Appendix 6 Geotechnical Report

PRELIMINARY GEOTECHNICAL EVALUATION
HUNTINGTON BEACH SENIOR CENTER
GOLDENWEST STREET
CITY OF HUNTINGTON BEACH, CALIFORNIA

PREPARED FOR:
EIP Associates
12301 Wilshire Boulevard, Suite 430
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PREPARED BY:
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May 9, 2007 (Revised July 31, 2007)
Project No. 207112001

Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

May 9, 2007 (Revised July 31, 2007)
Project No. 207112001

Ms. TJ Nathan
EIP Associates
12301 Wilshire Boulevard, Suite 430
Los Angeles, California 90025

Subject: Preliminary Geotechnical Evaluation
Huntington Beach Senior Center
Goldenwest Street
Huntington Beach, California

Dear Ms. Nathan:

In accordance with your request and authorization, we have performed a preliminary geotechnical evaluation for the proposed Huntington Beach Senior Center along the west side of Goldenwest Street in Huntington Beach, California. This report describes the soil and geologic conditions in the area of the proposed construction and addresses the seismic and geotechnical issues pertaining to the proposed Senior Center project.

We appreciate this opportunity to be of service on this project.

Respectfully submitted,
NINYO & MOORE

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Principal Engineer

JJB/LTJ/JV/emp

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1. INTRODUCTION

In accordance with your request, Ninyo & Moore has performed a preliminary geotechnical evaluation for the proposed Senior Center to be located southwest of the intersection of Goldenwest Street and Talbert/Library Drive in Huntington Beach, California (Figure 1). We are concurrently performing a geotechnical feasibility study for the project, which includes a subsurface evaluation. The feasibility report was not completed at the time of this report. Information from the subsurface evaluation, however, was utilized in our preliminary evaluation of the site characteristics. The purpose of this study was to address the geotechnical and seismic issues pertaining to the proposed improvements for inclusion in the Environmental Impact Report (EIR). Our evaluation was conducted in general accordance with our proposal dated December 22, 2006. This report presents our findings, conclusion, and preliminary recommendations regarding the subject project.

2. SCOPE OF SERVICES

Our scope of services for this geotechnical evaluation included the following:

- Review of readily available geologic and geotechnical literature, including topographic maps, geologic maps, regional fault maps, seismic hazard maps and reports, a draft master environmental impact report for the Huntington Beach Central Park, and stereoscopic aerial photographs.
- Performance of a geotechnical site reconnaissance by our engineering geologist on April 4, 2007.
- Assessment of the general geologic conditions and seismic hazards affecting the area, and evaluation of their potential impacts on the project.
- Compilation and analysis of the data obtained from our review and reconnaissance.
- Preparation of this report presenting our findings, conclusions, and preliminary recommendations regarding the geotechnical aspects of the site development.

3. PROJECT BACKGROUND AND UNDERSTANDING

The project study area is within a 5-acre portion of the 356-acre City of Huntington Beach Central Park (Figure 1). Prior usage of the overall park site (before 1974) generally included mining

of peat and sandy soils as well as disposal of solid wastes and inert debris (Sapphos Environmental, 1999). Numerous improvements have been constructed at the park subsequent to circa 1993, including an expansion to the library and development of the sports complex east of the subject site. Previous environmental evaluations for new improvements at the park did not indicate soil or geologic impacts, such as mining of peat and soils or disposal of solid wastes and inert debris, in the area of the proposed Senior Center site.

The proposed Senior Center site consists of approximately 5 acres of an undeveloped, 14-acre site within the Huntington Beach Central Park. The Senior Center site is located southwest of the intersection of Goldenwest Street and Talbert Avenue (Library Drive). The Senior Center would be an approximately 45,000-square-foot, single-story structure with multi-purpose rooms. Access to the site would be from the intersection of Goldenwest Street and Library Drive (Figure 2). In addition to the structure, outdoor patio and pavements would be provided. Grading is expected to generally consist of cuts and fills of less than 10 feet.

4. SITE DESCRIPTION

The site is situated in a relatively low-lying area bordered by ascending slopes on the north, east, and south sides of the project site. The slopes are up to approximately 20 feet in height and are generally inclined at approximately 2 to 1 (horizontal to vertical) and steeper. Based on a review of older aerial photographs (1953) and topographic maps (1968), previous grading has altered the original topography. The property currently slopes to the west from an elevation of approximately 26 feet above mean sea level (MSL) near the southeast corner to approximately 14 feet MSL near the southwest corner of the site.

The northern portion of the site is bounded by a composite fill/natural slope that separates the remainder of the 14-acre undeveloped area. The Shipley Nature Center is located farther north. The eastern portion of the site is bounded by a slope that ascends up to Goldenwest Street. The southern portion of the site is adjacent to a Frisbee golf course. Further to the south, a fill slope is present ascending approximately 20 feet to a landscaped portion of the Frisbee golf course.

Huntington Lake (man-made) is located approximately 400 feet southwest of the site. Developed park land (landscaped group picnic and open turf areas) are present west of the subject site.

The ascending slopes bordering the project are graded slopes. Erosion of the site and numerous gopher holes were observed along the slopes. An underground sewer line is present at the base of the eastern slope. Details regarding the sewer line were not available at the time of this report. Vegetation across the site generally consists of scattered weeds with a relatively thick cover of tumble weeds near the base of the eastern slope and along the southern margin of the site.

5. GEOLOGIC AND SUBSURFACE CONDITIONS

5.1 Regional Geologic Setting

The site is situated along the northern margin of the uplifted Huntington Beach Mesa within the central block of the Los Angeles Basin of the Transverse Ranges Geomorphic Province (Norris, 1990). The central block of the basin is bordered on the south by the active Newport Inglewood fault zone, approximately ¾ mile southwest of the site, and the Whittier-Elsinore fault zone, approximately 16 miles northeast of the site. The inactive Bolsa-Fairview fault is located approximately ¼ mile south of the site. The property is also situated along the northwest margin of the Huntington Beach Oil Field. No oil wells are known to be present within the site boundaries.

The City of Huntington Beach lies on a coastal plain underlain by relatively recent sediments ranging from Quaternary deposits from the Pliestocene (11,000 to 1,700,000 years) to Holocene (less than 11,000 years) (Figure 3). The older sediments are typically shallow marine terrace deposits that have been uplifted and eroded to form the Bolsa Chica and Huntington Beach mesas. The mesas are bordered by younger (unconsolidated) alluvial soils that fill the gaps near Seal Beach, Bolsa Chica, and the Santa Ana River. Older alluvial and/or terrace deposits are present at the site. These sediments are estimated to be in excess of 50 feet thick.

5.2 Site Geology

Based on our geologic reconnaissance, review of the referenced geologic maps, and recent subsurface exploration (April 4 and 13, 2007, feasibility study), the majority of the site is underlain by Pleistocene age older alluvial and/or terrace deposits. Artificial fill associated with previous grading activities mantles the natural deposits to variable depths. Based on our review of stereoscopic aerial photographs and site reconnaissance, the study area is not underlain by deep-seated landslides.

Based on our observation of the materials encountered in the borings and test pits for the feasibility study, the fill soils are generally comprised of loose to medium dense, clayey and silty sand with some oversize concrete and asphalt rubble to depths possibly up to approximately 15 feet. The fill soils are generally underlain by reddish to yellowish brown, medium dense to very dense, silty to poorly graded sand with some clayey silt older alluvium and/or terrace deposits to the maximum depths explored of approximately 50 feet. The on-site soils are relatively sandy and generally possess a low expansion potential. The more clayey natural soils, however, possess a medium to high expansion potential.

5.3 Groundwater

Groundwater was encountered in some of the borings recently drilled at the site at depths ranging from approximately 18 to 27 feet below the ground surface at the time of the drilling. Historic high groundwater levels at the project site have been estimated to be at depths ranging from approximately 10 feet along the west side of the site to approximately 30 feet along the east side of the site (California Division of Mines and Geology [CDMG], 1998). For the purpose of planning, groundwater is anticipated to be at a depth of approximately 10 feet or more below the ground surface within the project area. However, fluctuations in the level of groundwater may occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, and other factors that may not have been evident at the time of our field evaluation. Groundwater may, therefore, be shallower or deeper at the time of construction than the depth encountered during our subsurface evaluation.

5.4 Flood Potential

Based on our review of flood insurance rate maps for the project area (Federal Emergency Management Agency [FEMA], 1997), the project site is partially located in the Flood Hazard Zone X, along the west side. Zone X includes areas of 500-year floods and areas of 100-year floods with average depths of less than one foot. Further to the west and north of the site within the Huntington Beach Central Park, the area is located in the Flood Hazard Zone A99. In light of the proximity to Zone A, consideration should be given to protecting the site from a 100-year flood event.

6. FAULTING AND SEISMICITY

Based on our review of referenced geologic maps and stereoscopic aerial photographs, the ground surface in the vicinity of the subject site is not mapped as being transected by a known active or potentially active fault; therefore, the potential for surface fault rupture is considered to be low. The site is not located within a State of California Earthquake Fault Zone (Alquist-Priolo Special Studies Zone, Hart and Bryant, 1997). However, the subject site is located in a seismically active area, as is the majority of southern California, and the potential for strong ground motion at the site is considered significant. Figure 4 shows the approximate site location relative to the major faults in the region.

Table 1 lists selected principal known active faults that may affect the subject site, the maximum moment magnitude (M_{max}) as published by the CDMG (now known as the California Geological Survey [CGS]) (CDMG, 1998), and the type of fault as defined in Table 16-U of the Uniform Building Code (UBC) (International Conference of Building Officials [ICBO], 1997). The approximate fault to site distances were calculated using the computer program FRISKSP developed by Blake (2000).

Table 1 – Principal Active Faults

Fault	Approximate Fault to Site Distance miles (km)	Maximum Moment Magnitude[1] (M_{max})	Fault Type[2]
Newport-Inglewood (Los Angeles Basin)	0.75 (1.4)	6.9	B
San Joaquin Hills	4.35 (7.0)	6.6	B
Newport-Inglewood (Offshore)	9.2 (14.8)	6.9	B
Palos Verdes	10.9 (17.5)	7.1	B
Puente Hills Blind Thrust	16.0 (25.8)	7.1	B
Whittier	18.1 (29.2)	6.8	B
Elsinore-Glen Ivy	23.9 (38.5)	6.8	B
San Jose	24.7 (38.5)	6.5	B

Notes:
[1] CDMG, 1998.
[2] ICBO, 1997; CDMG, 1998.
Slip Rate <5 millimeters per year.

The potential seismic hazards at the site are ground shaking, surface ground rupture, seismically induced liquefaction, and liquefaction-induced settlement and lateral spreading, as well as landsliding and tsunamis. A brief description of the hazards and the potential for their occurrences on site are presented below.

6.1 Ground Motion

A probabilistic seismic hazard assessment that includes statewide estimates of peak horizontal ground accelerations has been conducted for California (Peterson, et al., 1996). Based on our review of this report and updated data available from the current United States Geological Survey website, the peak ground acceleration (PGA), with a 10 percent probability of exceedance in 50 years, is approximately 0.41g at the project site.

6.2 Ground Rupture

The probability of damage from surface ground rupture is low due to the lack of known active faults underlying the subject site. Surface ground cracking related to shaking from distant events is not considered a significant hazard, although it is a possibility.

6.3 Liquefaction, Dynamic Settlement, and Lateral Spread

Liquefaction is the phenomenon in which loosely deposited, saturated, granular soils (located below the water table) with clay contents (particles less than 0.005 millimeters [mm]) of less than 15 percent, liquid limit of less than 35 percent, and natural moisture content greater than 90 percent of the liquid limit undergo rapid loss of shear strength due to development of excess pore pressure during strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure, and it eventually causes the soil to behave as a fluid for a short period of time. Liquefaction is known generally to occur in saturated or near-saturated cohesionless soils at depths shallower than 50 feet below the ground surface. Factors known to influence liquefaction potential include composition and thickness of soil layers, grain size, relative density, groundwater level, degree of saturation, and both intensity and duration of ground shaking.

The project site is not located in an area mapped as susceptible to liquefaction (Figure 5). Based on the recent subsurface exploration, the materials below the groundwater are relatively dense and liquefaction should not be considered as a potential impact at the subject site.

6.4 Landsliding

The site is located in an area of relatively flat terrain. There are no mapped landslides onsite or adjacent to the site. Accordingly, seismic induced landsliding is not considered to be a potential hazard at the site.

6.5 Tsunamis and Seiches

Tsunamis are long wavelength, seismic, sea waves (long compared to ocean depth) generated by the sudden movements of the ocean floor during submarine earthquakes, landslides, or volcanic activity. Seiches are waves generated in a large, enclosed body of water. The project area is not mapped within an area considered susceptible to tsunamis or seiche inundation (Morton, 1976). The site is not expected to be affected by sieches due to the lack of a

large landlocked body of water at or adjacent to the site. The Huntington Lake is approximately 400 feet southwest and downgradient of the site. Accordingly, the lake should not impact the proposed development from a seiche event.

7. PRELIMINARY CONCLUSIONS

Based on the results of our geologic reconnaissance and limited geotechnical evaluation, it is our preliminary opinion that the proposed project is feasible from a geotechnical perspective. Furthermore, there are no significant geotechnical hazards associated with the soil and geologic conditions that would significantly impact the proposed development. The principal geotechnical impacts on the property are high ground shaking associated with the nearby faults and potentially compressible undocumented fill soils. These and other potential geotechnical constraints may be mitigated through appropriate planning, engineering design, and sound construction practices. In general, the following conclusions were made:

- Undocumented fill soils are expected at the site up to approximately 15 feet deep below the ground surface. Details regarding the placement and compaction of the fill soils, as well as the original ground preparation, are unknown. Accordingly, the fill soils are considered to be potentially compressible under future loading from new fills or foundations.
- The natural soils underlying the fill soils are expected to be comprised of relatively consolidated, older alluvial and /or terrace deposits. Organic clay or peat deposits are not expected at the site. Based on our recent subsurface exploration and past experience with similar soils, we do not anticipate that the natural deposits will be compressible under the currently proposed fill and foundation loads.
- The fill and natural soils at the site are generally suitable for reuse during the proposed grading. Existing oversize materials, such as concrete rubble, however, are present within the fill soils and will be encountered during grading and construction. These materials are unsuitable for reuse and should be disposed of off site. Trash and other debris were not observed in the old fill materials on site but may be encountered during grading and should be selectively removed and disposed off site.
- Groundwater was recently encountered at a depth of 18 or more feet below the ground surface at the site. Based on historical data provided by CDMG, groundwater may be as high as 10 feet below the ground surface. Provided no deep excavations are made, groundwater is not anticipated to impact the grading and proposed improvements.

- The site is not located in an area subject to seismic hazards such as landsliding, liquefaction, subsidence lateral spreading, or ground rupture. The site is, however, subject to relatively strong ground shaking from nearby active faults.
- Based on our reconnaissance and review of readily available aerial photographs, the property is not underlain by landslides. However, erosion is present on the slopes adjacent to the north, east, and south sides of the project.
- Based on our review of older photographs and topographic maps, no deep excavations associated with mining activities were evident at the site. Mining of peat, sand, and gravel, however, was evident on properties further east and southwest of the subject site.

8. GEOTECHNICAL CONSIDERATIONS AND MITIGATION

The site has some potential geologic and geotechnical constraints. Special consideration should be given to the geotechnical issues presented below, along with appropriate mitigative measures. The design and planning of the development should be based on a detailed geotechnical evaluation. As previously indicated, a geotechnical evaluation is being performed for the subject property the results of which will be in a separate report.

8.1 Seismic Ground Shaking

The proposed project site is situated in a seismically active area. During the design life of the development, strong ground shaking may occur. The closest active fault is the Newport Inglewood fault zone approximately ¾ mile south of the site. An estimated earthquake magnitude of 6.9 could occur on this fault zone, producing a peak horizontal ground acceleration of 0.41g at the project site. Accordingly, the proposed structures and improvements could be adversely impacted by the seismic ground shaking if proper mitigation measures are not implemented.

Seismic ground shaking can generally be mitigated through proper design and construction. Prior to the design, a subsurface geotechnical evaluation, including laboratory testing, should be performed. Structures should be designed and constructed in accordance with the current building code standards, as well as a detailed design geotechnical evaluation report.

8.2 Earthwork

Earthwork for the project should be performed in accordance with the Uniform Building Code (UBC) and local grading ordinances, as appropriate. We recommend that fill soils be compacted to 90 percent relative compaction in accordance with American Society of Testing Materials (ASTM 1557).

Based on our understanding of the project, the majority of the earthwork on the project will consist of minor cuts and fills. Existing fill and natural soils generated from excavations should be generally suitable for use in fills, provided unsuitable debris or oversized rock (larger than 6 inches) that may be present is removed. Fill soils to be used for backfill around utilities should be compacted to 90 percent relative compaction. Detailed earthwork recommendations should be provided in the design geotechnical report.

8.3 Compressible Soils

The project is underlain by undocumented fill soils. Our experience with similar materials suggests that the existing fills at the site are likely compressible under loading from additional fill or structures. Accordingly, structures situated in areas underlain by the undocumented fill soils may be impacted by differential settlement resulting from compression of these soils. The potential impact of settlement can be reduced through remedial grading to remove compressible soils and replace them with appropriately compacted fill or by supporting new structures on deep foundation systems that bear on underlying dense soils. Based on our discussions with Makar Properties, LLC (developer of the project), the remedial grading alternative will likely be used at the site.

8.4 Excavatability

The on-site soils should be readily excavated with conventional heavy grading equipment. Oversize material will be encountered at the site and should be disposed of off-site. Excavatability of the on-site materials may be further evaluated during the design phase of this project.

8.5 Slope Stability

The site is relatively flat, and no existing landslides were observed or mapped on site. Slopes should be generally stable if constructed at inclinations of 2 to 1 (horizontal to vertical) or flatter.

Existing slopes bordering the property have been subject to burrowing and erosion. In order to mitigate the erosion potential of the slopes adjacent to the site, the near surface soils should be compacted along the slope face. The slopes should then be covered with an appropriate erosion protection device and drought tolerant plants. For both cut and fill slopes, it is imperative that surface water runoff be diverted away from the tops of slopes to reduce the likelihood of surficial sliding and erosion.

8.6 Expansive Soils

Based on past experience with similar soils and available geotechnical literature, the alluvium and existing fills at the site generally possess a low to moderate expansion potential. The soil expansion potential, however, should be evaluated during the design phase of work on the project. Due to the potential for volume changes with fluctuations in moisture, expansive soils present a risk of distress to pavement, foundation elements, and other structures where present. Removal or chemical treatment may be recommended for expansive soil present near design grades to mitigate the potential for heaving or cracking of rigid structures. Expansive soils generated from excavations are undesirable for use as fill within 3 feet of slab-on-grade areas.

8.7 Corrosive Soils

Data pertaining to the corrosivity of the on-site soils was not available for our review. Corrosivity testing of the on-site soils should be performed during the design phase. Corrosivity testing may also need to be considered for soils that are imported for use as fill during construction. The corrosion potential of soils will influence the type of construction materials that may be used for structures and pipelines on the project. Where corrosive soils are present, selection of corrosion resistant material types for underground improvements and/or

providing corrosion protection to surfaces in contact with corrosive soils may be used. Concrete protection against sulfate bearing soils may include the use of corrosive resistant cement type and limiting the water-cement ratio of the concrete mix.

9. LIMITATIONS

The geotechnical analyses presented in this report have been conducted in accordance with current engineering practice and the standard of care exercised by reputable geotechnical consultants performing similar tasks in this area. No other warranty, implied or expressed, is made regarding the conclusions, recommendations, and professional opinions expressed in this report. Our preliminary conclusions and recommendations are based on a review of aerial photographs and available geotechnical literature, and an analysis of the observed conditions. Variations may exist and conditions not observed or described in this report may be encountered.

The purpose of this study was to evaluate geologic and geotechnical conditions within the site limits using readily available data and to provide a preliminary geotechnical report which can be utilized in the preparation of the Environmental Impact Report. A more detailed geotechnical evaluation, including subsurface exploration and laboratory testing, will be provided in a separate report for the design and construction of the proposed improvements.

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AERIAL PHOTOGRAPHS

Source	Date	Flight	Numbers	Scale
USDA	6-30-53	AXK – 1K	53, 54	1:20,000

REFERENCE: 2005 THOMAS GUIDE FOR LOS ANGELES/ORANGE COUNTIES, STREET GUIDE AND DIRECTORY

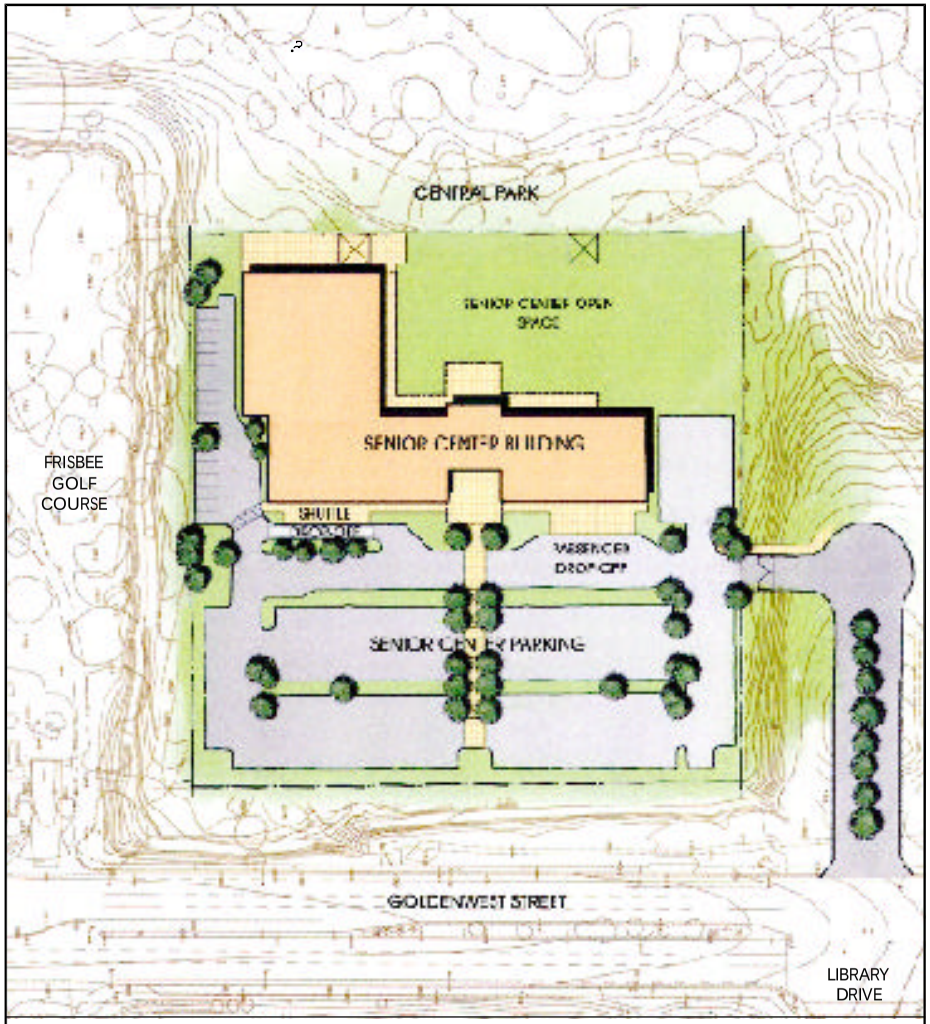
APPROXIMATE SCALE IN FEET
0 2400 4800

N

NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

207112—A1.DWG

Ninyo & Moore	SITE LOCATION MAP	FIGURE
PROJECT NO. 207112001 / DATE 7/07	HUNTINGTON BEACH SENIOR CENTER HUNTINGTON BEACH, CALIFORNIA	1



APPROXIMATE SCALE IN FEET

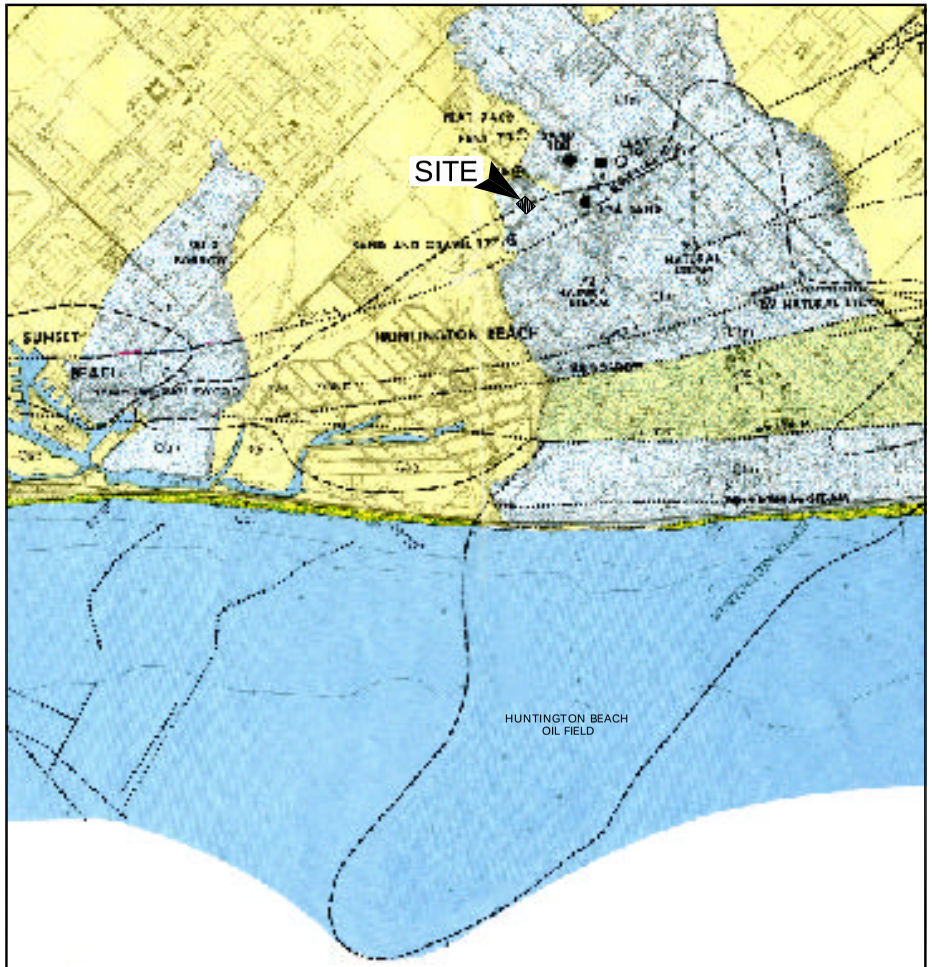
0 100 200

NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

N

207112-A2.DWG

Ninyo & Moore	CONCEPTUAL SITE PLAN	FIGURE
PROJECT NO. / DATE	HUNTINGTON BEACH SENIOR CENTER HUNTINGTON BEACH, CALIFORNIA	2
207112001 / 7/07		



N

APPROXIMATE SCALE IN FEET

0 4,000 8,000

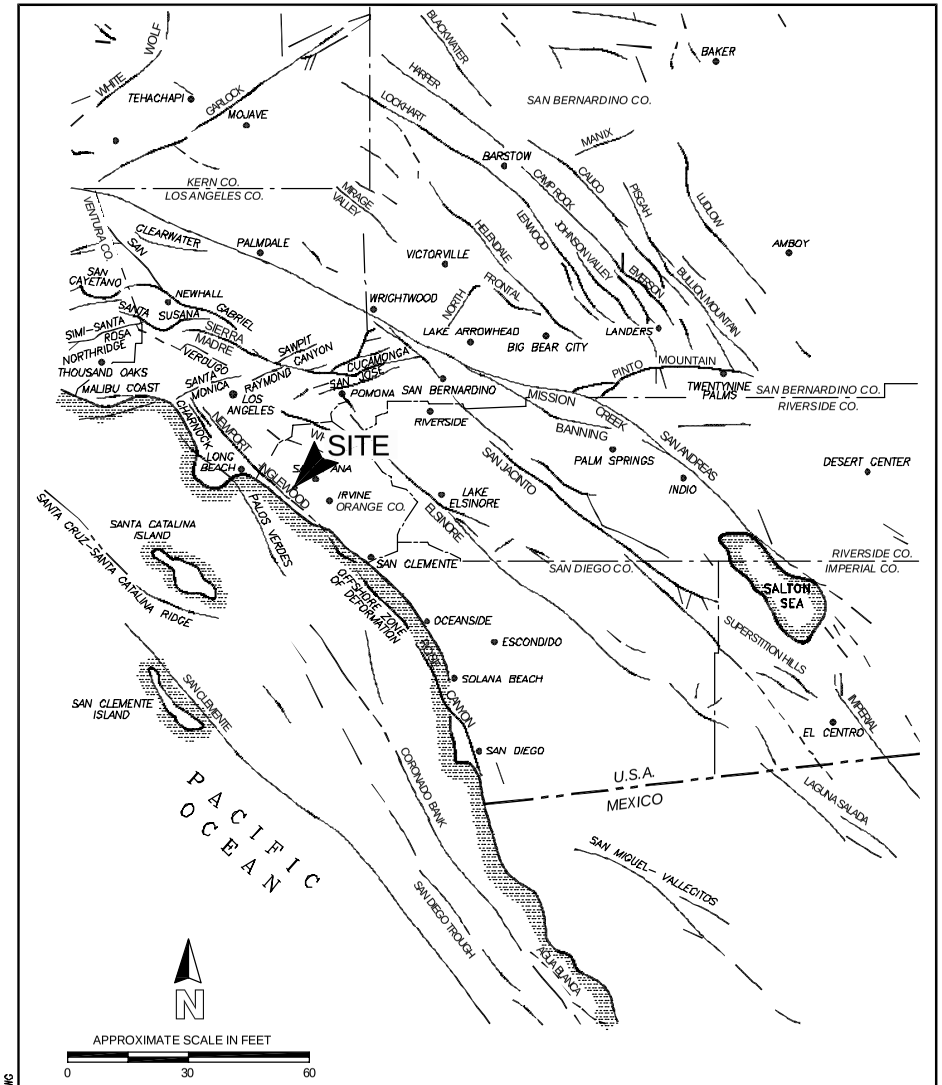
NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

- ALLUVIUM AND COLLUVIUM
- MARINE TERRACE DEPOSITS

207112-A3.DWG

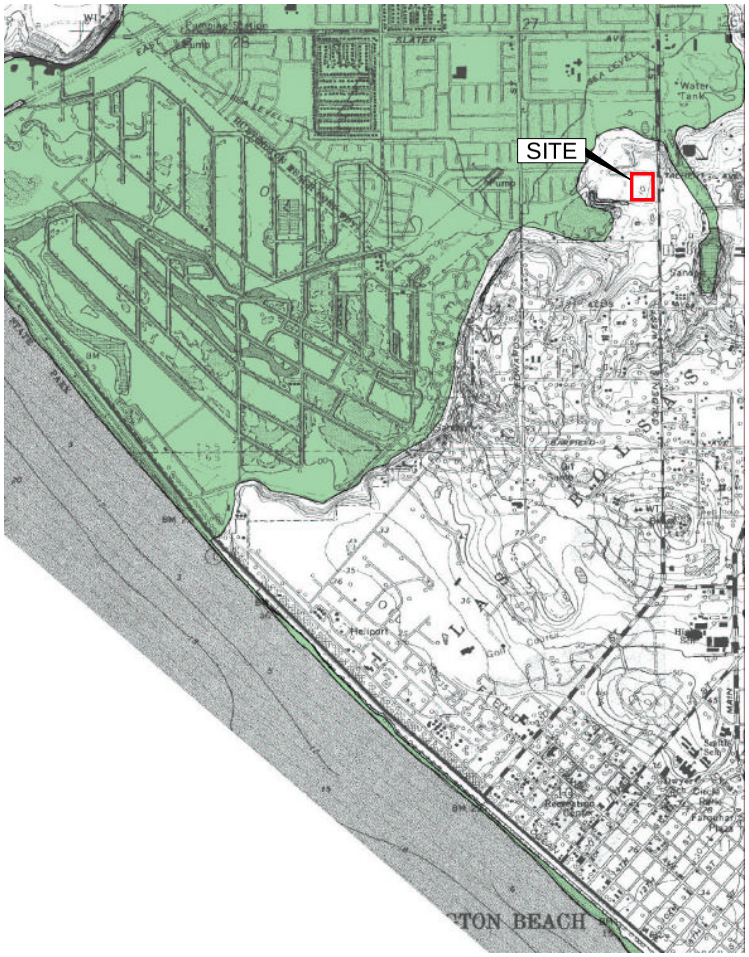
Ninyo & Moore	REGIONAL GEOLOGIC MAP	FIGURE
PROJECT NO. / DATE	HUNTINGTON BEACH SENIOR CENTER HUNTINGTON BEACH, CALIFORNIA	3
207112001 / 7/07		



NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

207112-A4.DWG

Ninyo & Moore	FAULT LOCATION MAP	FIGURE
PROJECT NO. 207112001 / DATE 7/07	HUNTINGTON BEACH SENIOR CENTER HUNTINGTON BEACH, CALIFORNIA	4



REFERENCE: STATE OF CALIFORNIA SEISMIC HAZARD ZONES, SEAL BEACH QUADRANGLE MAP, 1999.

APPROXIMATE SCALE
0
2,400
4,800 FEET

N

NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

MAP EXPLANATION

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

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Ninyo & Moore	SEISMIC HAZARD ZONES MAP	FIGURE
PROJECT NO. 207112001 / DATE 7/07	HUNTINGTON BEACH SENIOR CENTER HUNTINGTON BEACH, CALIFORNIA	5

Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

September 12, 2007
Project No. 207112001

Ms. T.J. Nathan
EIP Associates
12301 Wilshire Boulevard, Suite 430
Los Angeles, California 90025

Subject: Addendum to Preliminary Geotechnical Evaluation
Huntington Beach Senior Center
Goldenwest Street
Huntington Beach, California

Reference: Ninyo & Moore, 2007, Preliminary Geotechnical Evaluation, Huntington Beach Center, Goldenwest Street, Huntington Beach, California, May 9, revised July 31.

Dear Ms. Nathan:

In accordance with your request and authorization, we are providing this addendum to help clarify the mitigation of the erosion potential for slopes bordering the subject property. We previously issued the referenced preliminary geotechnical evaluation report for the site. At that time, we indicated that in order to mitigate the erosion potential of the slopes adjacent to the site, the near surface soils should be compacted along the slope face. In addition, the slopes should then be covered with erosion protection material and drought tolerant plants. Surface water runoff should be diverted away from the tops of slopes to reduce the likelihood of surficial sliding and erosion.

Based on our review of the conceptual grading plan, the proposed grading and improvements generally will not involve the existing slopes bordering Goldenwest Street and the Frisbee Golf Course to the south (Figure 1). It is our opinion that the erosion control measures cited in our referenced report may be omitted for these slopes without significant impact to the project. Future maintenance of these slopes, however, may include periodic removal of sedimentation and/or erosion repair depending on slope runoff or other environmental conditions.

We appreciate this opportunity to be of service on this project.

Respectfully submitted,
NINYO & MOORE

James J. Barton, C.E.G.
Senior Geologist

JJB/LTJ/emp

Attachment: Figure 1 – Conceptual Grading Plan

Distribution: (2) Addressee

207112001 L Add Prelim Geo - PDF

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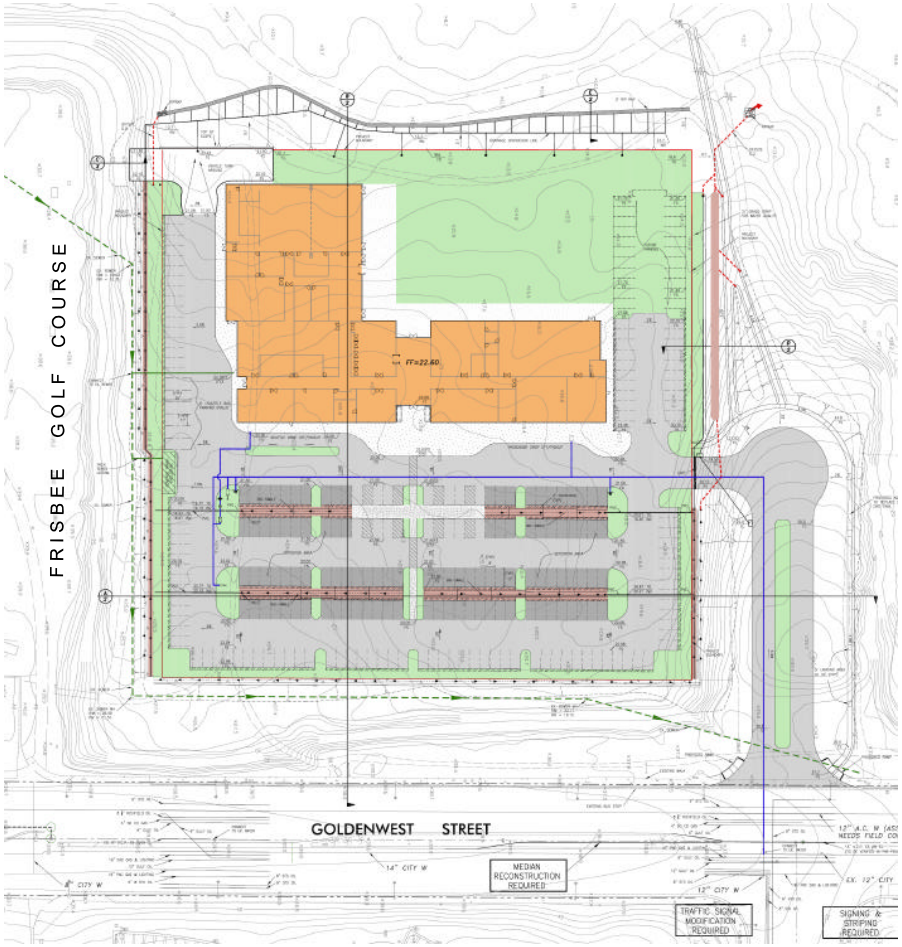

REFERENCE: BASE MAP BY FUSCOE ENGINEERING, 7/19/07.

N

APPROXIMATE SCALE
0 100 200 FEET

NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore	CONCEPTUAL GRADING PLAN	FIGURE
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