DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
11511 MAIN ST., P.O. BOX 90012
BELLEVUE, WA 98009-9012

DETERMINATION OF NON-SIGNIFICANCE

PROPONENT: Don Perinchief

LOCATION OF PROPOSAL: 355 Shoreland Drive SE

NAME & DESCRIPTION OF PROPOSAL: Perinchief Wall Stabilization

This is a proposal to install stabilization measures on an existing retaining wall that supports access to a residence within a steep slope critical area. Shoreline Exemption 10-123537-WE is associated with this review.

FILE NUMBER: 10-123536-LO

The Environmental Coordinator of the City of Bellevue has determined that this proposal does not have a probable significant adverse impact upon the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(C). This decision was made after the Bellevue Environmental Coordinator reviewed the completed environmental checklist and information filed with the Land Use Division of the Development Services Department. This information is available to the public on request.

☐ There is no comment period for this DNS. There is a 14-day appeal period. Only persons who submitted written comments before the DNS was issued may appeal the decision. A written appeal must be filed in the City Clerk's office by 5:00 p.m. on _____.

☒ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS. There is a 14-day appeal period. Only persons who submitted written comments before the DNS was issued may appeal the decision. A written appeal must be filed in the City Clerk's Office by 5 p.m. on 11/18/10.

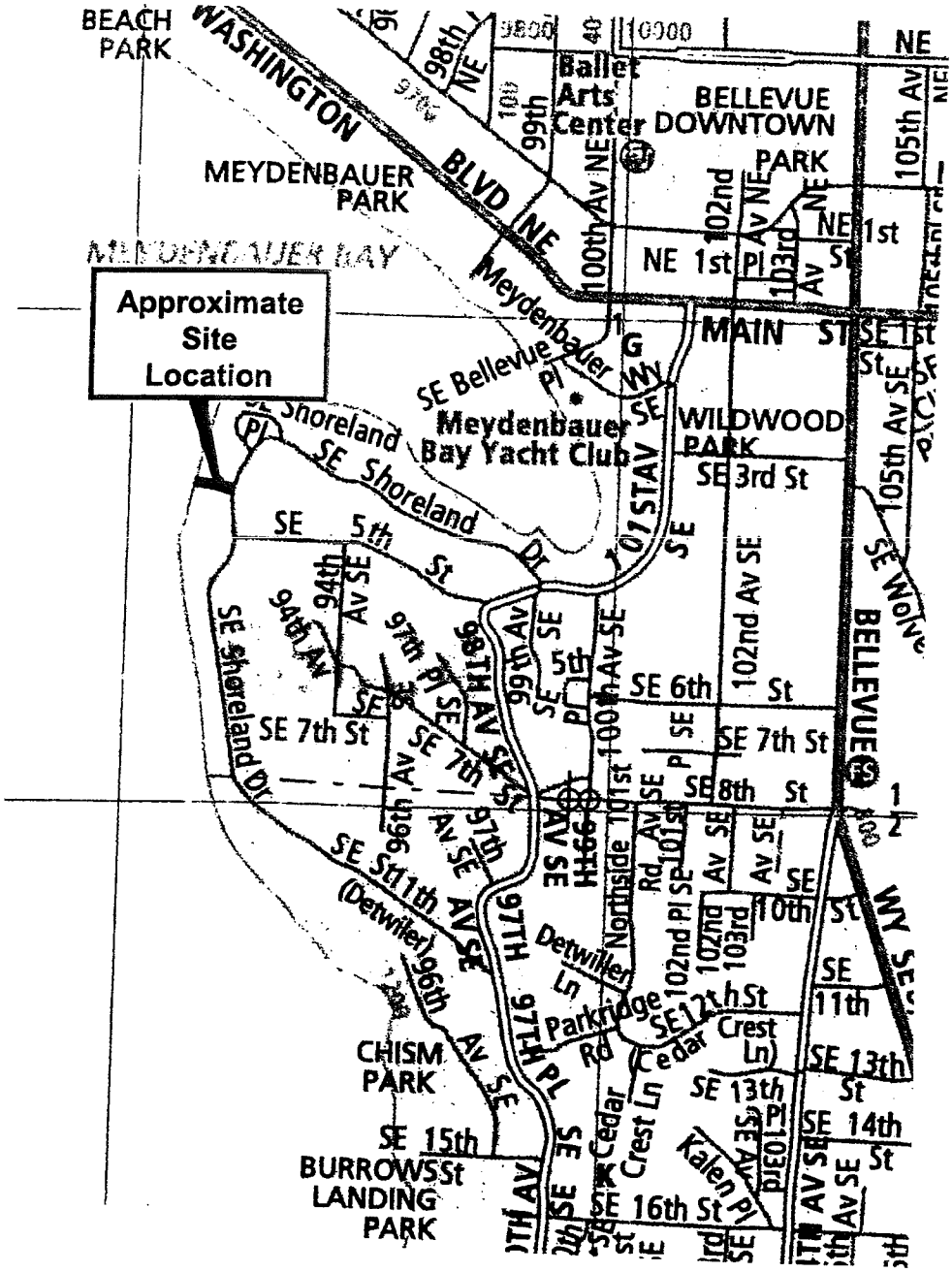
☐ This DNS is issued under WAC 197-11-340(2) and is subject to a 14-day comment period from the date below. Comments must be submitted by 5 p.m. on _____. This DNS is also subject to appeal. A written appeal must be filed in the City Clerk's Office by 5 p.m. on _____.

This DNS may be withdrawn at any time if the proposal is modified so that it is likely to have significant adverse environmental impacts; if there is significant new information indicating, or on, a proposals probable significant adverse environmental impacts (unless a non-exempt license has been issued if the proposal is a private project): or if the DNS was procured by misrepresentation or lack of material disclosure.

Environmental Coordinator

10/4/2010
Date

OTHERS TO RECEIVE THIS DOCUMENT:
State Department of Fish and Wildlife
State Department of Ecology,
Army Corps of Engineers
Attorney General
Muckleshoot Indian Tribe



Reference: Based on the 2008 edition of the Thomas Brothers King County Map number 566, grid C-6.

LEGAL DESCRIPTION

MAYDENBAUER POINT, LOT 15 TOGETHER WITH 2ND CLASS SHORELANDS AND TOGETHER WITH UN. INT. TRACT "B", "PRIVATE ROAD".

Creative Engineering Options INC. CEO A Firm Practicing in the Geosciences	VICINITY MAP	Plate 1

City of Bellevue
Development Services Department
Land Use Staff Report

Proposal Name:	Perinchief Wall Stabilization
Proposal Address:	355 Shoreland Drive SE
Proposal Description:	Land Use review of a Critical Areas Land Use Permit for stabilization repair of an existing retaining wall supporting access to a residence within a steep slope critical areas. Shoreline Exemption 10-123537-WE is associated with this review.
File Number:	10-123536-LO
Applicant:	Don Perinchief, Property Owner
Decisions Included	Critical Areas Land Use Permit (Process II. 20.30P)
Planner:	Reilly Pittman, Land Use Planner
State Environmental Policy Act Threshold Determination:	**Determination of Non-Significance** Carol V. Helland, Environmental Coordinator Development Services Department
Director's Decision:	**Approval with Conditions** Michael A. Brennan, Director Development Services Department By: _____ Carol V. Helland, Land Use Director
Application Date:	October 4, 2010
Notice of Application Date:	October 14, 2010
Decision Publication Date:	November 4, 2010
Project/SEPA Appeal Deadline:	November 18, 2010

For information on how to appeal a proposal, visit Development Services Center at City Hall or call (425) 452-6800. Comments on State Environmental Policy Act (SEPA) Determinations can be made with or without appealing the proposal within the noted comment period for a SEPA Determination. Appeal of the Decision must be received in the City's Clerk's Office by 5 PM on the date noted for appeal of the decision.

CONTENTS

I. Proposal Description ..... Pg 3

II. Site Description, Zoning & Land Use Context ..... Pg 3-5

III. Consistency with Land Use Code Requirements ..... Pg 5-8

IV. Public Notice & Comment ..... Pg 8

V. Summary of Technical Review ..... Pg 8-9

VI. State Environmental Policy Act (SEPA) ..... Pg 9

VII. Changes to Proposal Due to Staff Review ..... Pg 9

VIII. Decision Criteria ..... Pg 9-11

IX. Conclusion and Decision ..... Pg 11

X. Conditions of Approval ..... Pg 11-13

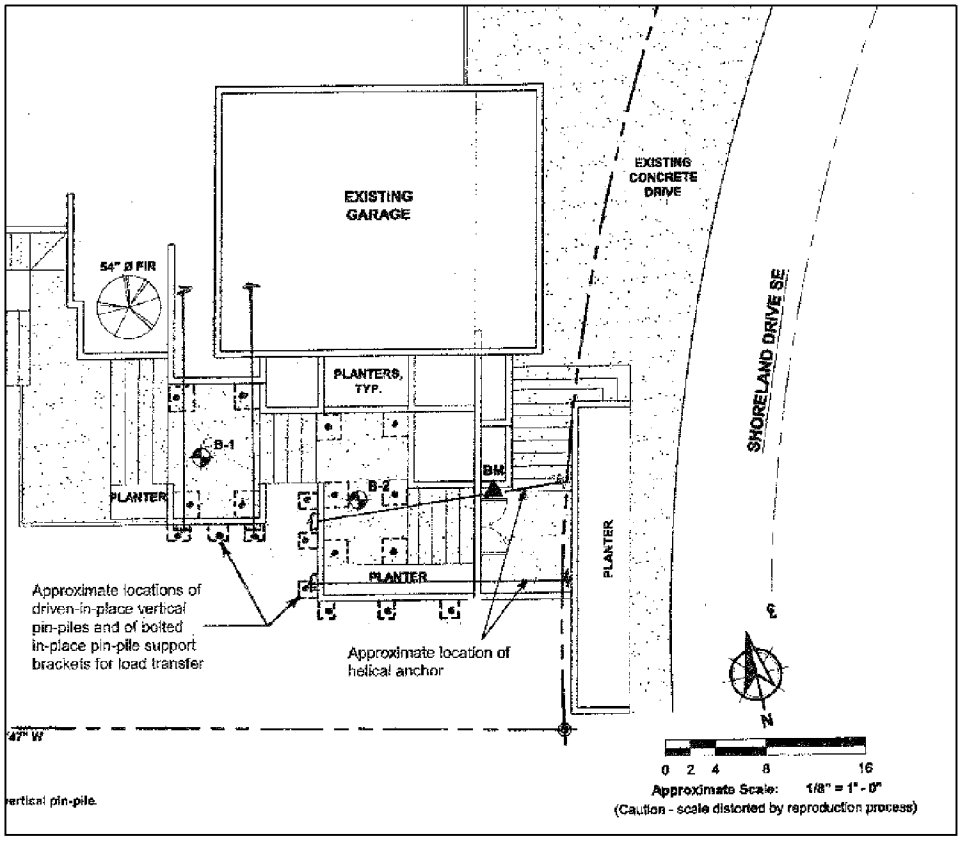
XI. Attachments ..... Pg 13

I. Proposal Description

The applicant proposes to stabilize an existing retaining wall which supports a walkway to an existing residence. The proposed work is significant enough to be considered stabilization within a steep slope critical area. Therefore, this work requires a Critical Areas Land Use Permit with SEPA review. This project is within 200 feet of Lake Washington and qualifies for an exemption letter from a Shoreline Substantial Development Permit for repair of an existing structure as the actual wall is not expanded and remains in its existing condition. An exemption letter will be issued under associated permit 10-123537-WE.

Stabilization is an allowed use in a critical area per LUC 20.25H.055 provided the City approves a Critical Areas Land Use Permit and the project is in conformance with required performance standards for work within a steep slope. See Figure 1 below for a site plan showing the proposed activities and Attachment 1 for the project plans.

Figure 1



II. Site Description, Zoning, Land Use and Critical Areas

A. Site Description

The project site is located at 355 Shoreland Drive SE in the Southwest Bellevue subarea. The site is located in the SE quadrant of Section 31, Township 25 North, Range 5 East. The site is adjacent to other single-family residences to the north and south, has shoreline frontage on Lake Washington to the west and is adjacent to Shoreland Drive SE to the east. The site has grades of 40 percent of greater, sloping down from Shoreland Drive SE to Lake Washington.

The existing residence occupies roughly the central two thirds of the property, and a single story wood frame garage is located in the northeastern corner of the site and is accessed directly off the edge of the street. Most of the easterly portion of the site, particularly along the southern side of the garage, is occupied by a series of concrete stairs, walkways and retaining walls that provide pedestrian access to the house. The remainder of the site adjacent to these walkways and stairs comprises a relatively steep, and landscaped, slope. See Figure 2 for existing site condition and Figure 3 for views of the slope adjacent to the retaining wall to be stabilized.

Figure 2

Figure 3

Looking East

Looking Southeast at Slope

B. Zoning

The property is zoned R-4, single-family residential and is located in the Critical Areas Overlay District. The properties to the north and south are also zoned R-4, but the surrounding area to east across Shoreline Drive SE is zoned R-3.5. Properties in the vicinity to the south are zoned R-1.8. The proposed work is allowed in the R-4 zone.

C. Land Use Context

The property has a Comprehensive plan Land Use Designation of SF-H (Single Family High

Density).

D. Critical Areas On-Site and Regulations

i. Geologic Hazard Areas

Geologic hazards pose a threat to the health and safety of citizens when commercial, residential, or industrial development is inappropriately sited in areas of significant hazard. Some geologic hazards can be reduced or mitigated by engineering, design, or modified construction practices. When technology cannot reduce risks to acceptable levels, building in geologically hazardous areas is best avoided (WAC 365-190).

Steep slopes may serve several other functions and possess other values for the City and its residents. Several of Bellevue's remaining large blocks of forest are located in steep slope areas, providing habitat for a variety of wildlife species and important linkages between habitat areas in the City. These steep slope areas also act as conduits for groundwater, which drains from hillsides to provide a water source for the City's wetlands and stream systems. Vegetated steep slopes also provide a visual amenity in the City, providing a "green" backdrop for urbanized areas enhancing property values and buffering urban development.

ii. Critical Areas Overlay District/Critical Areas Land Use Permit

Stabilization is an allowed use in LUC 20.25H.055, provided certain performance standards are met and a Critical Areas Land Use Permit is approved.

III. Consistency with Land Use Code Requirements:

A. Zoning District Dimensional Requirements:

The proposal generally meets the R-4 zoning dimensional requirements found in LUC 20.20.010. The proposed repairs are not expanding the existing structures but are anchoring the wall to the slope with pin piles and helical anchors. The work will require a building permit and/or a clearing and grading permit. See Conditions of Approval in Section X of this report.

B. Critical Areas Requirements LUC 20.25H:

The City of Bellevue Land Use Code Critical Areas Overlay District (LUC 20.25H) establishes performance standards and procedures that apply to development on any site which contains in whole or in part any portion designated as steep slope critical area. LUC 20.25H.055 establishes certain uses which are allowed in critical areas. The proposed stabilization is an allowed use, provided certain requirements are met. The project is subject to the performance standards found in LUC 20.25H as specified in the table below

Critical Area	**Geologic Hazard-Steep Slopes**
Performance Standards	20.25H.055.C.3.M 20.25H.125

Staff has reviewed the following documents prepared by the project geotechnical engineer:

- Geotechnical Engineering Study dated July 6, 2010 prepared by Creative Engineering Options Inc.
- Geotechnical Study Addendum A dated August 9, 2010 prepared by the same
- Geotechnical Study Addendum B dated September 29, 2010 prepared by the same

i. Consistency with Land Use Code 20.25H.055.C.3.M

The following performance standards, when applicable, shall be incorporated in the design of development on sites with steep slope geologic hazard critical areas, buffers, or structure setbacks. The submitted geotech reports address these performance standards

a. When Allowed. New or enlarged stabilization measures shall be allowed only to protect existing primary structures and infrastructure, or in connection with uses and development allowed pursuant to subsection B of this section. Stabilization measures shall be allowed only where avoidance measures are not technically feasible.

This proposal will stabilize existing retaining walls which support pedestrian access to the residence from the garage which is located adjacent to Shoreline Drive SE. Due to the location of the slope avoidance is not possible and stabilization is allowed. The project geotech has reviewed options which included "cantilevered solider pile wall, demolition of the existing wall structure… …and the construction of a new engineered concrete retaining wall" (Addendum B, P.2). These options would have required a large amount of equipment and significantly more disturbance than the repairs which are proposed that maintain the existing structures in place by anchoring them. The stabilization will result in a small amount of disturbance affecting an area within three feet of the wall.

b. Type of Stabilization Measure Used. Where a stabilization measure is allowed, soft stabilization measures shall be used, unless the applicant demonstrates that soft stabilization measures are not technically feasible. An applicant asserting that soft stabilization measures are not technically feasible shall provide the information relating to each of the factors set forth in this section for a determination of technical feasibility by the Director. Only after a determination that soft stabilization measures are not technically feasible shall hard stabilization measures be permitted. The determination of whether a technique or stabilization measure is "technically feasible" shall be made by the Director as part of the decision on the underlying permit after consideration of a report prepared by a qualified professional addressing the following factors:

(1) Site conditions, including topography and the location of the primary structure in relation to the critical area;

(2) The location of existing infrastructure necessary to support the proposed measure or technique;

(3) The level of risk to the primary structure or infrastructure presented by erosion or slope failure and ability of the proposed measure to mitigate that risk;

(4) Whether the cost of avoiding disturbance of the critical area or critical area buffer is substantially disproportionate as compared to the environmental impact of proposed disturbance, including any continued impacts on functions and values over time; and

(5) The ability of both permanent and temporary disturbance to be mitigated

The submitted geotechnical reports reviewed the stability of the slopes and the proposed wall stabilization. Generally, due to the slope's proximity to the existing improvements and the safety issues resulting failure of these improvements which are located above the residence, soft stabilization will not stabilize the existing structures and would require significantly more disturbance and slope alteration to establish soft stabilization. The proposal will maintain the existing access configuration and preserve vegetation on the slope and restore a minimal area of disturbance. The geotech has states the "proposed stabilization provides the best and most practical result with the minimum of site disturbance" (Addendum B, P.2). The wall is a hazard mitigation measure and does not stabilize the entire slope which would require several walls, substantial cost, and result in substantial disturbance.

Given that the wall is hazard mitigation and avoids extensive alteration and disturbance of the existing slope, staff concur that the proposed stabilization system will serve the desired purpose of maintaining the existing access. All evaluations and recommendations contained in the geotechnical studies and used in the city's evaluation of the proposal were completed by a licensed qualified professional. Any design or documentation submitted to the city as part of future permit applications related to this project must follow the recommendations of the project geotech. See Conditions of Approval in Section X of this report.

ii. Consistency With LUC 20.25H.125

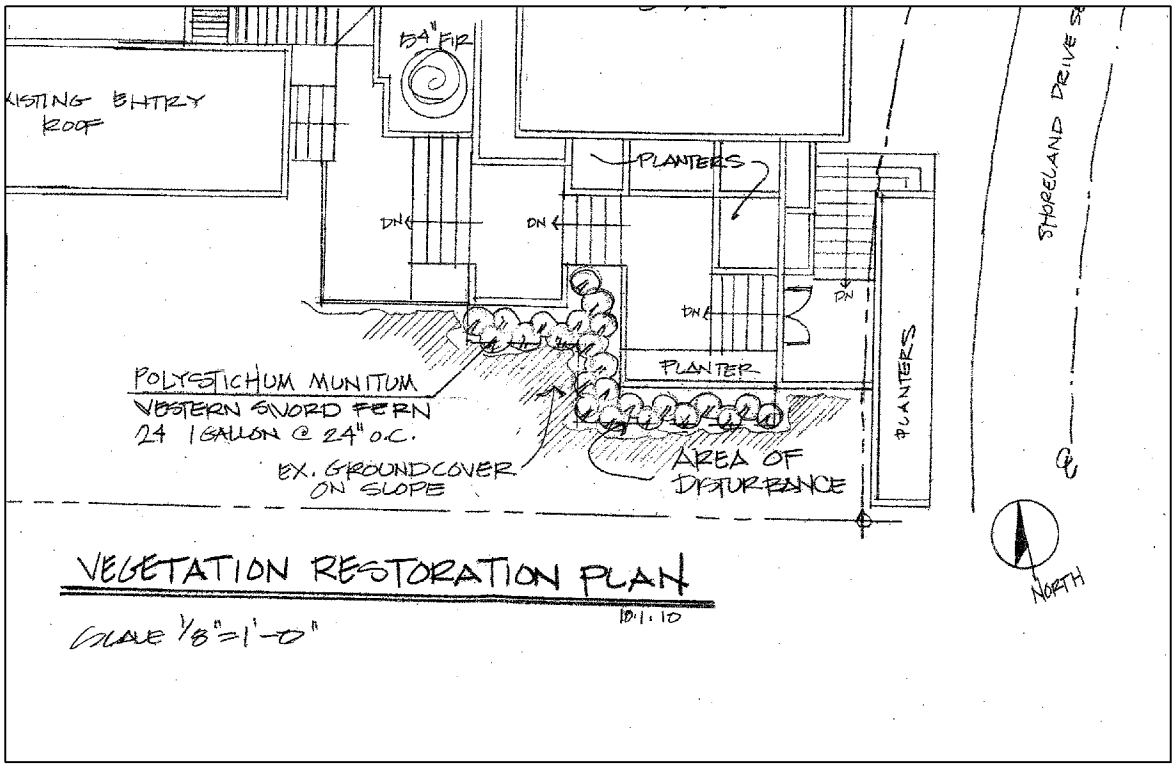
The performance standards found in LUC 20.25H.125 are being met as:

- The proposed stabilization does not alter the natural contours, steep slopes, and vegetation.
- The proposed anchor stabilization will secure the existing walls which will improve safety and risk from wall failure.
- The stabilization is for a retaining wall which maintains the existing steep slopes

and avoids regarding.

- Minimal new impervious surface is being created and is only resulting from the piles and anchors being driven into the wall.
- No buildings are proposed in a critical area and no structures other than the soldier pile wall will disturb the slope.
- No structures are proposed
- Restoration of temporary disturbance is proposed which will be found at the foot of the wall as seen in Figure 4 below. See Conditions of Approval in Section X of this report.

Figure 4



IV. Public Notice and Comment

Application Date:	October 4, 2010
Public Notice (500 feet):	October 14, 2010
Minimum Comment Period:	October 28, 2010

The Notice of Application for this project was published the City of Bellevue Weekly Permit Bulletin on October 14, 2010. It was mailed to property owners within 500 feet of the project site. No comments were received.

V. Summary of Technical Reviews

A. Clearing and Grading

The Clearing and Grading Division of the Development Services Department has reviewed the proposed site development for compliance with Clearing and Grading codes and

standards. The Clearing and Grading staff found no issues with the proposed development and has approved the application.

VI. State Environmental Policy Act (SEPA)

The environmental review indicates no probability of significant adverse environmental impacts occurring as a result of the proposal. The Environmental Checklist submitted with the application adequately discloses expected environmental impacts associated with the project. The City codes and requirements, including the Clear and Grade Code, Utility Code, Land Use Code, Noise Ordinance, Building Code and other construction codes are expected to mitigate potential environmental impacts. Therefore, issuance of a Determination of Non-Significance (DNS) is the appropriate threshold determination under the State Environmental Policy Act (SEPA) requirements.

A. Earth, Air, and Water

The nature of the stabilization result in minimal earth movement and the existing topography will be maintained. Any erosion and sedimentation control requirements and BMPs will be reviewed by the Clearing and Grading Department under development permits. See Conditions of Approval in Section X of this report.

B. Plants and Animals

No significant trees will be removed and no impacts to species of local importance are anticipated. Vegetation to be removed will be ornamental or in most cases invasive and noxious plants. Restoration of temporary disturbance is proposed in an areas within 2 to 3 feet of the toe of the wall where construction will disturb existing vegetation cover. See Conditions of Approval in Section X of this report.

D. Noise

The only noise anticipated as a result of this work will be from construction. Any noise is regulated by Chapter 9.18 BCC. See Conditions of Approval in Section X of this report.

VII. Changes to Proposal Due to Staff Review

No changes were requested.

VIII. Decision Criteria

A. 20.25H.145 Critical areas report – Approval of modification.

Modifications to geologic hazard critical areas and critical area buffers shall only be approved if the Director determines that the modification:

1. **Will not increase the threat of the geological hazard to adjacent properties over conditions that would exist if the provisions of this part were not modified;**

   The project geotechnical engineer has reviewed the proposed modifications and found in the geotech report that the proposal is not expected to "disturb, damage, or destabilize" the steep slope" (Addendum B, P. 1).

2. **Will not adversely impact other critical areas;**

   The only proposed work in a critical area is for the installation of stabilization measures. This will cause minimal disturbance along the toe of the wall. No other critical areas other than the slope will be impacted.

3. **Is designed so that the hazard to the project is eliminated or mitigated to a level equal to or less than would exist if the provisions of this part were not modified;**

   The proposed stabilization is removing the hazard of immediate wall failure to maintain access and protect the existing house (Addendum B, P.1).

4. **Is certified as safe as designed and under anticipated conditions by a qualified engineer or geologist, licensed in the state of Washington;**

   The project geotechnical engineer has found that the proposal will avoid "significantly greater detrimental impact," to the critical area than other methods would create (Addendum B, P.2).

B. 20.30P.140 Critical Areas Land Use Permit Decision Criteria – Decision Criteria
The Director may approve, or approve with modifications an application for a Critical Areas Land Use Permit if:

1. **The proposal obtains all other permits required by the Land Use Code;**

   The applicant must obtain a building permit. Plans submitted for the building permit must reflect all work proposed. See Conditions of Approval in Section X of this report.

2. **The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer;**

   The proposal is consistent with required performance standards for projects in steep slope critical areas and stabilization projects.

3. **The proposal incorporates the performance standards of Part 20.25H to the maximum extent applicable, and ;**

   As discussed in Section III of this report, the applicable performance standards of LUC Section 20.25H are being met.

4. **The proposal will be served by adequate public facilities including street, fire protection, and utilities; and;**

The proposed activity will not affect public services or facilities.

5. **The proposal includes a mitigation or restoration plan consistent with the requirements of LUC Section 20.25H.210; and**

   The proposed restoration of temporary disturbance is per the planting templates found in the City's Critical Areas Handbook which is acceptable. Restoration will be per the submitted plan found as Attachment 2 of this report. Maintenance and monitoring is required for a period of 1 year and Land Use inspection of the planting, once installed, is required. See Conditions of Approval in Section X of this report.

6. **The proposal complies with other applicable requirements of this code.**

   As discussed in this report, the proposal complies with all other applicable requirements of the Land Use Code.

IX. Conclusion and Decision

After conducting the various administrative reviews associated with this proposal, including Land Use Code consistency, SEPA, City Code and Standard compliance reviews, the Director of the Development Services Department does hereby **approve with conditions** the stabilization of existing retaining walls within a steep slope. **Approval of this Critical Areas Land Use Permit does not constitute a permit for construction. A building permit, and/or clearing and grading permit is required and all plans are subject to review for compliance with applicable City of Bellevue codes and standards.**

Note- Expiration of Approval: In accordance with LUC 20.30P.150 a Critical Areas Land Use Permit automatically expires and is void if the applicant fails to file for a building permit or other necessary development permits within one year of the effective date of the approval.

X. Conditions of Approval

The applicant shall comply with all applicable Bellevue City Codes and Ordinances including but not limited to:

Applicable Ordinances	Contact Person
Clearing and Grading Code- BCC 23.76	Savina Uzunow, 425-452-7860
Land Use Code- BCC Title 20	Reilly Pittman, 425-452-4350
Noise Control- BCC 9.18	Reilly Pittman, 425-452-2973

The following conditions are imposed under the Bellevue City Code or SEPA authority referenced:

1. **Building Permit or Clearing and Grading Permit Required:** Approval of this Critical Areas Land Use Permit does not constitute an approval of a development permit.

Application for a building permit or clearing and grading permit must be submitted and approved. Plans submitted as part of either permit application shall be consistent with the activity permitted under this approval.

Authority: Land Use Code 20.30P.140
Reviewer: Reilly Pittman, Development Services Department

2. **Restoration of Temporary Disturbance:** The proposed restoration planting shall be consistent with the plan dated September 1, 2010 which is Attachment 2 of this report. The restoration plan shall be revised to include the following notes:
   - **Land Use inspection of planting required.**
   - **Maintenance and Monitoring of planting required for at least 1-year following Land Use inspection. A report is required to be submitted to Land Use with photos showing the planting and a description of the maintenance activity at the end of the 1-year monitoring period.**

   Authority: Land Use Code 20.30P.140
   Reviewer: Reilly Pittman, Development Services Department

3. **Land Use Inspection:** Following installation of planting the applicant shall contact Land Use staff to inspect the planting area.

   Authority: Land Use Code 20.25H.220
   Reviewer: Reilly Pittman, Development Services Department

4. **Maintenance and Monitoring Plan:** Maintenance and monitoring of the planting is required for at least 1-year from the date of the Land Use inspection. After the 1-year monitoring period a report of the planting is required to be submitted to Land Use with photos showing the planting and a description of the maintenance activity.

   Authority: Land Use Code 20.25H.220
   Reviewer: Reilly Pittman, Development Services Department

5. **Hold Harmless Agreement:** The applicant shall submit a hold harmless agreement in a form approved by the City Attorney which releases the City from liability for any damage arising from the location of improvements within a critical area buffer in accordance with LUC 20.30P.170. The hold harmless agreement is required to be recorded with King County prior to building permit issuance. Staff will provide the applicant with the hold harmless form.

   Authority: Land Use Code 20.30P.170
   Reviewer: Reilly Pittman, Development Services Department

6. **Geotechnical Recommendations:** Construction of the proposed improvements shall

meet all recommendations and performance standards found in the project geotechnical reports which are attached to this report:

- Geotechnical Engineering Study dated July 6, 2010 prepared by Creative Engineering Options Inc.
- Geotechnical Study Addendum A dated August 9, 2010 prepared by the same
- Geotechnical Study Addendum B dated September 29, 2010 prepared by the same

Authority: Land Use Code 20.30P.140
Reviewer: Reilly Pittman, Development Services Department

7. **Noise Control:** Noise related to construction is exempt from the provisions of BCC 9.18 between the hours of 7 am to 6 pm Monday through Friday and 9 am to 6 pm on Saturdays, except for Federal holidays and as further defined by the Bellevue City Code. Noise emanating from construction is prohibited on Sundays or legal holidays unless expanded hours of operation are specifically authorized in advance. Requests for construction hour extension must be done in advance with submittal of a construction noise expanded exempt hours permit.

   Authority: Bellevue City Code 9.18
   Reviewer: Reilly Pittman, Development Services Department

XI. Attachments:

1. Project Plans – Enclosed
2. Restoration Planting Plan – Enclosed
3. Geotechnical Addendum A and Addendum B prepared by Creative Engineering Options Inc.– Enclosed
4. Geotechnical Engineering Study prepared by Creative Engineering Options Inc. – In File
5. Application, plans, SEPA checklist, and other project information – In File

BUILDING DEPARTMENT NOTES:

Job Address: 355 Shoreland Drive S.E.
Bellevue, Washington 98004
[Parcel Number 5494400150]

Property Owners: Mr. & Ms. Donald Perinchief

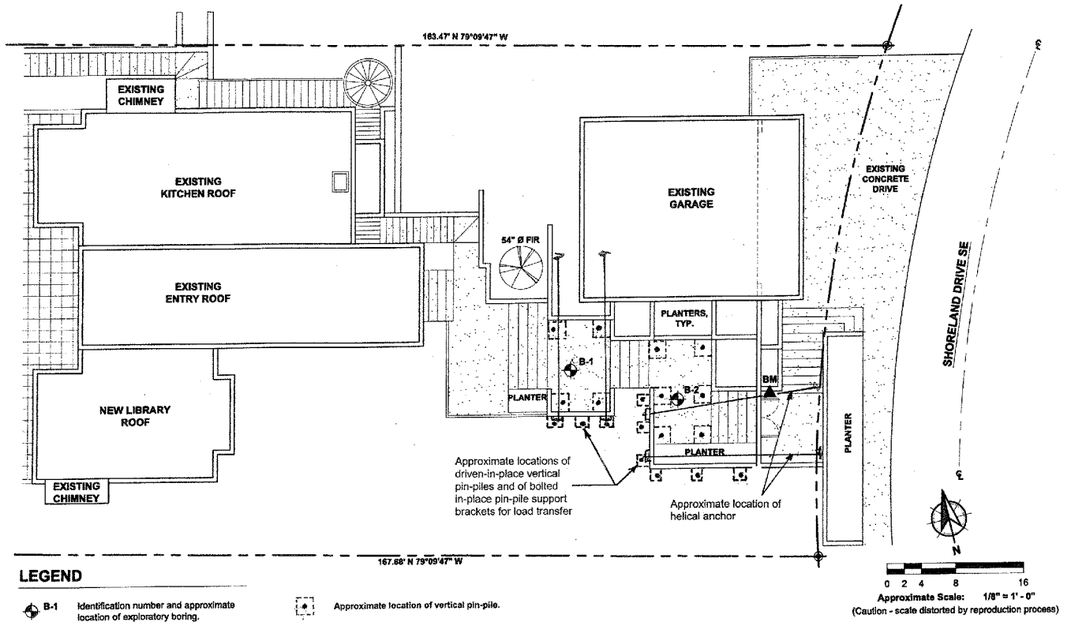
Scope of Work: To install a series of nine driven-in-place vertical, small diameter, steel pin-piles to provide supplemental vertical support to an approximately 25-foot long segment of existing concrete retaining wall, and to connect them to bolted-in-place steel load transfer and support brackets. Also, to drive ten additional pin-piles beneath the existing concrete flatwork above the walls to provide supplemental slab support, and to attach them to the slab by means of reinforced concrete "patches". And, to install five screwed-in-place helical anchors through pre-cored holes in the existing concrete walls to provide lateral restraint to the retaining walls. All of the above to be completed without performing any site excavation or filling.

Building Code: 2009 I.B.C. as amended by the local building code.

Geotechnical Engineer: **Creative Engineering Options, Inc.**
5418 - 159th Place N.E.
Redmond, Washington 98052
[425] 883-6889
Mr. Glen Mann, P.E.

Reference: Geotechnical Engineering Study, Proposed residential Retaining Wall and Walkway Stabilization and Repair, 355 Shoreland Drive S.E., Bellevue, Washington report by CEO, Inc., dated July 6, 2010.

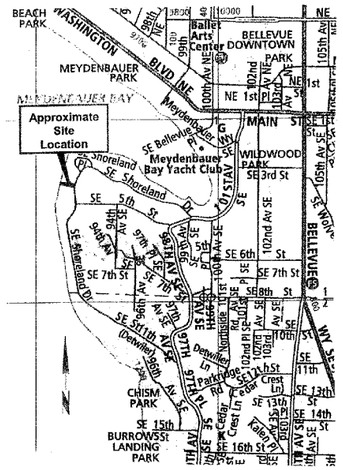
Addendum A to the above Geotechnical Engineering Study Report dated August 9, 2010.



LEGEND

- B-1 — Identification number and approximate location of exploratory boring.
- Approximate location of vertical pin-pile.
- BM — Approximate location of temporary bench mark (at assumed elevation of 100 feet)

Site Plan



Vicinity Map

General Construction Notes:

1) All construction shall be in accordance with the details, or as specified in the attached Geotechnical Engineering Report by CEO, Inc., 10-2916, dated July 6, 2010, and Addendum A to that report dated August 9, 2010.

2) All materials and workmanship shall be in accordance with the recommendations provided in the CEO, Inc., Geotechnical Engineering Report 10-2916, dated July 6, 2010 and Addendum A to that report dated August 9, 2010, or as modified by the Manufacturers' specifications or procedures.

3) In the event there is a conflict between the Geotechnical Engineering Report and the Manufacturers' specifications or procedures, the Manufacturers' specifications or procedures shall govern.

4) The contractor shall be responsible for the preparation of the construction area and for the installation of the appropriate Temporary Erosion and Sediment Control [TESC] measures before any work gets underway.

5) The contractor is responsible for all measures, means, and elements of construction site safety as it pertains to his staff, his subcontractors' staff, the engineer, and the owners representatives when visiting the site, and for all measurements, dimensions, processes or procedures.

6) The geotechnical engineer does **not** in any way supervise or direct the contractor, his subcontractors and their staff, or any other engineers. This responsibility remains solely with the General Contractor.

CODE COMPLIANCE:

All materials, workmanship, field design and construction shall conform to the drawings, specifications, local jurisdictions, and the 2006 edition of the International Building Code [IBC], as amended by the local building code. It shall then be the Contractors' responsibility to adhere to the applicable code, regardless of what is shown in the plans and specifications. Should conflicts arise between the plans and specifications and/or code requirements, the Contractor shall immediately notify the engineer and will conduct no further work until the conflict is resolved in writing. Construction not specifically shown or specified shall be accomplished per minimum IBC standards, as appropriate.

Materials:

1) All steel tie-back anchor system materials and any steel reinforcement shall be ASTM A-36, or higher, grade steel.

2) All steel pin-pile pipe material shall be Schedule 80 ASTM A53 Grade B or ASTM A501, black iron pipe

STRUCTURAL NOTES:

GENERAL

1] All materials and workmanship shall conform to the contract documents.

2] During the construction period the contractor shall be responsible for the safety and stability of the adjacent [downgrade] slope area.

3] All erection procedures shall conform to OSHA and/or WISHA standards. Any deviation must be approved by OSHA and/or WISHA prior to erection.

4] The contractor shall be solely responsible for all construction procedures including excavation of excess soil, and protection of adjacent property, structures, streets, and utilities in accordance with all applicable National, State and local safety regulations.

5] The contractor shall be responsible for coordinating the work of all trades and shall check and verify all dimensions. All discrepancies shall be called to the attention of the engineer *in writing* and shall be resolved before proceeding with the work.

6] The drawings indicate the typical details of construction. Where conditions are not specifically indicated, but are of similar character to details shown, similar details of construction shall be used subject to review by the structural engineer.

7] All of the information shown on the drawings relative to existing conditions is given as the best present knowledge but without any guarantee of accuracy. Where actual conditions conflict with the drawings, they shall be reported in writing to the structural engineer so that proper revisions may be made. Modification of details of construction shall not be made without prior written approval of the structural engineer.

DESIGN CRITERIA

1] Building Code: 2006 International Building Code, as amended by local building agency.

2] Lateral load for concrete wall: = 36 pcf

3] Peak horizontal seismic acceleration: = 0.20g

SPECIAL INSPECTION

1] Special inspection is required in accordance with the IBC and any additional requirements imposed by the local jurisdiction with the following items:

Item	Type of Inspection
Installation and performance [during the repair] of temporary erosion control measures	Periodic
Coring of access holes through concrete retaining walls for anchor installation	Periodic
Observation of vertical pin-pile driving, and verification of pile driving refusal	Periodic
Observation of helical anchor installation and verification of the achievement of the minimum embedment depth	Periodic
Observation of helical anchor load testing process	Full Time
Visual evaluation of the stability of the existing site slope whilst the repair work is being performed	Periodic
Verification of final site landscaping, and removal of temporary erosion control measures	Periodic

2] Send copies of all inspection reports and test data to client and to City of Bellevue on completion of the work.

Pin-Pile Foundations - Structural Notes:

Code:

1] Design is in accordance with the 2006 International Building Code [I.B.C.] as amended by the local building department.

Supplemental Foundation Support:

1] The design for the alternative supplemental foundation support system, driven-in-place pin-piles, is based on the recommendations on pages 19 through 23 of Report Number 10-2916 by Creative Engineering Options, Inc., dated July 6, 2010, or on page 8 of Addendum A to that report dated August 9, 2010. Unless otherwise indicated, supplemental foundation support work [pin-pile driving and proof testing] shall be performed in general accordance with this report. The report is part of the plan set and should be kept on the job site at all times.

2] The supplemental foundation support system design is based on the following parameters:

Allowable axial pile capacity	=	6 kips
Allowable uplift [tension] capacity	=	4 kips
Allowable lateral capacity	=	0.5 kips
Minimum pile embedment	=	15 feet
Maximum pile embedment	=	30 feet

3] Pin-piles shall comprise Schedule 40 galvanized iron pipe [ASTM A-501] with a minimum [nominal] diameter of six inches.

4] All pin-piles shall be driven-in-place with a 90 pound air compressor operated jack hammer until less than one inch of pile embedment can be achieved during one full minute of continuous driving. Verification of the achievement of the refusal criterion shall be based on reaching the above for three consecutive cycles [a total of three one minute increments].

5] After contractor believes he has met, or exceeded, the above-described pin-pile driving refusal criterion the geotechnical engineer shall observe the performance of a proof load testing program. The proof loading involves the redriving of each pin-pile for one minute with a 90 pond jack hammer and the recording the pile embedment achieved during this period. If the pile is embedded less than one inch it is considered to have met the driving refusal criterion and to be an "acceptable" pile. If it fails to meet the refusal criterion driving will be continued until such time as the pile does meet the refusal criterion.

6] Geotechnical engineer shall record the results of the pin-pile proof load testing and shall provide a summary report to the client and to the City of Bellevue.

7] At the time of final "cut off" verify that the heads of all installed pin-piles are extended a minimum of six inches above the existing native subgrade and into the socket located beneath the load transfer and support bracket.

CALL BEFORE YOU DIG!
1-800-424-5555
Obtain utility location services *before* you break ground.

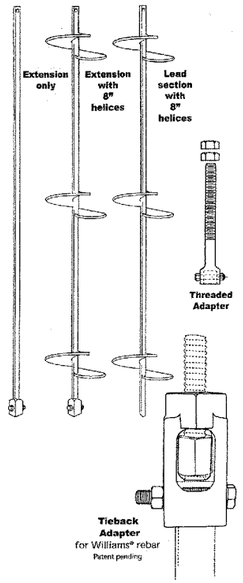
REVISIONS	BY

Perinchief Residence Retaining Wall and Walkway Stabilization and Repair
355 Shoreland Drive S.E.
Bellevue, Washington 98004

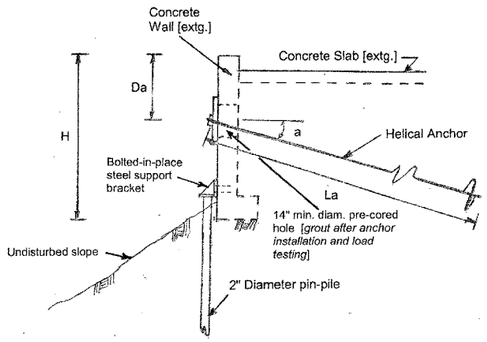
Creative Engineering Options, Inc.
5418 - 159th Place N.E.
Redmond, Washington 98052
425-883-6889

Date	9-29-10
Scale	As Shown
Drawn	GM
Job	10-2916
Sheet	1
Of	2 Sheets

Not to Scale
[For informational purposes only - dimensions as shown]



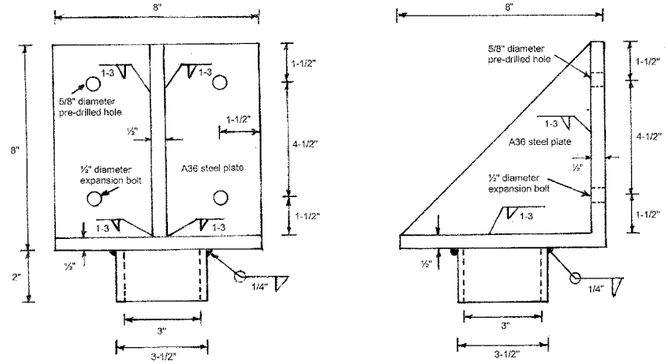
Typical Helical Anchor Detail



NOTES

- Maximum estimated retaining wall height, H = 5' - 8"
- Recommended depth to helical anchor head, Da = 2 feet
- Minimum recommended helical anchor length, La = 20 feet
- Angle of helical anchor installation, a = 20 degrees
- Minimum width and depth of A36 steel, bolted in-place pin-pile load support bracket = 8 inches
- Maximum estimated helical anchor load for wall maximum height of 5' - 8" = 8 kips
- Maximum allowable permanent helical anchor load at helical plate depth of > 8 feet [per manufacturer] = 17 kips
- Minimum recommended torque for helical anchor installation = 9 foot-kips
- Use expanding bolts to attach load bracket to existing concrete wall.

Typical Section of Pin-Pile & Helical Anchor Supported Retaining Wall



Pin-Pile Load Transfer and Support Bracket

GENERAL PIN-PILE INSTALLATION AND TESTING NOTES:

Installation:

1) The contractor shall install vertical pin-piles along the portion of the existing stairway retaining walls designated for repair at the center-to-center spacings shown on the plans.

2) The contractor shall install the vertical pin-piles consisting of 2-inch nominal diameter Schedule 80 "strong" black iron pipe at the indicated locations on the Site Plan, Sheet 1 of 2, by driving-in-place with a 90 pound jack hammer. The pile segments shall be driven to "refusal" as defined in Note 3, below.

3) Refusal for two inch diameter pin-piles is considered to be "*not less than one inch of pile penotration after one full minute of continuous driving with a 90 pound jack hammer.*" The contractor shall drive each pin-pile for three one minute increments to verify that the refusal criterion has been satisfactorily achieved.

4) Sufficient pin-pile length, but a minimum of six inches, shall be left protruding from the ground surface to allow for attachment to the steel load transfer and support brackets.

5) In the event that a pin-pile segment is of insufficient length to achieve refusal a "force fit" connector shall be used to connect an additional pipe segment and driving shall recommence until refusal is achieved or an additional connection is required. Since these pin-piles are only to act in compression it is not necessary to weld the pipe connectors in-place.

6) On completion of pile driving and achievement of the refusal criterion the contractor shall install the eight inch square and 1/2-inch thick A36 steel load transfer and support bracket atop each pin-pile and shall bolt it in-place into the existing concrete retaining walls.

Proof Testing:

1) After the pin-piles are driven and the recommended refusal criterions are, in the Contractor's opinion, met [as described in Note 3, above] each pin-pile shall be proof tested under the geotechnical engineer's observation to verify that refusal has been achieved.

2) Proof testing comprises of each pin-pile being continuously re-driven for a full minute of driving with a 90 pound jack hammer, with the penetration of the pile during this minute being recorded.

3) If the pile penetration is less than one inch during the one minute of proof test driving the pile is considered acceptable and capable of developing in excess of six thousand (6,000) pounds in allowable axial capacity.

4) If more than one inch of penetration is recorded the driving is continued until such time as less than one inch of penetration is recorded.

5) Geotechnical engineer shall observe the proof testing on a full time basis and shall record the penetrations achieved during the re-driving of each pin-pile, and shall also verify that the refusal criterion has been met.

Pin-Pile Load Transfer and Support Brackets:

1) Once the pin-piles have been proof tested and the refusal criterion has been achieved and verified, the contractor shall "fresh head" the piles as necessary.

2) An eight inch square, A36 steel load transfer and support bracket shall then be set atop each pin-pile so that the top of the pin-pile is set firmly into the socket extended from the base of the bracket. The bracket shall then be st4ructurally connected to the existing concrete wall by means of four 1/2-inch diameter expansion bolts.

Helical Anchor Installation And Load Testing Program

1) Randomly select a total of 15% of the helical anchors, or a minimum of one from each stage of anchored wall, and mark for verification load testing.

2) After each helical anchor is installed to the design length install a 24-inch square and ½ inch thick A-36 steel load spreader plate over the free end of each anchor rod, passing the rod through the pre-cut central hole in the plate.

3) Place loading jack assembly over free end of selected anchor rod and butt the base of the jack against the steel load spreader plate. Place nut on rod and tighten down "hand tight" to push the jack firmly in place.

4) Apply a "seating" load to the anchor to "set" the nut and washer against the load spreader plate and underlying resistant concrete retaining wall. Then release loading assembly and reset loading jack and movement recording gauges or graphs to zero.

5) Set dial gauge on firm and unyielding stand which is NOT attached to the and record the zero gauge reading and note it is the start point for the test.

6) Load each anchor to the proof test load, 133% of design anchor load in 0.25DL [design load] increments. Pause at the end of each incremental load application for 2 minutes to determine if creep is occurring and record the dial gauge reading for each load increment. Record anchor movement, then add next incremental load and repeat process.

7) Continue anchor loading until a minimum of 133% of the design load is achieved. Record the anchor rod movement, and leave load in-place for a minimum of ten (10) minutes. Record the dial gauge reading at end of ten (10) minute period, record anchor movement and note it is the maximum test load.

8) Carefully and slowly release the load to zero and record the dial gauge reading at zero load and note it is the end of the test. Record anchor movement after all load is removed.

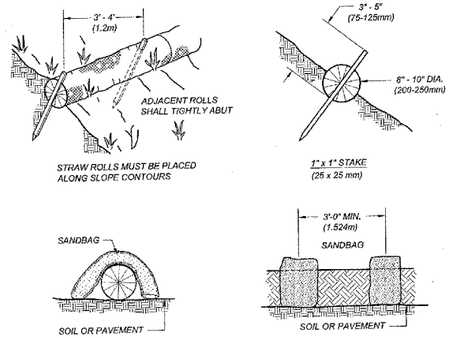
9) Remove loading jack and gauge assembly from free end of rod.

10) Repeat the anchor proof test procedure (steps 1 through 9) for each of the selected anchors.

11) After satisfactory completion of proof load test and removal of jack assembly, contractor should temporarily remove the steel load spreader plate and re-grout the open hole around the anchor head, but should make sure there is no structural interconnection between the grout and the steel anchor shaft.

12) After the grout has been allowed to set-up, replace the steel load spreader plate over the anchor head and re-grouted hole, add shaped steel washer and nut on free end of anchor rod. Tighten the locking nut against the shaped steel washer and load spreader plate until no additional movement of the wrench can be achieved without the use of a "lever" or "pry" bar. Do NOT use a pry bar to tighten the anchor locking nuts.

13) Geotechnical engineer shall record results of anchor proof load testing and provide summary report to the client, contractor, and City of Bellevue on completion.



NOTES:

1.) The use of a straw filled coir roll as a temporary silt filter fence allows for flexibility and the ability to move and replace the roll for construction access purposes with a minimum of fuss, and also minimizes disturbance in areas that are either difficult to reach or are sensitive to disturbance, such as required by installation of a post mounted filter fence.

2.) Any coir roll installation on a sloping surface requires the placement of the roll in a shallow hand dug trench and secure staking firmly into the ground surface so that surface water flow does not occur directly beneath the roll.

3.) Any coir roll placed on flat ground or an asphalt or concrete surface must be "squashed" firmly-in-place so that the bottom of the roll becomes flat and generates a firm contact with the underlying material. The roll shall then be firmly fixed-in-place wither by staking [in soil] or by the placement of a series of heavy sandbags over the roll.

4.) Where feasible the coir roll may also be set on, or may be buttressed on the upgrade [drainage] side by, a layer of moist, fine grained soil which may then act as a supplemental seepage prevention measure.

Temporary Coir Roll Silt Filter Fence

Temporary Erosion and Sediment Control Measures

1] Contractor to install temporary silt filter fence, comprising an 8 or 10-inch diameter, straw filled, coir roll, around the downgrade perimeter of the proposed retaining wall repair construction area of the site. All temporary erosion and sediment control measures shall be in conformance with the applicable local [City of Bellevue] Best Management Practices.

2] All construction vehicle traffic is to occur on the asphalt paved street in front of the site so no site stabilization measures will be required. Provide periodic [minimum of once per day] sweeping of adjacent site access driveway and street, as necessary, the keep it free of sediment.

3] Provide a temporary protective impermeable protective plastic overlay for all exposed concrete walkway slabs forming residential access.

4] Periodically inspect and maintain all required temporary erosion control measures to verify continued performance on their intended function during the retaining wall repair and stabilization efforts.

5] After the retaining walls have been satisfactorily underpinned and restrained, permanently stabilize all soils exposed along the bases of the repaired retaining walls using permanent seeding, sodding, or landscape plantings.

6] On satisfactory completion of the retaining wall repair, and the installation of all appropriate "permanent" erosion control measures [landscaping, sod, seed and mulch, etcetera] remove all temporary erosion control measures.

REVISIONS	BY

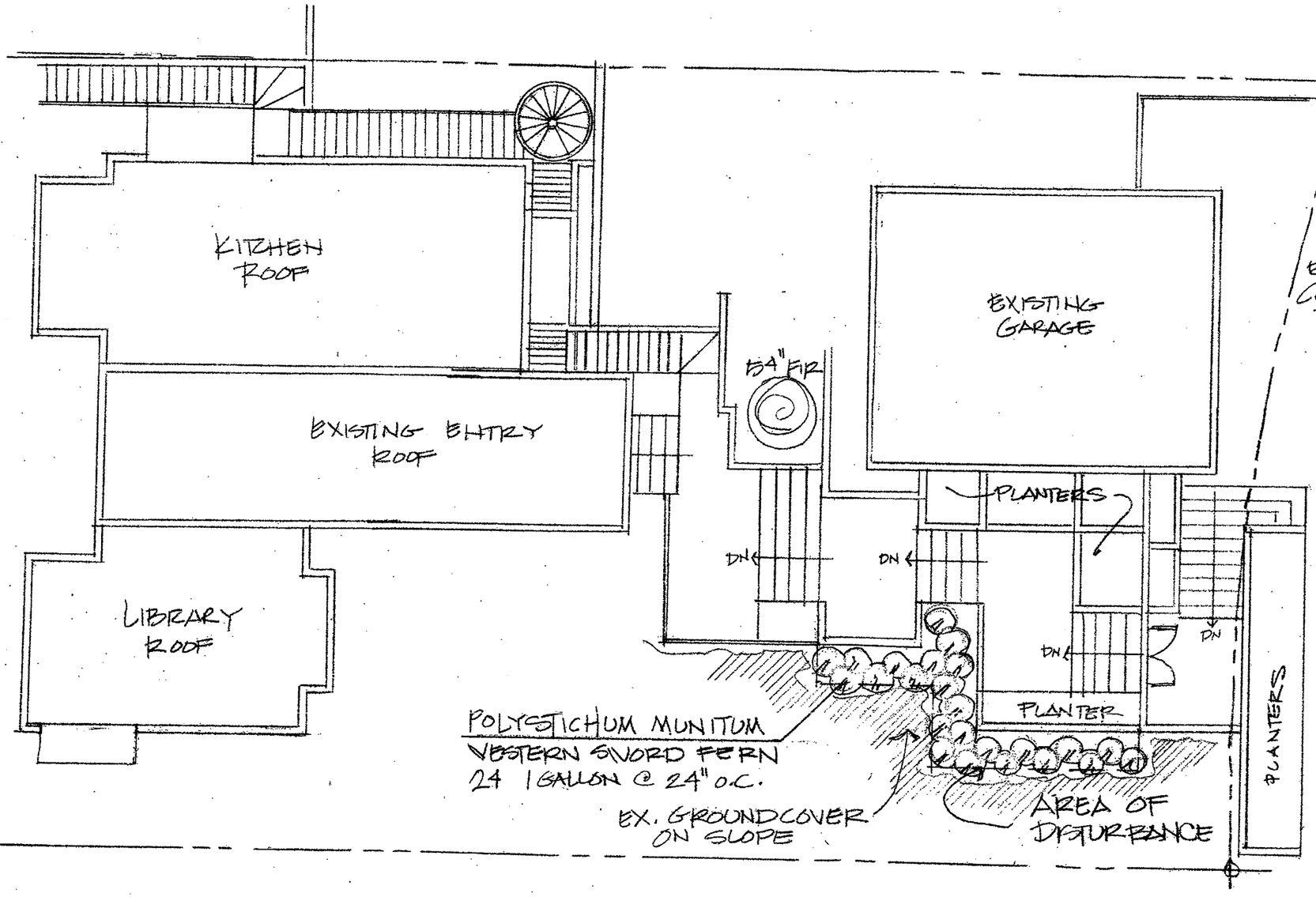
Perinchief Residence Retaining Wall and Walkway Stabilization and Repair
355 Shoreland Drive S.E.
Bellevue, Washington 98004

Creative Engineering Options, Inc.
5418 - 159th Place N.E.
Redmond, Washington 98052
425-883-6889

Date 9-29-10
Scale As Shown
Drawn GM
Job 10-2916
Sheet 2
Of 2 Sheets

PLANT LEGEND

QUANTITY	SPECIES	SIZE	SPACING
24	POLYSTICHUM MUNITUM WESTERN SWORD FERN	#1	24" o.c.



VEGETATION RESTORATION PLAN

10.1.10

SCALE 1/8"=1'-0"

SHAPIRO RYAN DESIGN
7215 W. GREEN LAKE DR. N.
SEATTLE, WA. 98103

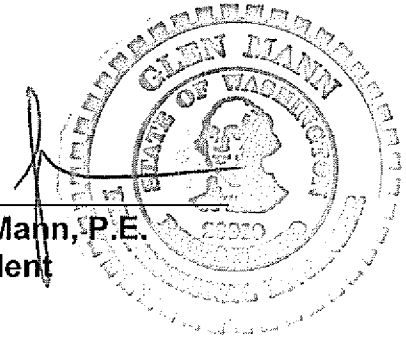
VEGETATION RESTORATION
10.1.2010
1/8"=1'-0"

PERINCHIEF RESIDENCE
355 SHORELAND DR. SE
BELLEVUE, WA. 98004

Creative Engineering Options INC.
CEO
A firm practicing in the geosciences

PREPARED FOR
MR. DON PERINCHIEF

ADDENDUM A
GEOTECHNICAL ENGINEERING STUDY
PROPOSED RESIDENTIAL RETAINING WALL AND WALKWAY
STABILIZATION AND REPAIR
355 SHORELAND DRIVE S.E.
BELLEVUE, WASHINGTON



Glen Mann, P.E.
President

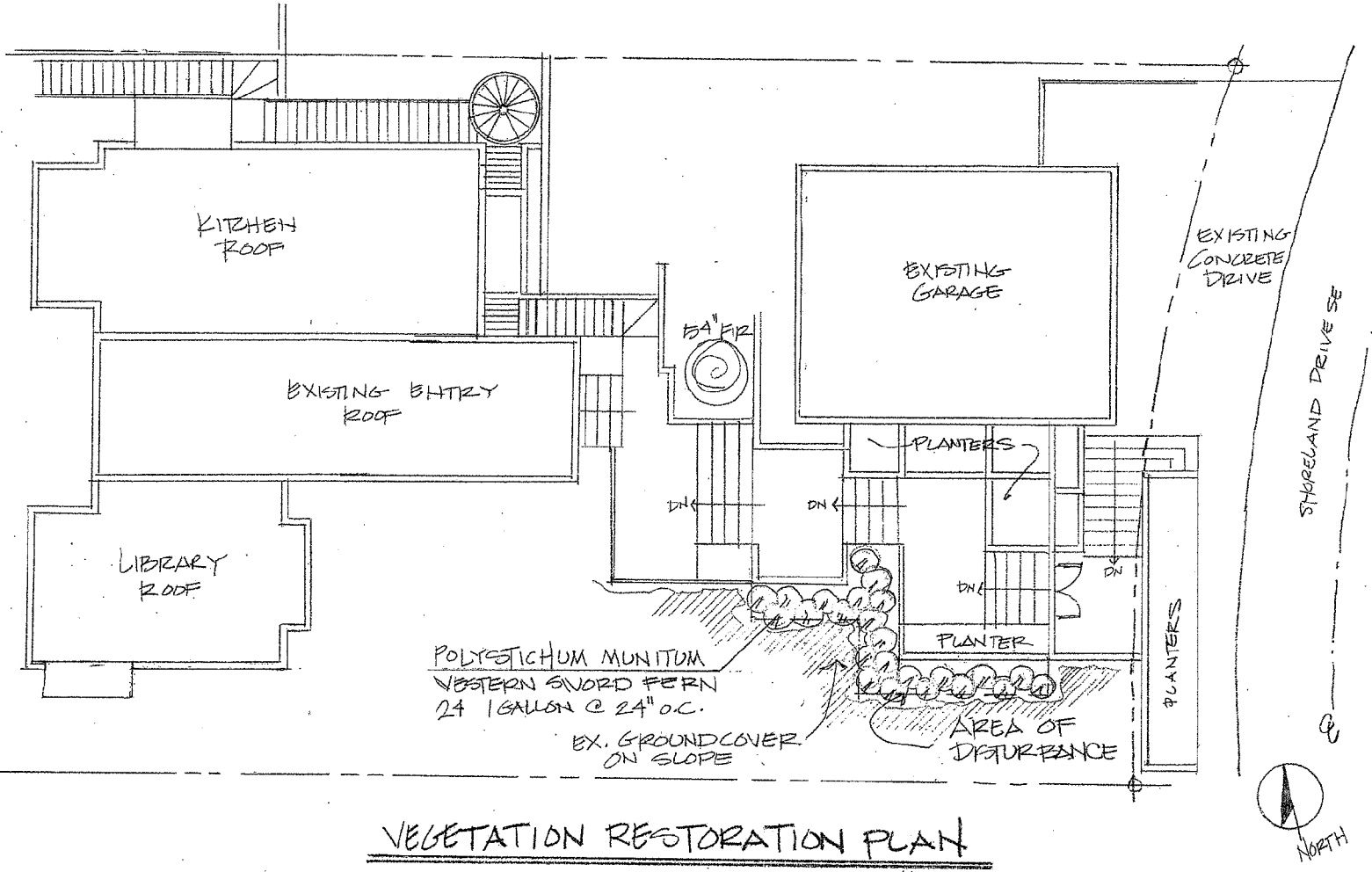
10-2916

August 9, 2010

5418 - 159th Place NE · Redmond, WA 98052 · (425) 883-6889 · FAX (425) 867-9664 · www.ceogeo.org

PLANT LEGEND

QUANTITY	SPECIES	SIZE	SPACING
24	POLYSTICHUM MUNITUM WESTERN SWORD FERN	#1	24" o.c.



VEGETATION RESTORATION PLAN

10.1.10

SCALE 1/8"=1'-0"

SHARRO RYAN DESIGN
7215 W. GREEN LAKE DR. N
SEATTLE, WA. 98103

VEGETATION RESTORATION
10.1.2010
1/8"= 1'-0"

PERLMUTTER RESIDENCE
355 SHORELAND DR. SE
BELLEVUE, WA. 98004

TABLE OF CONTENTS

ADDENDUM A

10-2916

PAGE

INTRODUCTION 1

General 1
Optional Retaining Wall Anchor System 1
- General 1
- Screwed-in-Place Helical Anchors 2
- Helical Anchor Design Parameters 2
- Anchor Shaft Twist 5
- Anchor Load Testing 5
- Anchor Lock Off 6
Helical Anchor Installation and Load Testing 6

ILLUSTRATION LIST

09-2873

Plate 1	Anchor and Pin-Pile Location Plan
Plate 2	Typical Helical Anchor Detail
Plate 3	Typical Wall and Helical Anchor Section
Plate 4	Pin-Pile Load Support Bracket Details

ADDENDUM A
GEOTECHNICAL ENGINEERING STUDY
PROPOSED RESIDENTIAL RETAINING WALL AND WALKWAY STABILIZATION AND REPAIR
355 SHORELAND DRIVE S.E.
BELLEVUE, WASHINGTON

10-2916

INTRODUCTION

General

As requested, this Addendum briefly summarizes our recommendations for the design, installation, and testing of an optional helical tie-back anchor system for the project. Provided the helical anchors meet thee recommendations presented below, they may be used in lieu of the previously recommended drilled-in-place and grouted tie-back anchors. Also, as a potential cost saving element it is both practical and feasible to eliminate the use of a shotcrete overlay, and a steel waler beam system, with these anchors. In order to develop load resistance they may been locked off against a suitably sized A36 steel load spreader plate.

Optional Retaining Wall Anchor System

General: As a practical and reasonably economical repair option we recommend that, instead of using drilled and grouted-in-place tie-back anchors, it is geotechnically feasible to employ a series of screwed-in-place helical plate anchors. In combination with a suitably sized A36 steel load spreader plate this form of tie-back anchor can meet, or possibly exceed, the original design load resistance requirements, and provide more than adequate lateral resistance to the damaged concrete retaining walls without causing any significant wall or site disturbance. This wall anchor system is also environmentally friendly since it can be accomplished entirely with man-portable equipment and materials, and does not generally cause any significant site disturbance [demolition, or excavation into the slope].

The helical plate anchors will be screwed back, and embedded, into the firm "native" soil found at relatively shallow depth where they will gain their lateral resistance. After anchor installation is completed, and the anchors are load tested, the steel load spreader plates will be installed and the anchors "locked off." Subsequently, the steel anchor head and load spreader plate assemblies can be painted to make them

more aesthetically pleasing. The following paragraphs provide more specific details of this proposed helical plate wall anchorage system. Also, for informational purposes, we have provided a pictorial rendition of the pin-pile and anchor installation locations on plate 1, attached.

Screwed-in-Place Helical Anchors: As a geotechnically acceptable option to the originally recommended drilled and grouted-in-place tie-back anchor system it is considered acceptable to employ a series of screwed-in-place helical plate anchors to develop the requisite lateral wall load resistance. Once installed, these helical plate anchors should also be expected to provide a means of enhancing the stability of the upper portion of the site's eastern slope. A typical helical anchor is shown on Plate 2 for your information.

These anchors typically comprise five foot long segments of rounded "square" steel shaft with [in this case] one helical steel plate affixed to the initial segment of shaft which is rotated into the ground with a man-portable hydraulic torque machine. The anchor shafts are inserted into the ground in segments, and additional segments are added using a bolted-in-place coupler until the requisite total anchor length is achieved. The anchors will pass through a hole cored through the existing damaged and deteriorating walls, through the active soil wedge behind the walls, and then into the firm and competent underlying native soils.

Sufficient anchor rod should be left protruding from the face of the existing wall to allow for the installation of the steel load spreader plate as well as the jack assembly for performance of proof loading. Once the anchors have been satisfactorily installed and load tested the previously cored holes should be re-grouted so that the hole is filled. In order to avoid generating a structural "connection" between the anchor shaft and the concrete grout filler we also recommend that the anchor shaft be heavily "greased" or otherwise prevented from forming an anchor-to-grout connection to prevent set-up between the shaft and concrete.

We anticipate that since the bases of each stage of stairway wall will be restrained by the presence of a series of driven-in-place pin-piles and a reinforced concrete grade beam only one row of anchors will be required to maintain stable wall structures. We estimate that the helical anchors nearest each end of any given stage of wall should be installed at least eighteen (18) inches from the ends of the wall structures. This should allow sufficient space to install the steel load spreader plates, and to avoid the potential for "breaking" the ends of the walls when the anchors are loaded.

Helical Anchor Design Parameters: Given that the damaged and deteriorating walls vary in height we have developed a tabulation of the maximum estimated lateral loads below for use in anchor system design. These loads presume a maximum five foot horizontal center-to-center anchor spacing, no groundwater present, and include a 2.0 design factor of safety.

Wall Height [feet]	Design Lateral Anchor Load [kips]
3	2.84
4	5.04
5	7.88
6	11.34

For helical anchor design purposes we recommend the following geotechnical parameters be used:

- Recommended helical anchor shaft dimension = 1-3/4 inches
- **Maximum** manufacturer's allowable *permanent* anchor load [*presumes helical plate is at > 10.0 feet vertical depth and > 25 feet behind wall*] = 20 kips
- **Maximum** manufacturer's allowable *permanent* anchor load [*presumes helical plate is at > 8.0 feet vertical depth and > 20 feet behind wall*] = 17 kips
- Minimum recommended helical anchor plate diameter [*use single plate only*] = 12 inches

- **Minimum** recommended inclination of all anchor rods - measured down from horizontal = 20 degrees
- **Minimum** recommended non-loaded anchor length = 10 feet
- **Minimum** recommended total installed helical anchor length for all walls of six feet to eight feet in height = 25 feet
- **Minimum** recommended total installed helical anchor length for all walls of three feet five feet in height = 20 feet
- Maximum recommended horizontal center-to-center anchor spacing [*but determined by actual wall dimensions*] = 5 feet
- Maximum recommended helical anchor installation torque = 10 foot-kips
- Minimum recommended helical anchor installation torque = 9 foot-kips

Although these helical plate anchors are being designed for a specific maximum estimated load capacity, depending on the specific location of an anchor the applied design load will probably vary, mainly on the low side of the estimated maximum design load. We also recommend that the "unloaded" anchor length, that portion extending back immediately behind the rear face of the shotcrete wall and through the potential active soil wedge, have a *minimum length of ten (10) feet* regardless of the design requirements.

Helical Anchor Installation: The first step in helical anchor installation will be to core a hole through the existing concrete retaining wall at each of the predetermined anchor locations. Since the design helical plate will be twelve (12) inches in diameter the cored hole should be at least fourteen (14) inches to allow free and unimpeded anchor passage.

Next, the initial segment of anchor shaft incorporating the twelve (12) inch diameter helical plate, should be set against the exposed soil at the appropriate installation angle. The helical anchor should then be *carefully* screwed-in-place at the recommended installation angle until only about one foot of shaft is left protruding from the exposed soil face. An additional segment of shaft should then be added and bolted-in-place then the installation process may be continued. This process should be repeated until either the helical anchor plate reaches the minimum recommended design embedment depth [twenty (20) or twenty-five (25) feet depending on wall height], or the hydraulic torque motor achieves the maximum installation torque and begins to twist the anchor shaft. At this point anchor installation is considered complete.

Because these helical anchors are screwed into the ground behind the existing concrete walls it is not possible to observe them. However, it is of considerable assistance to periodically observe the installation operation since this provides an opportunity to note the rate of helical plate [and anchor] penetration (indicative of the soil composition and density), to observe the amount of torque being used for anchor installation, and [where feasible] to observe any soil cuttings being returned from the hole. In our opinion this is of considerable help in determining the location of firm and competent soils along the installed helical anchor length, and in verifying that the design tip location is appropriate.

Anchor Shaft Twist: We understand from the anchor manufacturer that one of the means of determining the "refusal" for helical anchor installation is the "twisting" of the anchor shaft once it is embedded in the denser native soils. According to the anchor manufacturer, it is acceptable to develop a maximum of a single twist in the shaft of the anchor without causing a loss of material strength that might be detrimental to the anchor's long term performance. Again, according to the manufacturer, the visible elastic twist in the anchor shaft is considered to be "normal" and is not [apparently] detrimental to the performance of the installed anchor. Also, keep in mind that the anchors are to be subjected to proof load testing to 133% of the design load and this should also verify that any shaft twist has no detrimental impact.

Anchor Load Testing: Because these helical anchors are installed below ground and are not visible, and because they are required to restrain the soil behind the existing retaining walls, we recommend that a randomly selected percentage [typically 15%] of the installed anchors [or a minimum of one anchor per stage of wall] be verification load tested. This allows us to determine that the allowable design capacity can be achieved by loading the selected anchors to 133% of the

maximum estimated design load. The maximum test load should be maintained on each of the tested anchors for a period of ten (10) minutes to determine if any "creep" action is occurring. The recommended anchor load verification test program is outlined in more detail in this Addendum.

Our field representative should observe the performance of the verification tests and record the anchor movement at each load increment. In our experience we have found that the tested anchor capacity is usually considerably greater than the computed capacity and, thus, develops a much larger factor of safety. On completion of the verification tests we will provide you, the contractor, and the City of Bellevue with copies of the tabulated test data. We have provided a pictorial rendition of the typical anchored wall section for informational purposes on Plate 2, attached.

Anchor Lock Off: After the anchors have been successfully tested and the load testing devices removed we recommend that a steel load spreading plate should be slipped over the end of the anchor rod and placed firmly against the face of the concrete wall. Because the diameter of the cored installation hole is so large, estimated at no less than fourteen (14) inches, the steel load spreader plate, comprising A36 steel plate, should be at least two feet square and ½ inch thick. Then the locking nut should be threaded onto the rod and tightened down by hand. Once the nut is firm against the load spreader plate it should be further tightened with a short, approximately two foot long, wrench. The nut should be tightened down to the point where no additional tightening can be achieved by hand without the use of a pry bar. At this point the anchor is considered to be "locked off."

IT IS CRITICAL THAT NO LOCK NUT IS TIGHTENED WITH THE USE OF A PRY BAR!

Helical Anchor Installation And Load Testing Program

1) Randomly select a total of 15% of the helical anchors, or a minimum of one from each stage of anchored wall, and mark for verification load testing.

2) After each anchor is installed to the design length install a 24-inch square and ½ inch thick A-36 steel load spreader plate over the free end of each anchor rod, passing the rod through the pre-cut central hole in the plate.

3) Place loading jack assembly over free end of selected anchor rod and butt the base of the jack against the steel load spreader plate. Place nut on rod and tighten down "hand tight" to push the jack firmly in place.

4) Apply a "seating" load to the anchor to "set" the nut and washer against the load spreader plate and underlying resistant concrete retaining wall. Then release loading assembly and reset loading jack and movement recording gauges or graphs to zero.

5) Set dial gauge on firm and unyielding stand which is NOT attached to the and record the zero gauge reading and note it is the start point for the test.

6) Load each anchor to the proof test load, 133% of design anchor load in 0.25DL [design load] increments. Pause at the end of each incremental load application for 2 minutes to determine if creep is occurring and record the dial gauge reading for each load increment. Record anchor movement, then add next incremental load and repeat process.

7) Continue anchor loading until a minimum of 133% of the design load is achieved. Record the anchor rod movement, and leave load in-place for a minimum of ten (10) minutes. Record the dial gauge reading at end of ten (10) minute period, record anchor movement and note it is the maximum test load.

8) Carefully and slowly release the load to zero and record the dial gauge reading at zero load and note it is the end of the test. Record anchor movement after all load is removed.

9) Remove loading jack and gauge assembly from free end of rod.

10) Repeat the anchor proof test procedure (steps 1 through 9) for each of the selected anchors.

11) After satisfactory completion of proof load test and removal of jack assembly, contractor should temporarily remove the steel load spreader plate and re-grout the open hole around the anchor head, but should make sure there is no structural interconnection between the grout and the steel anchor shaft.

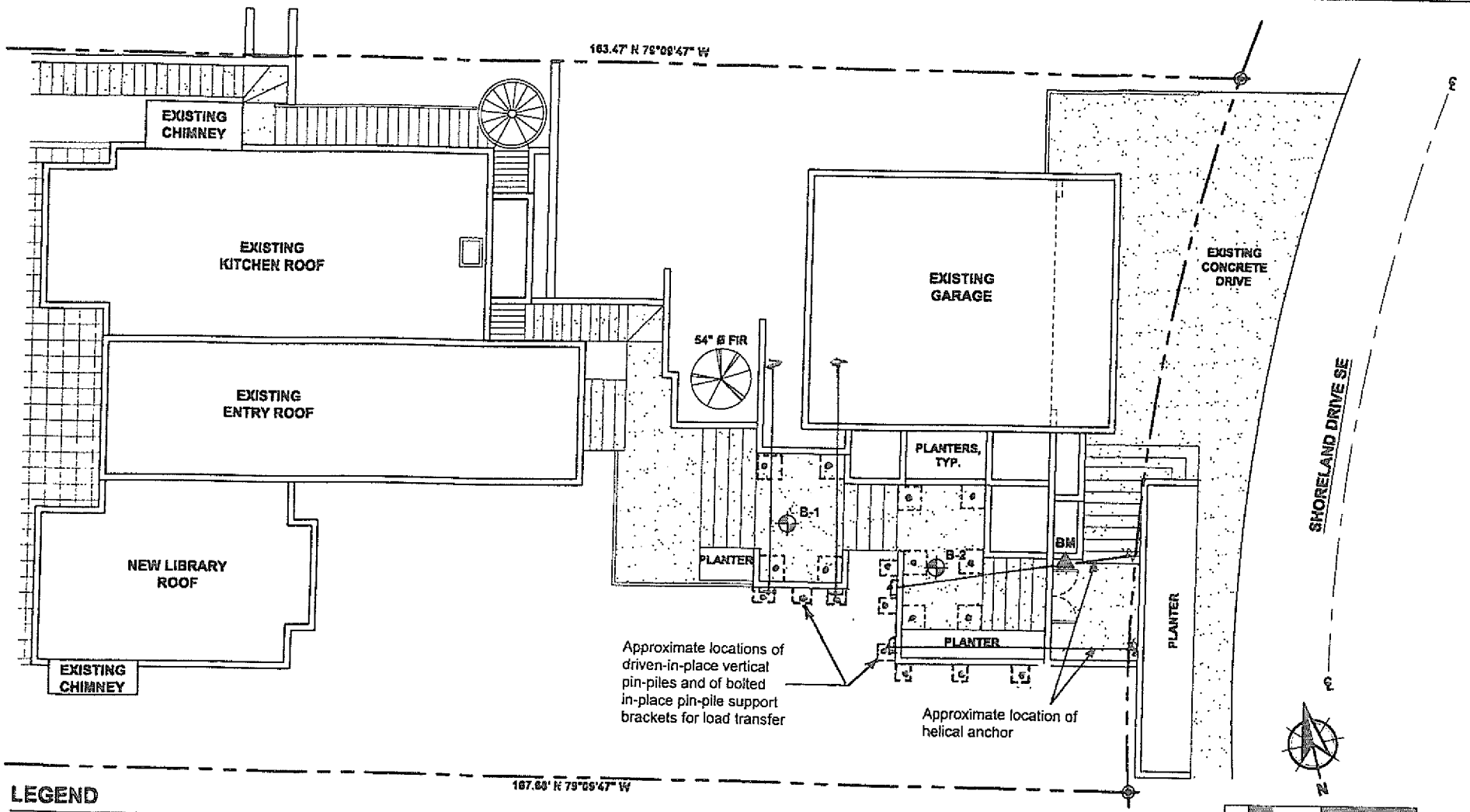
12) After the grout has been allowed to set-up, replace the steel load spreader plate over the anchor head and re-grouted hole, add shaped steel washer and

nut on free end of anchor rod. Tighten the locking nut against the shaped steel washer and load spreader plate until no additional movement of the wrench can be achieved without the use of a "lever" or "pry" bar. Do NOT use a pry bar to tighten the anchor locking nuts.

13) Geotechnical engineer shall record results of anchor proof load testing and provide summary report to the client, contractor, and City of Bellevue on completion.

Modified Pin-Pile Load Support System

General: The originally recommended reinforced concrete grade beam would have required a small amount [approximately 18" in depth and 12" in width] of hand excavation along the base of each wall segment, and the removal and disposal of the excavated soil. Therefore, in an effort to avoid creating any significant disturbance of the site surface in the immediate proximity of the retaining walls that are being repaired we are providing an alternative pin-pile to wall connector. This alternative comprises an A36 steel plate that is bolted-in-place to the existing concrete wall above the existing ground surface. As a result there will be no excavation along the base of any of these retaining walls. We have provided a pictorial representation of the proposed alternative pin-pile load support bracket on Plate 4, attached.



LEGEND

- B-1 — Identification number and approximate location of exploratory boring.
- BM — Approximate location of temporary bench mark (at assumed elevation of 100 feet)
- Approximate location of vertical pin-pile.

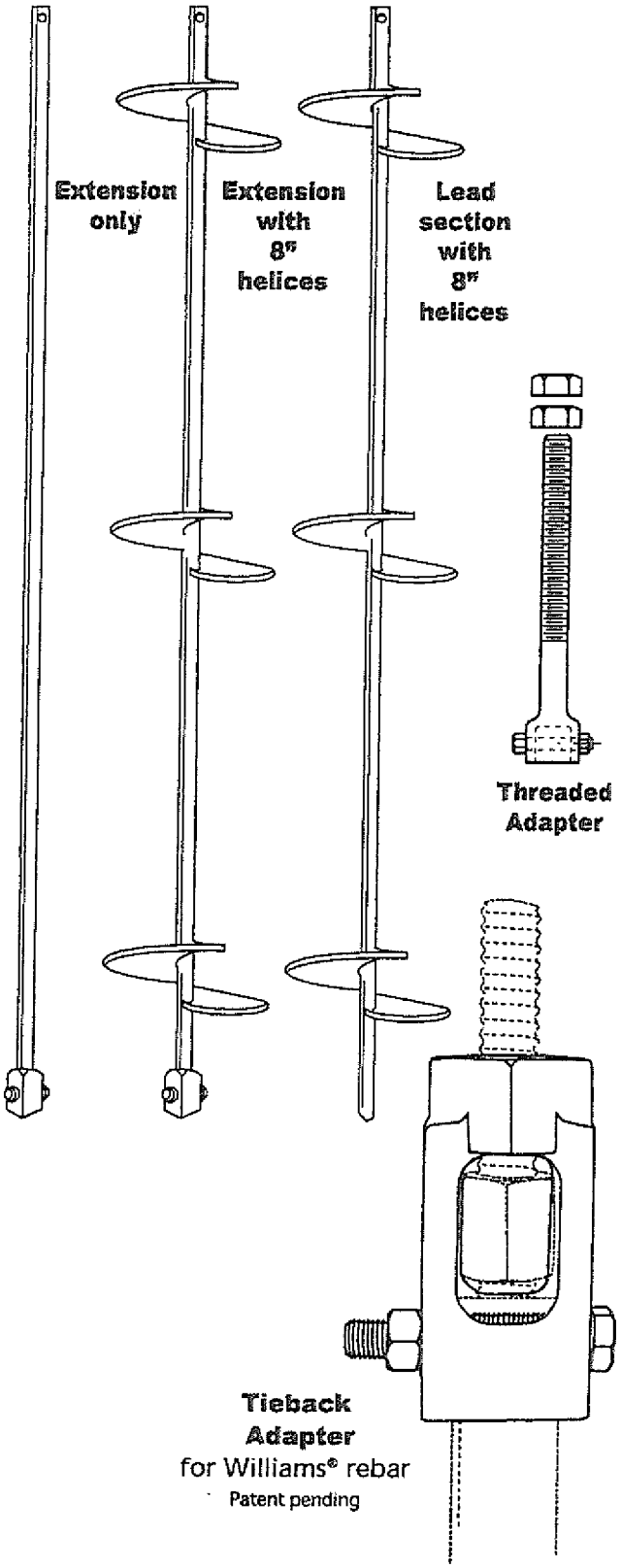
Creative Engineering Options INC.
A firm practicing in the geosciences

Anchor and Pin-Pile Location Plan

Plate 1

Not to Scale

[For informational purposes only - dimensions as shown]



Creative Engineering Options INC

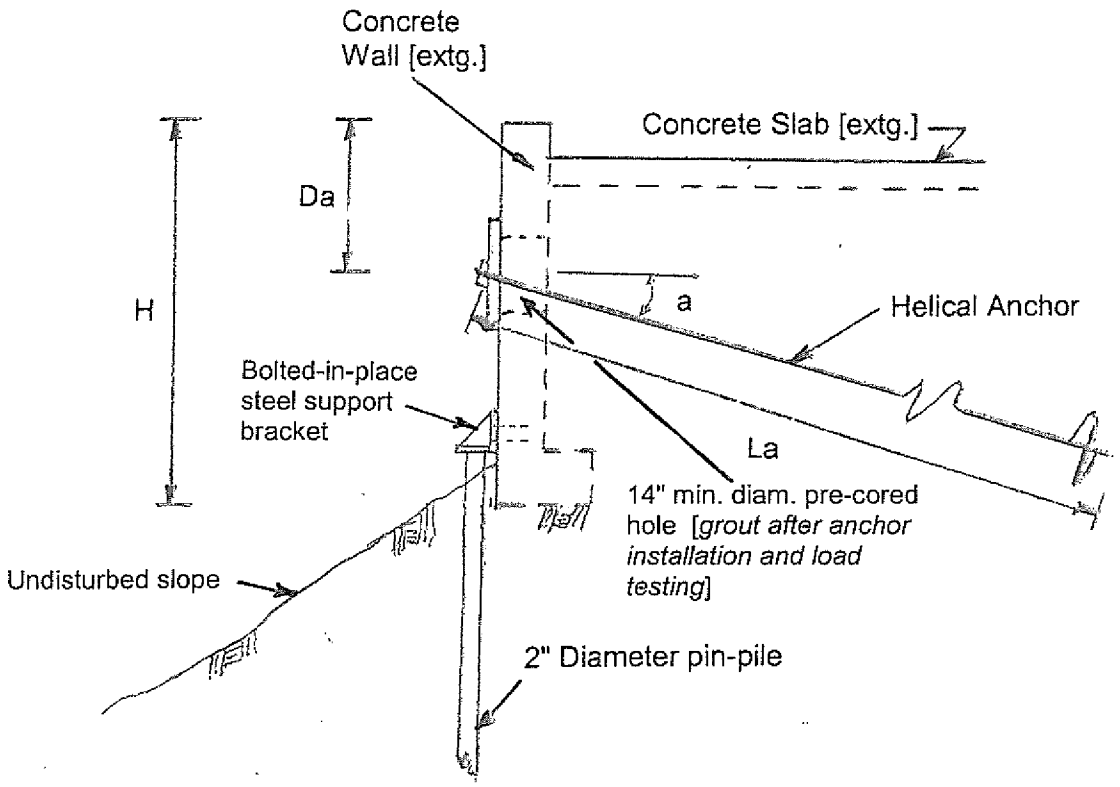
CEO

A Firm Practicing in the Geosciences

Typical Helical Anchor Detail

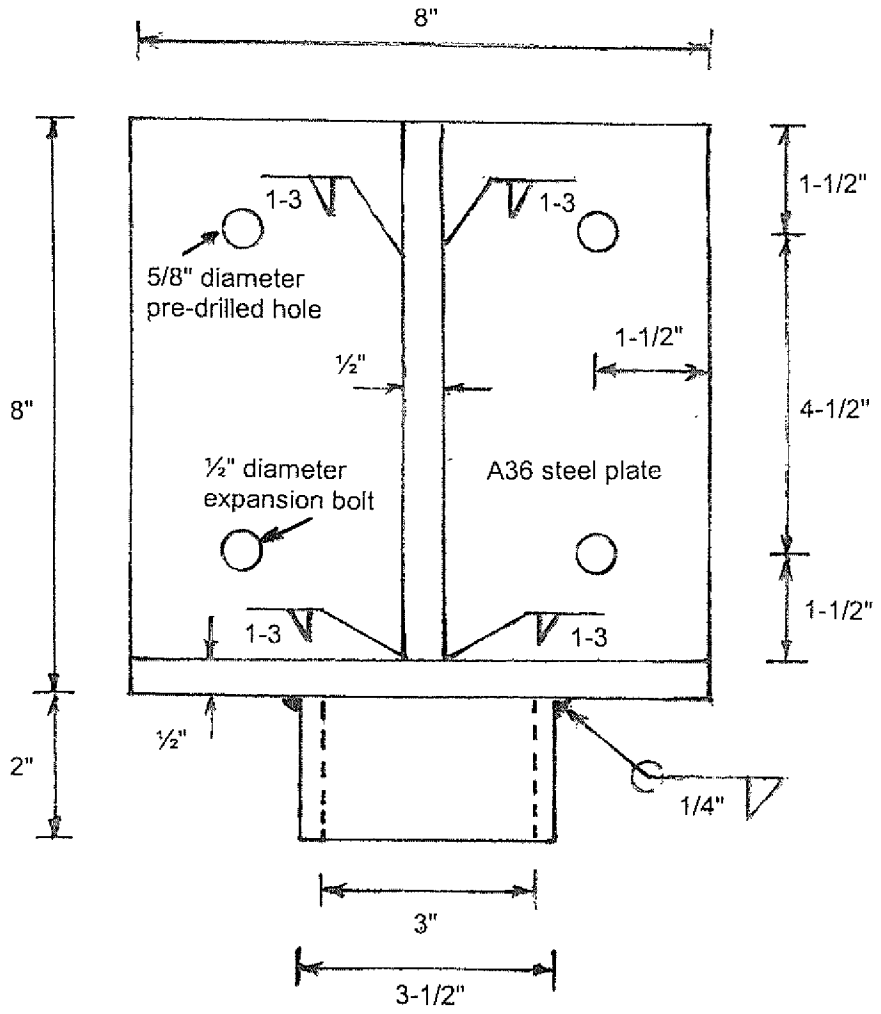
Plate 2

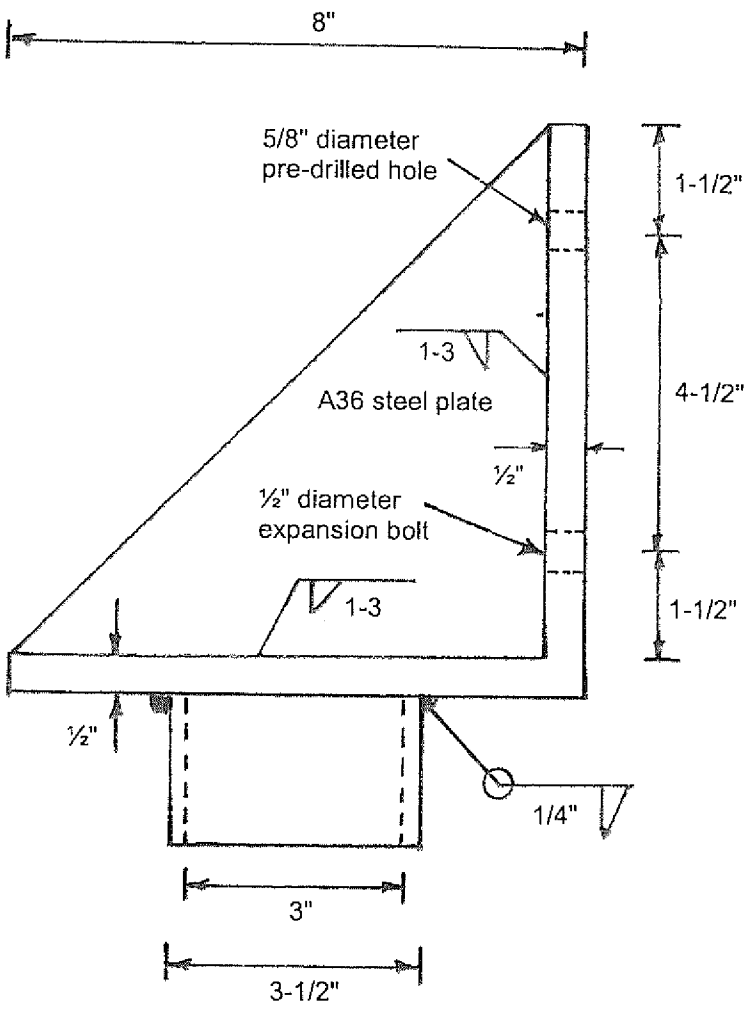
Not to Scale
[For informational purposes only - dimensions as shown]



NOTES

- Maximum estimated retaining wall height, H = 5' - 8"
- Recommended depth to helical anchor head, Da = 2 feet
- Minimum recommended helical anchor length, La = 20 feet
- Angle of helical anchor installation, a = 20 degrees
- Minimum width and depth of A36 steel, bolted in-place pin-pile load support bracket = 8 inches
- Maximum estimated helical anchor load for wall maximum height of 5' - 8" = 8 kips
- Maximum allowable permanent helical anchor load at helical plate depth of > 8 feet [per manufacturer] = 17 kips
- Minimum recommended torque for helical anchor installation = 9 foot-kips
- Use expanding bolts to attach load bracket to existing concrete wall.





Creative Engineering Options INC
CEO
A Firm Practicing in the Geosciences

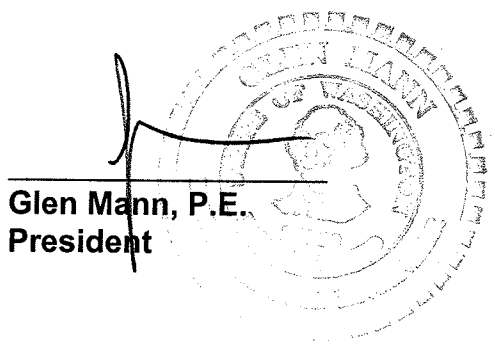
Pin-Pile Load Support Bracket Details

Plate
4

Creative Engineering Options, INC.
CEO
A firm practicing in the geosciences

PREPARED FOR
MR. DON PERINCHIEF

ADDENDUM B
GEOTECHNICAL ENGINEERING STUDY
PROPOSED RESIDENTIAL RETAINING WALL AND WALKWAY
STABILIZATION AND REPAIR
355 SHORELAND DRIVE S.E.
BELLEVUE, WASHINGTON



Glen Mann, P.E.
President

10-2916

September 29, 2010

5418 - 159th Place NE · Redmond, WA 98052 · (425) 883-6889 · FAX (425) 867-9664 · www.ceogeo.org

ADDENDUM B
GEOTECHNICAL ENGINEERING STUDY
PROPOSED RESIDENTIAL RETAINING WALL AND WALKWAY STABILIZATION AND REPAIR
355 SHORELAND DRIVE S.E.
BELLEVUE, WASHINGTON

10-2916

Critical Areas Land Use

As you are aware, the proposed retaining walls and walkways are adjacent to a steep slope critical area which extends down to the eastern shore of Lake Washington. The proposed repair is a stabilizing measure which is intended to prevent the settlement and lateral movement damaged segment of the existing retaining wall and supported walkway slab from further distortion and damage and from potential further movement downslope.

To support the recommended repair we have provided a geotechnical report, and an Addendum A, which outlines not only the details of the proposed repair, but also the nature and condition of the in-situ soil conditions, and the design and construction recommendations for the performance of the proposed repair. This geotechnical report and its Addendum A are being provided separately, but as part of the permit submittal package.

The roughly twenty-five (25) foot long segment of damaged retaining wall is being maintained in-place in its existing location both during the period of repair, and is expected to last for the reasonable post repair lifetime of the residence. The construction repair related "disturbance" of the adjacent site is expected to be minimal and, if any disturbance does occur, it will be limited to the roughly two to three feet immediately in front of the wall only. There will be no intrusion on or into the steep slope, not is the repair expected to disturb, damage, or destabilize the body of the steep slope.

As constructed this retaining wall maintains and stabilizes the site's only access to the existing residence. As such, this retaining wall, walkway, and stairway system is a critical element at this site, and one that must be kept "open" so that the home's occupants can access the building without threat of a wall failure, and without threat to their health and safety.

As part of our assessment of the retaining wall and walkway damage we evaluated several potential repair options. These included, but were not limited to, installation of a cantilevered soldier pile wall, demolition of the existing wall structure and its replacement with a geogrid reinforced concrete block wall, and the construction of a new engineered concrete retaining wall. Unfortunately, because of the presence of the steep site slope, the location of existing improvements which the wall stabilizes, the constrained [predominantly pedestrian] access conditions, and because virtually all of the options require large construction equipment for installation and would lead to significantly greater detrimental impact [excavation and disturbance] on the site and slope, we elected not to employ any of these other stabilization methods.

In our professional opinion, the proposed wall underpinning and anchorage repair option provides the best and most practical result with the minimum of site disturbance. Given the above, we believe the proposed repair and wall stabilization is appropriate and acceptable under section 20.25H.055 of the Land Use Code [LUC].