Provincial Agricultural Land Commission - Applicant Submission

Application ID: 58010
Application Status: Under LG Review
Applicant: Michael Watson
Agent: NRG Consulting Ltd.
Local Government: Fraser Valley Regional District
Local Government Date of Receipt: 09/20/2018
ALC Date of Receipt: This application has not been submitted to ALC yet.
Proposal Type: Non-Farm Use
Proposal: Mr. Watson is applying for non-farm use so that he will be able to construct a building with a 17000 SF footprint on his property. The proposed structure would be located at the site of the old manure pit and existing MMAR Act facility described in previous sections of this proposal. The proposed structure would be used as a production facility for medical marijuana and proposes to be ACMPR and Cannibas Act compliant. The building currently in this location would be removed as it is non-compliant to the new ACMPR standards, and is no longer appropriate for use as a production facility according to Health Canada's regulations. A successful application would achieve the realization of a six year long project goal for Mr. Watson and his family. This long-time farming family is ready and eager to enter into the new and exciting agricultural business of producing plants for medical use. The Watson family has invested a great deal of time and money into this project. In 2014 they went to great lengths to ensure their land was appropriately zoned for these non-farm use purposes, in hopes they might someday be able to run a regulated, legal, and financially rewarding business on their land. They have participated in many discussions with the ALC as far back as 2012 and have always believed that cannabis is as much a plant as any other crop being farmed in this area.

Agent Information

Agent: NRG Consulting Ltd.
Mailing Address:
16757 61 Avenue
Surrey, BC
V3S 1W2
Canada

Parcel Information

Parcel(s) Under Application

1. **Ownership Type:** Fee Simple
   Parcel Identifier: 011-945-311

Legal Description: Lot 7, section 20, township 4, range 27, west of the sixth meridian, New Westminster district plan 1447K
Parcel Area: 4 ha
Civic Address: 58551 A Dent Road, Laid Law
Date of Purchase: 09/01/2000
Farm Classification: Yes
Owners

1. **Name:** Michael Watson
   Address:
   58551 Dent Road
   Laid Law, BC
   V0X 1L2
   Canada

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2. **Ownership Type:** Fee Simple
   Parcel Identifier: 011-945-354
   Legal Description: LOT 8 EXCEPT: PART SUBDIVIDED BY PLAN 23054, SECTION 20 TOWNSHIP 4 RANGE 27 WEST OF THE SIXTH MERIDIAN NEW WESTMINSTER DISTRICT PLAN 1447K
   Parcel Area: 1.6 ha
   Civic Address: 58551 Dent Road, Laid Law
   Date of Purchase: 09/01/2000
   Farm Classification: Yes
   Owners
   1. **Name:** Michael Watson
      Address:
      58551 Dent Road,Laid Law
      Laid Law, BC
      V0X 1L2
      Canada

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3. **Ownership Type:** Fee Simple
   Parcel Identifier: 011-945-303
   Legal Description: LOT 6 SECTION 20 TOWNSHIP 4 RANGE 27 WEST OF THE SIXTH MERIDIAN NEW WESTMINSTER DISTRICT PLAN 1447K
   Parcel Area: 4 ha
   Civic Address: 58661 Dent Road, Laid Law
   Date of Purchase: 09/01/2000
   Farm Classification: Yes
   Owners
   1. **Name:** Michael Watson
      Address:
      58551 Dent Road,
      Laid Law, BC
      V0X 1L2
      Canada

Current Use of Parcels Under Application

1. Quantify and describe in detail all agriculture that currently takes place on the parcel(s).
Parcel PID 011-945-311 (58551 A): This parcel of land is owned and operated by Michael Watson, who resides on the adjacent parcel of land to the west and also owns the parcel of land to the east. It is noted that Mr. Watson and his family have been living and farming in this area for over 80 years. The parcel under application here is approximately 4 ha (10 acres) in size. Approximately 2 ha (5 acres) of the land is currently under hay production, and is sometimes occupied by Mr. Watson's Black Angus cows or horses. The property yeilds one or two cuts per year to create round hay bales. When the last cut has been made in either late summer or early fall, Mr. Watson allows his livestock to free graze on the parcel until winter sets in. Another 1 ha (2.5 acres) of this parcel is overgrown with trees and berries, making it unsuitable for agricultural use. 0.86 ha (approximately 20% of the parcel) is currently covered by many small buildings and structures. There are 2 large hog barns which are no longer in use for hogs, one to the east and one closer to the western border of the parcel. The barn in the eastern section is approximately 5000 SF and the other is approximately 7000 SF. The remaining structures include a chute for cows, a chicken coop, a pump house, a garage, a paddock, and a mobile home. There are also driveways and ditches included in this 20%. The final 5% of the parcel (0.14 ha) is comprised of an old manure pit that has been reclaimed. This 15000SF area is no longer acceptable for agricultural purposes given it's previous use. This is the area in which Mr. Watson is proposing to construct a building for non-farm use.

2. Quantify and describe in detail all agricultural improvements made to the parcel(s).
In 2009, Mr. Watson leased the hog barn located in the eastern section of this parcel to his family friend, Robert Hill. Mr. Hill used the space to produce medical marijuana licensed under the MMAR Act within the Health Canada guidelines. Due to recent health concerns and a diagnosis of MS, Mr. Hill has had to stop his business practices and is no longer able to use this space. In 2013, Mr. Watson hired a geotechnical engineer (Fraser Valley Geotech) to oversee the process of reclaiming the 15000SF manure pit on this parcel. Mr. Watson was able to acquire a hazard assessment for the area and then remediate this portion of the parcel. As well, at this time Mr. Watson was told that the access road to the hog barns built up of materials that were sourced on site in the 1970's.

3. Quantify and describe all non-agricultural uses that currently take place on the parcel(s).
There are no non-agricultural uses that currently take place on this parcel, other than what remains of the MMAR Act facility.

Adjacent Land Uses

North

Land Use Type: Agricultural/Farm
Specify Activity: Not being used for any current form of agriculture. It is overgrown and dormant. Owner is Charlie Chapman 58538 Mckay Road 604-869-7439

East

Land Use Type: Agricultural/Farm

Specify Activity: For Hay production/Cows. Also owned by Michael Watson.

South

Land Use Type: Agricultural/Farm
Specify Activity: Currently dormant, but was previously used for raising of hogs.

West

Land Use Type: Agricultural/Farm
Specify Activity: For Hay production/Cows. Primary residence, also owned by Michael Watson.

Proposal

1. How many hectares are proposed for non-farm use?
0.2 ha

2. What is the purpose of the proposal?
Mr. Watson is applying for non-farm use so that he will be able to construct a building with a 17000 SF footprint on his property. The proposed structure would be located at the site of the old manure pit and existing MMAR Act facility described in previous sections of this proposal. The proposed structure would be used as a production facility for medical marijuana and proposes to be ACMPR and Cannibas Act compliant. The building currently in this location would be removed as it is non-compliant to the new ACMPR standards, and is no longer appropriate for use as a production facility according to Health Canada's regulations. A successful application would achieve the realization of a six year long project goal for Mr. Watson and his family. This long-time farming family is ready and eager to enter into the new and exciting agricultural business of producing plants for medical use. The Watson family has invested a great deal of time and money into this project. In 2014 they went to great lengths to ensure their land was appropriately zoned for these non-farm use purposes, in hopes they might someday be able to run a regulated, legal, and financially rewarding business on their land. They have participated in many discussions with the ALC as far back as 2012 and have always believed that cannabis is as much a plant as any other crop being farmed in this area.

3. Could this proposal be accommodated on lands outside of the ALR? Please justify why the proposal cannot be carried out on lands outside the ALR.
Mr. Watson does not own any lands outside of the ALR, therefore, he would be unable to accommodate this proposal elsewhere.

4. Does the proposal support agriculture in the short or long term? Please explain.
Mr. Watson believes that this proposal will support agriculture in the long term, because having a successful farming family be able to continue to be productive on their own land is good for any farming community. Mr. Watson intends to continue hay production and the raising of livestock, as his ancestors have for decades. However, as other farmers move toward high tech dairy barns, 400 foot long chicken houses, and 100,000 SF hog barns, he feels these practices aren't where his family wants to be. In order to keep his farm "a farm" he needs to be able to find a way to continue to exist in the modern world. Growing plants for medical use will allow Mr. Watson to continue his family's farming traditions for years to come, while providing an opportunity for financial stability.

Applicant Attachments

- Agent Agreement - Mr.
- Other correspondence or file information - Health Canad Confirmation of Readiness for Licence
- Other correspondence or file information - Destruction Equipment BINPAK
- Professional Report - Building Code Compliance
- Other correspondence or file information - NRG Consulting supporting Information
- Proposal Sketch - 58010
- Professional Report - Geo Report
- Professional Report - Hazard Report
- Other correspondence or file information - Petition support of facility by community
- Other correspondence or file information - Existing permit to cultivate
- Certificate of Title - 011-945-311
- Certificate of Title - 011-945-354
- Certificate of Title - 011-945-303

ALC Attachments

None.

Decisions

None.

TITLE SEARCH PRINT 2018-09-14, 14:52:51

File Reference: Requestor: Allan Tunbridge

Declared Value $ 126750

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Land Title District	NEW WESTMINSTER
Land Title Office	NEW WESTMINSTER
Title Number	BA461227
From Title Number	BP214265
Application Received	2006-01-31
Application Entered	2006-02-06

Registered Owner in Fee Simple

Registered Owner/Mailing Address: MICHAEL CORNELIUS WATSON, BULK FUEL SALES MANAGER
363 - 1755 ROBSON STREET
VANCOUVER, BC
V6G 3B7

Taxation Authority New Westminster Assessment District

Description of Land

Parcel Identifier: 011-945-303

Legal Description:

LOT 6 SECTION 20 TOWNSHIP 4 RANGE 27 WEST OF THE
SIXTH MERIDIAN NEW WESTMINSTER DISTRICT PLAN 1447K

Legal Notations

THIS CERTIFICATE OF TITLE MAY BE AFFECTED BY THE AGRICULTURAL LAND COMMISSION ACT, SEE AGRICULTURAL LAND RESERVE PLAN NO. 56 DEPOSITED SEPTEMBER 11TH, 1974.

Charges, Liens and Interests

Nature:	STATUTORY RIGHT OF WAY
Registration Number:	D50139
Registration Date and Time:	1968-07-29 13:08
Registered Owner:	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY
Remarks:	INTER ALIA PLAN 34112

Nature:	MORTGAGE
Registration Number:	CA2242146
Registration Date and Time:	2011-10-24 11:56
Registered Owner:	THE TORONTO-DOMINION BANK

Duplicate Indefeasible Title	NONE OUTSTANDING
Transfers	NONE
Pending Applications	NONE

TITLE SEARCH PRINT 2018-09-14, 14:52:36

File Reference: Requestor: Allan Tunbridge

Declared Value $ 136500

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Land Title District NEW WESTMINSTER
Land Title Office NEW WESTMINSTER

Title Number BA461229
From Title Number BP214267

Application Received 2006-01-31

Application Entered 2006-02-06

Registered Owner in Fee Simple
Registered Owner/Mailing Address: MICHAEL CORNELIUS WATSON, BULK FUEL SALES MANAGER
363 - 1755 ROBSON STREET
VANCOUVER, BC
V6G 3B7

Taxation Authority New Westminster Assessment District

Description of Land
Parcel Identifier: 011-945-354
Legal Description:
LOT 8 EXCEPT: PART SUBDIVIDED BY PLAN 23054, SECTION 20
TOWNSHIP 4 RANGE 27 WEST OF THE SIXTH MERIDIAN NEW WESTMINSTER DISTRICT
PLAN 1447K

Legal Notations
THIS CERTIFICATE OF TITLE MAY BE AFFECTED BY THE AGRICULTURAL LAND COMMISSION ACT, SEE AGRICULTURAL LAND RESERVE PLAN NO. 56 DEPOSITED SEPTEMBER 11TH, 1974.

Charges, Liens and Interests
Nature: MORTGAGE
Registration Number: CA727861
Registration Date and Time: 2008-03-19 10:02
Registered Owner: THE TORONTO-DOMINION BANK

Nature:	MORTGAGE
Registration Number:	CA4245668
Registration Date and Time:	2015-02-23 13:13
Registered Owner:	RELIABLE MORTGAGES INVESTMENT CORP. INCORPORATION NO. 476257
Remarks:	INTER ALIA

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

TITLE SEARCH PRINT 2018-09-11, 14:54:50

File Reference: Requestor: Allan Tunbridge

Declared Value $126750

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Land Title District	NEW WESTMINSTER
Land Title Office	NEW WESTMINSTER
Title Number	BA461228
From Title Number	BP214266
Application Received	2006-01-31
Application Entered	2006-02-06

Registered Owner in Fee Simple

Registered Owner/Mailing Address: MICHAEL CORNELIUS WATSON, BULK FUEL SALES MANAGER
363 - 1755 ROBSON STREET
VANCOUVER, BC
V6G 3B7

Taxation Authority New Westminster Assessment District

Description of Land

Parcel Identifier: 011-945-311

Legal Description:

LOT 7 SECTION 20 TOWNSHIP 4 RANGE 27 WEST OF THE
SIXTH MERIDIAN NEW WESTMINSTER DISTRICT PLAN 1447K

Legal Notations

THIS CERTIFICATE OF TITLE MAY BE AFFECTED BY THE AGRICULTURAL LAND COMMISSION ACT, SEE AGRICULTURAL LAND RESERVE PLAN NO. 56 DEPOSITED SEPTEMBER 11TH, 1974.

Charges, Liens and Interests

Nature:	COVENANT
Registration Number:	BH259643
Registration Date and Time:	1994-07-11 12:43
Registered Owner:	REGIONAL DISTRICT OF FRASER-CHEAM
Remarks:	SECTION 215 LAND TITLE ACT

Nature:	MORTGAGE
Registration Number:	CA727863
Registration Date and Time:	2008-03-19 10:03
Registered Owner:	THE TORONTO-DOMINION BANK

Nature:	MORTGAGE
Registration Number:	CA4245668
Registration Date and Time:	2015-02-23 13:13
Registered Owner:	RELIABLE MORTGAGES INVESTMENT CORP. INCORPORATION NO. 476257
Remarks:	INTER ALIA

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

AGENT AUTHORIZATION LETTER

I (we) Michael WATSON
Printed/typed name(s) of landowner(s)

hereby appoint NAG CONSULTING to
Printed/typed name of agent

make application to the Agricultural Land Commission as agent on my/our behalf with respect to the following parcel (s): *Insert legal description for each parcel under application*

011-945-311
5855 1A DENT ROAD

LOT 7, SECTION 20, TOWNSHIP 4, RANGE 27, WEST OF 6TH MERIDIAN, NEW WESTMINISTER, DISTRICT PLAN 1447K

I CRAIG GARDEN understand that as
Printed/typed name of agent

agent, I am required to ensure that all landowners are provided with information being submitted to and received from the Agricultural Land Commission.

Signature(s) of landowner(s):

Signature	Printed Name	Date
	Michael Watson	09/01/18
Signature	Printed Name	Date

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

Mr. Michael Watson
58551A Dent Road
Laidlaw, BC

May 5, 2018
(revised September 18, 2018)

Attention: Mr. Michael Watson

Regarding: Geotechnical and Hazard Assessment Report
Proposed Agricultural Building
58551A Dent Road, Laidlaw, Project: 43921-01

1.0 INTRODUCTION

Valley Geotechnical Engineering Services Ltd. (Valley Geo) has been retained by Mr. Michael Watson to conduct a Hazard Assessment Report for the proposed agricultural storage building. This report summarizes our work to date and presents recommendations pertinent to the proposed building at the above site. This report supersedes our November 14, 2013 report previously issued.

This report has been prepared in accordance with the Fraser Valley Regional District (FVRD) guidelines for geotechnical reports and hazard assessment, pursuant to the Section 56 of the Community Charter and the APEGBC "Guidelines for Legislated Landslide Assessments for Proposed Residential Developments in BC (Revised May 2010)." This report may be used by the FVRD Approving Officer for building permit approval.

Based on our analyses we confirm that the land can be used safely for the use intended provided the recommendations presented in this report are completed. We note that this report only addresses the hazards and presents recommendations for the above proposed development.

2.0 INFORMATION REVIEWED

Valley Geo has reviewed the following documents in preparation of this report:

- FVRD online topographical and hazard mapping system
- Fraser Valley Regional District, Bylaw No. 0681, 2005, A Floodplain Management Bylaw Pursuant to Section 910 of the Local Government Act
- Fraser Valley Regional District, Report dated January 2007, November 2006 Flood Damage Assessment

- British Columbia Geologic Hazards Workshop February 20 & 21 of 1991, November 1993. Hazard Acceptability Thresholds for Development Approvals by Local Government, Dr. Peter W. Cave Director of Planning of the Regional District of Fraser-Cheam.
- Took Structural Laboratory Inc. Report dated January 8, 1991, Proposed Open Sand Pit Operation at 5871 Dent Road, Hope, B.C.
- Took Structural Laboratory Inc. Report dated September 28, 1994, Proposed 40ft x 60ft x 18ft high steel building for farm machinery storage at 58671 Dent Road, Laidlaw, B.C.
- Took Engineering Inc. Report dated February 22, 2001, Flooding Hazard Evaluation for 58510 Laidlaw Road, Laidlaw, B.C.
- Thurber Engineering Ltd. Report dated July 10, 1989, Hagkull Property, 58278 McKay Road, Laidlaw, B.C.
- Thurber Engineering Ltd. Report dated September 7, 1995, Geotechnical Evaluation of Slope Stability, 58728 McKay Road, Laidlaw, B.C.
- Thurber Engineering Ltd. Report dated April 16, 2001, 58751 McKay Road, Laidlaw, BC Due-diligence Geological Hazard Assessment
- Thurber Engineering Ltd. Report dated June 11, 2013, Barn Footing and Proposed House, Pump House and Powerhouse, 58751 McKay Road, Laidlaw, BC, Geological Hazard Assessment
- Hardy Associates Ltd. Report dated May, 1986, Review of Geological and Snow Avalanche Hazards for The Official Community Plan for Electoral Areas “B” and “C”, Upper Fraser Valley, B.C.
- Hay & Company Consultants, Report dated November 15, 2005, Site-Specific Hazard Assessment for the Property at 58480 Laidlaw Road
- Hay & Company Consultants, Report dated November 21, 2005, Site-Specific Hazard Assessment for the Property at 58470 Laidlaw Road
- Wedler Engineering Civil Consultants, Report dated October 9, 2008, Site Specific Exemption from Bylaw 0681 Regarding Floodproofing for Proposed Livestock Barn @ 58251 Laidlaw Rd. – Lot 1, District Lot 8, Section 19, Township4, Land District 3, Plan LMP 35026

3.0 PROPOSED CONSTRUCTION

An agricultural storage building is purposed to be constructed at the at the mid-point of the east property line. The building will be two floors high and rectangular in shape with dimensions of 24.7m wide 54.5m long and 7.6m high. A portion of the building is proposed to be located over an existing manure pit which has been filled in with structural material tested and approved by Valley Geo.

See Appendix A for Building Drawings and Site Location Plan.

4.0 SITE INFORMATION

Valley Geo has completed a desktop review, aerial photo review, soil investigation, detailed site reconnaissance of the site and surrounding area. We have also interviewed Mr. Michael Watson, current owner, of the subject property. The following subsections summarize the relevant findings and observations.

4.1 Site Description

The subject site is located within Electoral Area B within the FVRD and has the following civic address and legal description:

- 58551A Dent Road
- Lot 7, Section 20, Township 4, Range 27, Meridian 6, New Westminster District, Plan Meridian W6, Except Plan 23054.

The subject site is bounded by rural agricultural properties to the north, west, and east and Dent Road to the south. The property is 3.9Ha with approximate dimensions of 198m both north-south and west-east. The majority of the site is free of major vegetation except the north-west corner adjacent to Lorenzetta Creek located outside of the property. Several barns and houses are located on the site.

The property slopes slightly to the west between the approximate elevations of 31m and 28m according to the available online contour and elevation information. A shallow channel or depression is located at the east property line. This channel appears to be part of a tributary to Lorenzetta Creek. It is our understanding that this channel receives flow during the winter months but is otherwise dry.

The proposed building area elevation is approximately 29.5m and within a local high point elevated approximately 2.5m from the lowest point to the west of the property, 1.5m higher than Dent Road, and 1m above the bottom of the depression to the east. It should be noted that a survey has not yet been completed and the building site elevation requires confirmation from a surveyor.

The proposed building area is subject to a Fraser River Flood Construction Level (FCL) of 30.1m and 3m above the natural boundary of Lorenzetta Creek. In addition, potential hazards from alluvial fan and localized flooding has been identified by the FVRD.

4.2 Surrounding Topography and Hydrology

The subject site is located in a relatively flat area between the Fraser River and a mountain. The Fraser River and toe of the mountain are located approximately 800m and 500m, respectively, from the proposed building area.

Laidlaw Road is located to the west of the subject site. Laidlaw road is generally elevated slightly above the surrounding grade at elevations between 28.7 to 29.4m (Took, May 2001). Several culverts and bridges exist for Laidlaw Road for local drainage and creeks.

From review of the available contour information the lower mountain slopes are approximately 20% with steeper slopes at the higher reaches of the mountain. From our site observations it appears that historically there may have been some localized slope failures. Several older logging roads and cuts exist at the mountain.

Lorenzetta Creek is approximately 185m from the proposed building area at its closest point. The creek originates from the mountain slopes to the north-east with its apex at the toe of the mountain approximately 950m east from the building area. It appears that historically this creek split into several channels just past the apex before re-joining and flowing to the south-west. Currently the creek is confined to a single channel and is protected with local private dykes and rip-raped banks. We estimate that the proposed building area is approximately 3m above the natural boundary. A tributary joins Lorenzetta Creek approximately 390m southwest from the building area. This tributary exists on the subject property as the above shallow depression.

See Appendix B for Overall Site Plan.

4.3 Site and Surrounding Area Soil Stratigraphy

Valley Geo completed a test pit investigation on October 7, 2013 with a track mounted excavator. Three test pits (designated as TP1 and TP3) were excavated to depths ranging from 1.7m to 1.9m below the existing grade.

The subsurface conditions encountered generally consist of:

- Sand and silt fill up to 0.8m thick underlain by
- Moist, medium stiff to medium dense sandy silt, up to 1.2m thick underlain by
- Moist, very dense, sandy gravel to depths explored

An exception to the above was TP 3 were topsoil over clayey silt was encountered. No free water was encountered during the test pit investigation.

It is expected that the soil conditions on the mountain consist of a surficial topsoil layer over glacial till and bedrock. No geology maps were available for this area.

See Appendix C for Test Pit Location Plan and Test Pit Logs.

4.4 Aerial Photo Review

The subject site and surrounding area's historical aerial photographs, provided by the UBC geography department, were reviewed in preparation of this report. The highlights from the review are as follows:

- Possible debris deposition at apex of Lorenzetta Creek (1951& 1954), well away from this site
- A slope failure on the upper mountain slopes to the east (1973)
- Escarpment in upper reaches of Lorenzetta Creek (1979)
- Lorenzetta Creek diked and confined to single channel (1983)

A detailed tabulated summary of this review is presented in Appendix D attached.

4.5 Interviews

An interview was undertaken with Michael Watson the current homeowner and applicant. It was identified that the proposed building area has never flooded in recent history. The fields

surrounding the building area, which are lower, flood regularly during heavy rainfalls and high flow events. The channel to the east (part of Lorenzetta Tributary) does receive flow during the winter months.

4.6 Aerial Review

A helicopter reconnaissance was completed by Mr. Narayan Abhyankar, P.Eng. as part of our geotechnical preliminary review for 58751 Mckay Road. The mountain and creek slopes were reviewed for evidence of instability and recent failures. Steep slopes were observed with several areas that may have sloughed in recent history.

5.0 HAZARDS ASSESSMENT & MITAGATION MEASURES

From our review of the site topography and soil conditions, we conclude that the primary hazards that may affect the proposed building are inundation by flood waters, mountain stream erosion and avulsion, debris flow, and debris flood. Protective measures and covenants are required to allow for the safe construction of the agricultural storage building.

The following sections discuss the applicable hazards listed in the Dr. Caves' *Hazard Acceptability Thresholds for Development Approvals by Local Government* report, dated November, 1993 along with their probability of occurrence.

5.1 Inundation by Flood Waters

The site is subject to a minimum FCL for protection from inundation from flood water from the Fraser River and Lorenzetta Creek. The FCL for the Fraser River is 30.1m (including freeboard) which is estimated to be slightly above the proposed building area grade. The FCL for Lorenzetta Creek is 3m above its natural boundary. At the time of this report the natural boundary elevation of the creek is unknown.

The building area is estimated to be approximately 3m above the natural boundary of Lorenzetta Creek. However, regardless of the creek natural boundary elevations we confirm that the building is adequately protected with the Fraser River FCL of 30.1m. The Fraser River FCL is above the high point of Laidlaw Road. The slope beyond Laidlaw Road is to the west and any Lorenzetta Creek flood waters would crest the road before inundating the proposed building. However, as an additional protective measure we are recommending a minimum FCL of 0.30m above the surrounding grade.

The higher of the two above FCL's (Fraser River FCL or 0.3m above grade) governs and is required to be confirmed by a surveyor during construction. *Additional fill will be required below the slab to raise the elevation to the above governing FCL.*

The frost depth is considered adequate for scour protection. Any flood water that would inundate the proposed building area would have very little energy resulting in minimal scour potential.

Provided that the above measures are implemented we estimate the probability of damage to the proposed building from inundation by flood waters to be low (<1:200)

5.2 Mountain Stream Erosion and Avulsion

The building area has been identified by the FVRD as being subject to hazards associated with the Lorenzetta Creek Alluvial Fan. Review of the aerial photo indicated possible alluvial deposition at the toe of the mountain at the creek apex. However, no evidence of deposition was observed within the building area.

As described above, the building area is located within a local high point with low-lying land between the creek and the building. In the event the creek breeches its current banks any deposition would occur in the low-lying area. In addition, our test pit investigation did not encounter any material conducive to alluvial deposition within the upper 1.8m. The sandy silt to clayey silt encountered is a characteristic of slow moving water deposition and may have been placed by the Fraser River during repeated historical flooding events. In addition, the stiff classification indicates that the silt stiffened due to desiccation over a historical time period.

On the basis of the above we estimate the probability of damage to the proposed building from mountain stream erosion of avulsion to be low (<1:500)

5.3 Debris Flows and Debris Torrents

During our review of the aerial photos evidence of debris flows was observed on the apex of Lorenzetta Creek. In addition, several reports completed for projects in the general area also comment on the occurrence of debris flows. The Thurber, June 11 2013 report states that debris flows have occurred in the past and could occur again and potentially breach the creek channel.

In our site reconnaissance no evidence of past debris flows affecting the building area was observed. If any smaller debris flows were to breach the current creek banks the low-lying land between the creek and the building area is sufficient to dissipate the energy and prevent damage to the building.

Valley Geo reviewed the recent construction at 58480 Laidlaw Road which had similar topographical conditions as the subject site. The report completed by Hay & Company, November 15, 2005 for 58480 Laidlaw Road for the storage building assigned a hazard level of low for debris flow. The report also identified that if the building was elevated even slightly above the surrounding grade that the hazard level could be considered as very low. The subject proposed building area is located in a local high point and elevated above the surrounding area. In addition, the building will be elevated a minimum of 300mm above the surrounding grade as part of the flood protection measures further protecting it from debris flows.

We estimate that annual probability of occurrence within the proposed building area from debris flow and torrents to be between 1:500 to 1:10000, therefore, requiring protective measures. We confirm that elevating the building 300mm above the surrounding grade (required for flood protection) is sufficient to protect from debris flows or torrents (<1:10000).

5.4 Debris Floods

The subject site may be subject to debris floods if the above debris flow impedes the collector channel's flow. We estimate that annual probability of damage to the proposed building from debris flow and torrents to be between 1:200 to 1:500, therefore, requiring protective measures. We confirm that elevating the building 300mm above the surrounding grade (required for flood protection) is sufficient to protect from debris floods (1:500 - 1:10000).

5.5 Landslides, Small-Scale, Localized

Several small landslides were observed on the mountain slopes approximately 500m from the proposed building area. In addition, some concern was raised about logging practices in the area.

The building area is located far enough away from the toe of the mountain and within a relatively flat area. On the basis of the above we estimate the probability of damage to the proposed building from small scale localized landslip to be low (<1:10000)

5.6 Snow Avalanche

The site is not located within an avalanche area; low probability of <1:10000.

5.7 Rock Falls

Bedrock outcrops or talus slopes are not present onsite or in the immediate vicinity of the subject site. This hazard has a low probability (<1:10000).

5.8 Catastrophic Landslide

Valley Geo has reviewed the surrounding topography and available aerial photos. To the best of our knowledge there have not been any large scale slippages or slides in the area. The annual probability of hazard from a Massive and Catastrophic Landslide is low (<1:10,000).

5.9 Seismic

Liquefaction of the underlying gravelly sand material below the water table could occur. However, the upper sandy silt to clayey silt is thick enough that punching of the footings would not occur.

The above sections presented our hazard assessment and methodology. Provided the above recommendations are implemented, we confirm that the land may be used safely for the use intended. A Landslide Assessment Assurance Statement has been attached as Appendix E.

6.0 CLOSURE

We trust that this geotechnical and hazard assessment report provides you with the information required for the proposed agricultural storage building. If you have any questions, please do not hesitate to call.

Yours very truly;

Brad VanDelft, A.Sc.T., Eng.L.
Geotechnical Engineering - Principal

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. F. BLANCO # 44388

Sept 18, 2018

Joel Blanco, P.Eng.
Senior Geotechnical Engineer

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA N. S. ABHYANKAR # 11712

Narayan Abhyankar, FEC, P.Eng.
Principal Geotechnical Engineer

Attachments:

Appendix A: Building Drawings and Site Location Plan
Appendix B: Overall Site Plan
Appendix C: Test Pit Location Plan and Logs
Appendix D: Aerial Photo Interpretation
Appendix E: Geohazard Assurance Statement

S:\VGES-PROJECTS\43900\43921-01\43921-01 (2018-09-18) hazard report revised.doc

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

Appendix A

Building Drawings and Site Location Plan

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD
Unit 15 20279 97th Avenue
Langley BC, V1M 4B9
Phone: (604) 882-8475
Fax: (604) 882-8476

Client: MICHAEL WATSON

Location: 58551A DENT ROAD
LAIDLAW, BC

FILE No.	DATE
43921-01	OCTOBER 16, 2013

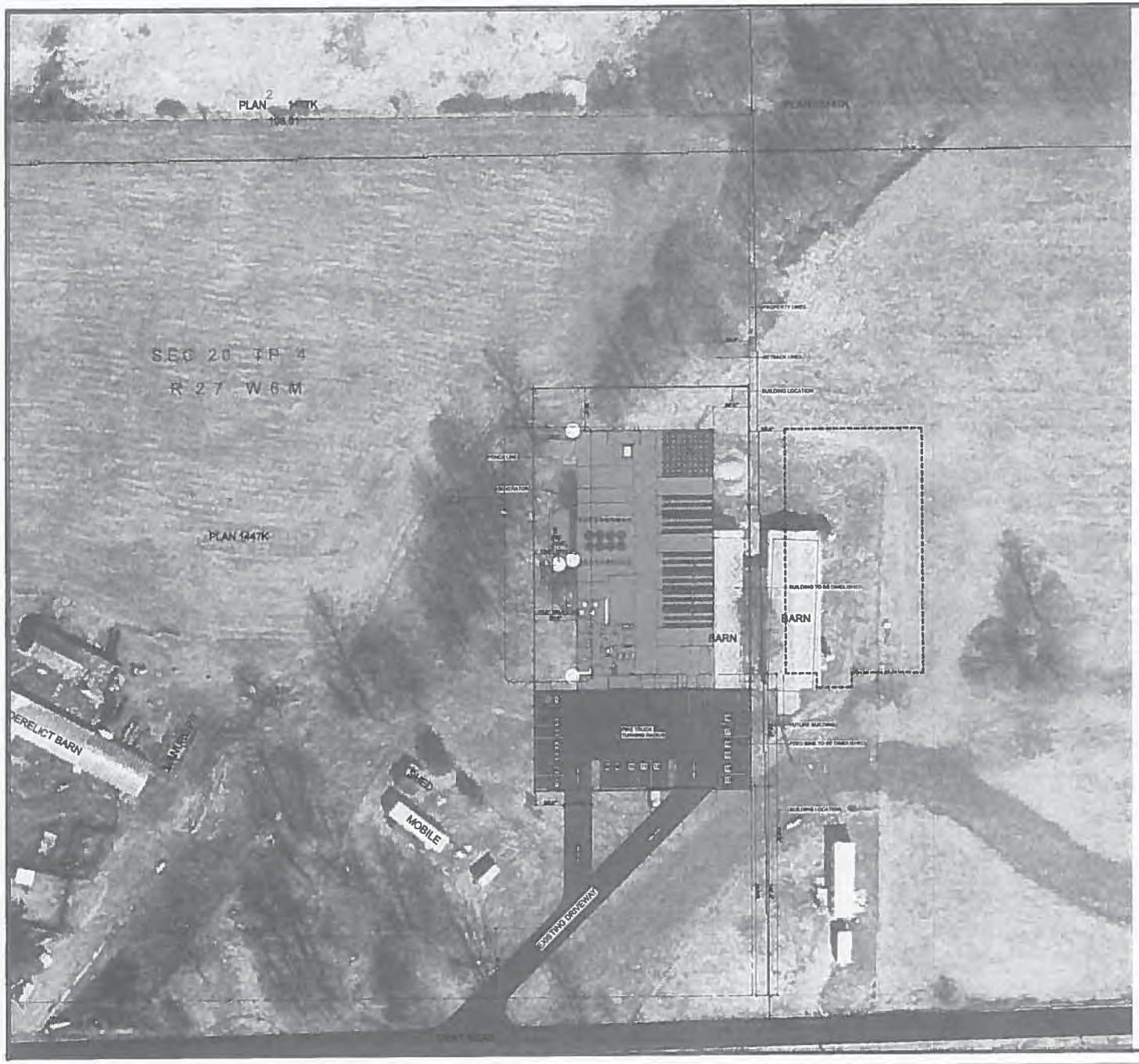
SEAL

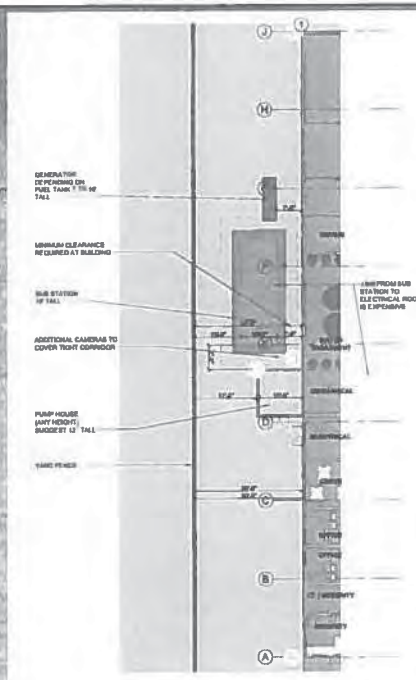
REV	DATE	DESCRIPTION

FARM STORAGE ROOM
SITE PLAN

Drawn:	EK	Dwg No.
Checked:	AJ	1
Scale:	NTS	

Z:\VGES-PROJECTS\43900\43921-01\(43921-01) 2013-10-16.dwg





3 A0.4 SITE YARD
1/16" = 1'-0"

7 A0.4 NORTH CAMERA - SITE YARD

5 A0.4 SOUTH CAMERA - SITE YARD

ISSUED FOR INFORMATION

PROJECT NO
18-128

ISSUES

NO.	DATE	DESCRIPTION
1	SEP 14, 18	ISSUED FOR INFORMATION

CONTRACTOR

STRUCTURAL CONSULTANT
kerkhoff Engineering Ltd
6161 - 8632 VEDDER RD,
CHILLIWACK, BC V2H 3N1

CLIENT
DBO Agriculture Inc.

PROJECT
Production Facility

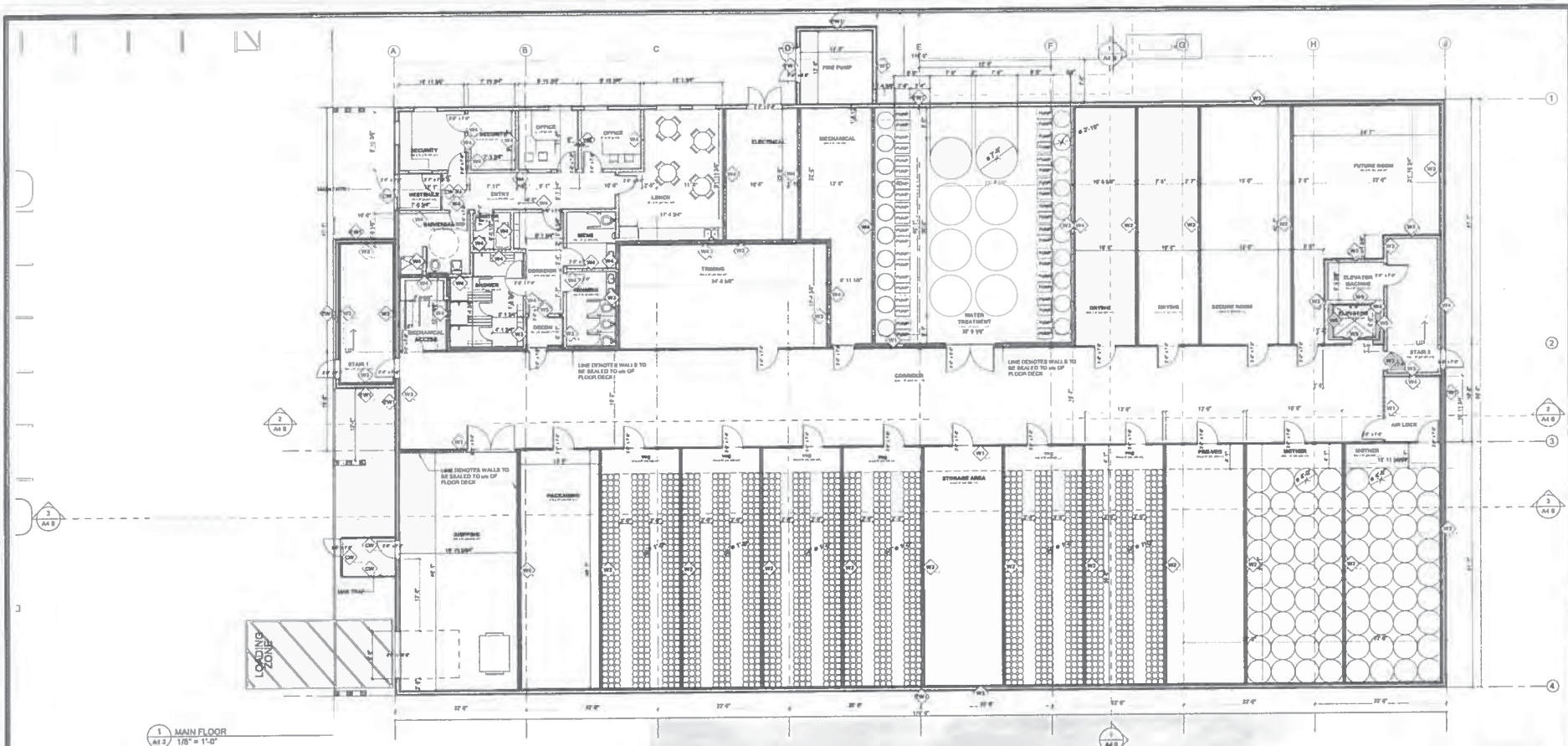
ADDRESS
58551 A Dent Road, Hope, BC

TITLE
SITE PLAN

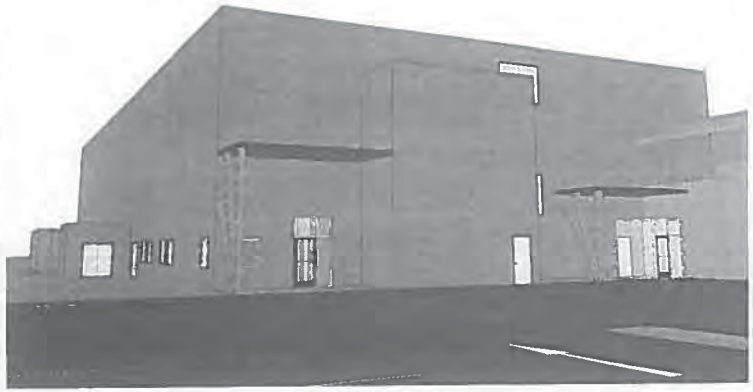
DRAWN BY	JDR
CHECKED BY	TK
SCALE	AS NOTED
DATE	SEP 13, 18

SHEET NO
A0.4

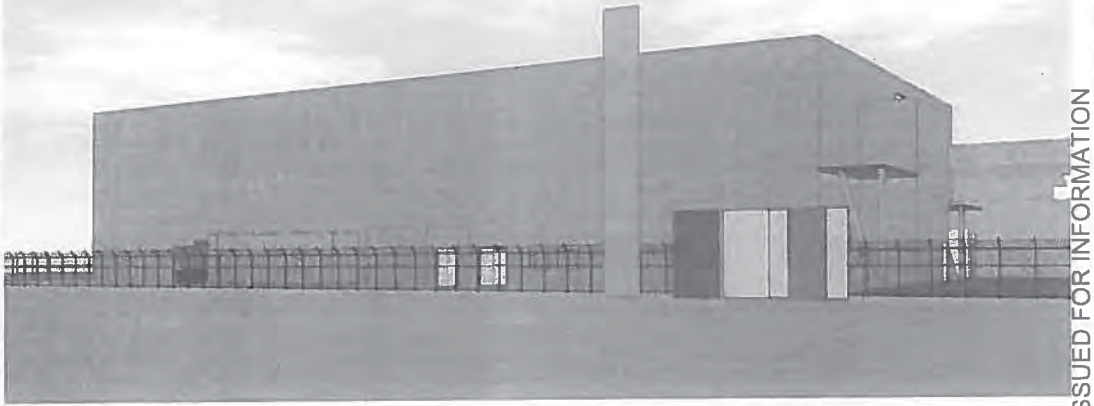
DATE PRINTED
9/17/2018 10:10:39 AM



1 MAIN FLOOR
A1.3 1/8" = 1'-0"



2 FRONT
A1.3



3 SIDE
A1.2

ISSUED FOR INFORMATION

PROJECT NO:
18-128

NO.	DRN.	CHK.	DATE	ISSUES DESCRIPTION
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2	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR:

STRUCTURAL CONSULTANT:

kerkhoff Engineering Ltd.

#101 - 9522 VEDDER RD,
CHILLIWACK, BC V2R 3N1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
MAIN FLOOR

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO:
A1.2

DATE PRINTED:
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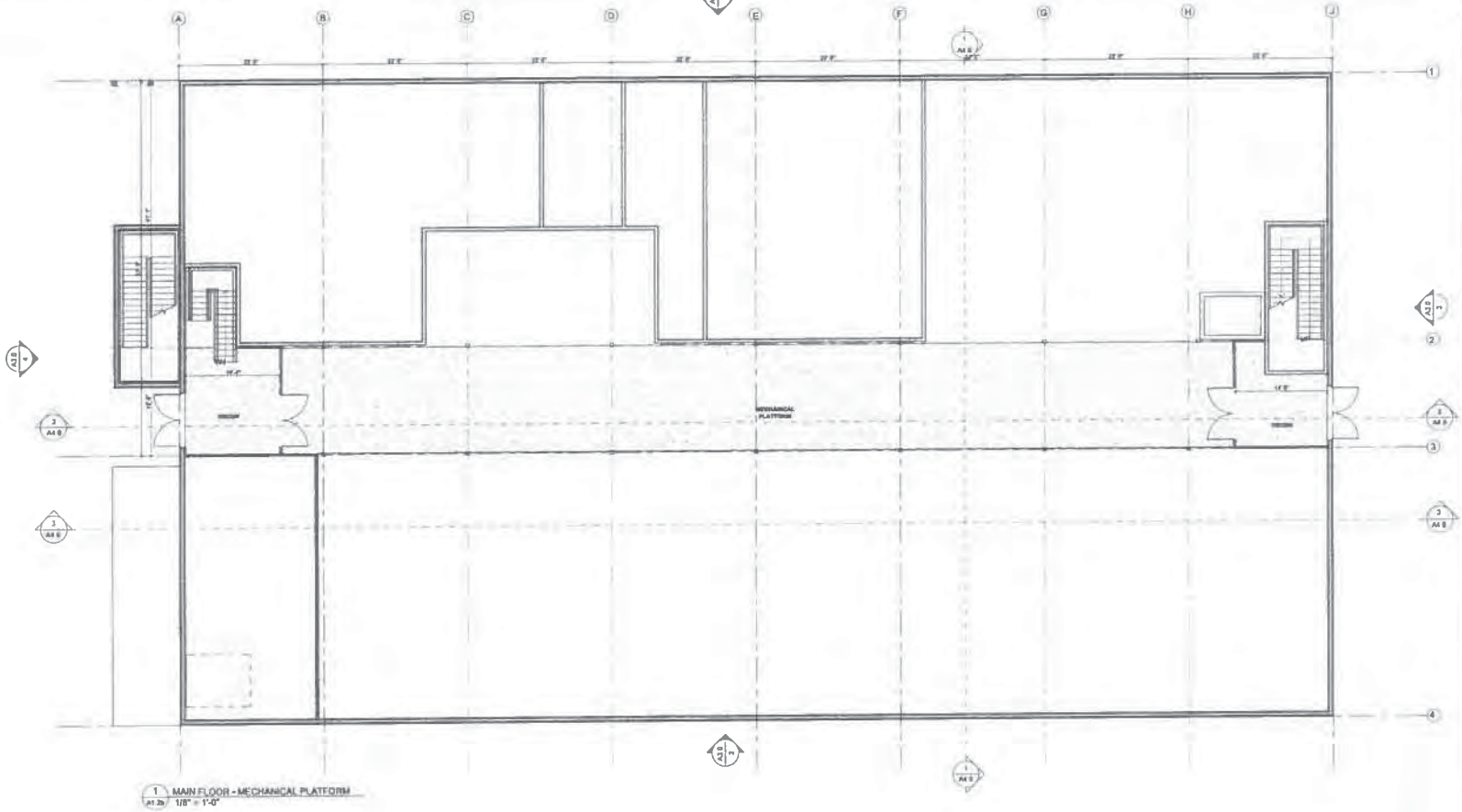

1 MAIN FLOOR - MECHANICAL PLATFORM
A1.2b 1/8" = 1'-0"

PROJECT NO
18-128

ISSUES

NO	DRN	CHK	DATE	DESCRIPTION
1	AR	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR

STRUCTURAL CONSULTANT
kerkhoff engineering Ltd.

#101 8822 VEDDER RD,
CHILLIWACK, BC V2R 3H1

CLIENT
DBO Agriculture Inc.

PROJECT
Production Facility

ADDRESS
58551 A Dent Road, Hope, BC

TITLE
MAIN FLOOR - MECANICAL PLATFORM

ISSUED FOR INFORMATION

DRAWN BY JDR
CHECKED BY TK
SCALE AS NOTED
DATE SEP. 13, 18

SHEET NO
A1.2b

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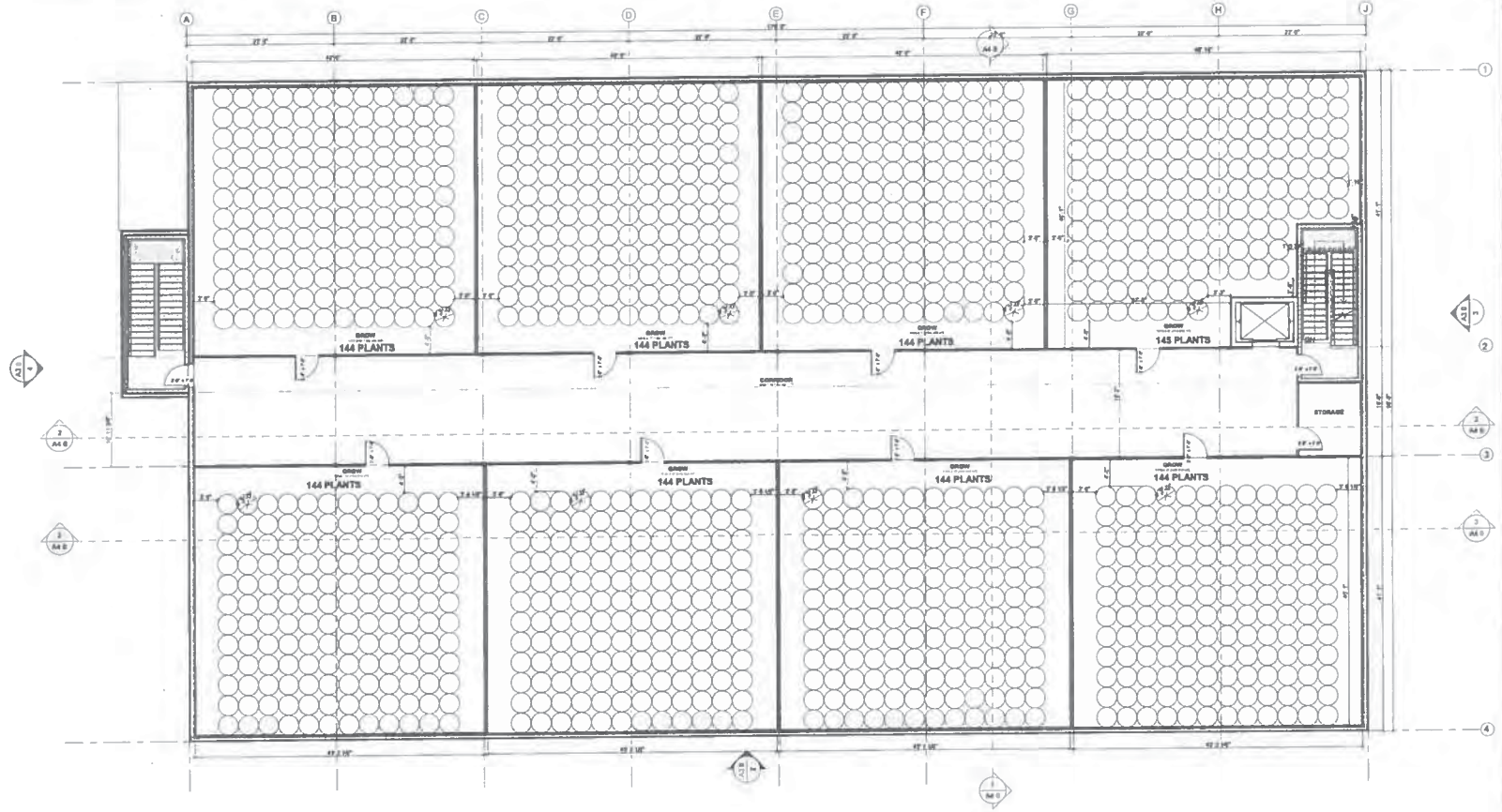

1 UPPER FLOOR
A1.3 1/8" = 1'-0"

PROJECT NO:
18-128

NO	DRN	CHK	DATE	DESCRIPTION
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2	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

ISSUES

CONTRACTOR:

STRUCTURAL CONSULTANT:
kerkhoff Engineering Ltd
#101 - 8822 VEDDER RD,
CHILLIWACK, BC V2H 3N1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road,
Hope, BC

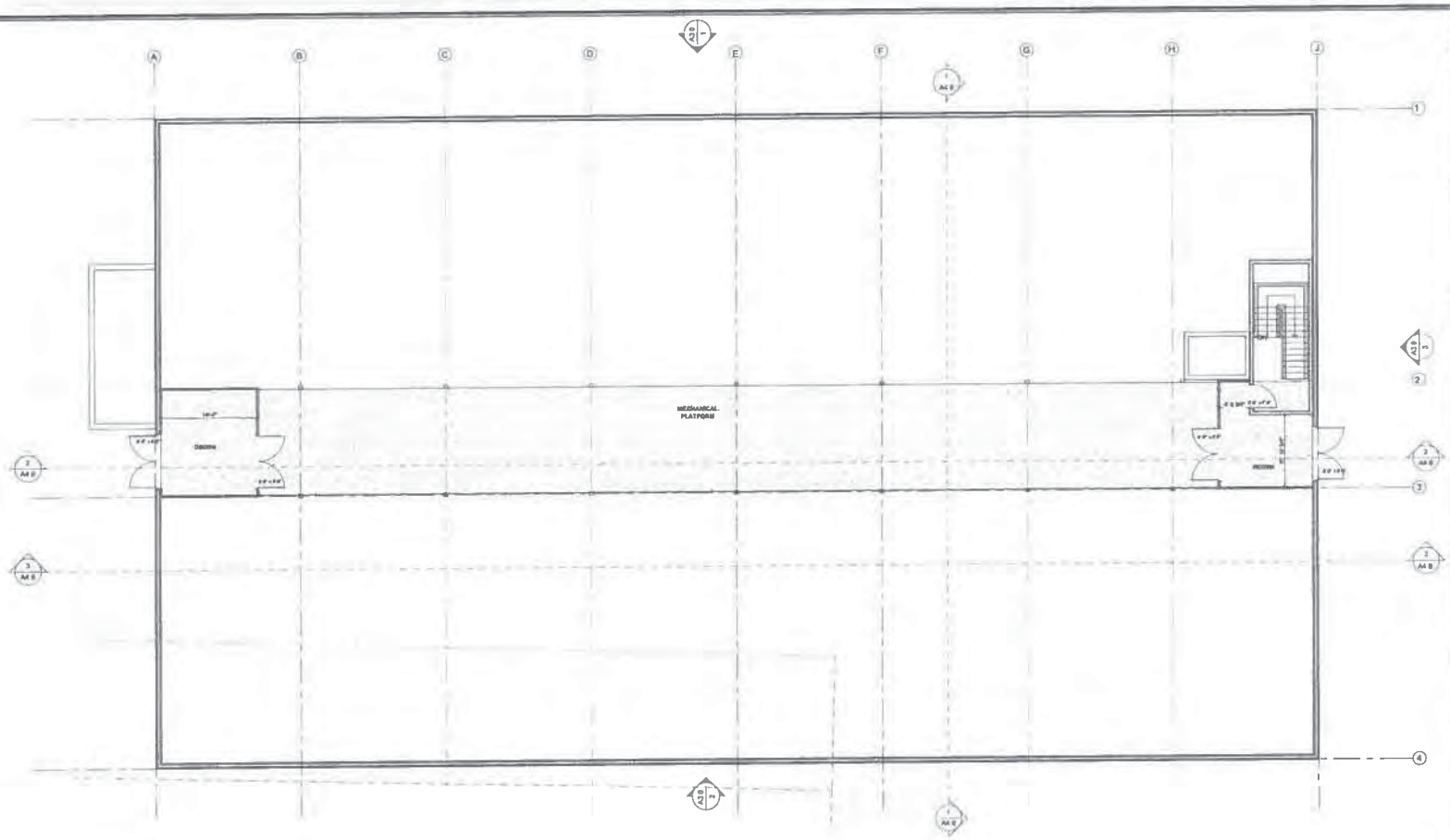
TITLE:
PRODUCTION FLOOR

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO.
A1.3

DATE PRINTED
9/13/2018 3:41:48 PM

ISSUED FOR INFORMATION



1 A1.3b PRODUCTION FLOOR - MECHANICAL PLATFORM
1/8" = 1'-0"

ISSUED FOR INFORMATION

PROJECT NO:
18-128

NO	DRN	CHK	DATE	DESCRIPTION
1	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR:

STRUCTURAL CONSULTANT:
kerkhoff Engineering Ltd.
#101 8623 VEDDER RD,
CHILLIWACK, BC V2H 3H1

CLIENT:
DBO Agriculture inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
PRODUCTION FLOOR - MECHANICAL PLATFORM

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

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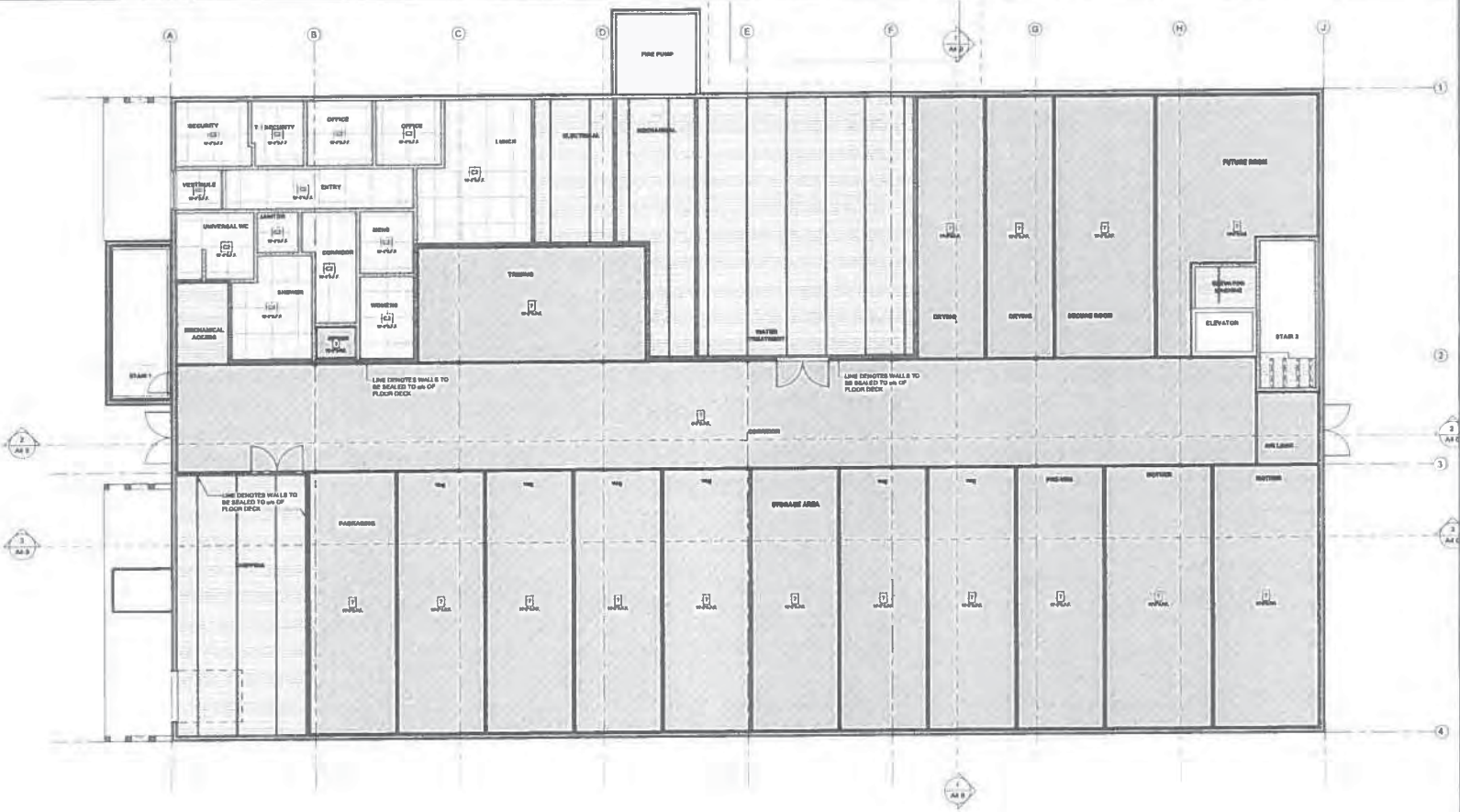

1 / A1.4 RCP - MAIN FLOOR
1/8" = 1'-0"

PROJECT NO.
18-128

ISSUES

NO.	DRN	DATE	DESCRIPTION
2	JDR	SEP 13, 18	ISSUED FOR INFORMATION

STRUCTURAL CONSULTANT
kerkhoff Engineering Ltd.
#101 8622 VEDDER RD,
CHILLIWACK, BC V2H 3N1

CLIENT
DBO Agriculture Inc.

PROJECT
Production Facility

ADDRESS
58551 A Dent Road, Hope, BC

TITLE
RCP MAIN FLOOR

DRAWN BY:	JDR
CHECKED BY	TK
SCALE:	AS NOTED
DATE:	SEP 13, 18

SHEET NO
A1.4

DATE PRINTED
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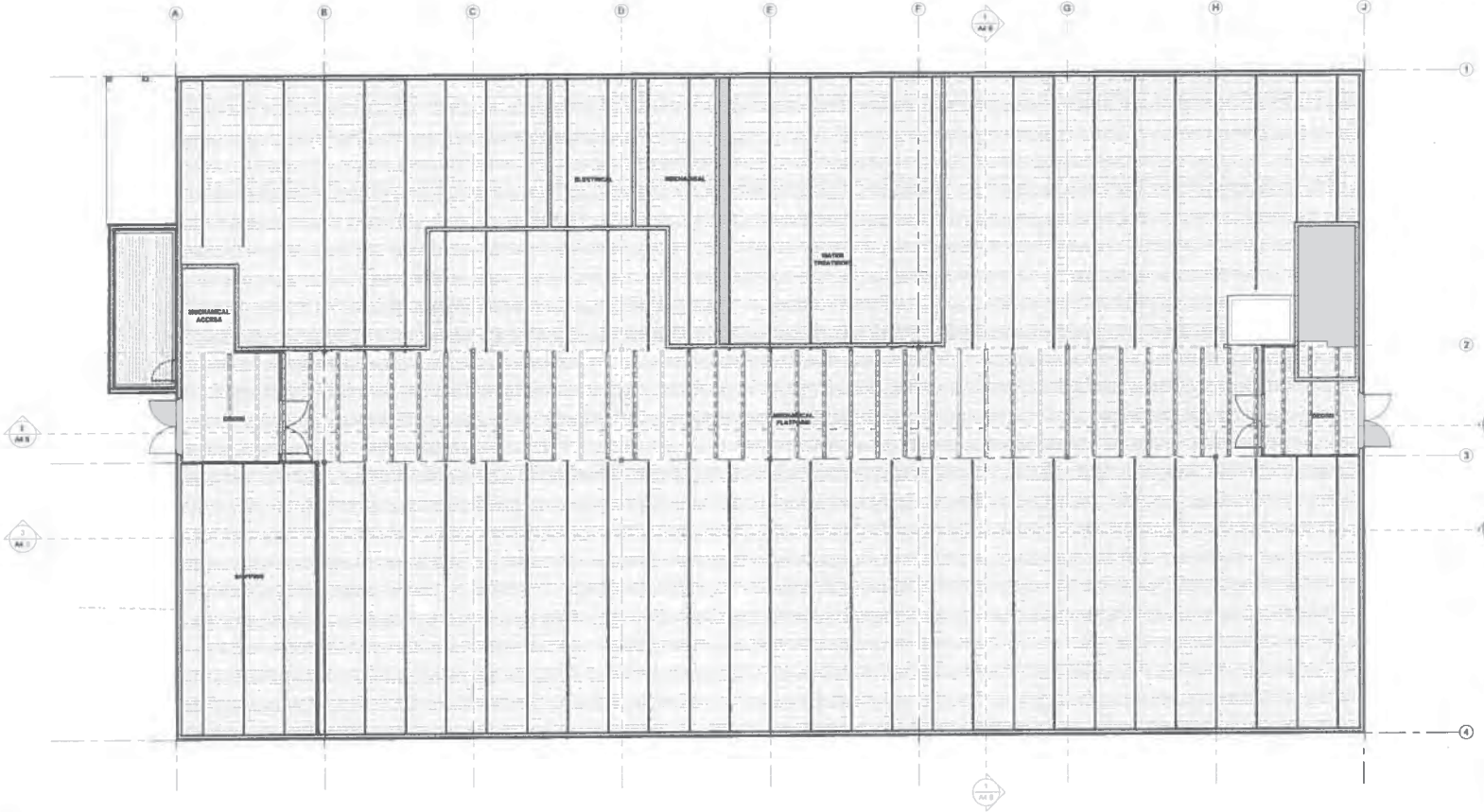
ISSUED FOR INFORMATION



1 MAIN FLOOR PLATFORM - RCP
A1.4b 1/8" = 1'-0"

PROJECT NO
18-128

NO	DRN	CHK	DATE	ISSUES DESCRIPTION
2		APP'L	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR

ARCHITECTURAL CONSULTANT
kerkhoff Engineering Ltd.
#101 - 8622 VEDDER RD,
CHILLIWACK, BC V2H 2H1

CLIENT
DBO Agriculture Inc.

PROJECT
Production Facility

ADDRESS
58551 A Dent Road, Hope, BC

TITLE
RCP - MAIN FLOOR MECHANICAL PLATFORM

ISSUED FOR INFORMATION

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
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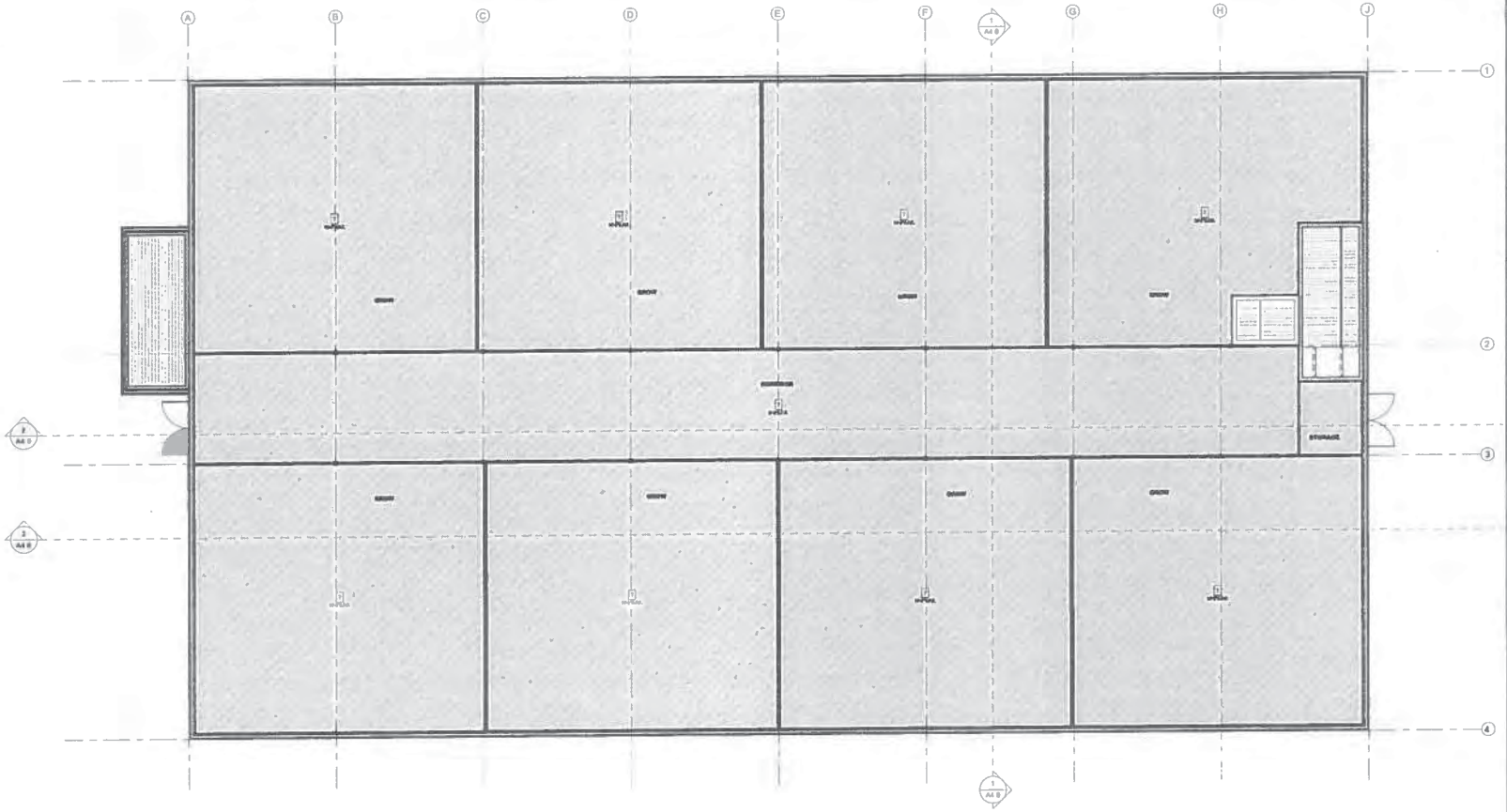

1 UPPER FLOOR - RCP
A1.5 1/8" = 1'-0"

ISSUED FOR INFORMATION

PROJECT NO:
18-128

ISSUES

NO	DRN	CHK	DATE	DESCRIPTION
1	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR:

ARCHITECTURAL CONSULTANT:
kerkhoff Engineering Ltd.
#101 - 8622 VEDDER RD,
CHILLIWACK, BC V2H 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS
58551 A Dent Road,
Hope, BC

TITLE:
RCP - PRODUCTION FLOOR

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

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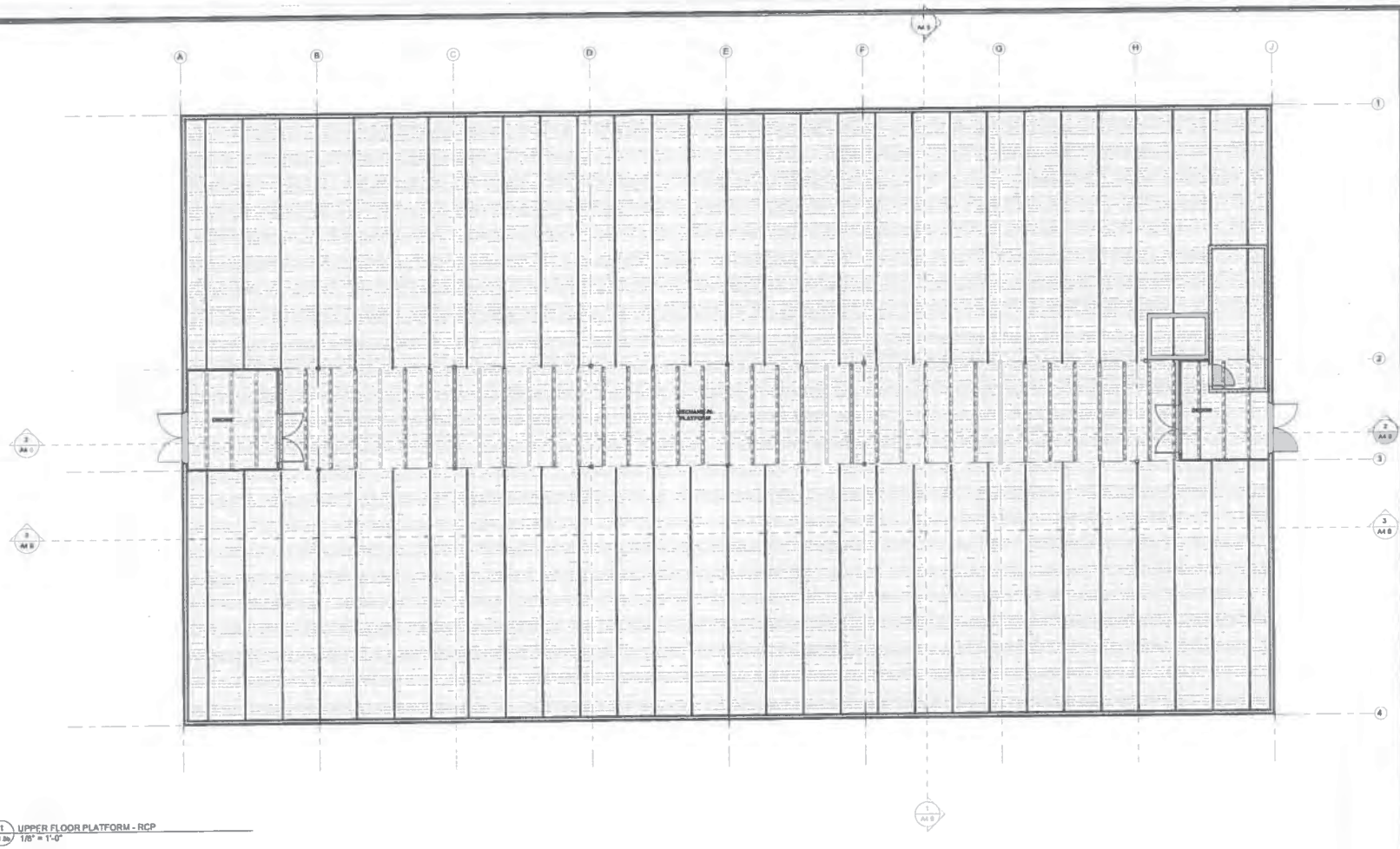

1 / A1.5b UPPER FLOOR PLATFORM - RCP
1/8" = 1'-0"

PROJECT NO.
18-128

NO.	DRWN	CHK	DATE	ISSUES DESCRIPTION
1	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR

ARCHITECTURAL CONSULTANT
kerkhoff Engineering Ltd.
#101 - 8622 VEDDER RD,
CHILLIWACK, BC V2H 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road,
Hope, BC

TITLE:
RCP - PRODUCTION FLOOR MECHANICAL PLATFORM

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO.
A1.5b

DATE PRINTED
9/13/2018 3:41:51 PM

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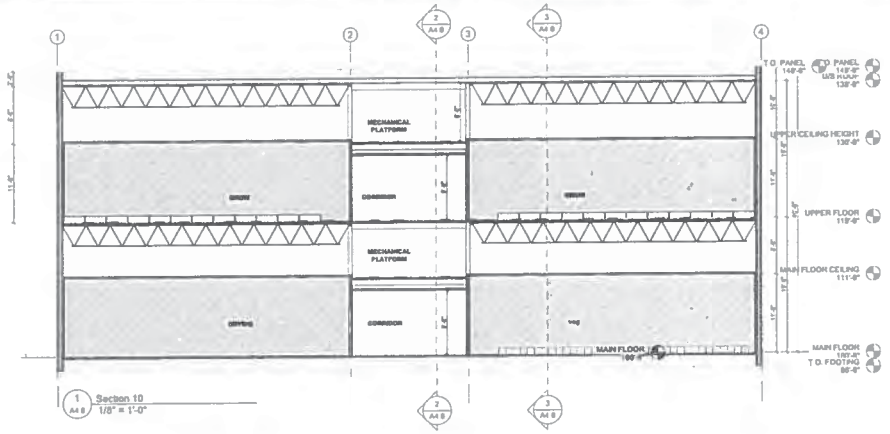

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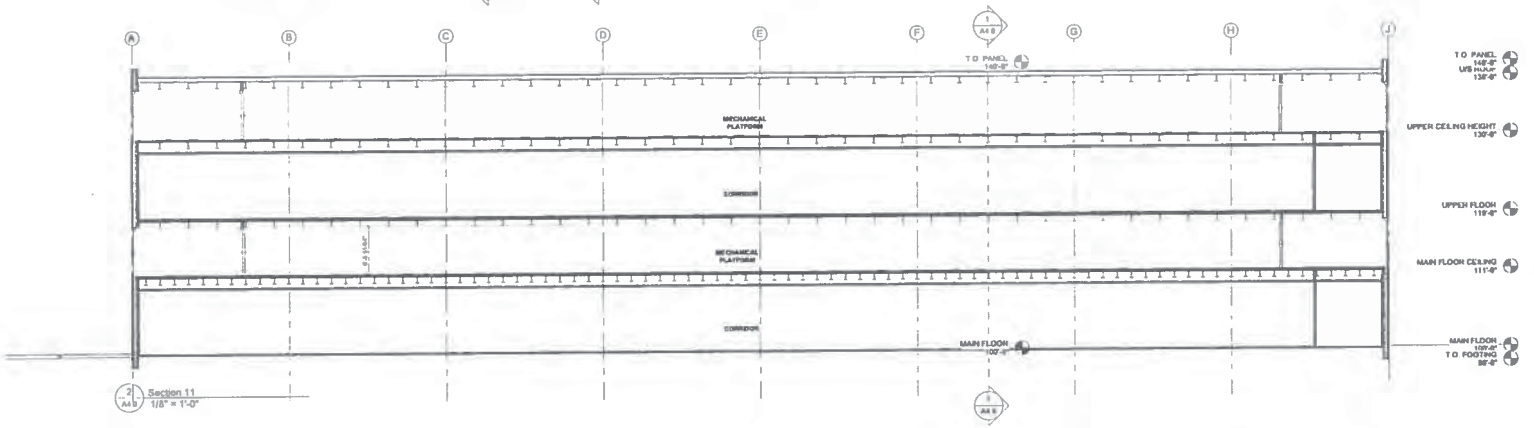
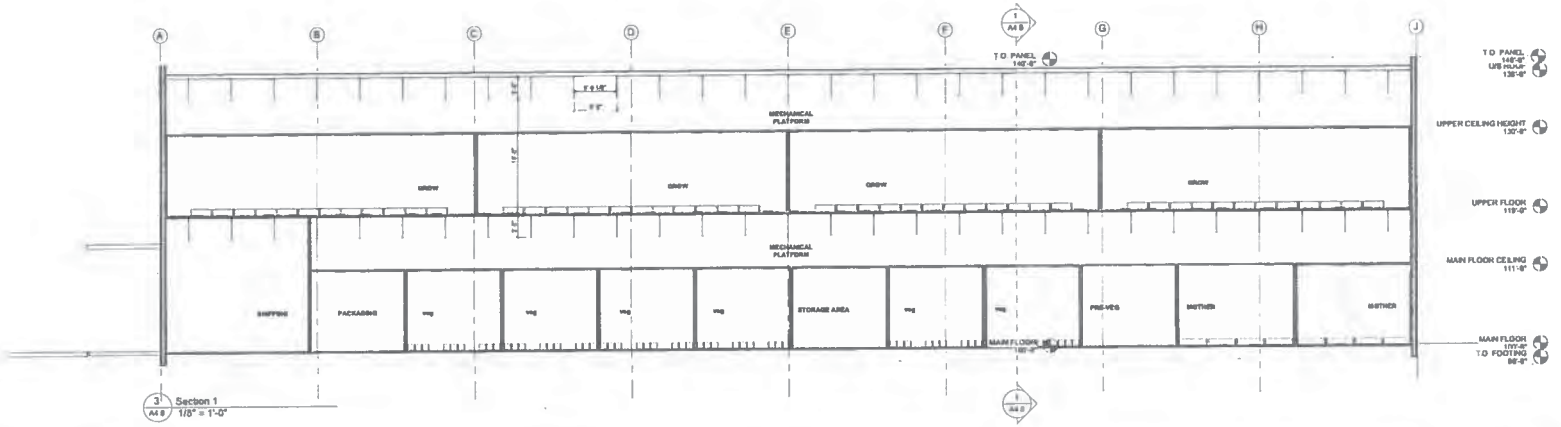


2 A4.0 Section 11 1/8" = 1'-0"



3 A4.0 Section 1 1/8" = 1'-0"

ISSUED FOR INFORMATION

PROJECT NO: 18-128

NO	APP'D	CHK'D	DATE	ISSUES / DESCRIPTION
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2.	JDR	TK	AUG.31.18	ISSUED FOR INFORMATION
1.	JDR	TK	SEP.13.18	ISSUED FOR INFORMATION

CONTRACTOR:

STRUCTURAL CONSULTANT:
kerkhoff Engineering Ltd.
#191 - 8622 YOUNG RD, CHILLIWACK, BC V2P 3N1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
BUILDING SECTION

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO: **A4.0**

DATE PRINTED: 9/13/2018 3:41:58 PM

VALLEY GEOTECHNICAL
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general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

Appendix B

Overall Site Plan

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.
Unit 15 20279 97th Avenue
Langley BC, V1M 4B9
Phone: (604) 882-8475
Fax: (604) 882-8476

Client: Michael Watson

Location: 58551A Dent Road, FVRD, BC

FILE No.	DATE
43921-01	November 07, 2013

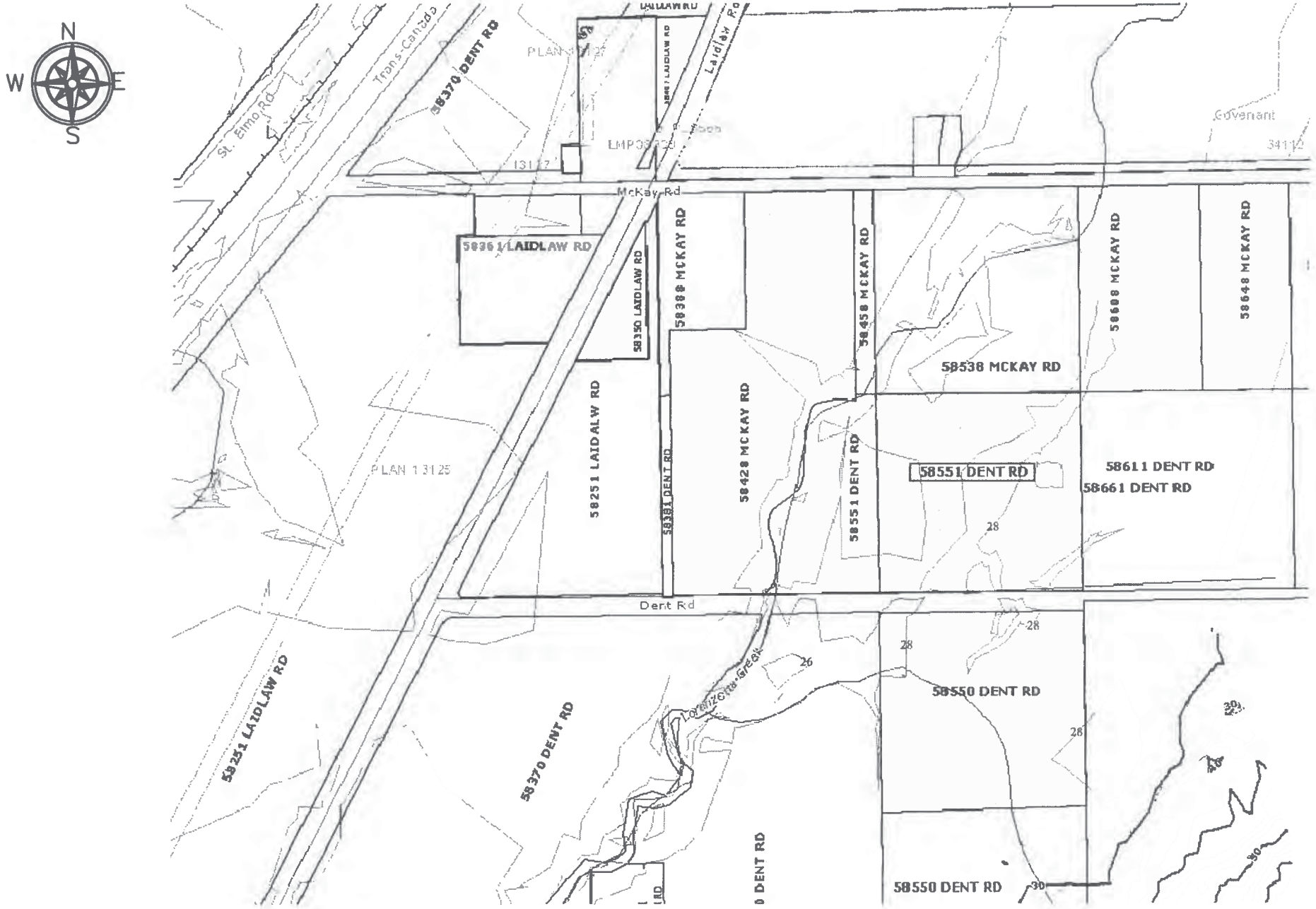
SEAL

REV	DATE	DESCRIPTION

Global Map
Site Plan

Drawn:	SC	Dwg No.
Checked:	AJ	1 of 2
Scale:	1:10000	

Z:\VGES-PROJECTS\43900\43921-01\(43921-01) 2013-10-16.dwg



VALLEY GEOTECHNICAL ENGINEERING SERVICES LTD Unit 15 20279 97th Avenue Langley BC, V1M 4B9 Phone: (604) 882-8475 Fax: (604) 882-8476	Client: Michael Watson Location: 58551A Dent Road Laidlaw BC					Topographic Map Site Plan	
	FILE No. 43921-01	DATE November 07, 2013	SEAL	REV	DATE	DESCRIPTION	Drawn: SC Checked: AJ Scale: 1:3000	Dwg No. 2 of 2

Z:\VGES-PROJECTS\43900\43921-01\(43921-01) 2013-10-16.dwg

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

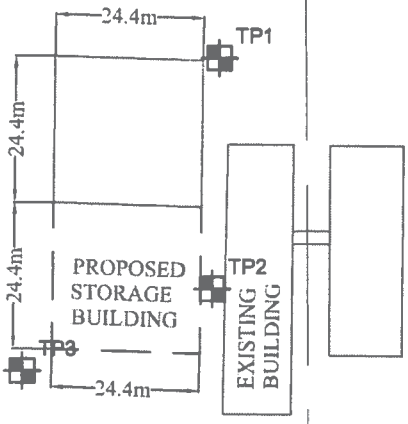
Appendix C

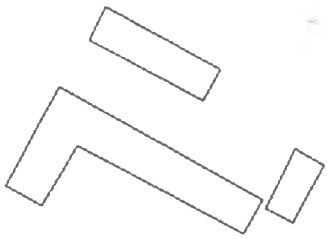
Test Pit Location Plan and Logs

354

311

303





DENT ROAD

VALLEY GEOTECHNICAL ENGINEERING SERVICES LTD. Unit 15 20279 97th Avenue Langley BC, V1M 4B9 Phone: (604) 882-8475 Fax: (604) 882-8476	Client: MICHAEL WATSON Location: 58551A DENT ROAD LAIDLAW, BC			TEST PIT LOCATION PLAN
	FILE No.: 43921-01	DATE: OCTOBER 16, 2013	SEAL	Drawn: EK Checked: AJ Scale: 1:1250 Dwg No. 1

Z:\VGES-PROJECTS\43900\43921-01\(43921-01) 2013-10-16.dwg

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

SUMMARY OF TEST PITS LOG

Project: 43921-01
Date of Investigation: October 7, 2013
Location: Lot 7, 58551A Laidlaw Road, Laidlaw, BC
Method of Excavation: Track Mounted Excavator
Logged By: Albert Jian

Test Pit No.	Depth (m)	Moisture %	Soil Conditions
1	0.0 – 0.8		Sand and silt FILL (loose)
	0.8 – 1.8		Brown SANDY SILT (moist) (Compact) Pocket Penetrometer: 2.7 kg/(cm)^2
	1.8-1.9		Grey SANDY GRAVEL (moist) (very dense) Pocket Penetrometer: > 3.5 kg/(cm)^2
			-Test pit discontinued at 1.9m -No water seepage encountered
2	0.0 – 0.6		Sand and silt FILL (loose)
	0.6 – 1.5		Brown SANDY SILT (moist) (Compact)
	1.5 – 1.7		Grey SANDY GRAVEL (moist) (very dense)
			- Test pit discontinued at a depth of 1.7 - No water seepage encountered

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

Test Pit No.	Depth (m)	Moisture %	Soil Conditions
3	0.0 - 0.5		Topsoil: organic SILT (wet) (loose)
	0.5 – 1.7	37.4	Brown CLAYEY SILT (moist)(very stiff)
	1.7 – 1.8	9.3	Grey SANDY GRAVEL (moist) (very dense) Pocket Penetrometer: > 3.5 kg/(cm)^2
			-Test pit discontinued at 1.9m -No water seepage encountered

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

Appendix D

Aerial Photo Interpretation

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

Aerial photographs dated 1928, 1947, 1951, 1954, 1961, 1963, 1973, 1979, 1983, 1992, 1996, 1999, and 2004.

AIRPHOTO INTERPRETATION

Project # 43921-01
58551A Dent Road, Laidlaw

Year	Description
1928	On The Subject Property - Single family residence, open field and agricultural land, - Buildings at the Southeast portion, - A channel travels from Northeast corner to south. Adjacent Areas - Single family residences on the North side, - Agricultural land on the North, East, West sides, - Dent Road (E-W) on the South side connected to a road (N-S) on the West side, - Natural forest on the South side. Lorenzetta Creek - Creek travels from the top to bottom of the mountain (SE-N) on the East, - At the flat area, creek travels (N- SW) on the West.
1947	On The Subject Property - Similar to year 1928, except - More buildings were constructed at the Southeast portion, - Creek does not exist. Adjacent Areas - Similar to year 1928, except - Laidlaw Road was constructed on the West side, - Logging activity (SE) on the mountain side. Lorenzetta Creek - Similar to year 1928, except - Mountain area (SE-N) observed alluvial deposition with creek channel, - Flat area (N-SW) not visible through trees.

1951	On The Subject Property - Similar to year 1947 Adjacent Areas - Similar to year 1947 Lorenzetta Creek - Similar to year 1947, except - Flat area (N-SW) observed high water level - Possible deposition of debris.
1954	On The Subject Property - Similar to year 1951 Adjacent Areas - Similar to year 1951 Lorenzetta Creek - Similar to year 1947, except - Flat area (N-SW) not visible through trees.
1961	On The Subject Property - Similar to year 1954 Adjacent Areas - Similar to year 1954, except - logging at South side, - Natural forest at Southeast side. Lorenzetta Creek - Similar to year 1954.
1963	On The Subject Property - Similar to year 1961 Adjacent Areas - Similar to year 1961, except - Dent Road connected to Laidlaw Road. Lorenzetta Creek - Similar to year 1961.

1973	On The Subject Property - Similar to year 1963 Adjacent Areas - Similar to year 1963, except - Single family residence, open field and agricultural land on the South side - Slope failure at the mountain on the Southeast. Lorenzetta Creek - Similar to year 1963. -
1979	On The Subject Property - Similar to year 1973 Adjacent Areas - Similar to year 1973 Lorenzetta Creek - Similar to year 1973.
1983	On The Subject Property - Similar to year 1979, except - Buildings were constructed at the west portion. Adjacent Areas - Similar to year 1979, except - The West side road (N-S) does not existed, - Logging area at the East side. Lorenzetta Creek - Similar to year 1979, except - Creek dyked improvement at the bottom of the Mountain area (SE-N) runoff.
1992	On The Subject Property - Similar to year 1983 Adjacent Areas - Similar to year 1983, except - South side single family residence, open field grew as a forest. Lorenzetta Creek - Similar to year 1983.

1996	On The Subject Property - Similar to year 1992, except - Buildings were constructed at the west portion. Adjacent Areas - Similar to year 1992, except - Logging at the Southeast side, - Located gravel extraction at the Southeast side. Lorenzetta Creek - Similar to year 1992.
1999	On The Subject Property - Similar to year 1996 Adjacent Areas - Similar to year 1996 Lorenzetta Creek - Similar to year 1996.
2004	On The Subject Property - Similar to year 1999 Adjacent Areas - Similar to year 1999 - Single family residence at the North, East, South, and West sides. Lorenzetta Creek - Similar to year 1999.

Appendix E

Landslide Assessment Assurance Statement [Appendix D]

APPENDIX D: *LANDSLIDE ASSESSMENT ASSURANCE STATEMENT*

Note: This Statement is to be read and completed in conjunction with the "*APEGBC Guidelines for Legislated Landslide Assessments for Proposed Residential Development in British Columbia*", March 2006/Revised September 2008 ("*APEGBC* Guidelines") and the "2006 BC Building Code (BCBC 2006)" and is to be provided for *landslide assessments* (not floods or flood controls) for the purposes of the Land Title Act, Community Charter or the Local Government Act. Italicized words are defined in the *APEGBC* Guidelines.

To: The *Approving Authority* Date: September 20, 2018

Fraser Valley Regional District
45950 Cheam Avenue, Chilliwack, V2P 1N6
Jurisdiction and address

With reference to (check one):

- ☐ Land Title Act (Section 86) – Subdivision Approval
- ☐ Local Government Act (Sections 919.1 and 920) – Development Permit
- ☑ Community Charter (Section 56) – Building Permit
- ☐ Local Government Act (Section 910) – Flood Plain Bylaw Variance
- ☐ Local Government Act (Section 910) – Flood Plain Bylaw Exemption
- ☐ British Columbia Building Code 2006 sentences 4.1.8.16 (8) and 9.4 4.4.(2) (Refer to BC Building and Safety Policy Branch Information Bulletin B10-01 issued January 18, 2010)

For the Property:

LT 8; SEC 20; TWP 4; Range 27, Meridian W6, NWD PL23054 (58551A Dent Road)

The undersigned hereby gives assurance that he/she is a *Qualified Professional* and is a *Professional Engineer* or *Professional Geoscientist.*

I have signed, sealed and dated, and thereby certified, the attached *landslide assessment* report on the Property in accordance with the *APEGBC Guidelines*. That report must be read in conjunction with this Statement. In preparing that report I have:

Check to the left of applicable items

- ✓ 1. Collected and reviewed appropriate background information
- ✓ 2. Reviewed the proposed *residential development* on the Property
- ✓ 3. Conducted field work on and, if required, beyond the Property
- ✓ 4. Reported on the results of the field work on and, if required, beyond the Property
- ✓ 5. Considered any changed conditions on and, if required, beyond the Property
- 6. For a *landslide hazard analysis* or *landslide risk analysis* I have:
  - ✓ 6.1 reviewed and characterized, if appropriate, any *landslide* that may affect the Property
  - ✓ 6.2 estimated the *landslide hazard*
  - ✓ 6.3 identified existing and anticipated future *elements at risk* on and, if required, beyond the Property
  - ✓ 6.4 estimated the potential *consequences* to those *elements at risk*
- 7. Where the *Approving Authority* has adopted a *level of landslide safety* I have:
  - ✓ 7.1 compared the *level of landslide safety* adopted by the *Approving Authority* with the findings of my investigation
  - ✓ 7.2 made a finding on the *level of landslide safety* on the Property based on the comparison
  - ✓ 7.3 made recommendations to reduce *landslide hazards* and/or *landslide risks*
- 8. Where the *Approving Authority* has **not** adopted a *level of landslide safety* I have:
  - ___ 8.1 described the method of *landslide hazard analysis* or *landslide risk analysis* used
  - ___ 8.2 referred to an appropriate and identified provincial, national or international guideline for *level of landslide safety*

___8.3 compared this guideline with the findings of my investigation

___8.4 made a finding on the *level of landslide safety* on the Property based on the comparison

___8.5 made recommendations to reduce *landslide hazards* and/or *landslide risks*

✓ 9. Reported on the requirements for future inspections of the Property and recommended who should conduct those inspections.

Based on my comparison between

Check one

☑ the findings from the investigation and the adopted *level of landslide safety* (item 7.2 above)

☐ the appropriate and identified provincial, national or international guideline for *level of landslide safety* (item 8.4 above)

I hereby give my assurance that, based on the conditions[1] contained in the attached *landslide assessment* report,

Check one

☐ for subdivision approval, as required by the Land Title Act (Section 86), "that the land may be used safely for the use intended"

Check one

☐ with one or more recommended registered covenants.

☐ without any registered covenant.

☐ for a development permit, as required by the Local Government Act (Sections 919.1 and 920), my report will "assist the local government in determining what conditions or requirements under [Section 920] subsection (7.1) it will impose in the permit".

☑ for a building permit, as required by the Community Charter (Section 56), "the land may be used safely for the use intended"

Check one

☑ with one or more recommended registered covenants.

☐ without any registered covenant.

☐ for flood plain bylaw variance, as required by the "Flood Hazard Area Land Use Management Guidelines" associated with the Local Government Act (Section 910), "the development may occur safely".

☐ for flood plain bylaw exemption, as required by the Local Government Act (Section 910), "the land may be used safely for the use intended".

Narayan Abhyankar, P.Eng.
Name (print)

Signature

September 20, 2018
Date

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
N. S. ABHYANKAR
11742

(Affix Professional seal here)

Unit 15, 20279 97th Avenue, Langley, BC, V1M 4B9
Address

(604) 882-8475
Telephone

If the *Qualified Professional* is a member of a firm, complete the following.

I am a member of the firm Valley Geotechnical Engineering Service Ltd. and I sign this letter on behalf of the firm.
(Print name of firm)

[1] When seismic slope stability assessments are involved, *level of landslide safety* is considered to be a "life safety" criteria as described in the National Building Code of Canada (NBCC 2005), Commentary on Design for Seismic Effects in the User's Guide, Structural Commentaries, Part 4 of Division B. This states:

"The primary objective of seismic design is to provide an acceptable level of safety for building occupants and the general public as the building responds to strong ground motion; in other words, to minimize loss of life. This implies that, although there will likely be extensive structural and non-structural damage, during the DGM (design ground motion), there is a reasonable degree of confidence that the building will not collapse nor will its attachments break off and fall on people near the building. This performance level is termed 'extensive damage' because, although the structure may be heavily damaged and may have lost a substantial amount of its initial strength and stiffness, it retains some margin of resistance against collapse".

Geo-Hazard Assurance Statement
for Development Approvals

A. Project Information

Date Sept 18, 2018 FVRD File No. _____

Property Information

Project Name & Description Proposed Agricultural Building

Legal Description Lot 7, Sec 20, TWP 4, Range 27, Meridian 6, NWD PL Meridian WB Except PL 23054

Site Address 58551A Dent Road PID _____

Client Information

Name Michael Watson

Role Property Owner Developer Other

Client Address 58551A Dent Rd

Qualified Professional Information

Name Narayan Abhyankar

APEGBC Designation ✓P.Eng. P. Geo. Eng.L Geo.L

Company Name VALLEY GEOTECHNICAL ENGG. SER. LTD.

Mailing Address #15-20279 97 Avenue Langley B.C. V1M 4B9

Email Address general@valleygeo.ca Phone # 604-882-8475

Geo-Hazard Report Reference

Title Geotechnical and Hazard Assessment Report Date Sept. 18, 2018

Personal information on this form is being collected in accordance with Section 27 of the Freedom of Information and Protection of Privacy Act, RSBC 1996 Ch. 165; Part 9, Division 1 [Building Regulation] and Part 14 [Planning and Land Use Management] of the Local Government Act, RSBC 2015 Ch. 1; and Section 56 of the Community Charter, SBC 2003 Ch. 26 and will only be collected, used and disclosed for the purpose of administering geo-technical hazard reviews and assurance statements related to development approvals. Questions? Contact FVRD Privacy Officer at 45950 Cheam Avenue, Chilliwack, BC V2P 1N6; 604-702-5000 or 1-800-528-0061; or FOI@fvrd.ca.

B. Assurance

Based on the contents of this Assurance Statement and the Report, I hereby give assurance that:
(check as applicable)

Development Permit	The Report will "assist the local government in determining what conditions or requirements under it will impose in the permit", as required by the *Local Government Act* (Division 7)
Building Permit Community Charter	"The land may be used safely for the use intended", as required by the *Community Charter* (Section 56)
Seismic Slope	The Report addresses the requirements of the BC Building Code 2006, 4.1.8.1.6 (8) and 9.4.4.4 (2), as detailed in the BC Building & Safety Policy Branch Information Bulletin B10-01, Jan 18, 2010
Floodplain Management Bylaw Exemption	"The land may be used safely for the use intended", as required by the *Local Government Act*. (Section 524)
Subdivision	"The land may be used safely for the use intended", as required by the *Land Title Act* (Section 86).
Other *(e.g. Zoning Bylaw Amendment, Official Community Plan Amendment, Temporary Use Permit, etc.)*	<Insert statement as appropriate>

C. APEGBC Professional Practice Guidelines

The Report and this Assurance Statement should be completed in accordance with the current version of one or both of the following Professional Engineers and Geoscientists of BC (APEGBC).

- *Legislated Flood Assessments in a Changing Climate in BC*
- *Legislated Landslide Assessments for Proposed Residential Development in British Columbia, ("APEGBC Landslide Guidelines").*

These two documents are collectively referred to as the "APEGBC Guidelines". The italicized words in this Assurance Statement are defined in the APEGBC Guidelines.

The Report has been prepared pursuant to the following APEGBC Guidelines *(check one or both as applicable)*.

APEGBC Flood Guidelines ✓

APEGBC Landslide Guidelines ✓

If the Report is **not** prepared pursuant to either of the APEGBC Guidelines, please explain.

D. Background Information

Qualified Professionals **must** confirm and check that each item is included in the Report.

1. Property location map — 8.5 x 11 size
2. Development proposal site plan — 8.5 x 11 size. *If a subdivision, show the parent parcel and all lots to be created, including any remainder.*
3. Description of the proposed development project (including building use) to the extent this is known at the time of Report preparation.

   residential

   industrial

   commercial

   institutional

   other _____

E. Technical Requirements

Qualified Professionals **must** review, confirm and check completed items (as applicable).

Report Content

4. Relevant information pertaining to the Property and pertinent potential hazards from appropriate background sources, including the FVRD online library.
5. Time limitation or condition statement to describe extent the FVRD may rely on the Assurance Statement and Report for development approvals, and when resubmittal is recommended.
6. Maps, illustrations and diagrams to illustrate areas referred to in the Report.
7. Description of field work conducted on and, if required, beyond the Property.
8. Contact and consultation with the Fraser Valley Regional District. Provide name and title of contact.

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9. Review of relevant FVRD bylaws and other statutory requirements.
10. Restrictive covenants registered against the Property title that pertain to geo-hazards (if registered, the Report provides relevant information about the covenants).
11. Notation of any visibly apparent natural hazards or other hazards identified in background reports, which are not identified and addressed in this Report. If yes, provide details in Section H: Geo-Hazard Summary Table.

    Yes

    (No)

12. Does the report rely on one or more supporting reports, each of which is independently reviewed, signed and sealed. If yes, provide details in Section H: Geo-Hazard Summary Table.

    Yes

    (No)

13. For subdivision approval, the Report addresses natural hazards for:

    the parent parcel prior to subdivision

    any lots to be created (including any remainder)

Geo-hazard Assessment, Risk Acceptability and Risk Transfer

14. In considering the above-noted potential hazards that may affect the property, I have:

    reviewed and characterized the potential hazard(s)

    estimated the potential frequency and magnitude of the potential hazard(s)

    relied on supporting reports as noted above

    relied on a pre-existing assessment of hazard frequency and magnitude

    considered the potential effects of climate change in the context identified in the Report

    considered the potential effects of changed future conditions (upstream watershed changes, forestry activity, land use changes, sea level rise, etc.) in the context identified in the Report

15. This Assurance Statement pertains to all geo-hazards that are assessed in the Report and any supporting reports, and accurately reflects the contents of those documents.

16. The FVRD has adopted "Hazard Acceptability Thresholds for Development Approvals by Local Government", which provides a specific level of hazard or risk tolerance. I have included a Hazard Summary Table which:

    lists all the potential hazards addressed by the Report and any supporting reports

    provides an annual return frequency and acceptability threshold classification for the unmitigated condition

    proposes mitigative measures to appropriately reduce the geo-hazard risk

    provides an annual return frequency and acceptability threshold classification for the mitigated condition

17. The Report describes the potential transfer of natural hazard risk to other properties or infrastructure as a result of the proposed project (including any proposed *mitigation works*) and

    considered the potential for transfer of natural hazard risk

    concludes that there is no significant transfer of natural hazard risk

    identifies the potential transfer of natural hazard risk and proposes measures to offset such transfer of risk

Mitigation and Design Recommendations (if recommended)

The Report contains the following items:

18. Implementation steps for the identified structural mitigation works (in terms of design, construction and approval).

19. Clearly identified safe locations for building(s), ancillary structures, and onsite utility services (as applicable, such as a septic field) out of the natural hazard area as a preferred development alternative.

20. Commentary on the effectiveness of proposed structural mitigation works in terms of ability to reduce the potential hazard impact, and identification of any residual risk that would remain.

21. Proposed Flood Construction Level (FCL) for future development and including specification of an appropriate method of achieving the FCL.

22. Proposed watercourse setback, which is clearly referenced from the natural boundary, top of bank or another suitable basis.

23. Proposed operation and maintenance actions that will be necessary in order for the level of safety to be maintained in the future, with indications of who should be responsible for those actions and when.

Riparian Area Regulation (if applicable)

24. QP must review RAR assessment report to avoid conflict with Geo-Hazard Report recommendations.

F FVRD Supplemental Requirements

The following points are understood by the Qualified Professional when submitting a Report:

25. Permission is granted to the FVRD to use the Report in considering approval of the proposed development on the property, provided that such permission is limited only to the proposed development project for which the Report was prepared.

26. Methodology used in the Report is described in sufficient detail to facilitate a professional review of the study by the FVRD when necessary.

27. Professional liability insurance coverage of at least $1 million per claim is carried by the QP.

28. Third party review or supplemental information may be required by the FVRD where complex development proposals warrant.

29. Permission is granted to the FVRD to include the Report in the online FVRD geo-hazard report library (as background information, not for other parties to rely).

G. Qualified Professional (QP)

Prepared by: (QP of Record)

Name NARAYAN ABHYANKAR

Designation (P.Eng.) P. Geo. Eng.L Geo.L

Reviewed by:

Name Joel Blanco

Designation (P.Eng.) P. Geo.

The Report has received appropriate technical review which is consistent with both the APEGBC Professional Practice Guidelines, and APGBC Quality Management Guidelines. The name of the reviewer is noted in the Report and below.

Professional Seal, Signature and Date:

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. T. BLANCO # 44386

Sept 20, 2018

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA N. S. ABHYANKAR # 11742

18 Sept 2018

I am a Qualified Professional as defined in the APEGBC Guidelines, and I fulfill the education, training and experience requirements as outlined in the APEGBC Guidelines

I have signed, sealed, dated and thereby certify, this Assurance Statement and the attached report.

Geo-Hazard Assurance Statement
for Development Approvals

H. Geo-Hazard Summary Table

The geo-hazard report and/or any supporting reports addresses the following hazard types.

Geo-Hazard Type #1		Geo-Hazard Type #2	
Inundation - flood water		Mountain Stream Erosion/Avulsion	
Annual Return Frequency (Unmitigated)		Annual Return Frequency (Unmitigated)	
unknown		1:500	
Acceptability Threshold Classification		Acceptability Threshold Classification 1	
MITIGATION (if necessary)			
Proposed Mitigation Measures	(Yes) / No	Proposed Mitigation Measures	Yes / (No)
Annual Return Frequency (Mitigated)		Annual Return Frequency (Mitigated)	
1:200		1:500	
Acceptability Threshold Classification 1		Acceptability Threshold Classification 1	
Comments		Comments	
Fraser River & Lorenzetta Creek			
SUPPORTING REPORT			
Was this report prepared by others?	Yes / (No)	Was this report prepared by others?	Yes / (No)
If yes, list report name, date and author.		If yes, list report name, date and author.	

Geo-Hazard Type #3		Geo-Hazard Type #4	
Debris Flow & Torrents		Debris Floods	
Annual Return Frequency (Unmitigated)		Annual Return Frequency (Unmitigated)	
1:500 - 1:30,000		1:200 - 1:500	
Acceptability Threshold Classification 3		Acceptability Threshold Classification	
MITIGATION (if necessary)			
Proposed Mitigation Measures	(Yes) / No	Proposed Mitigation Measures	(Yes) / No
Annual Return Frequency (Mitigated)		Annual Return Frequency (Mitigated)	
1:10,000		1:500 - 1:10,000	
Acceptability Threshold Classification 1		Acceptability Threshold Classification 1	
Comments		Comments	
SUPPORTING REPORT			
Was this report prepared by others?	Yes / (No)	Was this report prepared by others?	Yes / (No)
If yes, list report name, date and author.		If yes, list report name, date and author.	

Indicate which hazards were **NOT** reviewed:

Chilliwack River Valley Erosion or Avulsion	Seismic Effects/Liquefaction
Debris Flow and Debris Torrent	Rockfall - Small Scale Detachment
Debris Flood	Slope Stability
Fraser River & tributaries flooding	Small Scale Localized Landslide
Mountain Stream Erosion or Avulsion	Snow Avalanche
Major Catastrophic Landslide	✓ Tsunami

Hazard Acceptability Thresholds Classification, as per Hazard Acceptability Thresholds for Development Approvals by Local Government dated November 1993 by Dr. Peter Cave.

1 Approval with conditions relating to hazards.
2 Approval, without siting conditions or protective works conditions, but with a covenant including "save harmless" conditions.
3 Approval, but with siting requirements to avoid the hazard, or with requirements for protective works to mitigate the hazard.
4 Approval as (3) above, but with a covenant including "save harmless" conditions as well as siting conditions, protective works or both.
5 Not approvable.

Additional Comments

VALLEY GEOTECHNICAL
Engineering Services Ltd.

Unit 15 - 20279 97th Avenue
Langley, BC, V1M 4B9

Mr. Michael Watson
58551A Dent Road
Laidlaw, BC

August 14, 2018
(revised September 18, 2018)

Attention: Mr. Michael Watson

Regarding: Geotechnical Report
Proposed Agricultural Building at 58551A Dent Road, Laidlaw, BC
Project: 43921-01

1.0 INTRODUCTION

Valley Geotechnical Engineering Services Ltd. (Valley Geo) has been retained by Mr. Michael Watson to complete a Geotechnical Report for the proposed architectural building. This report summarizes our work to date and presents our recommendations.

Valley Geo previously completed a Hazard Report for this site. At that time several test pits were put down to determine the soil conditions. In addition, we tested the filling of the old manure pit within the building footprint. This information was referenced in preparation of this report.

Provided the recommendations presented in this report and in our May 5, 2018 Hazard Report are implemented, we confirm that the building may be safely constructed as proposed.

2.0 PROPOSED CONSTRUCTION

An agricultural storage building is purposed to be constructed at the at the mid-point of the east property line. The building will be two floors high and rectangular in shape with dimensions of 24.7m wide 54.5m long and 7.6m high. A portion of the building is proposed to be located over an existing manure pit which was previously filled in with structural material; tested and approved by Valley Geo.

See Appendix A for Building Drawings and Site Location Plan.

3.0 SITE SOIL STRATIGRAPHY

Valley Geo completed a test pit investigation on October 7, 2013 with a track mounted excavator as part of our previous hazard report. Three test pits (designated as TP1 and TP3) were excavated to depths ranging from 1.7m to 1.9m below the existing grade.

The subsurface conditions encountered generally consist of:

- Sand and silt fill up to 0.8m thick underlain by
- Moist, medium stiff to medium dense sandy silt, up to 1.2m thick underlain by
- Moist, very dense to dense, sandy gravel to depths explored

An exception to the above was TP 3 where topsoil was over a very stiff clayey silt deposit. No free water was encountered during the test pit investigation.

See Appendix B for Test Pit Location Plan and Test Pit Logs.

4.0 DISCUSSIONS ARE RECOMMENDATIONS

The following presents our recommendations for the construction of the proposed building.

4.1 Seismic

Data provided by Earthquake Canada (2015) indicates that the site is subject to a Peak Ground Acceleration of 0.181g and seismic hazard values of Sa(0.2)= 0.398g, Sa(0.5)= 0.335g, Sa(1.0)= 0.218g, and Sa(2.0)= 0.142g during a 1:2475 design earthquake. Based on the soil data obtained from the site, the Site Classification is D.

Due to lack of deep soil information we are unable to rule out the potential for liquefaction. Ground water was not encountered in our investigation on the subject site and several projects in the vicinity to a minimum depth of 3.0m. If liquefaction did occur, global settlement and lateral movement during or after a major seismic event may result in damage to the building. To allow egress we recommend that the building slab be reinforced in two directions and tied to the foundations. It is our understanding that this building is not considered post disaster and therefore provision are only required for egress from the building.

In order to use Site Class D, the structural engineer must confirm that the fundamental period of vibration of the proposed structure is equal to or less than 0.5 *(Based on BCBC 4.1.8.4. Clause 6). If not, additional deeper soil information and a site-specific spectral analysis will be required which is not included in our scope of work.

4.2 Foundations

Topsoil and unsuitable fill must be removed from the entire building area. Conventional strip and spread footings on the approved compacted fill or native stiff silt or sand and gravel can be used. The following design parameters should be used for the foundation design by the structural engineer.

Factored Ultimate Limit State (ULS)	180kPa (3750psf)
Serviceability Limit State (SLS)	120kPa (2500psf)
Site Class	D

All bearing surfaces should be inspected and approved by Valley Geo prior to concrete placement. Re-Bar slab reinforcement is to be structurally tied to the foundation (per section 4.1)

A frost protection depth of 450mm is required.

4.3 Drainage

All structures with slabs at or below the surrounding grade should be provided with perimeter drains constructed at the footing level. The drains should consist of a perforated pipe surrounded with drain-rock, encapsulated in a non-woven, needle punched filter fabric and backfilled with granular free draining soil. If the crawlspace slab is above the exterior grades, deletion of the perimeter drain can be considered.

The perimeter drainage system and the roof drain should be connected separately by gravity to sumps and then in tight lines to an on-site system.

Exterior building grade should be sloped at a minimum gradient of 1.5% to shed water away from the buildings.

5.0 CLOSURE

The recommendations presented in this report are based on the analysis of the results of the subsurface investigation and other information deemed relevant to the subject site. Variations in the subsurface conditions should be anticipated. If conditions differ from those presented in this letter are encountered during construction, Valley Geo should be notified immediately to examine these conditions and reassess our recommendations.

This letter was prepared for the exclusive use of Mr. Michael Watson and their agent for the purposed stated. It has been prepared in accordance with generally accepted engineering practices and no other warranty, express or implied, is made. Any use which a Third Party makes of this letter, or reliance on decisions to be made based on it, is the responsibility of the Third Party.

The acceptance of responsibility for the design/construction recommendations presented in this letter is contingent on adequate and/or full time inspection (as required, based on the site conditions at the time of construction) by a representative of the Geotechnical Consultant. Valley Geo will not accept any responsibility on this project for any unsatisfactory performance if adequate and/or full time inspection is not performed by a representative of Valley Geo.

We trust that the above information satisfies your requirements at this time. Please contact our office if you have any questions or require additional information.

Yours very truly,

Brad VanDelft, A.Sc.T., Eng.I.
Geotechnical Engineering - Principal

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
N. S. ABHYANKAR
2018

Narayan Abhyankar, FEC, P.Eng
Principal Geotechnical Engineer

Joel Blanco, P.Eng
Senior Geotechnical Engineer

Attachments:

Appendix A: Building Drawings and Site Location Plan
Appendix B: Test Pit Location Plan and Logs

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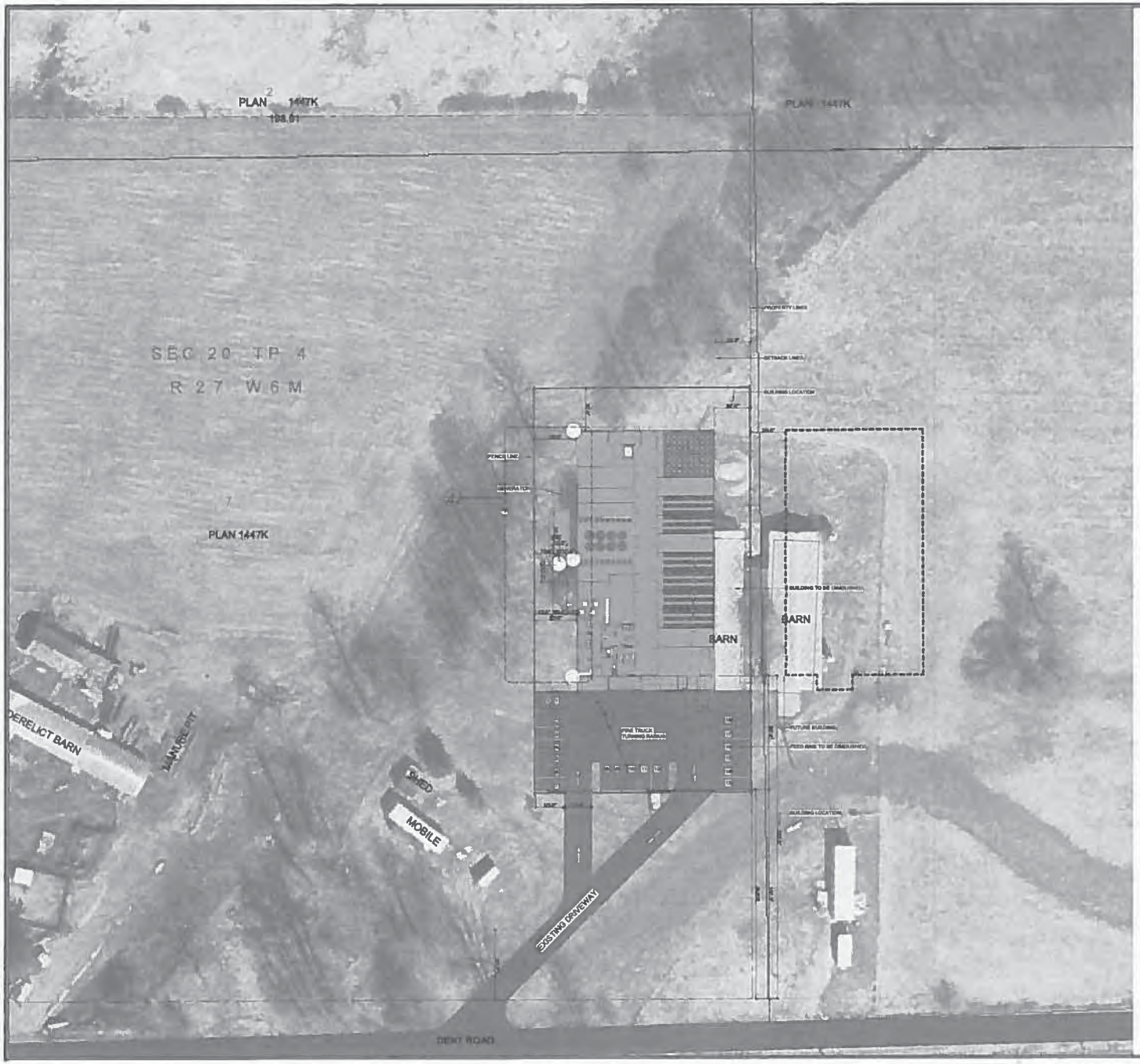
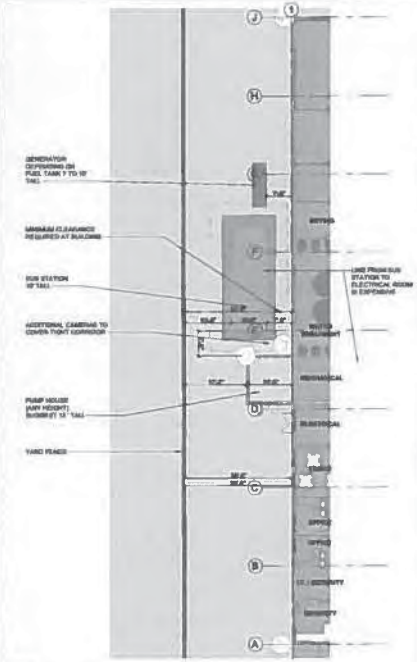
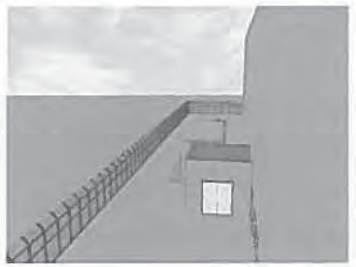




3 A0.4 SITE YARD
1/16" = 1'-0"

7 A0.4 NORTH CAMERA - SITE YARD



5 A0.4 SOUTH CAMERA - SITE YARD

ISSUED FOR INFORMATION

PROJECT NO: 18-128

NO	DRN	CHKD	DATE	DESCRIPTION
1	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR:

STRUCTURAL CONSULTANT:
kerkhoff Engineering Ltd.
#191 8822 VEDDER RD,
CHILLIWACK, BC V2R 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

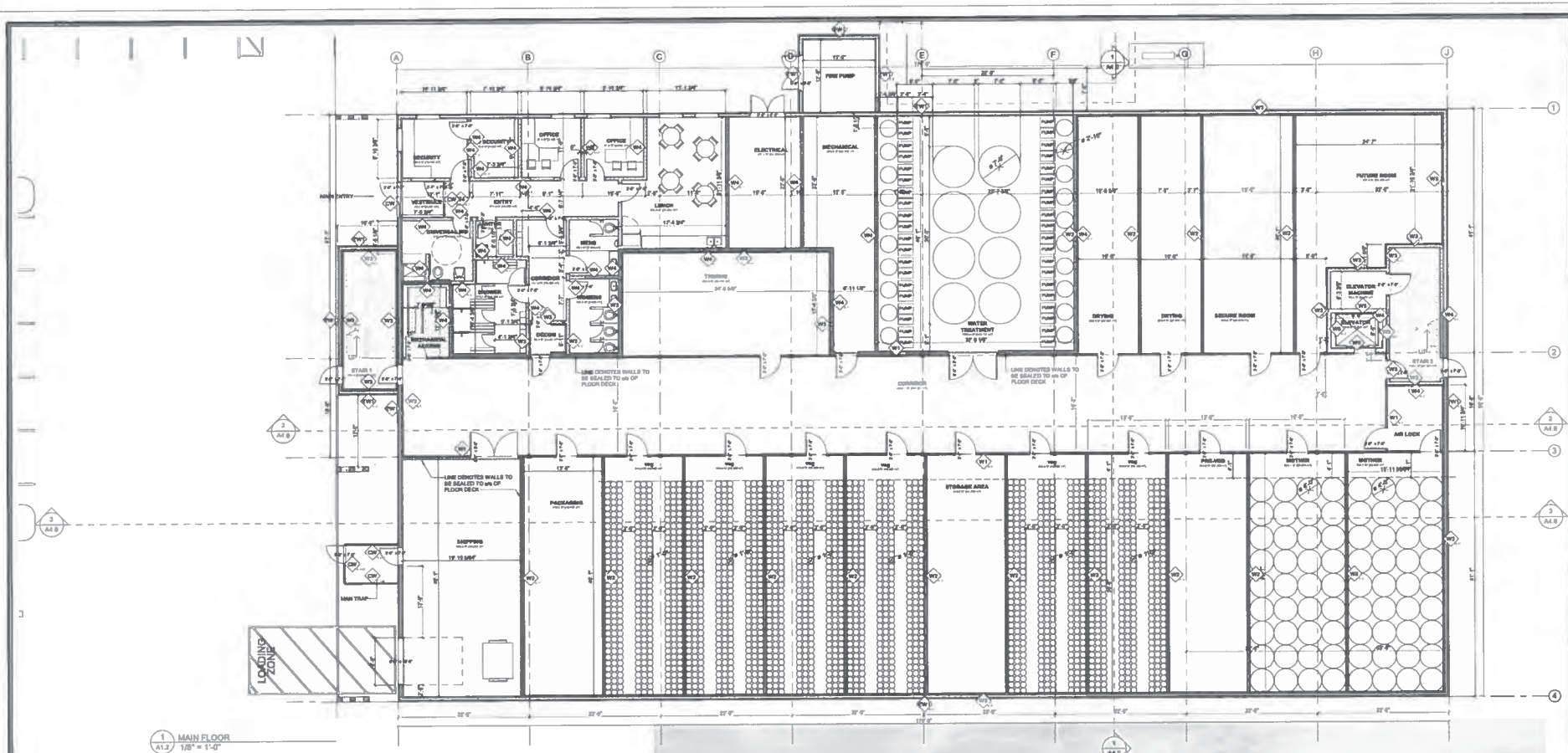
ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
SITE PLAN

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO:
A0.4

DATE PRINTED:
9/17/2018 10:18:38 AM



1 MAIN FLOOR
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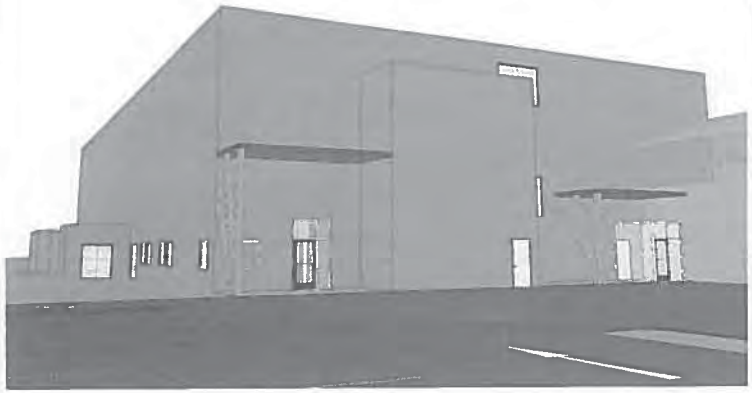
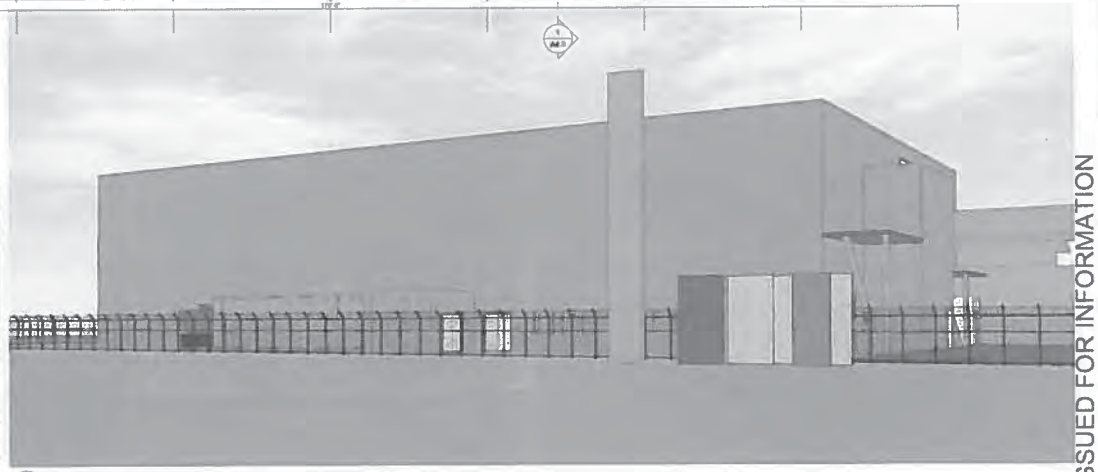


2 FRONT
A1.2



3 SIDE
A1.2

ISSUED FOR INFORMATION

PROJECT NO:
18-128

NO	DRN	CHK	DATE	DESCRIPTION:
1	JDR	TK	AUG 29, 18	ISSUED FOR INFORMATION
2	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

ISSUES

CONTRACTOR:

STRUCTURAL CONSULTANT:

kerkhoff Engineering Ltd.
5101 - 8622 VEDDER RD,
CHILLIWACK, BC V2R 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

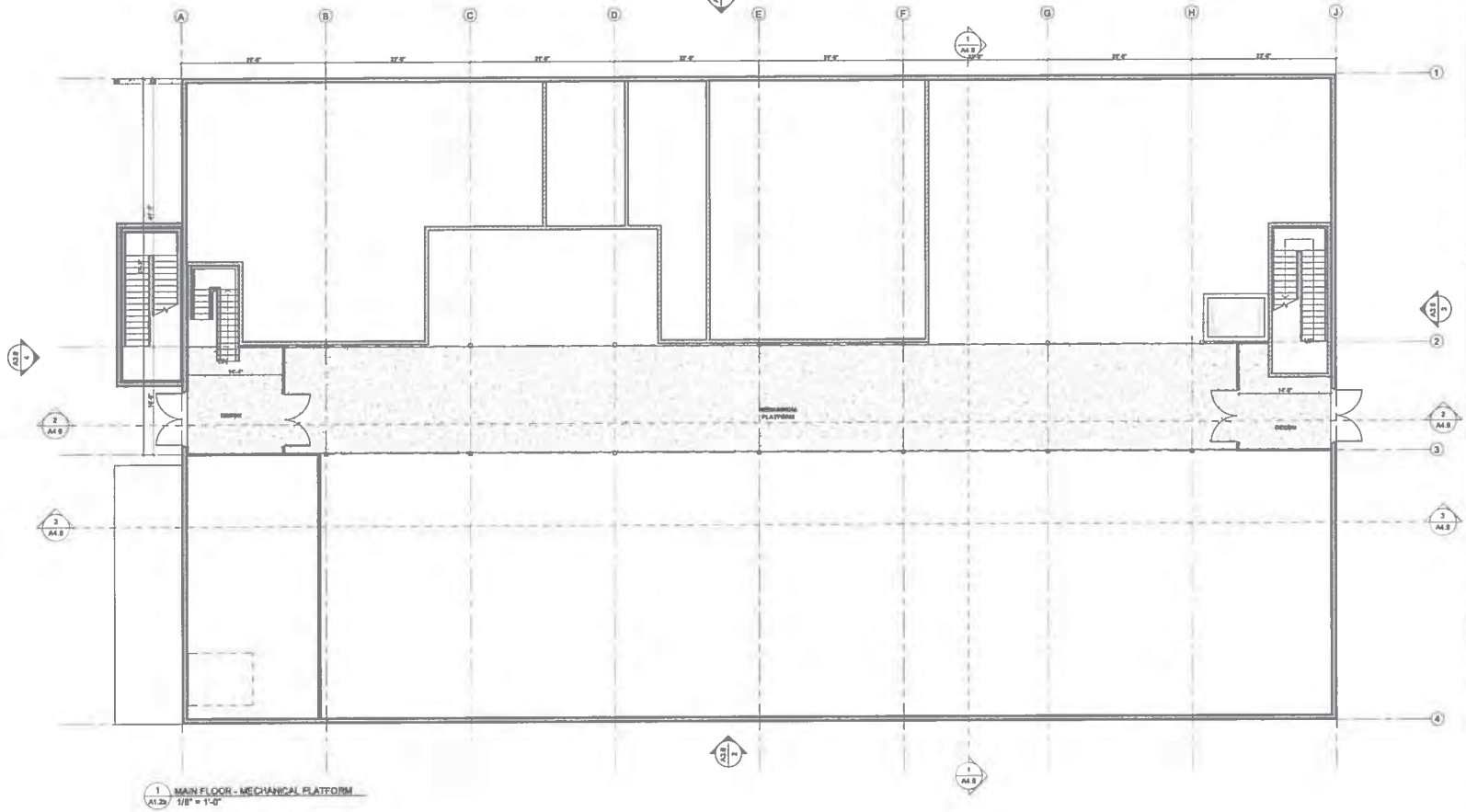
ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
MAIN FLOOR

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO:
A1.2

DATE PRINTED
9/13/2018 3:41:47 PM



1 A1.2b MAIN FLOOR - MECHANICAL PLATFORM
1/8" = 1'-0"

ISSUED FOR INFORMATION

PROJECT NO: 18-128

NO.	BY	DATE	ISSUES DESCRIPTION
1	JDR	TK	18.11.13 ISSUED FOR INFORMATION

CONTRACTOR:

STRUCTURAL CONSULTANT:
kerkhoff Engineering Ltd
#161 - 8622 VEDDER RD,
CHILLIWACK, BC V2R 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT
Production Facility

ADDRESS:
58551 A Dent Road,
Hope, BC

TITLE.
MAIN FLOOR - MECANICAL PLATFORM

DRAWN BY: JDR
CHECKED BY: TK
SCALE. AS NOTED
DATE. SEP 13, 18

SHEET NO:
A1.2b

DATE PRINTED
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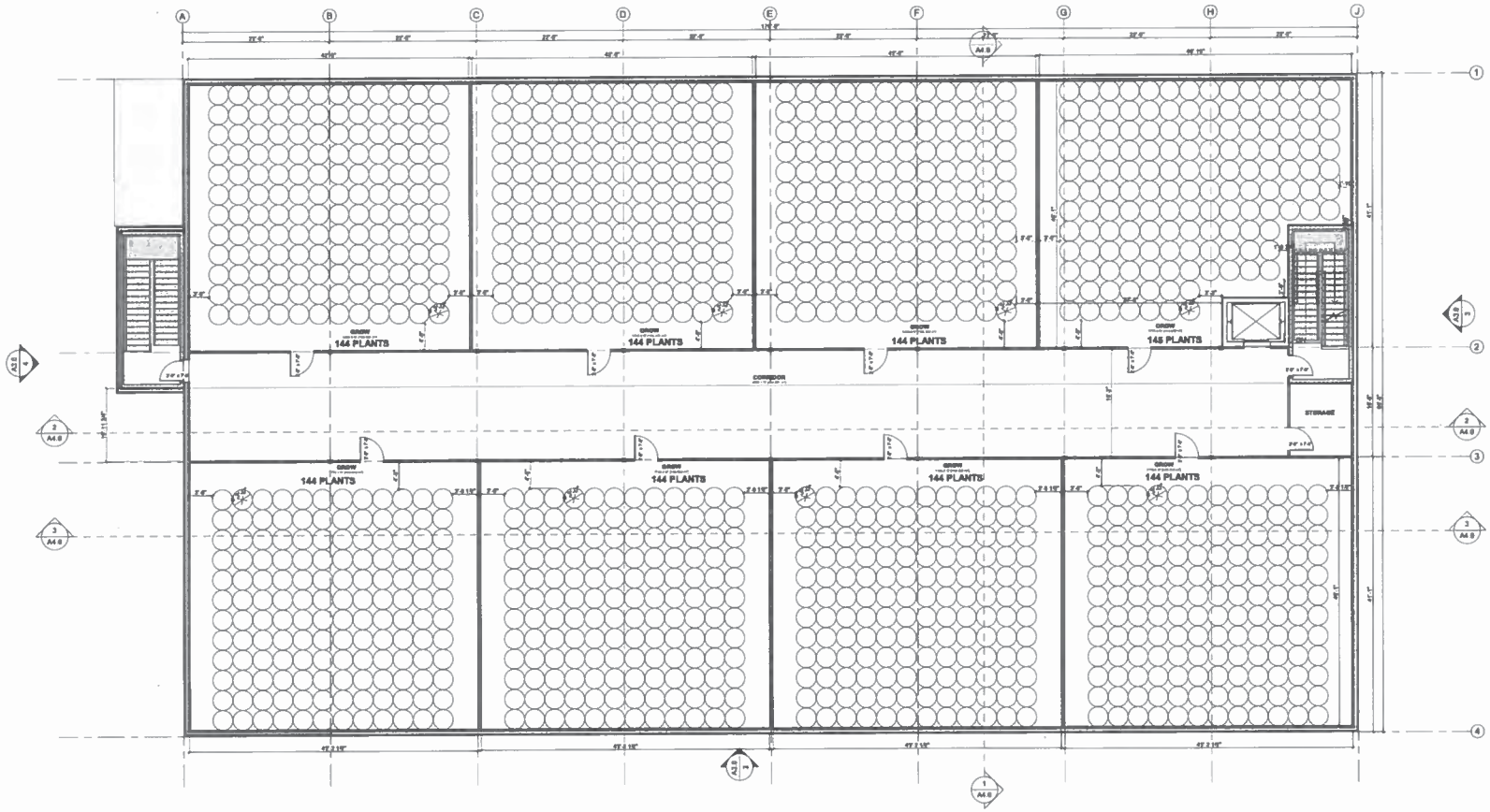

1 / A1.3 UPPER FLOOR
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ISSUED FOR INFORMATION

PROJECT NO:
18-128

NO.	APP.	TYPE	DATE	DESCRIPTION
2	JDR	TK	SEP 12, 18	ISSUED FOR INFORMATION
1	JDR	TK	AUG 31, 18	ISSUED FOR INFORMATION

ISSUES

CONTRACTOR:

STRUCTURAL CONSULTANT:
kerkhoff Engineering Ltd.
#101 - 8822 YEDDER RD,
CHILLIWACK, BC V2R 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
PRODUCTION FLOOR

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO:
A1.3

DATE PRINTED
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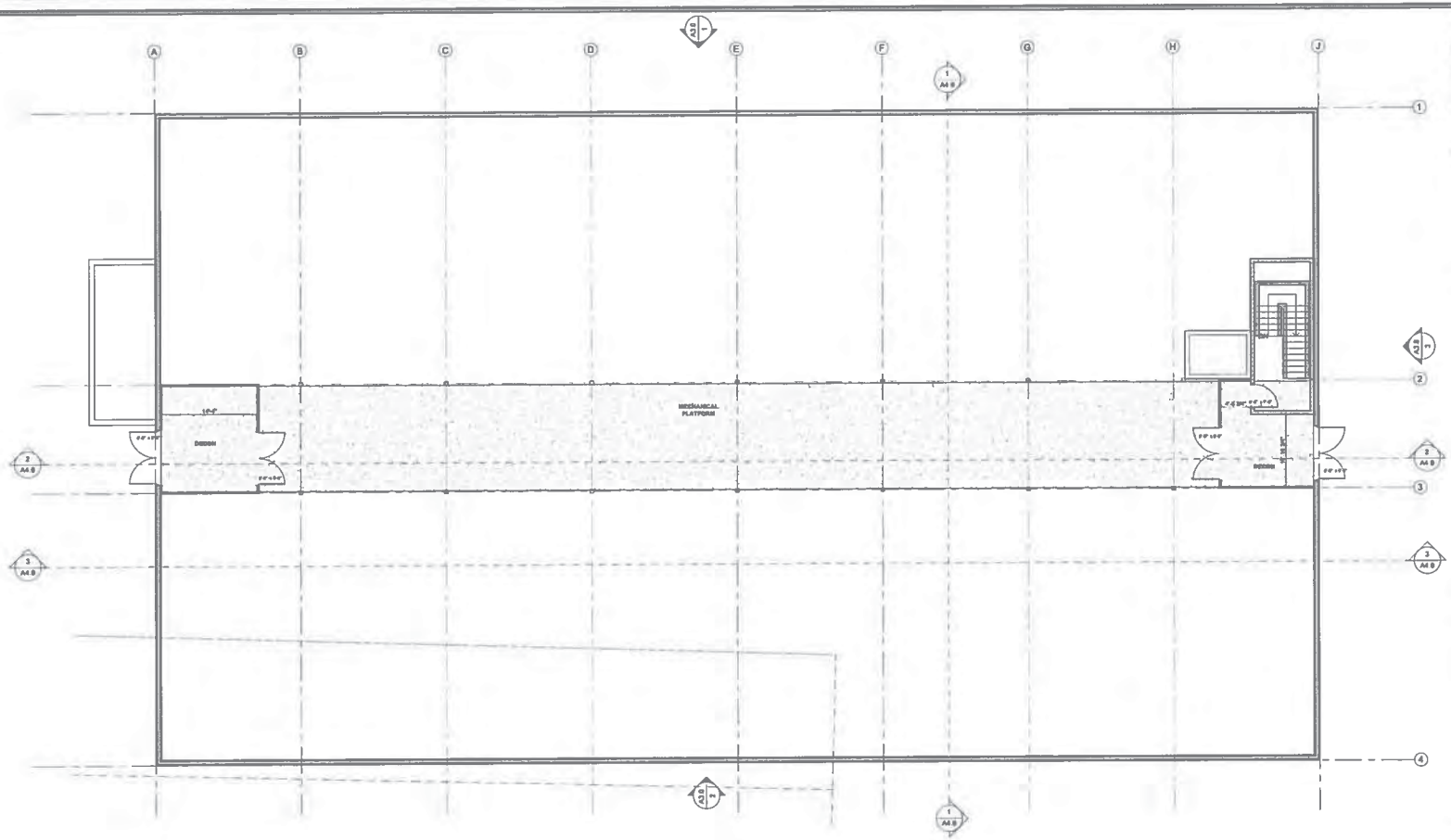

1 A1.3b PRODUCTION FLOOR - MECHANICAL PLATFORM
1/8" = 1'-0"

ISSUED FOR INFORMATION

PROJECT NO: 18-128

NO	DRN	CHK	DATE	DESCRIPTION
1	AS	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR:

STRUCTURAL CONSULTANT:
kerkhoff Engineering Ltd.
6161 - 9522 VEDDER RD,
CHILLIWACK, BC V2R 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road,
Hope, BC

TITLE:
PRODUCTION FLOOR - MECHANICAL PLATFORM

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO:
A1.3b

DATE PRINTED
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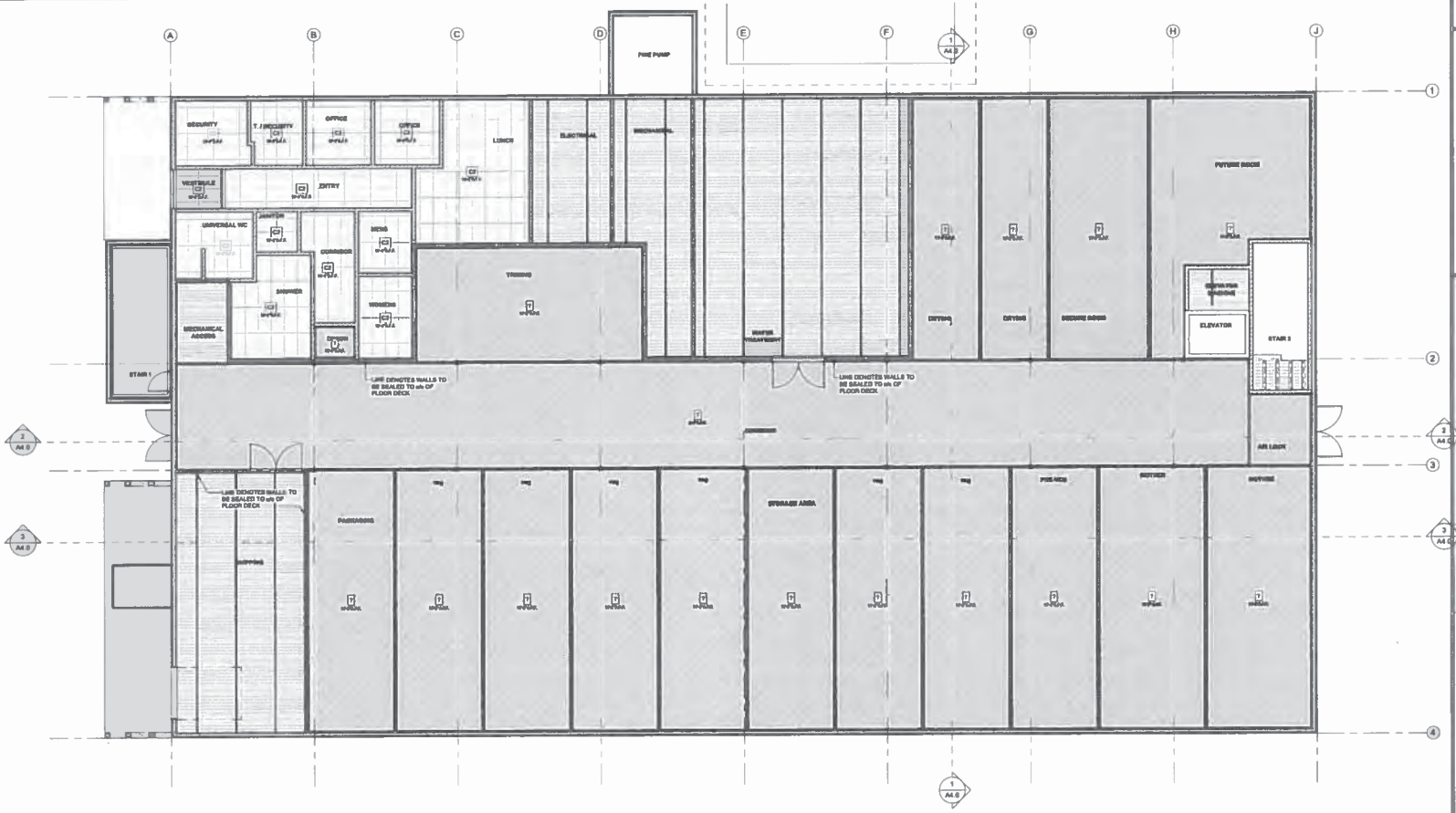


1 A1.4 RCP - MAIN FLOOR
1/8" = 1'-0"

ISSUED FOR INFORMATION

PROJECT NO: 18-128

NO.	BY	DATE	DESCRIPTION
1	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR:

STRUCTURAL CONSULTANT:
kerkhoff Engineering Ltd.
#101 - 8833 VEDDER RD.
CHILLIWACK, BC V2P 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

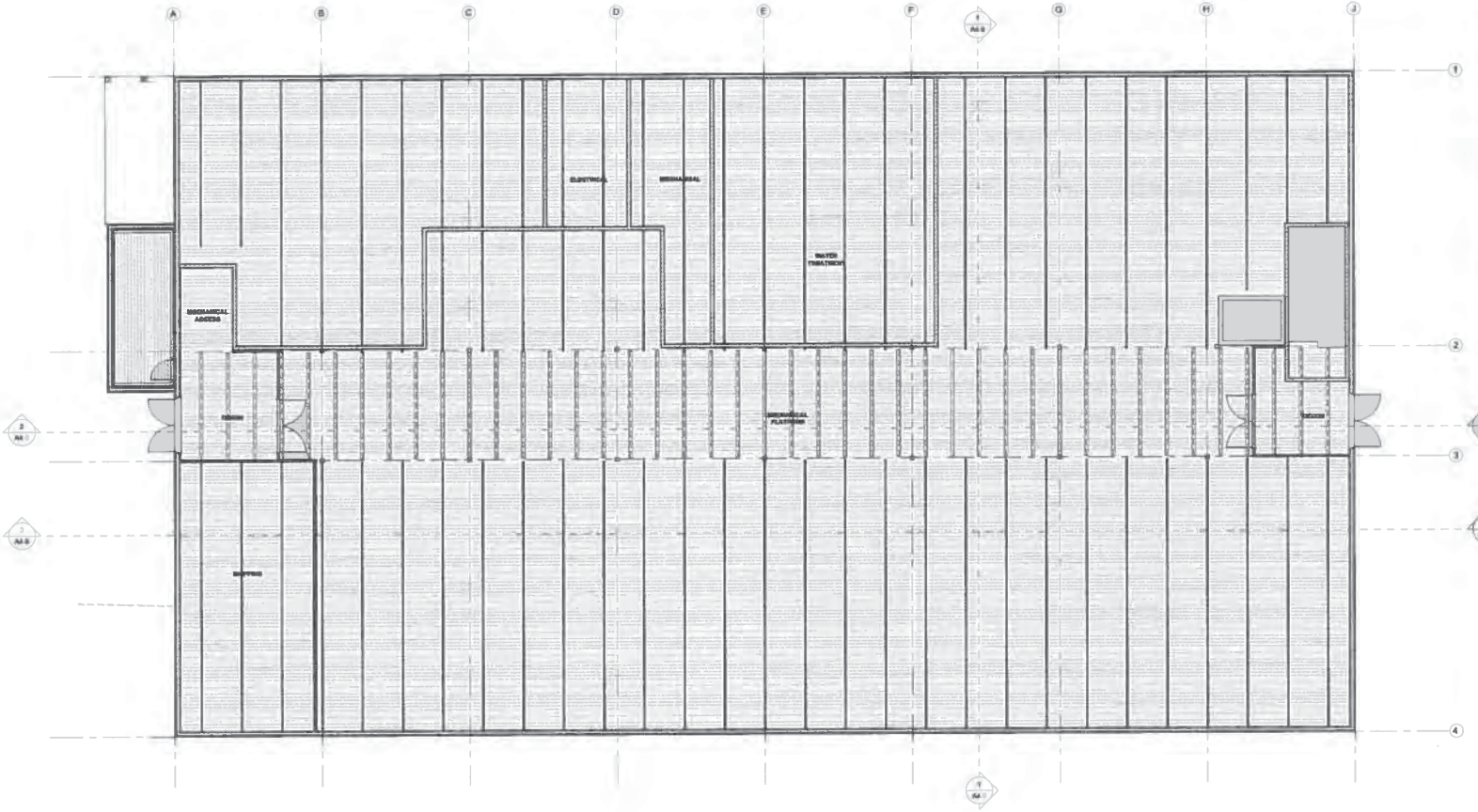
ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
RCP MAIN FLOOR

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO: **A1.4**

DATE PRINTED: 9/13/2018 3:41:58 PM



1 A1.4b MAIN FLOOR PLATFORM - RCP
1/8" = 1'-0"

PROJECT NO:
18-128

NO.	DRN	CHK	DATE	ISSUES DESCRIPTION
1	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR:

ARCHITECTURAL CONSULTANT:
kerkhoff Engineering Ltd.
#101 - 8622 VEDDER RD,
CHILLIWACK, BC V2R 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road,
Hope, BC

TITLE:
RCP - MAIN FLOOR MECHANICAL PLATFORM

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

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A1.4b

DATE PRINTED
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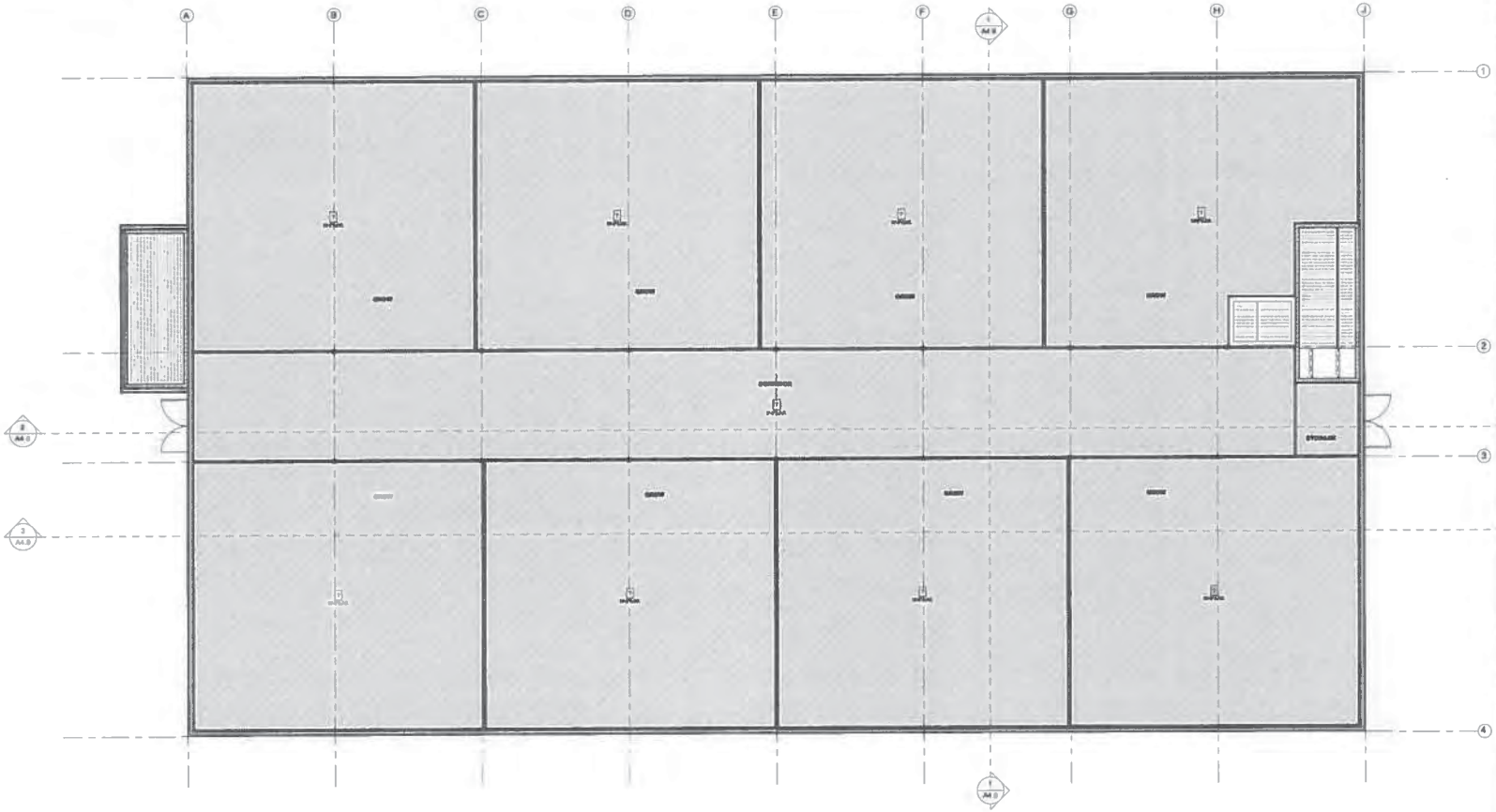
ISSUED FOR INFORMATION



1 / A1.5 UPPER FLOOR - RCP
1/8" = 1'-0"

ISSUED FOR INFORMATION

PROJECT NO: 18-128

NO.	DRN	DES	DATE	DESCRIPTION
2	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

ARCHITECTURAL CONSULTANT:
kerkhoff Engineering Ltd.
#101 - 9822 VEDDER RD,
CHILLIWACK, BC V2R 3N1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
RCP - PRODUCTION FLOOR

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO: A1.5

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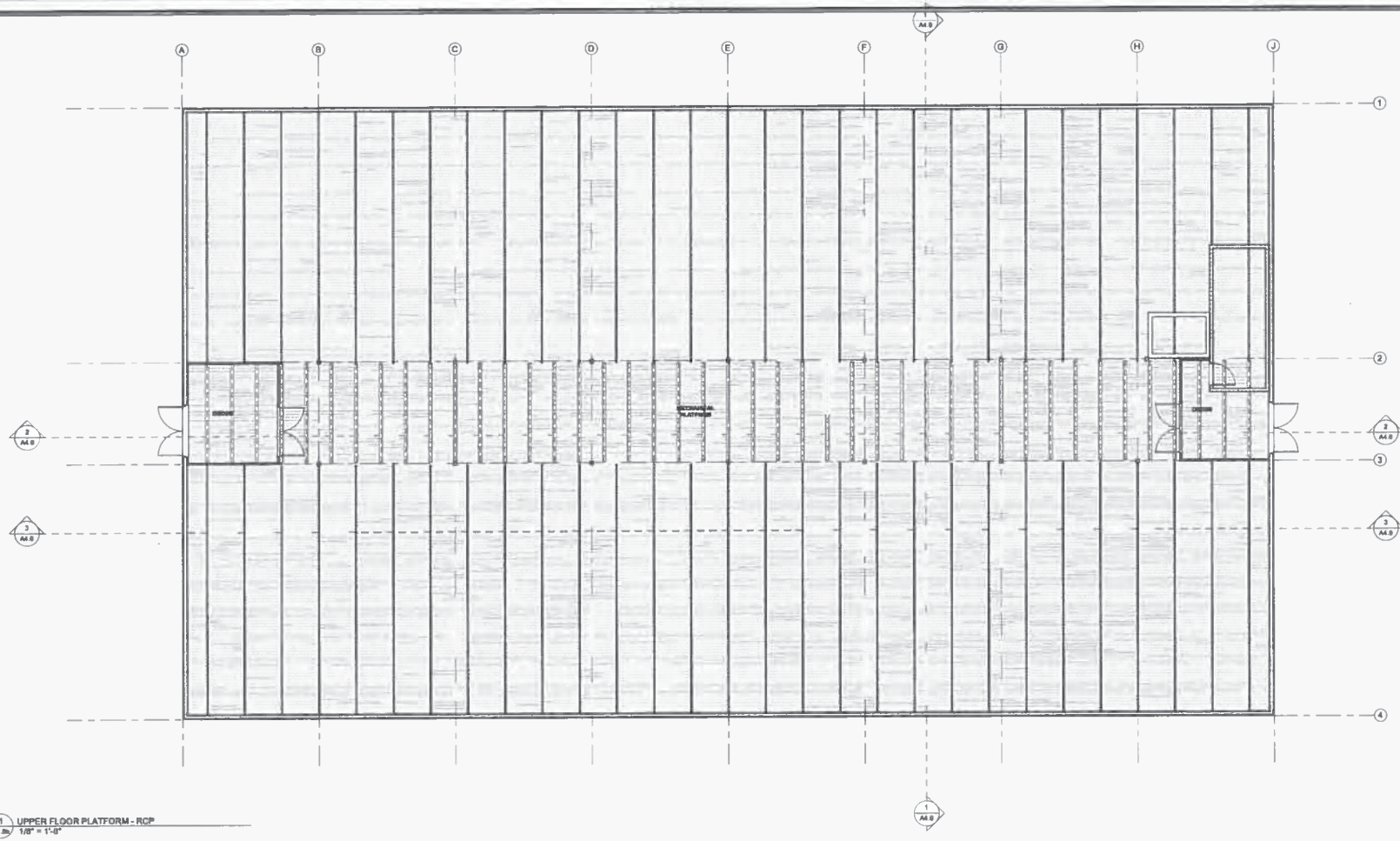

1 UPPER FLOOR PLATFORM - RCP
A1.5b 1/8" = 1'-0"

ISSUED FOR INFORMATION

PROJECT NO:
18-128

NO	DRN	CHK	DATE	DESCRIPTION
2	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION

CONTRACTOR:

ARCHITECTURAL CONSULTANT:

kerkhoff Engineering Ltd

#101 9822 VEDDER RD,
CHILLIWACK, BC V2R 3N1

CLIENT
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
RCP - PRODUCTION FLOOR MECHANICAL PLATFORM

DRAWN BY:	JDR
CHECKED BY:	TK
SCALE:	AS NOTED
DATE:	SEP 13, 18

SHEET NO:
A1.5b

DATE PRINTED:
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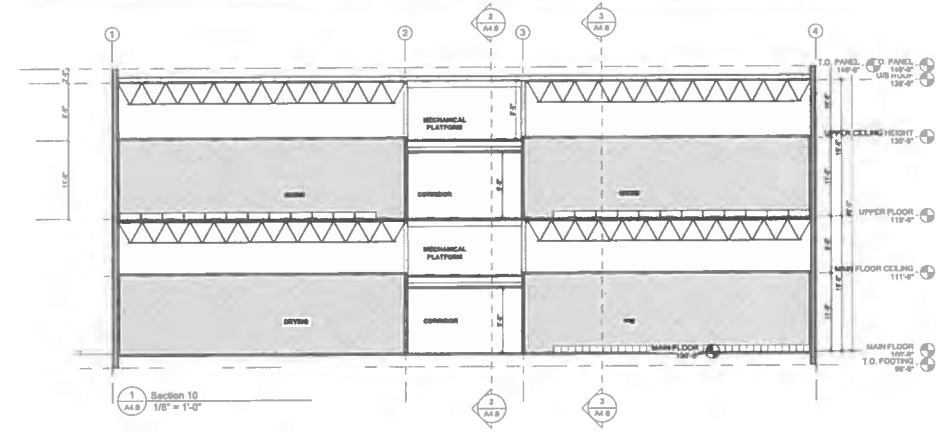

1 / A4.0 Section 10
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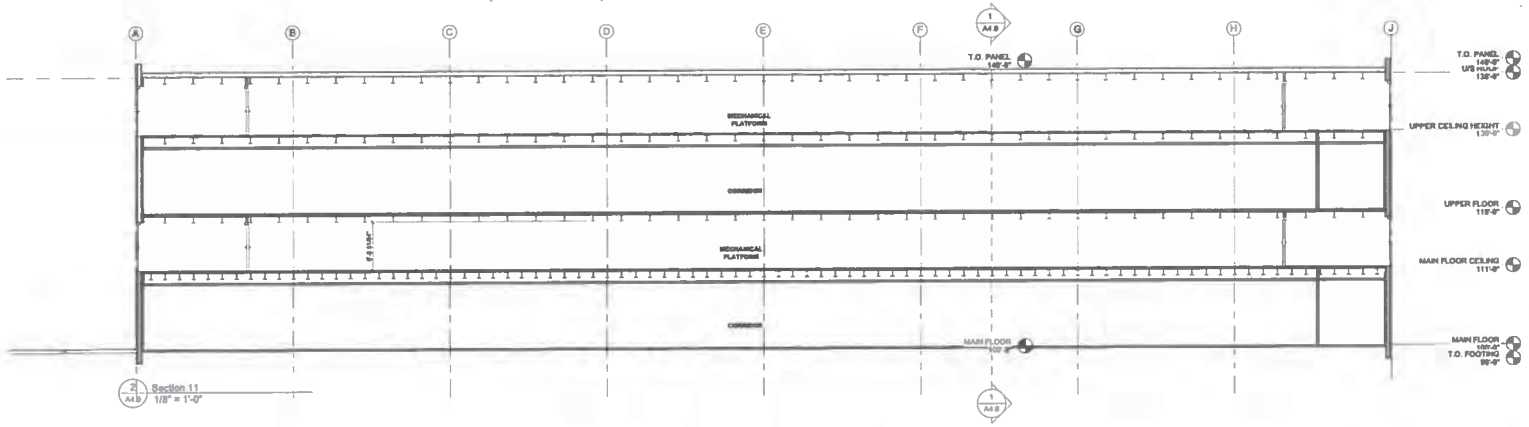

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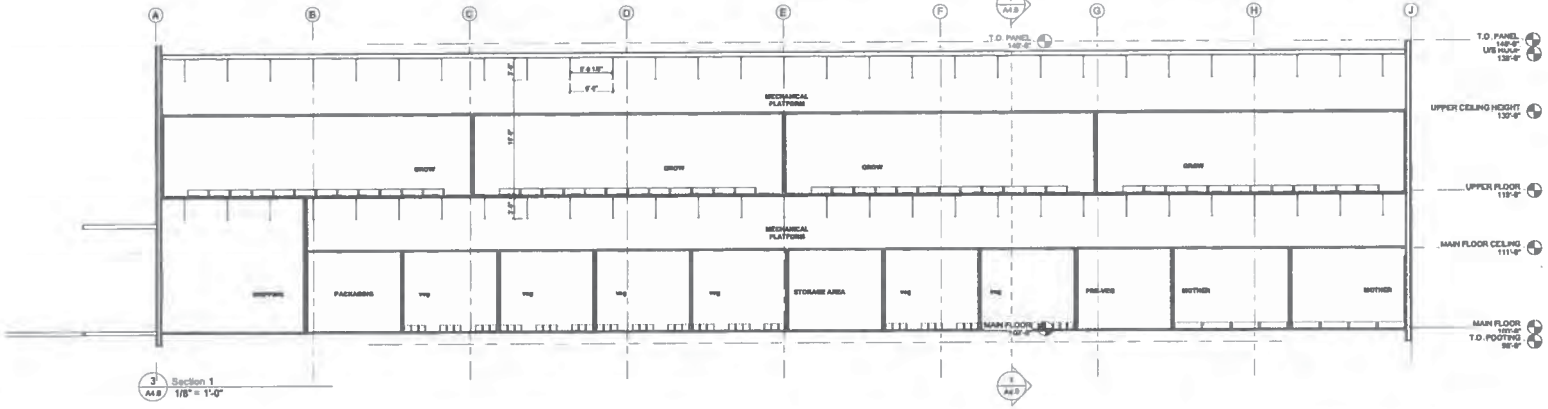

3 / A4.0 Section 1
1/8" = 1'-0"

ISSUED FOR INFORMATION

PROJECT NO:
18-128

NO.	DRN.	CHK.	DATE	ISSUES DESCRIPTION
2.	JDR	TK	SEP 13, 18	ISSUED FOR INFORMATION
1.	JDR	TK	SEP 11, 18	ISSUED FOR INFORMATION

CONTRACTOR:

STRUCTURAL CONSULTANT:
kerkhoff Engineering Ltd.
#101 - 8582 VEDDER RD,
CHILLIWACK, BC V2P 3H1

CLIENT:
DBO Agriculture Inc.

PROJECT:
Production Facility

ADDRESS:
58551 A Dent Road, Hope, BC

TITLE:
BUILDING SECTION

DRAWN BY: JDR
CHECKED BY: TK
SCALE: AS NOTED
DATE: SEP 13, 18

SHEET NO:
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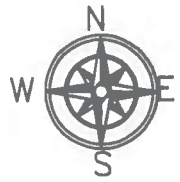

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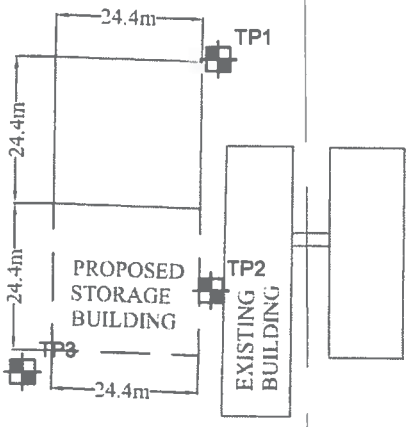
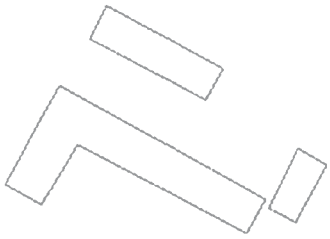




DENT ROAD

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.
Unit 15 20279 97th Avenue
Langley BC, V1M 4B9
Phone: (604) 882-8475
Fax: (604) 882-8476

Client:	MICHAEL WATSON
Location:	58551A DENT ROAD LAIDLAW, BC
FILE No.	43921-01
DATE	OCTOBER 16, 2013
SEAL	

TEST PIT LOCATION PLAN

Drawn:	EK	Dwg No.
Checked:	AJ	1
Scale:	1:1250	

Z:\VGES-PROJECTS\43900\43921-01\(43921-01) 2013-10-16.dwg

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

SUMMARY OF TEST PITS LOG

Project: 43921-01
Date of Investigation: October 7, 2013
Location: Lot 7, 58551A Laidlaw Road, Laidlaw, BC
Method of Excavation: Track Mounted Excavator
Logged By: Albert Jian

Test Pit No.	Depth (m)	Moisture %	Soil Conditions
1	0.0 – 0.8		Sand and silt FILL (loose)
	0.8 – 1.8		Brown SANDY SILT (moist) (Compact) Pocket Penetrometer: 2.7 kg/(cm)^2
	1.8-1.9		Grey SANDY GRAVEL (moist) (very dense) Pocket Penetrometer: > 3.5 kg/(cm)^2
			-Test pit discontinued at 1.9m -No water seepage encountered
2	0.0 – 0.6		Sand and silt FILL (loose)
	0.6 – 1.5		Brown SANDY SILT (moist) (Compact)
	1.5 – 1.7		Grey SANDY GRAVEL (moist) (very dense)
			- Test pit discontinued at a depth of 1.7 - No water seepage encountered

VALLEY GEOTECHNICAL
ENGINEERING SERVICES LTD.

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9
www.valleygeo.ca

Test Pit No.	Depth (m)	Moisture %	Soil Conditions
3	0.0 - 0.5		Topsoil: organic SILT (wet) (loose)
	0.5 – 1.7	37.4	Brown CLAYEY SILT (moist)(very stiff)
	1.7 – 1.8	9.3	Grey SANDY GRAVEL (moist) (very dense) Pocket Penetrometer: > 3.5 kg/(cm)^2
			-Test pit discontinued at 1.9m -No water seepage encountered

TECHNICAL MEMO

To:	From
Michael Watson	Cindy Lipp, R.P. Bio.
Company:	**MCSL Branch**
c/o NRG Consulting: Craig Garden	2111
Re:	**Date**
Environmental report: Riparian setbacks	2018/09/19
	File Number
	2111-05315-00

The McElhanney Consulting Services Ltd. (McElhanney) qualified environmental professional (QEP) was requested to review the setback requirements from a swale within the Agricultural Land Reserve (ALR) next to which non-farm commercial agricultural buildings will be situated. The development is located at 58551A Dent Road, Laidlaw, BC. The QEP is practiced in watercourse classifications and characterizations and is knowledgeable about the provincial *Riparian Areas Regulations* (RAR), ALR requirements and has discussed requirements with the Fraser Valley Regional District (FVRD). The QEP has reviewed the site and the legislation applicable to this project.

Local Watercourses

The development site is located on low lying, relatively flat land (elevations between 31 and 28 m) of the floodplains of the Fraser River and Lorenzetta Creek (Valley Geotechnical 2013). The channel of Lorenzetta Creek lies 185 m from the proposed building area at its closest point. Lorenzetta Creek is prone to flooding. The provincial database (iMapBC 2018) reports that beaver dams on the creek create an obstacle to fish passage and may promote flooding. Despite such obstacles to fish passage, recent studies at Lorenzetta Creek found several species of salmonids in the creek such as Rainbow trout and steelhead (*Oncorhynchus mykiss*), Coho Salmon (*O. kisutch*) and Cutthroat trout (*O. clarkii*) (iMapBC 2018). A review of the provincial database for terrestrial and aquatic species did not find any species at risk associated with this creek system (iMapBC 2018).

Remnant Channel

A topographic swale or channel is evident on the property. The swale is a shallow depression on the landscape, 11 to 14 m wide at top of bank, and about 1.5 to 2 m deep (*Figure 1*). It is a remnant topographic feature as part of an alluvial fan of Lorenzetta Creek. Lorenzetta Creek was diked a few decades ago so that this swale no longer carries flows from Lorenzetta Creek. Overland and surface flows of water from the adjacent mountainside spread out across the landscape, flooding several of the local farm properties in the winter during heavy rainfalls. This swale collects some of this overland flow from the base of the mountain and may also receive some backup flood waters from the adjacent properties through the culvert at Dent Road. The swale has no natural boundary, high water mark, bed or scour to indicate that water flows through this channel. There is no evidence of sorting or rafting of material or vegetation characteristic of high moisture or water filled conditions. In the area of the proposed building development the swale does have a top of bank emphasized by the creation of farm roads within the property.

Vegetation found in the swale (grasses and herbs) are not species typical of streams or wetlands that would provide evidence that water flows through the swale at any time of year. However, the property owner has indicated that the swale pools water in the wintertime. Water within the swale at this time may be due to overland flooding on a neighbour's property and improperly sized drainage systems and culverts.

Figure 1. Shallow and wide swale which is a remnant channel of Lorenzetta Creek, has no visible evidence of water flow. Photo looking northward from Dent Road.

Though this swale was historically a part of a stream system, it no longer has the character of a stream since it has been cut off from the flows the main creek channel. Water pools in this swale during heavy rains of winter only and otherwise is dry. The swale does not provide fish habitat, but through a culvert on Dent Road, drainage of the land through the Dent Road culvert, water is seasonally conveyed from the swale to fish bearing Lorenzetta Creek.

This swale has now become a drainage feature of the farm property and as such, under the *Riparian Area Regulation* (RAR) may be best described as drainage ditch that seasonally conveys water to fish bearing streams but has no headwater or significant source of groundwater (MOA 2011). There is no 'riparian' vegetation.

Applicability of RAR and riparian setbacks

The Province provides guidance for determine of building setbacks from watercourses in farming areas (MOA 2011) for the protection of fish habitat. The swale on this property (natural and dry due to diking of the main creek channel of Lorenzetta Creek) does not meet any of the classification standards for watercourses described in the guidance document. However, the swale most closely resembles the definition of a constructed channel which is a drainage channel that carries drainage water from more than one property but does not carry water from headwaters or significant sources of groundwater.

Under RAR for residential, industrial or commercial developments, the riparian setback determinations for constructed ditches which convey water to fish bearing habitat is 2 times the channel width or a maximum of 10 m (BC 2004). Under riparian protection guidelines applied to farming areas such as facilities involved in greenhouses, crop storage, and on-farm product preparation (Category 4 farm buildings) the setback from ditches is 5 m (MOA 2008). In the case of this proposed development, the building is considered a commercial development, non-farm

use, and is subject to a 10 m setback from the top of bank of this swale. The existing farm roads and buildings are exempt from the RAR (MOA 2011).

To properly locate the setback boundaries a QEP is required to flag the top of bank of the swale for BCLS surveyors to survey and draw onto the proposed plans to demonstrate that the development is outside of the setback. *Figure 2* below approximates the location of the proposed riparian protection setbacks with respect to the proposed location of the buildings.

Figure 2. Proposed building placement with respect to the top of bank of the swale and recommended riparian setback distance demonstrated. Scale is relative.

Floodplain

The property has been determined to be in the floodplain of Lorenzetta Creek. The FVRD has required an elevation for buildings of more than 3 m above the natural boundary of Lorenzetta Creek. The plan is to provide an additional 0.3 m elevation to the building site. Table 2 of the MOA (2008) factsheet outlines the minimum provincial guidelines for setbacks and flood control levels for farm dwellings which includes guidelines for commercial and industrial buildings on farmland that are not used for agricultural purposes. In situations where protection is provided by standard dikes and where floodproofing is impractical, the RAR process determines the setback for buildings from the watercourse (MOA 2008).

In Summary

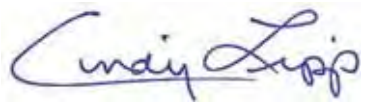
The QEP has determined that a 10m setback for buildings from the top of bank of the swale is sufficient to protect downstream fish and fish habitat. There is no setback requirement for the existing farm roads if they remain gravelled and unpaved (do not become an impervious surface).

In Closing

We hope this provides the information needed for your reporting. If you have any questions, please feel free to contact me.

Regards,

McELHANNEY CONSULTING SERVICES LTD.



Dr. Cindy Lipp, R.P.Bio.
Senior Biologist, QEP
clipp@mcelhanney.com l 604-424-4866

References

iMapBC. 2018. iMapBC 2.0. Accessed from URL: https://maps.gov.bc.ca/ess/hm/imap4m/

Ministry of Agriculture (MOA). 2011. Agricultural Building Setbacks from Watercourses in Farming Area. Order NO. 823, 400-1 February 2011.

Ministry of Agriculture (MOA). 2008. Flood Construction Levels and Setbacks for Farm Building Situations. Order No. 823.400-2. July 2008.

Province of BC (BC). 2004. *Riparian Areas Regulation*. BC Reg. 376/2004. Accessed from URL: http://www.bclaws.ca/civix/document/id/complete/statreg/376_2004

BUILDING CODE COMPLIANCE REPORT

FOR

Production Facility

58551 A Dent Road, Hope, BC

Prepared for:

DBO Agriculture Inc.

Revision 2, September 13, 2018

Prepared by:

Kerkhoff Engineering Ltd.

Theo Kerkhoff, P.Eng

TABLE OF CONTENTS

INTRODUCTION

This report is intended as a design aid and reference tool for the project team and the Fraser Valley Regional District (FVRD) in their review of this project. All Code references in this report are to the 2012 BC Building Code, unless otherwise indicated. It is the responsibility of the registered professionals for this project to ensure that the life safety and fire protection requirements of Part 3 of the code are incorporated into this project. This report is not intended to be used as a contract document.

This report is based on the architectural drawings prepared by Kerkhoff Engineering Ltd. (project no. 18-128, dated September 13, 2018) and summarizes the approach to Code compliance for this project.

PROJECT DESCRIPTION

The project is sited on the North side of Dent Road between Lorenzetti creek and the base of the mountain on the East. The existing agricultural barn on the east property line will be demolished and replaced with the new facility.

Bylaw Review

Area B – Zoning Bylaw No. 85

203- Off Street Parking and Loading Spaces (see division 19 & Schedule A)

Agricultural Zone Ag-1

403 Setbacks

a) Highway: No building or part thereof, mobile home, or unit, modular home or structure shall be located closer than 25feet to the right of way boundary of a road allowance or flanking street, or closer than 58feet to the centre line of said allowance or street, whichever is the greater distance from the road or street centre line
b) Side and Rear: No building or part thereof, shall be located closer than 25 feet to any side or rear lot line.

Division 19 – Off Street Parking and Loading

1901 Off street parking site specifications

a) The width of each parking space shall be not less than 8'-6", the height shall be not less than 7ft, and the length shall be not les than 20ft.
b) A parking space which adjoins a fence or structure greater than one foot in height shall be increased in width to no less than 9'-6".
c) Minimum driveway width for 90deg. parking is to be 25ft.
d) Where driveway width is less than 18ft one way traffic only shall be permitted.

1902 Off street loading site specifications

a) One off street loading space shall be provided for every 20,000 sq.ft or any part thereof of gross floor area
b) Each off street loading space shall be no smaller in area than 375 sq.ft, provided that the width of each such space shall be no less than 10ft, and the height no less than 14ft.
c) Every off street loading space shall be either hard surfaced or gravelled.

Building description:

The building is 98'-8 wide x 176ft long, 2 stories. The building will be used for the growing and production of cannabis, with plants starting on lower floor, being brought up to upper floor and than processed back on the main floor where it will be stored in the vault before shipping. There will be a very small office area on the lower floor. The building will not be open to the public.

FIRE PROTECTION PROGRAM

The following is a summary of the approach to compliance with Part 3 of the BC Building Code 2012.

BUILDING CHARACTERISTICS

Summary of Building Characteristics with respect to the application of Building Code Subsection 3.2.2 the major Code characteristics is as follows:

Building Area = 98'-8"x176 = 17,365sq.ft (1,613.3 sq.m)

Mechanical room = 13'-8"x12'-10" = 175.4 sq.ft (16.3 sq.m)

Stair tower = 10'-0"x25'-2" = 251.7 sq.ft (23.4 sq.m)

Total Building Area for 3.2.2 purposes = 1613.3 + 16.3 + 23.4 = **1,653sq.m** (17,792.74sq.ft)

Total main and second floor area = 1653 + 1613.3+23.4 = 3,289.7sq.m (35,410sq.ft)

	Construction Article	
	3.2.2.61	3.2.2.77
Major Occupancy	D	F2
Sprinklers	yes	yes
Construction type	NC/C	NC/C
Roof	N/A	N/A
Floors	3/4hr if C	3/4hr if C
Mezzanines	none	none
Load Brg Walls /Columns	3/4hr if C	3/4hr if C
Max Bldg Area	2,400sq.m	1,800sq.m

Legend:
SASA Same as supported assembly
NC Non-Combustible
C Combustible
N/A Not Applicable

Additional notes:

1. The building can not be designed with interconnected floor space as 50% building area exceeds permitted areas.

CONSTRUCTION REQUIREMENTS

Building Size & Construction – In accordance with Subsection 3.2.2, the building will be constructed in accordance with Articles 61 & 77.

Exit Separations – Exits will be separated from the remainder of the building by a fire separation having a fire resistance rating not less than 45min in accordance with Article 3.4.4.1

Janitors storage rooms do no require a separation in a sprinklered building in accordance with 3.3.1.21 (3)

Service Room Separations – Service rooms containing fuel – fired appliances will be separated from the remainder of the building by a fire separation having a fire resistance rating of at least 1 hr in accordance with Sentence 3.6.2.1(1)

Electrical Closets – Electrical closets will be separated from the remainder of the floor area including a public corridor by a fire separation having a fire resistance rating of at least 1h in accordance with Article 3.3.1.4

Closures – Closures in fire separations other than suite doors, and fire stopping materials for servicer penetrations, will have a fire protection rating in accordance with Table 3.1.8.4, reproduced below.

Table 3.1.8.4 (Forming part of Sentences 3.1.8.4(2) and 3.1.9.1 (1)

Fire – resistance Rating of Fire Separation	Minimum Fire Protection Rating of Closure

45 min	45 min
1 h	45 min
1.5 h	1 h
2 h	1.5 h
3 h	2 h
4 h	3 h

Hold – open Devices – Hold open devices are permitted but must be designed to release upon a signal from the building fire alarm system.

Firestopping – Piping, ducts, wiring and similar penetrations through a required fire separation will be tightly fitted, or the opening will be sealed at the penetration by listed fire stopping materials in compliance with Subsection 3.1.9.

Fire Dampers – Shall be installed as per 3.1.8.7 for ducts that penetrate an assembly required to be a fire separation

EXPOSURE ANALYSIS

The percentage of unprotected openings in the exterior walls of the tower has been reviewed for conformance with Table 3.2.3.1.E "Unprotected opening Limits for a Building or Fire Compartment that is Sprinklered Throughout". Area calculated by building width x 38ft(11.59m) to underside of roofing. As per sentence (8) A limiting distance equal to half the actual limiting distance shall be used as input where the time from receipt of notification of a fire by the fire department until the arrival of the first fire department vehicle at the building exceeds 10min. All LD values shows include 50% factor

Fire Compartment	L/H	Elev.	Area EBF (sq.m)	LD (m)	UPO(%) Permitted	UPO(%) Proposed	Construction Requirements	Type of Cladding
	2.6	North	348.8	34.4	100	3.4	None	C/NC
	4.9	East	657.5	3.8	13.2	0.0	2hr NC	NC
	2.6	South	348.8	33.55	100	9.3	None	C/NC
	4.9	West	657.5	23.6	100	1.7	None	C/NC

FIRE DEPARTMENT ACCESS

The proposed development has its main entry access on the South side of the site accessed off the existing driveway on Dent Road.

Access to above grade stories – for every storey that is not sprinklered, direct access for fire fighting shall be provided from the outdoors to every storey. One window is located on the second floor level on south side of building in line with the corridor. An access walk way has been provided on the East side of the building for access into each second floor room. This shall be approved by the fire department as does not comply with requirements of section 3.2.5.1. The access opening shall be 750 wide x 1,100mm high and 900mm above inside floor level.

Access routes – As our building is greater than 600sq.m in building area access routes shall be provided to the principal entrance. The access route shall be located minimum 3m from the principal entrance and not more than 15m.

The access route shall have a clear width of not less than 6m, centreline radius of 12m, overhead clearance of 5m, change of gradient not more than 1 in 12.5 over a minimum distance of 15m, have turnaround facilities for any dead end portion of the access route more than 90m long.

Every building shall be provided with an adequate water supply for firefighting in accordance with 3.2.5.7 and appendix A.

AUTOMATIC SPRINKLER SYSTEM

An automatic fire sprinkler system is required to be installed in conformance with NFPA 13 (3.2.5.12)

All service spaces shall be sprinklered in conformance with 3.2.5.14

Portable fire extinguishers shall be installed as per BC Fire code 3.2.5.16

If a fire pump is installed, it shall be installed in accordance with the requirements of NFPA 20.

STANDPIPE SYSTEM

A standpipe and hose system is not required

FIRE ALARM AND DETECTION SYSTEMS

A fire alarm system shall be installed in buildings in which an automatic sprinkler system is required (3.2.4.1)

The fire alarm system shall be a single or 2 stage system for Group F2/D occupancy 3.2.4.3

An annunciator shall be installed in close proximity to a building entrance that faces a street or an access route for fire department vehicles (3.2.4.9)

EXIT SYSTEMS

Each of the floor areas will be served by at least two exits.

Distance Between Exits – Sentence 3.4.2.3(2) requires exits to be separated by half the maximum diagonal dimension of the floor area but need not be more than 9m in a floor area served by a public corridor.

Travel Distance to an Exit – In a sprinklered building, Clause 3.4.2.5(1)c) permits a maximum travel distance of 45m(147.5ft) from within the floor area to an exit, and where an egress door from a suite or room leads to a public corridor the distance may be measured from the egress door in accordance with Sentence 3.4.2.4(2)

Protection of Exterior Exit Doors – Sentences 3.2.3.13(2) and (3) require protection of exits, exit stairs, and exit ramps, where such exits, stairs or ramps are exposed to unprotected openings within 3m horizontally, 10 m below, or 2m above. Both sentences required that the opening protection consist of glass block, wired glass, or a closure conforming to the requirements of

Article 3.2.3.12(4). The openings consist of windows. However closures are not practical for the windows exposing exits, and as such an equivalent approach to meeting the Code requirements shall be completed.

Rooms Opening into Exits – Service rooms including elevator machine rooms, mechanical rooms, electrical rooms will not open directly into an exit in accordance with Article 3.4.4.4. Accordingly, a vestibule will be provided between such rooms and the exit.

Occupant Load and Exit Capacity – The occupant load of floor areas will conform with the minimum design requirements of Subsection 3.1.17, maximum occupant load of 10 persons. The capacity of exits based on the occupant load of floor areas and suites will exceed the requirements of Subsection 3.4.3.

Based on the proposed Industrial use of manufacturing/process rooms of 4.6sq.m/person, 3,289.7sq.m /4.6sq.m = 715 persons. Based on occupant loads provided by the owner, the building will only see a maximum of 20 personnel at any given time. A permanent sign indicating the occupant load shall be posted in a conspicuous location.

Exit Width – As per table 3.4.3.2A

Exit corridors	1,100mm
Ramps	1,100mm
Stairs	900mm
Doorways	800mm

Headroom clearance – as per Subsection 3.4.3.4 the headroom clearance for doorways shall be not less than 2,030mm.

Stairs to be in accordance with Section 3.4.6

Landings shall be provided where vertical rise is greater than 3.7m between floors. The length and width of a landing shall be at least the width of the stairway, and need not be more than 1,100mm.

Stairs shall have a run of not less than 280mm, close back riser with a rake back of not more than 38mm.

See typical stair detail for hand rails, rise/run, tactile warning, etc.

HEALTH REQUIREMENTS

Based on Table 3.7.2.2.A for a total of 20 employees a minimum of one water closet shall be provided for each sex, and a universal toilet room.

One lavatory shall be provided in each washroom equipped with automatic or lever type handles.

Floor drains shall be installed in washrooms containing urinals equipped with an automatic flushing device.

LIGHTING AND EMERGENCY POWER SYSTEMS

Emergency lighting shall be provided at all principal routes providing access to exit in open floor areas. See electrical drawings for lighting details.