Memo

City of Kelowna

Date: October 2/09

To: City Manager

From: Community Sustainability Division

File No: DVP09-0123 **Applicant:** Watermark Developments Ltd. (John Hertay)

At: 314 Arab Road **Owner:** Watermark Developments Ltd. (John Hertay)

Purpose: To vary the maximum height of a retaining wall from 1.2 m maximum to 3.3 m proposed.

Existing Zone: RU2S - Medium Lot Housing with Secondary Suite

Report Prepared by: Greg Sauer

1.0 RECOMMENDATION:

THAT Council authorize the issuance of Development Variance Permit No. DVP09-0123 for Lot 11, Section 3, Township 23, ODYD, Plan KAP88257, located at 314 Arab Road, Kelowna, BC;

AND THAT a variance to the following section of Zoning Bylaw No. 8000 be granted:

> Section 7.5.9 Fencing and Retaining Walls - To vary the maximum height of a retaining wall from 1.2 m maximum to 3.3 m proposed.

2.0 SUMMARY:

The applicant proposes to construct a retaining wall to a maximum height of 3.3 m on the west side of the property. A retaining wall or similar solution has proven necessary as a result of above average storm events which have led to erosion along the west edge of the property. The proposed retaining wall will vary in height from a minimum of 1.0 m at the start of the wall adjacent Arab Road, to the maximum 3.3 m wall near the north property line. The proposal calls for Keystone Retaining Wall Systems which are engineered and a common retaining structure in Kelowna.

3.0 BACKGROUND:

3.1 Site Context

The subject property is located at 314 Arab Road. The subject property is at the edge of a new medium size lot residential neighbourhood with agricultural land adjacent on the northern edge. The future land use for the agricultural property anticipates that this property will be developed as an urban residential development. The subject property is also adjacent to a natural gas right-of-way which bisects the development and which will serve as an approximately 20 meter linear park for Kelowna residents.

The immediately adjacent zones/uses are as follows:

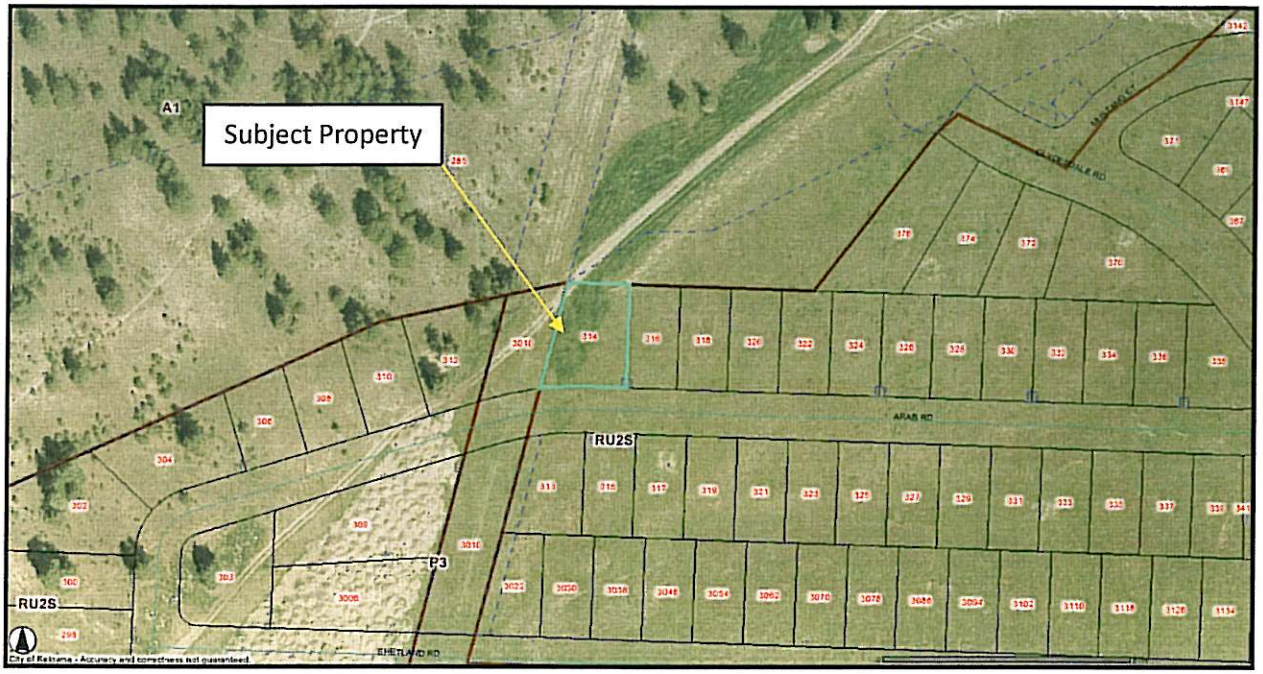
North A1 - Agricultural

South RU2S - Medium Lot Housing with Secondary Suite

East RU2S - Medium Lot Housing with Secondary Suite

West P3 - Parks & Open Space

3.2 Aerial Photo – 314 Arab Road



3.3 The Proposal

The table below shows this application's compliance with the requirements of the RU2S zone.

Zoning Bylaw No. 8000		
CRITERIA	**PROPOSAL**	**RU2S ZONE REQUIREMENTS**
Development Regulations		
Minimum Lot Area	811 m^2	400 m^2
Minimum Lot Width	20.3 m	15.0 m
Minimum Lot Depth	33.5 m	30.0 m
Retaining Wall Height	3.3 m *	1.2 m
* Indicates that a variance is required.		

5.0 TECHNICAL COMMENTS:

5.1 Building & Permitting

No concerns.

5.2 Development Engineering

The increased height of a retaining wall does not compromise the City of Kelowna servicing requirements and does not trigger any offsite upgrades.

5.3 Parks & Public Spaces

The Parks & Public Spaces Department supports the proposed variance contingent on the wall being designed and constructed to mitigate negative visual impacts to park users. Further, the parkland shall not be disturbed; no debris and garbage; no damage to natural vegetation, no material and construction storage and/or equipment parking. The parkland shall be kept in a natural, undisturbed condition.

6.0 LAND USE MANAGEMENT DEPARTMENT:

Zoning Bylaw 8000 is clear in its approach to retaining walls noting that "retaining walls on all residential lots, except those required as a condition of subdivision approval, must not exceed a height of 1.2 m measured from grade on the lower side, and must be constructed so that any retaining walls are spaced to provide at least a 1.2 m horizontal separation between them". The primary concern with large vertical retaining walls is the visual impact generated from public viewpoints, and especially "significant" public viewpoints around the City. This is especially true in hillside developments which are elevated and can be viewed from a distance.

The proposed retaining wall at 314 Arab Road is not a location which can be viewed from "significant" public viewpoints or from long distances. In fact, the proposed height variance is expected to have minimal visual impact from any public viewpoint, or from the adjacent park which will be elevated above the walls. Instead, the height variance will be limited largely to 314 Arab Road. Lots to the east, which are all owned by Watermark Developments Ltd. (the applicant), will experience minimal impacts.

Land Use Management staff recommends support for the variance given that the retaining wall is not expected to generate a negative impact for properties beyond those owned by the applicant.

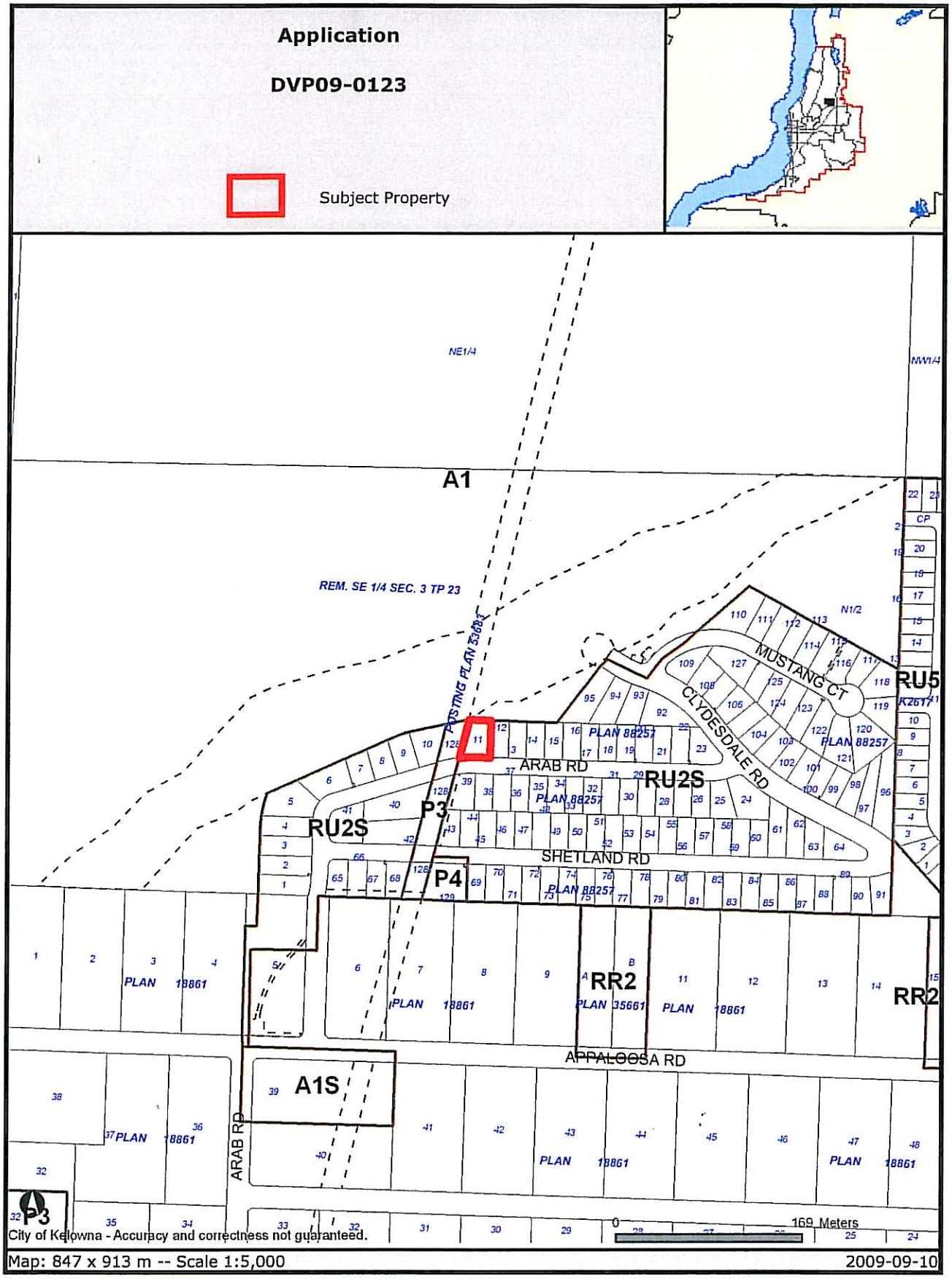
Submitted by:

Danielle Noble
Manager, Urban Land Use

Approved for inclusion:

Shelley Gambacort
Director, Land Use Management

Attachments:
Subject Property Map
Site Photos
Keystone Wall Design (3 pages)



Certain layers such as lots, zoning and dp areas are updated bi-weekly. This map is for general information only. The City of Kelowna does not guarantee its accuracy. All information should be verified.

314 Arab Road Showing Approximate Location of Retaining Wall Along Toe of Slope

View Along Arab Road Showing Linear Park and Absence of Retaining Wall

LOT 11 ARAB ROAD
KEYSTONE WALL DESIGN PACKAGE

GENERAL DESIGN NOTES

1. The following effective strength design parameters were assumed in the preparation of structural calculations for the Keystone retaining wall system:

	ϕ	c (kN/m2)	γ (kN/m3)	Soil Type
Reinforced Soil	30°	0	19.00	
Retained Soil	30°	0	19.00	
Foundation Soil	30°	0	19.00	

Soil types and design properties shall be confirmed by the Owner or its geotechnical engineer prior to wall construction. Keystone accepts no responsibility for the interpretation or verification of subsurface conditions.

2. The system has been evaluated for internal stability and simple external sliding and overturning. Unless otherwise specified, the design maintains a minimum factor of safety of 1.5 on all elements of the wall design.

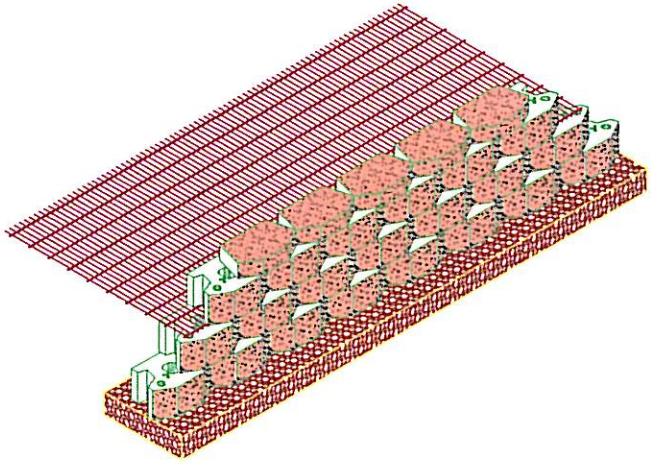
3. The walls are designed to support the following maximum surcharge loadings:

Live Load: 5 kN/m2
Dead Load: 0 psf
Backslope: 0°
Hydrostatic - n/a
Seismic - n/a

4. The wall foundation soils at each wall location shall be capable of safely supporting 150kPa or as indicated on the wall elevations without failure or excessive settlement. Local bearing capacity shall be confirmed by the site engineer.

5. The Contractor shall provide surface and subsurface drainage, grading, and erosion control during and after wall construction to avoid damage to the wall structure.

6. The Contractor is responsible for obtaining all permits and easements necessary for wall construction. The Contractor is responsible for protecting adjacent property from wall construction activities.



DRAWING INDEX	
Description	Sheet No.
Title Sheet	1
Site Plan	2
Wall Elevations	3
Specifications	4
Wall Details	5

QUALITY ASSURANCE PROVISIONS

1. Wall construction shall be monitored by a qualified Engineer to verify field conditions. If this work is not performed by the site geotechnical engineer, the geotechnical engineer shall be consulted in those matters pertaining to soil conditions and wall performance.

2. The foundation soils at each wall location shall be inspected by the Engineer and any unsuitable soils or improperly compacted embankment material removed and replaced as directed by the Engineer prior to wall construction to provide adequate bearing capacity and minimize settlement.

3. All wall excavation and retained soils shall be inspected for groundwater conditions and any additional drainage provisions required in the field shall be incorporated into the wall construction as directed by the Engineer.

4. Wall backfill material shall be tested and approved by the Engineer for use in the reinforced soil zone meeting the minimum requirements of the approved design plans.

5. All soil backfill shall be tested by the Engineer for moisture, density, and compaction periodically (every 2' vertically, 100'-200' c/c) meeting the minimum requirements of the approved design plans or project specifications.

6. Wall construction shall be periodically inspected by the Engineer to ensure the geogrid reinforcement elevations and lengths are installed in accordance with the approved design plans.

7. All wall elevations, grades, and backslope conditions shall be verified by the Engineer in the field for conformance with the approved design plans. Any revisions to the structure geometry or design criteria shall require design modification prior to proceeding with construction.

PROFESSIONAL ENGINEER
A. H. A. LOSCH
08/19/2009

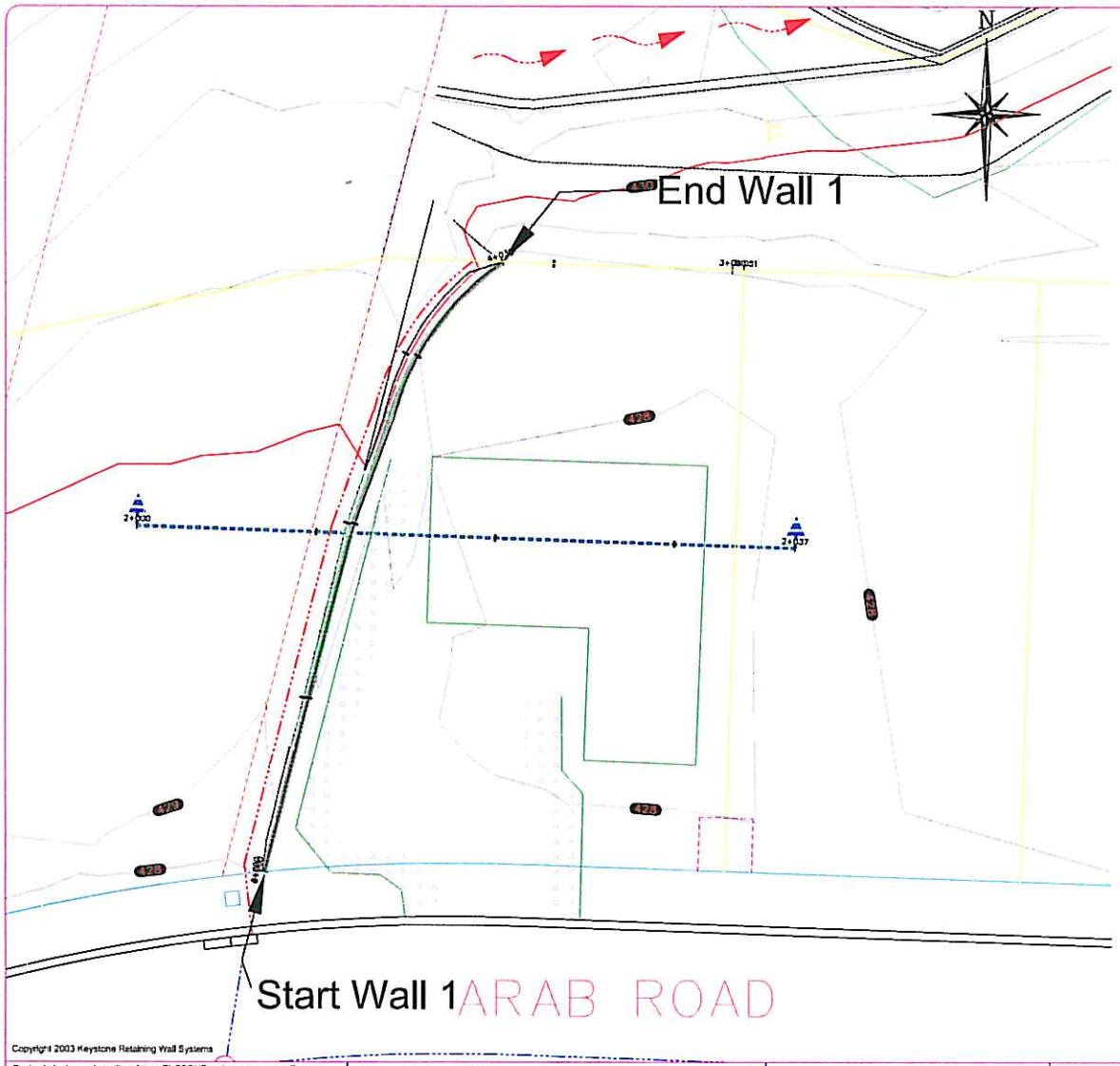
Design is for internal stability of the KEYSTONE wall structure only. External stability, including but not limited to foundation and slope stability is the responsibility of the Owner. The design is based on the assumption that the materials within the retained mass, methods of construction, and quality of materials conform to KEYSTONE's specification for this project.

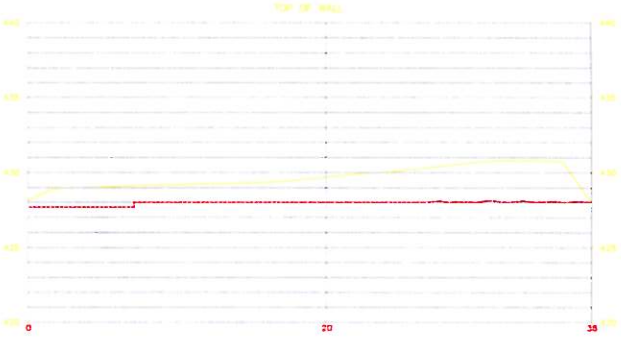
This drawing is being furnished for this specific project only. Any party accepting this document does so in confidence and agrees that it shall not be duplicated in whole or in part, nor disclosed to others without the consent of Keystone Retaining Wall Systems, Inc.

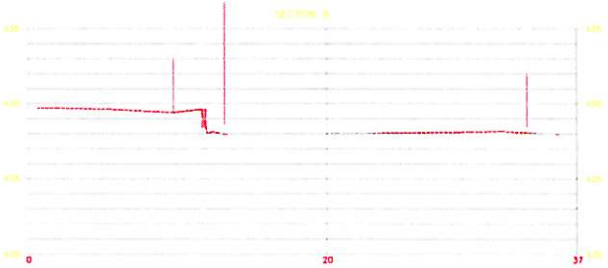
No.	Date	Revision	By

KEYSTONE
A CONTECH COMPANY
4444 W 78th Street
Minneapolis, MN 55435
952-897-1040

Designed By: Preliminary	Title: TITLE PAGE	Date: August 14, 2009
Checked By:	Project: Keystone Retaining Wall Systems Typical Wall Details	Project No:
Scale: No Scale		Drawing No: 1







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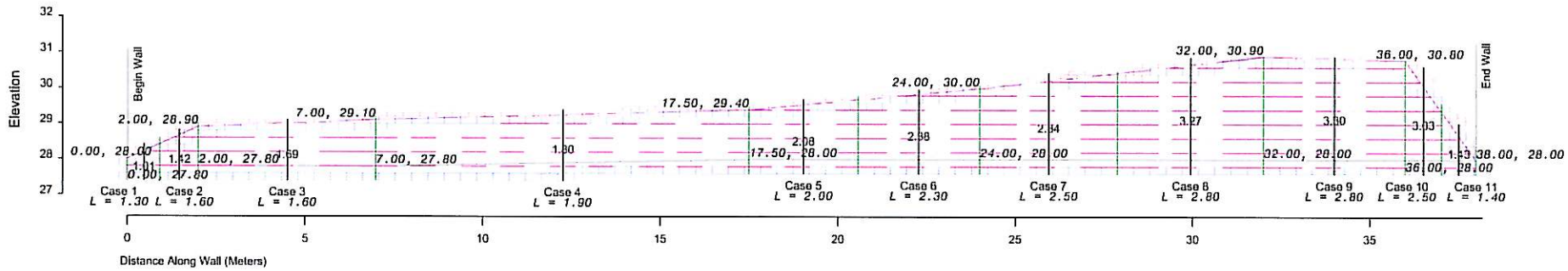
952-897-1040

PROFESSIONAL ENGINEER
MICHAEL A. LOSCH
02/09/2009

Designed By: Preliminary	Title: SITE PLAN		Date: August 14, 2009
Checked By:	Project: Keystone Retaining Wall Systems Typical Wall Details		Project No:
Scale: No Scale			Drawing No: 2



Arab Road Wall 1 - Front Face Elevation

General Notes:

1. The wall shall be constructed with KEYSTONE COMPAC units using the 0 degree batter.

2. The design requires Mirafi 3XTc soil reinforcements at the elevations shown.

Legend:

Mirafi 3XTc

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A CONTECH COMPANY
4444 W 78th Street
Minneapolis, MN 55435
952-897-1040

PROFESSIONAL ENGINEER
A. H. A. LOSCH
02/09/2009

Designed By: Preliminary	Title: Wall Elevation		Date: August 14, 2009
Checked By:	Project: Keystone Retaining Wall Systems Typical Wall Details		Project No:
Scale: No Scale			Drawing No: 3