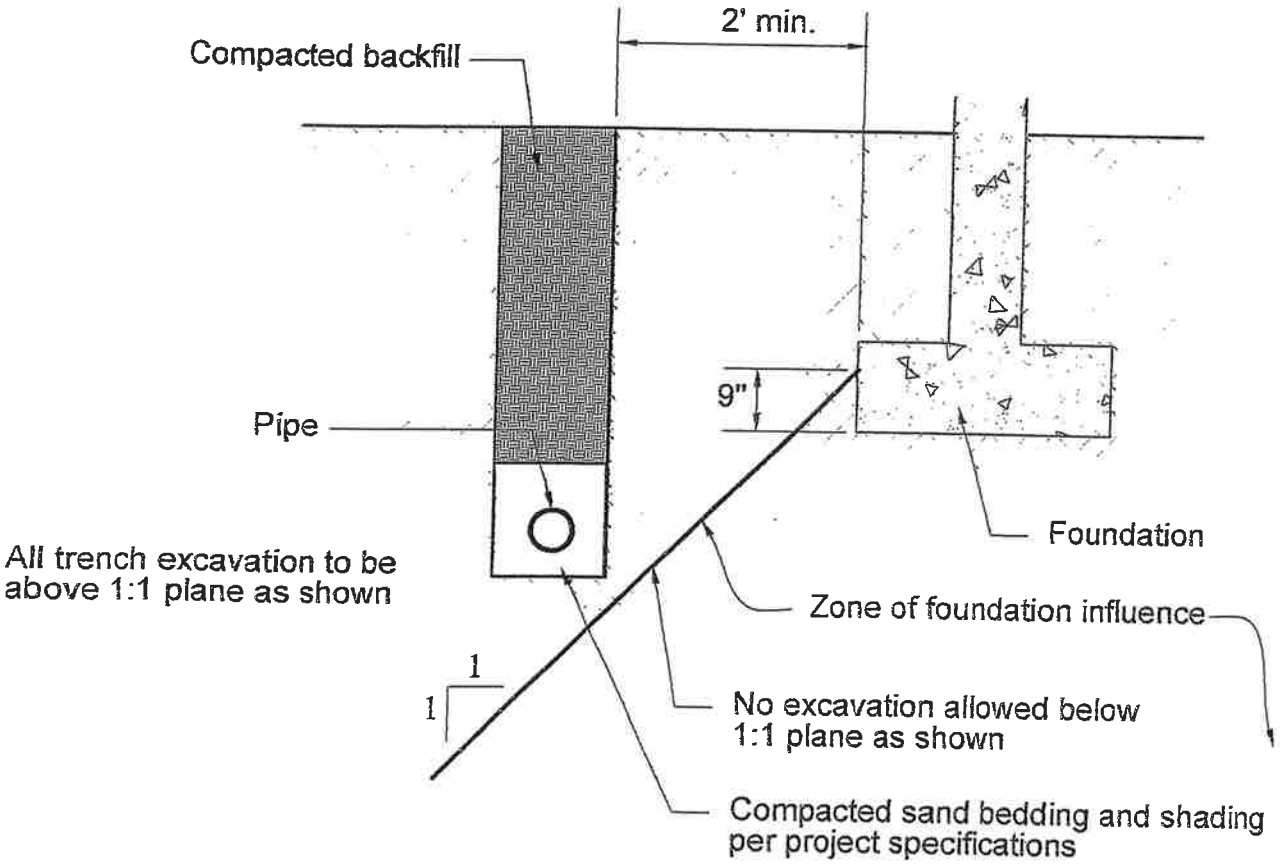
OPTIMUM MOISTURE: 9.7%



APPENDIX C

Typical Detail A: Pipe Placed Parallel to Foundations

TYPICAL DETAIL A
PIPE PLACED PARALLEL TO FOUNDATIONS



SCHEMATIC ONLY
NOT TO SCALE

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