Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY	Application number	Legal land description
☑ Approval ☐ Registration ☐ Authorization ☐ Amendment	RA21045	NW 3-47-2 W5

APPLICATION DISCLOSURE

This information is collected under the authority of the *Agricultural Operation Practices Act* (AOPA), and is subject to the provisions of the *Freedom of Information and Protection of Privacy Act*. This information is public unless the NRCB grants a written request that certain sections remain private.

Any construction prior to obtaining an NRCB permit is an offence and is subject to enforcement action, including prosecution.

I, the applicant, or applicant's agent, have read and understand the statements above, and I acknowledge that the information provided in this application is true to the best of my knowledge.

Dec 16 /21
Date of signing

Signature

G&S Cattle
Corporate name (if applicable)

Greg Thalen
Print name

GENERAL INFORMATION REQUIREMENTS

Proposed facilities: list all proposed confined feeding operation facilities and their dimensions. Indicate whether any of the proposed facilities are additions to existing facilities. (attach additional pages if needed)

Proposed facilities	Dimensions (m) (length, width, and depth)
4 feedlot pens, 40,197 sq. m	4 - 304.8m x 32.97m
Total area under roof, 11,582 sq. m	4 - 9.5mx304.8
Catch basin	96m x 66m x 1.5m

Existing facilities: list **ALL** existing confined feeding operation facilities and their dimensions

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY

NRCB USE ONLY

Application for new CFO

Last updated February 26, 2021

Part 2 — Technical Requirements

NRCB | Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

If a new facility is replacing an old facility, please explain what will happen to the old facility and when. ☑ **N/A**

Construction completion date for proposed facilities Dec. 31 2025

Additional information

Livestock numbers: Complete only if livestock numbers are different from what was identified in the Part 1 application. Note: If livestock numbers increase in your Part 2 application, a new Part 1 application must be submitted which may result in a loss of priority for minimum distance separation (MDS).

Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	**Permitted number**	**Proposed increase or decrease in number (if applicable)**	**Total**
Beef, Cow/finisher	0	4000	4000

Last updated February 26, 2021

Part 2 — Technical Requirements

NRCB | Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING *WATER ACT* LICENCE

Issued by Alberta Environment and Parks (AEP) for a confined feeding operation (CFO)

Date and sign one of the following four options

OPTION 1: Applying through the NRCB for both the AOPA permit and the *Water Act* licence

I **DO** want my water licence application coupled to my AOPA permit application.

Signed this ____day of _____, 20____. _____

Signature of Applicant or Agent

OPTION 2: Processing the AOPA permit and *Water Act* licence separately

1. I (we) acknowledge that the CFO will need a new water licence from AEP under the *Water Act* for the development or activity proposed in this AOPA application.
2. I (we) request that the NRCB process the AOPA application **independently of** AEP's processing of the CFO's application for a water licence.
3. In making this request, I (we) recognize that, if this AOPA application is granted by the NRCB, the NRCB's decision will not be considered by AEP as improving or enhancing the CFO's eligibility for a water licence under the *Water Act*.
4. I (we) acknowledge that any construction or actions to populate the CFO with livestock pursuant to an AOPA permit in the absence of a *Water Act* licence will **not** be relevant to AEP's consideration of whether to grant the *Water Act* licence application.
5. I (we) acknowledge that any such construction or livestock populating will be at the CFO's sole risk if the *Water Act* licence application is denied or if the operation of the CFO is otherwise deemed to be in violation of the *Water Act*. This risk includes being required to depopulate the CFO and/or to cease further construction, or to remove "works" or "undertakings" (as defined in the *Water Act*).
6. **AS RELEVANT:** I (we) acknowledge that the CFO is located in the South Saskatchewan River Basin and that, pursuant to the *Bow, Oldman and South Saskatchewan River Basin Water Allocation Order* [Alta. Reg. 171/2007], this basin is currently closed to new surface water allocations.

Signed this 16 day of Dec, 20 21 _____

Signature of Applicant or Agent

OPTION 3: Additional water licence not required

1. I (we) declare that the CFO will not need a new licence from AEP under the *Water Act* for the development or activity proposed in this AOPA application.

Signed this ____ day of _____, 20____. _____

Signature of Applicant or Agent

OPTION 4: Uncertain if *Water Act* licence is needed; acknowledgement of risk (for existing CFOs only)

1. At this time, I (we) do not know whether a new water licence is needed from AEP under the *Water Act* for the development or activity proposed in this AOPA application.
2. If a new *Water Act* licence is needed, I (we) request that the NRCB process the AOPA application **independently of** AEP's processing of the CFO's application for a water licence.
3. In making this request, I (we) recognize that, if this AOPA application is granted by the NRCB, the NRCB's decision will not be considered by AEP as improving or enhancing the CFO's eligibility for a water licence under the *Water Act*.
4. I (we) acknowledge that any construction or actions to populate the CFO with additional livestock pursuant to an AOPA permit in the absence of a *Water Act* licence will **not** be relevant to AEP's consideration of whether to grant my *Water Act* licence application, if a new water licence is needed.
5. I (we) acknowledge that any such construction or livestock increase will be at the CFO's sole risk if the *Water Act* licence application is denied or if the operation of the CFO is otherwise deemed to be in violation of the *Water Act*. This risk includes being required to depopulate the CFO and/or to cease further construction, or to remove "works" or "undertakings" (as defined in the *Water Act*).
6. **AS RELEVANT:** I (we) acknowledge that the CFO is located in the South Saskatchewan River Basin and that, pursuant to the *Bow, Oldman and South Saskatchewan River Basin Water Allocation Order* [Alta. Reg. 171/2007], this basin is currently closed to new surface water allocations.

Signed this ____ day of _____, 20____. _____

Signature of Applicant or Agent

Part 2 — Technical Requirements

NRCB | Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

GENERAL ENVIRONMENTAL INFORMATION

(complete this section for the worst case of the existing facility which is the closest to water bodies or water wells and for each of the proposed facilities)

Facility description / name *(as indicated on site plan)*

Existing: 2 pens **Proposed 1:** 4 feedlot pens, 40,197 sq. m

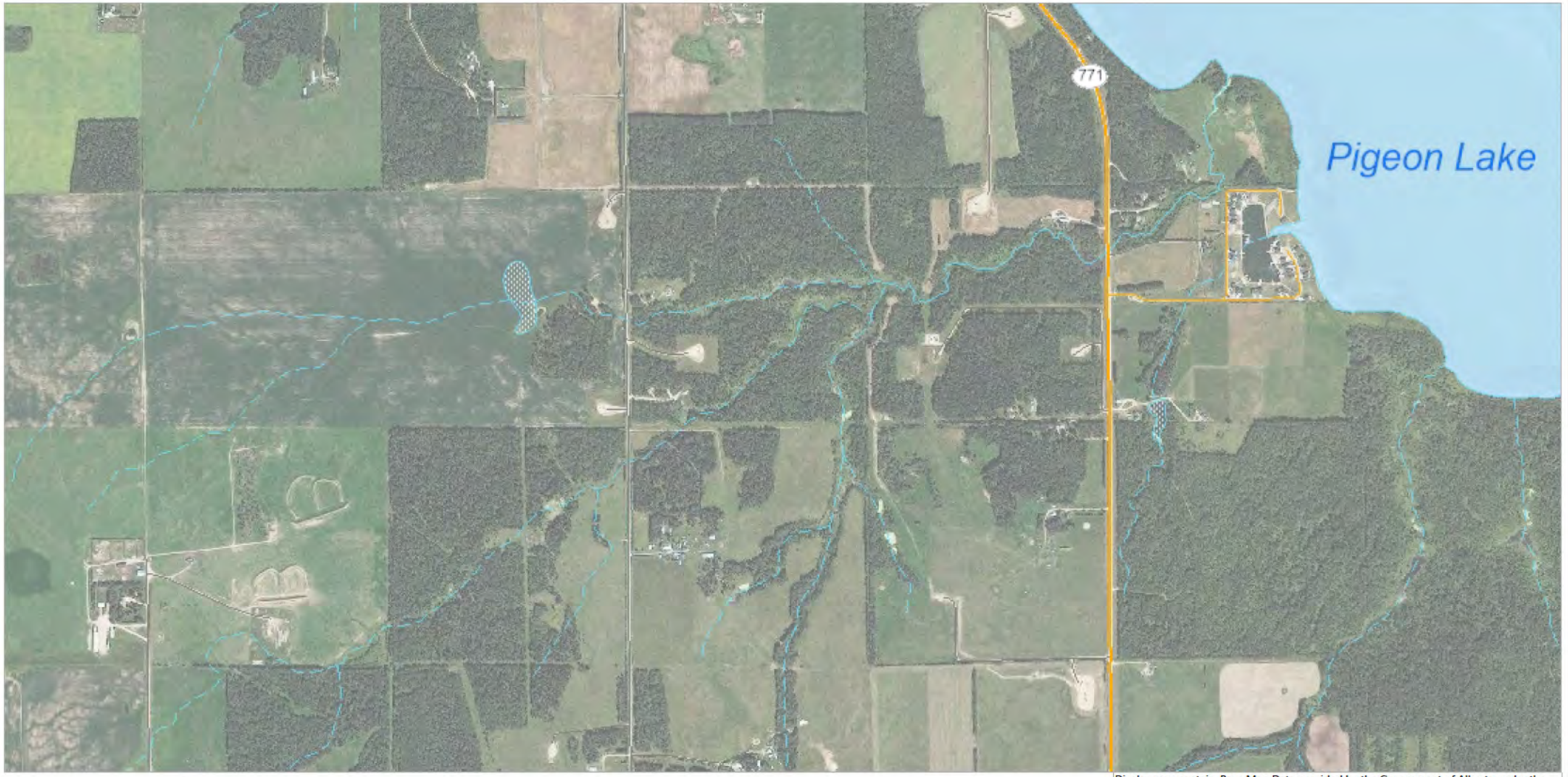
Proposed 2: _____ **Proposed 3:** _____

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☑ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☐ >1 m ☐ ≤ 1 m	☐ > 1 m ☐ ≤ 1 m	☑ YES ☐ NO ☐ YES with exemption	Not in known flood plain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	0	0			☑ YES ☐ NO ☐ YES with exemption	None known
	How many water wells are within 100 m of the manure storage facility or manure collection area?	0	0			☐ YES ☐ NO ☑ YES with exemption	2: ID 446821 ID 467627
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	900m	400m			☑ YES ☐ NO ☐ YES with exemption	30 m seasonal draiange
Groundwater information	What is the depth to the water table?		>2.7m			☑ YES ☐ NO ☐ YES with exemption	variable across site based on lithology. *BH3 being used for UGR
	What is the depth to the groundwater resource/aquifer you draw water from?	29m	29m			☑ YES ☐ NO ☐ YES with exemption	*ID 446821 potentially drawing from sand and shale layers from 6.1 m down to 35 m.

Additional information (attach supporting information, e.g. borehole logs, records, etc. you consider relevant to your application)

*The geotechnical investigation, specifically BH3 that was drilled near the latest (Aug 22) proposed catch basin area, finds mudstone at a depth of 1.5m. This corresponds with lithology reports from water wells in this area (alternating shale and sandstone to a depth of 35m). I therefore presumed the depth to groundwater to be 1.5 m.

Natural Resource Conservation Board



0.3 0 0.14 0.3 Kilometers

Projection: NAD_1983_10TM_AEP_Forest
Map Scale: 18,056
Printed on: May 17, 2022 15:20:28 -06:00

Alberta Environment and Parks

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This site is created, maintained, and monitored by AEP in direct consultation with the data authority.

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

WATER WELL AND SURFACE WATER INFORMATION

Well IDs: NW 3: ID 446821 | NW 3: ID 467627 | NE 4: ID 370006 | NE 4: ID 449504 | NE 4: ID 449502

Surface water related concerns from directly affected parties or referral agencies: ☑ YES ☐ NO

Groundwater related concerns from directly affected parties or referral agencies: ☑ YES ☐ NO

Water wells ☐ N/A

If applicable, exemption for 100 m distance requirements applied: ☐ YES ☑ NO Condition required: ☐ YES ☑ NO

Surface water ☐ N/A

If applicable, exemption for 30 m distance requirements applied: ☐ YES ☑ NO Condition required: ☐ YES ☑ NO

Water Well Exemption Screening Tool ☑ N/A

Water Well ID	Preliminary Screening Score	Secondary Screening Score	Facility

Groundwater or surface water related comments:

The 2 wells located at the proposed land location would likely require decomissioniong as the proposed pens are to be constructed on top of their location.
ID 446821 & ID 467627

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities

Facility	Groundwater score	Surface water score	File number
Pens	Low	Low	RA 21045
Catch basin	Low	Low	RA 21045

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number

ERST related comments:

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 370006
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1993/09/02

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
BAUMAN FARMS	P.O. BOX 5054 DRAYTON VALLEY				T0E 0M0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	4	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028573 Longitude -114.227356
How Location Obtained
Map

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Stock

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
10.00		Clay
16.00		Green Shale
30.00		Blue Shale
39.00		Gray Sandstone
45.00		Gray Shale
52.00		Blue Shale
65.00		Gray Sandstone
66.00		Coal
70.00		Blue Shale
78.00		Gray Sandstone
91.00		Blue Shale
110.00		Gray Sandstone
120.00		Gray Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 8.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
1993/08/24	10.00	48.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
120.00 ft		1993/08/24	1993/08/24

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	120.00

Surface Casing (if applicable)
Plastic
Size OD : 5.56 in
Wall Thickness : 0.375 in
Bottom at : 80.00 ft

Well Casing/Liner
Plastic
Size OD : 4.50 in
Wall Thickness : 0.250 in
Top at : 75.00 ft
Bottom at : 120.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)
95.00	115.00	0.020		0.00

Perforated by Machine

Annular Seal Driven
Placed from 0.00 ft to 78.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : 0.00 in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings Bottom Fittings

Pack
Type Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
PANKY'S CONSOLIDATED LTD.

Copy of Well report provided to owner Date approval holder signed

Printed on 9/7/2021 11:06:47 AM

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 370006
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1993/09/02

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
BAUMAN FARMS	P.O. BOX 5054 DRAYTON VALLEY				T0E 0M0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	4	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028573 Longitude -114.227356
How Location Obtained
Map

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate lgpm
Is Flow Control Installed
Describe

Recommended Pump Rate 8.00 lgpm
Recommended Pump Intake Depth (From TOC) 95.00 ft
Pump Installed Depth ft
Type Make H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth ft
Gas Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Sample Collected for Potability Submitted to ESRD

Additional Comments on Well

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Imperial

Test Date	Start Time	Static Water Level
1993/08/24	12:00 AM	48.00 ft

Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)

Method of Water Removal
Type Air
Removal Rate 10.00 lgpm
Depth Withdrawn From 100.00 ft

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	lg	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
PANKY'S CONSOLIDATED LTD.

Copy of Well report provided to owner Date approval holder signed

Printed on 9/7/2021 11:06:47 AM

Water Well Drilling Report

View in Metric | Export to Excel

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GOWN ID

GIC Well ID 446821
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1974/04/26

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
BAUMANN, D.	WESTEROSE				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NW	3	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028481 Longitude -114.214889
How Location Obtained
Map

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
20.00		Clay
60.00		Shale
65.00		Sand & Shale
112.00		Shale
115.00		Sand & Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 0.00 Igpm

Test Date	Water Removal Rate (Igpm)	Static Water Level (ft)
1972/11/01	10.00	24.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
115.00 ft			1972/11/01

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	115.00

Surface Casing (if applicable)
Galvanized Steel
Size OD : 4.50 in
Wall Thickness : 0.000 in
Bottom at : 40.00 ft

Well Casing/Liner
Size OD : 0.00 in
Wall Thickness : 0.000 in
Top at : 0.00 ft
Bottom at : 0.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)

Perforated by

Annular Seal Driven
Placed from 0.00 ft to 0.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : 0.00 in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings
Bottom Fittings

Pack
Type
Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Company Name
FRASER, RON

Certification No
1

Copy of Well report provided to owner Date approval holder signed

Printed on 9/7/2021 11:03:24 AM

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 446821
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1974/04/26

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
BAUMANN, D.	WESTEROSE				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NW	3	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028481 Longitude -114.214889
How Location Obtained
Map

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate lgpm
Is Flow Control Installed
Describe

Recommended Pump Rate 0.00 lgpm
Recommended Pump Intake Depth (From TOC) 0.00 ft
Pump Installed Depth ft
Type Make H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth ft
Gas Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well
ORIGINALLY NO LSD

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Imperial

Test Date	Start Time	Static Water Level
1972/11/01	12:00 AM	24.00 ft

Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)

Method of Water Removal
Type
Removal Rate 10.00 lgpm
Depth Withdrawn From 0.00 ft

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	lg	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
FRASER, RON

Copy of Well report provided to owner Date approval holder signed

Printed on 9/7/2021 11:03:24 AM

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 449502
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1981/10/07

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
M&R TRUCKING	DRAYTON VALLEY				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	4	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028573 Longitude -114.227356
How Location Obtained
Map

Elevation 3000.00 ft
How Elevation Obtained
Estimated

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Stock

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
14.00		Clay
38.00		Soft Shale
68.00		Gray Hard Shale
110.00		Green Hard Shale
125.00		Sandy Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 0.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
1981/07/07	4.00	33.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
125.00 ft		1981/07/07	1981/07/07

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	125.00

Surface Casing (if applicable)
Steel
Size OD : 4.50 in
Wall Thickness : 0.000 in
Bottom at : 82.00 ft

Well Casing/Liner
Size OD : 0.00 in
Wall Thickness : 0.000 in
Top at : 0.00 ft
Bottom at : 0.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)

Perforated by

Annular Seal Driven
Placed from 0.00 ft to 82.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : 0.00 in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings
Bottom Fittings

Pack
Type
Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
RONDAL WW DRLG

Copy of Well report provided to owner | Date approval holder signed

Printed on 9/7/2021 11:07:35 AM

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 449502
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1981/10/07

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
M&R TRUCKING	DRAYTON VALLEY				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	4	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028573 Longitude -114.227356
How Location Obtained
Map

Elevation 3000.00 ft
How Elevation Obtained
Estimated

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate lgpm
Is Flow Control Installed
Describe

Recommended Pump Rate 0.00 lgpm
Recommended Pump Intake Depth (From TOC) 70.00 ft
Pump Installed Depth ft
Type Make H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth ft
Gas Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well
DRILLER REPORTS WATER SOFT.

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Imperial

Test Date	Start Time	Static Water Level
1981/07/07	12:00 AM	33.00 ft

Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)

Method of Water Removal
Type Bailer
Removal Rate 4.00 lgpm
Depth Withdrawn From 56.00 ft

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	lg	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
RONDAL WW DRLG

Copy of Well report provided to owner Date approval holder signed

Printed on 9/7/2021 11:07:35 AM

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 449504
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1987/08/07

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
BOUMANN	WESTEROSE				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	4	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028573 Longitude -114.227356
How Location Obtained
Map

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Domestic & Stock

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
8.00		Clay
30.00		Brown Shale
33.00		Sandstone
55.00		Shale
60.00		Sandstone
70.00		Brown Shale
122.00		Green Shale
135.00		Sandy Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 8.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
1987/03/14	8.00	54.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
135.00 ft		1987/03/14	1987/03/14

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	135.00

Surface Casing (if applicable)
Galvanized Steel
Size OD : 4.50 in
Wall Thickness : 0.156 in
Bottom at : 94.00 ft

Well Casing/Liner
Size OD : 0.00 in
Wall Thickness : 0.000 in
Top at : 0.00 ft
Bottom at : 0.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)

Perforated by

Annular Seal Unknown
Placed from 0.00 ft to 94.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : 0.00 in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings
Bottom Fittings

Pack
Type
Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Company Name
FRASER, RON

Certification No
1

Copy of Well report provided to owner | Date approval holder signed

Printed on 9/7/2021 11:05:47 AM

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 449504
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1987/08/07

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
BOUMANN	WESTEROSE				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	4	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028573 Longitude -114.227356
How Location Obtained
Map

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level In
Is Artesian Flow
Rate lgpm
Is Flow Control Installed
Describe

Recommended Pump Rate 8.00 lgpm
Recommended Pump Intake Depth (From TOC) 80.00 ft
Pump Installed Depth ft
Type Make H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth ft
Gas Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Sample Collected for Potability Submitted to ESRD

Additional Comments on Well

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Imperial

Test Date	Start Time	Static Water Level
1987/03/14	12:00 AM	54.00 ft

Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)

Method of Water Removal

Type Bailer
Removal Rate 8.00 lgpm
Depth Withdrawn From 66.00 ft

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	lg	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
FRASER, RON

Copy of Well report provided to owner Date approval holder signed

Printed on 9/7/2021 11:05:47 AM

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 467627
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1997/05/05

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
BAUMAN FARMS	P.O. BOX 90 FALUN				T0C 1H0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NW	3	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028481 Longitude -114.214889
How Location Obtained
Map

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
8.00		Clay
30.00		Brown Sandy Sandstone
40.00		Gray Sandstone
43.00		Gray Shale
50.00		Gray Sandstone
60.00		Blue Shale
62.00		Gray Sandstone
75.00		Blue Shale
80.00		Gray Sandstone
103.00		Blue Gray Shale
110.00		Gray Sandstone
125.00		Blue Shale
150.00		Gray Sandstone
175.00		Gray Shale
183.00		Blue Shale
215.00		Gray Shale
264.00		Gray Sandstone
270.00		Blue Shale
331.00		Sandstone

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 12.00 Igpm

Test Date	Water Removal Rate (Igpm)	Static Water Level (ft)
1997/04/09	15.00	146.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
331.00 ft		1997/04/08	1997/04/09

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	331.00

Surface Casing (if applicable)
Steel
Size OD : 5.56 in
Wall Thickness : 0.188 in
Bottom at : 160.00 ft

Well Casing/Liner
Plastic
Size OD : 4.50 in
Wall Thickness : 0.215 in
Top at : 151.00 ft
Bottom at : 331.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)
291.00	331.00	0.000		0.02

Perforated by Machine

Annular Seal Driven
Placed from 150.00 ft to 160.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : 0.00 in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings Bottom Fittings

Pack
Type Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
PANKY'S CONSOLIDATED LTD.

Copy of Well report provided to owner Date approval holder signed

Printed on 9/7/2021 11:04:59 AM

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 467627
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1997/05/05

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
BAUMAN FARMS	P.O. BOX 90 FALUN				T0C 1H0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NW	3	47	2	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.028481 Longitude -114.214889
How Location Obtained
Map

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate lgpm
Is Flow Control Installed
Describe

Recommended Pump Rate 12.00 lgpm
Recommended Pump Intake Depth (From TOC) 240.00 ft
Pump Installed Depth ft
Type Make H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth ft
Gas Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well

DRILLER REPORTS DISTANCE FROM TOP OF CASING TO GROUND LEVEL: 2'.

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Imperial

Test Date	Start Time	Static Water Level
1997/04/09	12:00 AM	146.00 ft

Method of Water Removal
Type Air
Removal Rate 15.00 lgpm
Depth Withdrawn From 320.00 ft

If water removal period was < 2 hours, explain why

Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)
	3:00	255.42
	4:00	241.17
	5:00	228.17
	6:00	216.33
	7:00	207.25
	8:00	198.58
	9:00	191.67
	10:00	185.75
	12:00	177.50
	16:00	171.00
	60:00	150.17
	120:00	146.75

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	lg	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
PANKY'S CONSOLIDATED LTD.

Copy of Well report provided to owner

Date approval holder signed

Printed on 9/7/2021 11:04:59 AM

Part 2 — Technical Requirements

NRCB | Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

DISTANCE OF ANY MANURE STORAGE FACILITY (EXISTING OR PROPOSED) TO NEIGHBOURING RESIDENCES

			NRCB USE ONLY				
Neighbour name(s)	**Legal land description**	**Distance (m)**	**Zoning (LUB) category**	**MDS category (1–4)**	**Distance (m)**	**Waiver attached (if required)**	**Meets regulations**
not known AO note: J. Roussel	04-03-47-02 W5	849.2	RR	Cat 1	807 m	N/A	Yes
Marin Clatt AO note: D. Labutis	08-03-47-02 W5	1039	RR	Cat 1	1156 m	N/A	Yes
not known AO note: M. Klatt	04-11-47-02 W5	1278.1	AG	Cat 1	1528 m	N/A	Yes
Dave Labuttis	12-02-47-02 W5	1123	AG	Cat 1	1394 m	N/A	Yes
Rick and Ron Bowman	02-04-47-02 W5	993	RR	Cat 1	1063 m	N/A	Yes

LAND BASE FOR MANURE AND COMPOST APPLICATION (complete only if an increase in livestock or manure production will occur)

				NRCB USE ONLY	
Name of land owner(s)*	**Legal land description**	**Usable area** (ha)**	**Soil zone *****	**Usable area (ha)**	**Agreement attached (if required)**
See list and map provided.		510	Grey	2283 ac	n/a
			Total	See next page	

* If you are **not** the registered landowner, you must attach copies of land use agreements signed by all landowners.

** Available manure spreading area (excluding setback areas from residences, common bodies of water, water wells, etc. as identified in Agdex 096-5 Manure Spreading Regulations)

*** Brown, dark brown, black, grey wooded, or irrigated

Additional information (attach any additional information as required)

Rural Residential (RR) from Wetaskwin Land Use Bylaw (LUB) is for residences being constructed on larger agricultural land holdings. I would consider this to be equivalent to Cat 1 for MDS purposes.

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

MINIMUM DISTANCE SEPARATION

Methods used to determine distance (if applicable): google earth

Margin of error (if applicable): +/- 5 m

Requirements (m): Category 1: 631 m Category 2: 841 m Category 3: 1051 m Category 4: 1682 m

Technology factor: ☐ YES ☑ NO

Expansion factor: ☐ YES ☑ NO

MDS related concerns from directly affected parties or referral agencies: ☑ YES ☐ NO

LAND BASE FOR MANURE AND COMPOST APPLICATION

Land base required: 1027 ac Grey Wooded

Land base listed: 2654 ac

Area not suitable: 371 ac

Available area 2283 ac

Requirement met: ☑ YES ☐ NO

Land spreading agreements required: ☐ YES ☑ NO

Manure management plan: ☐ YES ☑ NO If yes, plan is attached: ☐

Applicant has provided double the area of land for manure spreading, sufficient land base has been met.

PLANS

Submitted and attached construction plans: ☑ YES ☐ NO

Submitted aerial photos: ☑ YES ☐ NO

Submitted photos: ☐ YES ☑ NO

GRANDFATHERING

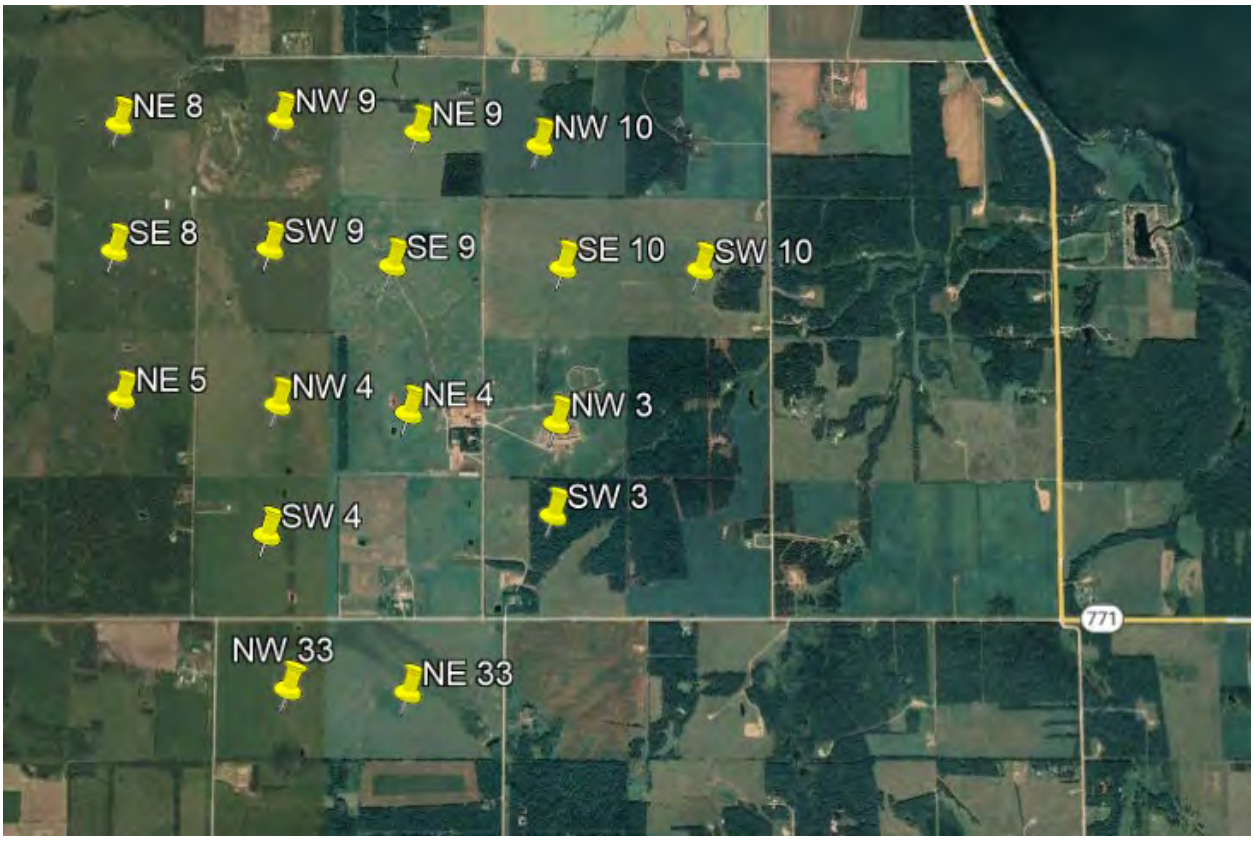
Already completed: ☐ YES ☐ NO ☑ N/A

If already completed, see _____

G&S Cattle - Land for Spreading

NW-33-46-2-W5
108 cultivated acres; 45.01 pasture acres totalling 153.01 acres.
NE-33-46-2-W5
86 cultivated acres; 67.01 pasture acres totalling 153.01 acres
NW-3-47-2-W5
88 cultivated acres; 73 pasture acres totalling 161 acres
SW-3-47-2-W5
69 cultivated acres; 77.78 pasture acres totalling 146.78 acres
NW-4-47-2-W5
127 cultivated acres; 33 pasture acres totalling 160 acres
SW-4-47-2-W5
125 cultivated acres; 24.79 pasture acres totalling 149.79 acres
NE-5-47-2-W5
152.39 pasture acres totalling 152.39 acres
NE-8-47-2-W5
160 pasture acres totalling 160 acres
SE-8-47-2-W5
143 cultivated acres; 16 pasture acres; 1 waste acre totalling 160 acres
NE-9-47-2-W5
109 cultivated acres; 47.02 pasture acres totalling 156.02 acres
NW-9-47-2-W5
68 cultivated acres; 90.04 pasture acres totalling 158.04 acres
SE-9-47-2-W5
119 cultivated acres; 41 pasture acres totalling 160 acres
SW-9-47-2-W5
127 cultivated acres; 33 pasture acres totalling 160 acres
NW-10-47-2-W5
129.04 cultivated acres; 15.75 pasture acres totalling 144.79 acres
SE-10-47-2-W5
131.23 cultivated acres; 25.75 pasture acres; 4.02 waste acres totalling 161 acres
SW-10-47-2-W5
156 cultivated acres; 5 pasture acres totalling 161 acres
NE-4-47-2-W5
132 cultivated acres; 18 pasture acres totalling 150 acres
NE4-47-2-W5
7 pasture acres; 3 acre building site totalling 10 acres
Main home site

Approval Officer addition: manure spreading lands listed.



Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

ALL SIGNATURES IN FILE ☑ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

December 16, 2021	June 8, 2022
March 29, 2022	June 16, 2022
April 22, 2022	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: March 10, 2022

Municipality: Wetaskiwin County

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

Alberta Health Services:

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

Alberta Environment and Parks: ☐ N/A

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

Alberta Transportation: ☑ N/A Not within 800 m of a provincial highway intersection

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

Alberta Regulatory Services: ☑ N/A

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

Other: _____ ☑ N/A

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

Other: _____ ☑ N/A

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

Part 2 — Technical Requirements

NRCB | Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Concrete liner

*(complete a copy of this section for **EACH** barn, feedlot, and storage facility for solid manure, composting materials, or compost with a concrete liner)*

Facility description / name *(as indicated on site plan)* **1.** Feedlot pens

2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	304.8	131.88	0	
2.				
			TOTAL CAPACITY	storage in pen

☐ I plan to use a short-term solid manure storage (STMS) as part of my manure storage and handling plan for this CFO. The AOPA requirements for STMS are set out in the NRCB Short-Term Solid Manure Storage Requirements Fact Sheet.

Surface water control systems

Describe the run-on and runoff control system

Catch basin used

Liner protection

Describe how the physical integrity of the liner will be maintained

Concrete would be monitored for breaking.

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Part 2 — Technical Requirements

NRCB | Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Concrete liner (cont.)

Concrete liner details

Concrete thickness 0.152m (6")	Method of sulphate protection: type 10 HS cement
Concrete strength 30 mpa	Concrete reinforcement size and spacing 10M bar at 0.305m on center each way

Concrete requirements can be found in Technical Guideline Agdex 096-93
Guideline minimums:
Solid manure: 25MPa (D)
Solid manure (wet): 30MPa (C)
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY
Requirements met: ☑ YES ☐ NO
Condition required: ☑ YES ☐ NO
Report attached: ☐ YES ☑ NO

Additional information *(attach as required)*

NRCB USE ONLY

Nine month manure storage volume requirements met ☑ YES ☐ YES With STMS ☐ NO

Depth to water table: >1.5 m Requirements met: ☑ YES ☐ NO

Depth to Uppermost groundwater resource: >1.5 m Requirements met: ☑ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO Details/comments:

Pens to be properly sloped and directed to catch basin. run on and run off controlled.
Short term manure storage of solid manure can be used as per legislation during pen cleanouts.

Concrete liner details

Leakage detection system required: ☐ YES ☑ NO If yes, please explain why.

n/a

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer

*(complete a copy of this section for **EACH proposed** runoff control catch basin with a naturally occurring protective layer)*

Facility description / name *(as indicated on site plan)*

1. Feedlot Catch Basin
2. _____
3. _____

Determination of runoff area

Provide a plan and show how you calculated the area contributing to runoff for each catch basin

Total area not under roof = 28,615 square meters.

Catch basin capacity

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY
					Inside end walls	Inside side walls	Outside walls	Calculated storage capacity (excl. 0.5 m freeboard) (m^3)
1.	96	66	1.5	1	3:1	3:1	4:1	6616 m^3
2.								
3.								
							TOTAL CAPACITY	

August 22, 2022 depth changed to 1.75 m, calculations adjust for this. See DS for further discussion.

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	2.38 (m)	Provide details (as required)	
Soil texture	20.2 % sand	40 % silt	39.8 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 2.38m	Hydraulic conductivity (cm/s): 3.54x10^-7	Describe test standard used: ASTM D5084

Catch Basin – Design and management requirements can be found in Technical Guideline Agdex 096-101

If soil info differs per facility include additional soils page.

NRCB USE ONLY

Requirements met:	☑ YES	☐ NO
Condition required:	☐ YES	☑ NO
Report attached:	☑ YES	☐ NO

RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer (cont.)

NRCB USE ONLY

Catch basin calculator. Total volume @ freeboard level: 6616 m^3 Runoff capacity requirements met: ☑ YES ☐ NO

Calculation of the volume attached: ☑ YES ☐ NO

Depth to water table: >1.5 m Requirements met: ☐ YES ☑ NO

Depth to uppermost groundwater resource: >1.5 m Requirements met: ☐ YES ☑ NO

ERST completed: ☐ See ERST page for details

Protective layer specification comments (e.g. sand lenses; layering uniform or irregular; number and location of boreholes):

The geotechnical report provides an equivalency calculation, showing that 0.36 m of the material present in BH105 is equivalent to 5 m of soil material with a hc of 7.44×10^{-8}

On August 22, 2022, the applicant provided me with another updated site plan.
The revised plan moves the catch basin and increases the depth of the catch basin which will now be an additional 0.25 m below ground level. Upon investigating this change I concluded that based on the information available, the proposed catch basin in its new location likely does not meet AOPA's protective layer requirements, nor the requirement for 1 m separation between the facility and the uppermost groundwater resource. The nearest borehole (BH3) in catch basin area indicates clay to a depth of 1.5 m followed by "mudstone".

Leakage detection system required: ☐ YES ☑ NO If yes, please explain.

n/a

Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin

*** Only cells in blue can be changed.**

Overall Dimensions of Catch Basin			Catch Basin Dimensions
Total Length*[4]	96.0	m	315 ft
Total Width*[4]	66.0	m	217 ft
Total Depth*[4]	1.8	m	6 ft
Design Capacity Depth	*1.25*	m	4 ft
End Slope*[4]	3	run:rise	3 run:rise
Side Slope*[4]	3	run:rise	3 run:rise
Length of Bottom	85.5	m	281 ft
Width of Bottom	55.5	m	182 ft
Capacity @ top of Bank	*9,664*	*m³*	*Capacity @tob* *341,279 ft³* *2,125,768 Imp. Gal*

Design Capacity of Catch Basin (freeboard level)			Design Capacity (freeboard level)
Length (design capacity depth)	93.0	m	305 ft
Width (design capacity depth)	63.0	m	207 ft
Total Depth	*1.8*	m	6 ft
Design Capacity Depth	1.25	m	4 ft
End Slope	3	run:rise	3 run:rise
Side Slope	3	run:rise	3 run:rise
Design Capacity (freeboard level)	**6,616**	**m³**	233,640 ft³
			1,455,302 Imp. Gal.
level)	*5,859*	*m²*	*63,066 ft²*

CFO Name [1]	G&S Cattle
Land Location [1]	NW 3-47-2 W5M

Paved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m²)
1	305	132	40,260.0
2	109	77	8,393.0
3			0.0
4			0.0
5			0.0
		Total Area (m²)	**48,653**

Unpaved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m²)
6	37	140	5,180.0
7	16	46	736.0
8			0.0
9			0.0
10			0.0
		Total Area (m²)	**5,916**

Rainfall (Select Town [3])

Rimbey 100

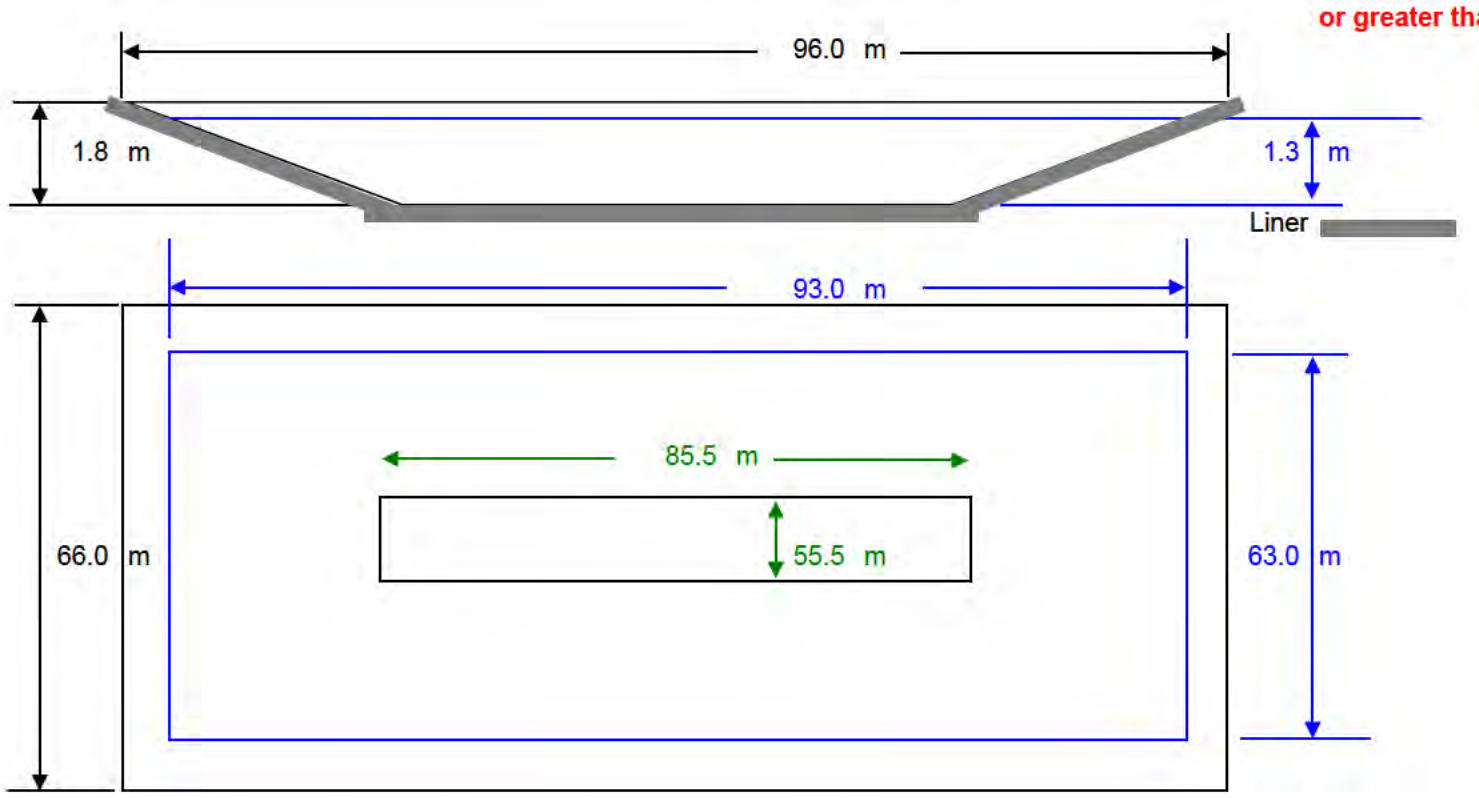
AOPA Design Rainfall 100 mm

Minimum Catchbasin Storage Volume Required

5,279 m³ ** 186440.958 ft³

1161309.59 Imp. Gal.

**** Design capacity of catch basin should be equal to or greater than, minimum storage volume required.**



Lines in Black - Overall catch basin dimensions

Lines in Blue - Design capacity depth dimensions (excludes freeboard)

NTS - Not To Scale

NRCB USE ONLY **RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)**	
Facility 1 Catch Basin	6616 m^3
Name / description	Capacity
Facility 2	
Name / description	Capacity
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	6616 m^3
RUNOFF VOLUME FROM CONTRIBUTING AREAS	5279 m^3
MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS	☑ YES ☐ NO

Approval Officer Notes: ORIGINAL DRAWINGS BEGINNING HERE.

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01

STANDARD LEGEND

PROPOSED		EXISTING
	GRADING	
280.00	CONTOURS	
N 100.000	ELEVATIONS	N100.000
0.30%	SLOPES	0.30%
	FUTURE ELEVATIONS	
	FUTURE SLOPES	
	DEEP UTILITIES	
	SANITARY SEWER	
	STORM SEWER	
	GRATED TOP MANHOLE	
	CATCHBASIN	
	VAULT OR LARGE DIA. MH	
	HYDRANT	
	REDUCER	
	TEE	
	VALVE	
	PLUG OR CAP	
	WATER MAIN	
	INSULATION	
	SHALLOW UTILITIES	
	GAS LINE	
	HIGH PRESSURE GAS LINE	
	BURIED POWER LINE	
	SHAW LINE TELUS LINE	
	OVERHEAD POWER	
	FIBER OPTIC LINE	
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	LAND BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOC BOC	CONCRETE CURB	LOC BOC
	EDGE OF ASPHALT	
	EDGE OF GRAVEL	
	DITCH BOTTOM	
	SIGNS	
	LEGAL	
	PROPERTY LINE	
	EASEMENT	
	MISCELLANEOUS	
	FENCE	
	TREES	
	SHELTERS & CONCRETE AREAS	
	BARN & SHEDS	
	LANDSCAPING	
	CATCH BASIN	

A	2021-12-01	ISSUED FOR REVIEW
1	2021-11-04	ISSUED FOR REVIEW
0	2021-11-01	ISSUED FOR REVIEW

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[illegible] PH: 403-340-3232

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RM SIGNATURE: [illegible]
RM APEGA ID #: 94781
DATE: December 17 2021
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: EAGLE BUILDERS

PROJECT: G4S FEEDLOT

DRAWING TITLE: SITE LOCATION & OVERALL DRAINAGE PLAN

PROJECT NO.:	5481
NW 3-47-2 W5M	
DRAWN:	JRB
DESIGNED:	JRB
REVIEWED:	FG
PLOTTED:	2021-12-17
SCALE: 1:2000 (25 50 100)	SHEET No.: 1/3

C00

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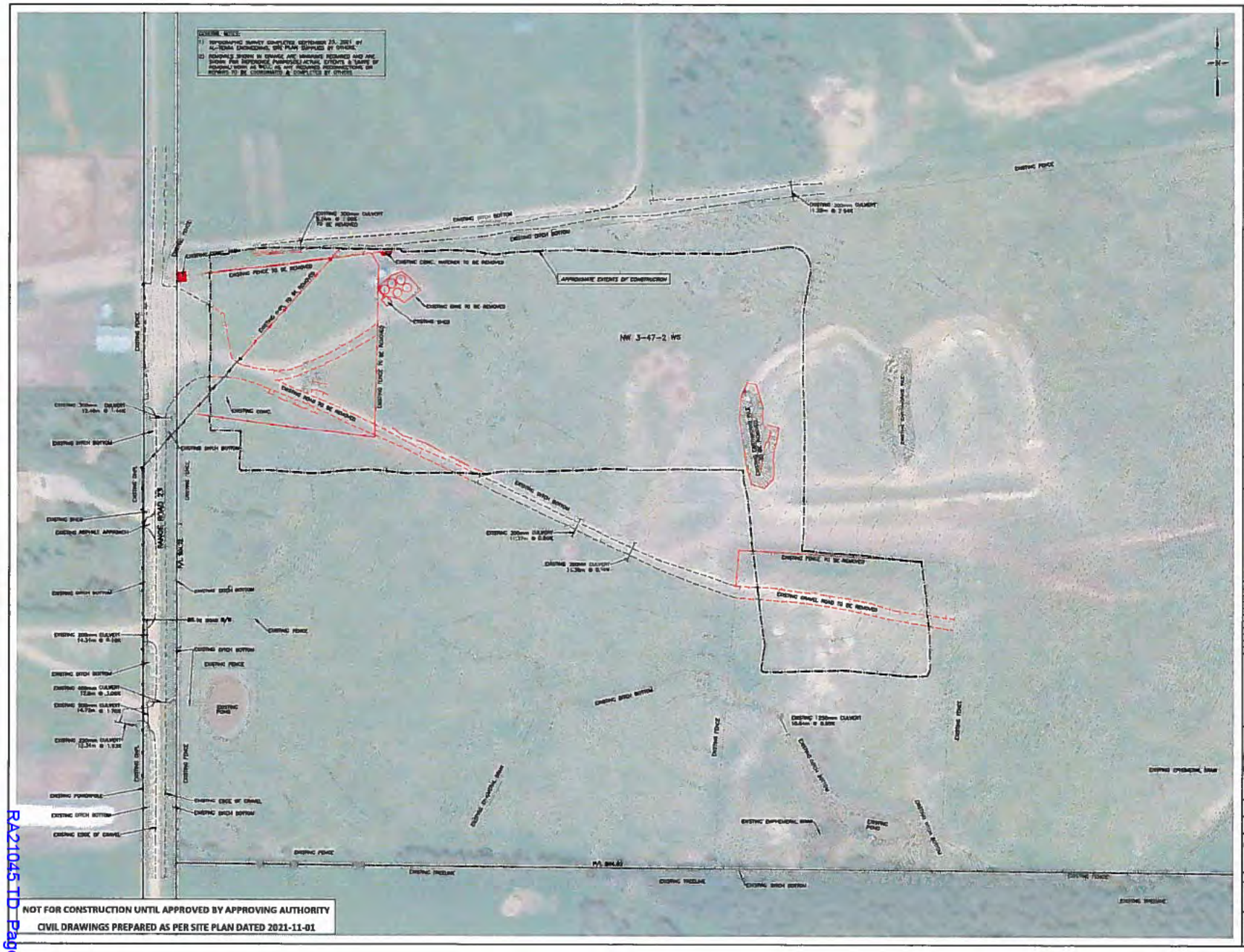

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01

STANDARD LEGEND

PROPOSED	EXISTING
GRADING	
CONTOURS	CONTOURS
ELEVATIONS	ELEVATIONS
SLOPES	SLOPES
FUTURE ELEVATIONS	
FUTURE SLOPES	
DEEP UTILITIES	
SANITARY SEWER	SANITARY SEWER
STORM SEWER	STORM SEWER
GRATED TOP MANHOLE	GRATED TOP MANHOLE
CATCH BASIN	CATCH BASIN
VAULT OR LARGE DIA. MH	
HYDRANT	HYDRANT
REDUCER	REDUCER
TEE	TEE
VALVE	VALVE
PLUG OR CAP	PLUG OR CAP
WATER MAIN	WATER MAIN
INSULATION	INSULATION
SHALLOW UTILITIES	
GAS LINE	GAS LINE
HIGH PRESSURE GAS LINE	HIGH PRESSURE GAS LINE
BURIED POWER LINE	BURIED POWER LINE
SHAW LINE	SHAW LINE
TELUS LINE	TELUS LINE
OVERHEAD POWER	OVERHEAD POWER
FIBER OPTIC LINE	FIBER OPTIC LINE
TRANSFORMER	TRANSFORMER
TELUS PEDESTAL	TELUS PEDESTAL
SHAW PEDESTAL	SHAW PEDESTAL
TELUS/SHAW PEDESTAL	TELUS/SHAW PEDESTAL
3 PARTY PEDESTAL	3 PARTY PEDESTAL
UNO BOX	UNO BOX
POWER POLE	POWER POLE
LIGHT POLE	LIGHT POLE
ROADWAYS	
CENTERLINE	CENTERLINE
CONCRETE CURB	CONCRETE CURB
EDGE OF ASPHALT	EDGE OF ASPHALT
EDGE OF GRAVEL	EDGE OF GRAVEL
DITCH BOTTOM	DITCH BOTTOM
SIGNS	SIGNS
LEGAL	
PROPERTY LINE	PROPERTY LINE
EASEMENT	EASEMENT
MISCELLANEOUS	
FENCE	FENCE
TREES	TREES
SHELTERS & CONCRETE AREAS	
BARN & ROADS	
LANDSCAPING	
CATCH BASIN	

2	2021-11-01	ISSUED FOR REVIEW
1	2021-11-05	ISSUED FOR REVIEW
0	2021-11-17	ISSUED FOR PERMIT

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APEGA ID #: 94781
DATE: December 17 2021
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: EAGLE BUILDERS

PROJECT: G&S FEEDLOT

DRAWING TITLE: EXISTING CONDITIONS & REMOVALS PLAN

PROJECT NO.:	5481
NW 3-47-2 W5M	
DRAWN:	JRR
DESIGNED:	JRR
REVIEWED:	TD
PLOTTED:	2021-11-17
SCALE: 1:2000 (25 50 100)	SHEET No.: 2/3
	C01

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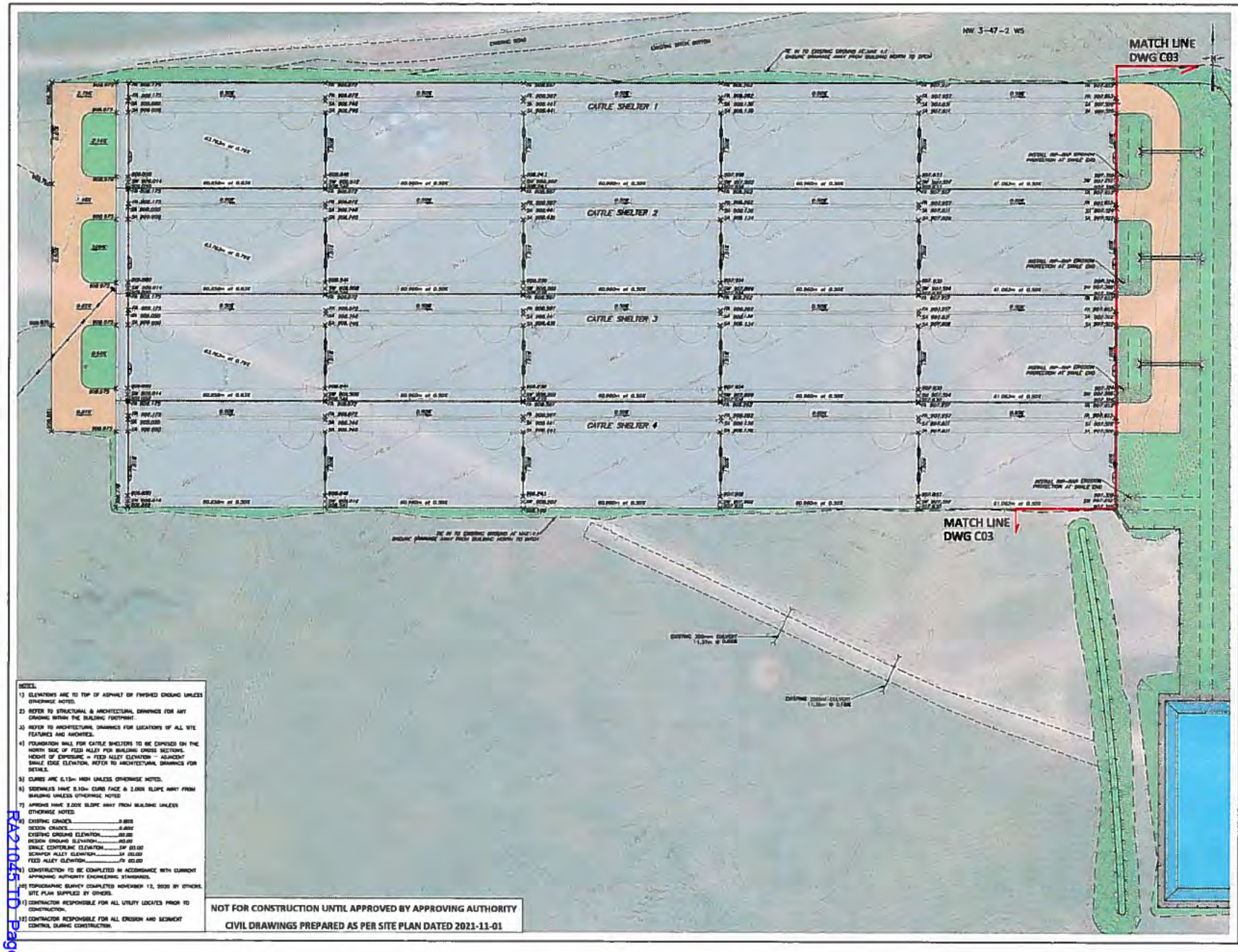

NOTES:

1) ELEVATIONS ARE TO TOP OF ASPHALT OR FINISHED GROUND UNLESS OTHERWISE NOTED.
2) REFER TO STRUCTURAL & ARCHITECTURAL DRAWINGS FOR ANY GRADING WITHIN THE BUILDING FOOTPRINT.
3) REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF ALL SITE FEATURES AND AMENITIES.
4) FOUNDATION WALL FOR CATTLE SHELTERS TO BE EXPOSED ON THE NORTH SIDE OF FEED ALLEY PER BUILDING CROSS SECTIONS. HEIGHT OF EXPOSURE = FEED ALLEY ELEVATION - ADJACENT SWALE EDGE ELEVATION. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.
5) CURBS ARE 0.15m HIGH UNLESS OTHERWISE NOTED.
6) SIDEWALKS HAVE 0.10m CURB FACE & 2.00% SLOPE AWAY FROM BUILDING UNLESS OTHERWISE NOTED
7) APRONS HAVE 2.00% SLOPE AWAY FROM BUILDING UNLESS OTHERWISE NOTED.
8) EXISTING GRADES 2.00%
DESIGN GRADES 0.50%
EXISTING GROUND ELEVATION 00.00
DESIGN GROUND ELEVATION 00.00
SWALE CENTERLINE ELEVATION ..... SW 00.00
SCRAPER ALLEY ELEVATION ..... SA 00.00
FEED ALLEY ELEVATION ..... FA 00.00
9) CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH CURRENT APPROVING AUTHORITY ENGINEERING STANDARDS.
10) TOPOGRAPHIC SURVEY COMPLETED NOVEMBER 12, 2020 BY OTHERS. SITE PLAN SUPPLIED BY OTHERS.
11) CONTRACTOR RESPONSIBLE FOR ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
12) CONTRACTOR RESPONSIBLE FOR ALL EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION.

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01

STANDARD LEGEND

PROPOSED / EXISTING

GRADING
CONTOURS
ELEVATIONS
SLOPES
FUTURE ELEVATIONS
FUTURE SLOPES

DEEP UTILITIES
SANITARY SEWER
STORM SEWER
GRATED TOP MANHOLE
CATCHBASIN
VAULT OR LARGE DIA. MH
HYDRANT
REDUCER
TEE
VALVE
PLUG OR CAP
WATER MAIN
INSULATION

SHALLOW UTILITIES
GAS LINE
HIGH PRESSURE GAS LINE
BURIED POWER LINE
TELUS LINE
OVERHEAD POWER
FIBER OPTIC LINE
TRANSFORMER
TELUS PEDESTAL
SHAW PEDESTAL
TELUS/SHAW PEDESTAL
3 PARTY PEDESTAL
UNO BOX
POWER POLE
LIGHT POLE

ROADWAYS
CENTERLINE
CONCRETE CURB
EDGE OF ASPHALT
EDGE OF GRAVEL
DITCH BOTTOM
SIGNS

LEGAL
PROPERTY LINE
EASEMENT

MISCELLANEOUS
FENCE
TREES
SHELTERS & CONCRETE AREAS
BARN & ROADS
LANDSCAPING
CATCH BASIN

1	2021-11-01	ISSUED FOR REVIEW	JRH
2	2021-11-17	REVISED PER NEW GRADING	FG

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PROFESSIONAL ENGINEER ALBERTA

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SIGNATURE: [illegible]
DATE: December 17 2021
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: EAGLE BUILDERS
PROJECT: G&S FEEDLOT
DRAWING TITLE: FEED LOT GRADING PLAN

PROJECT NO.:	3481
NW 3-47-2 W5M	
DRAWN:	JRH
DESIGNED:	JRH
REVIEWED:	FG
PLOTTED:	2021-12-17
SCALE: 1:1000 (5 10 20)	SHEET No.: 3/5
	C02

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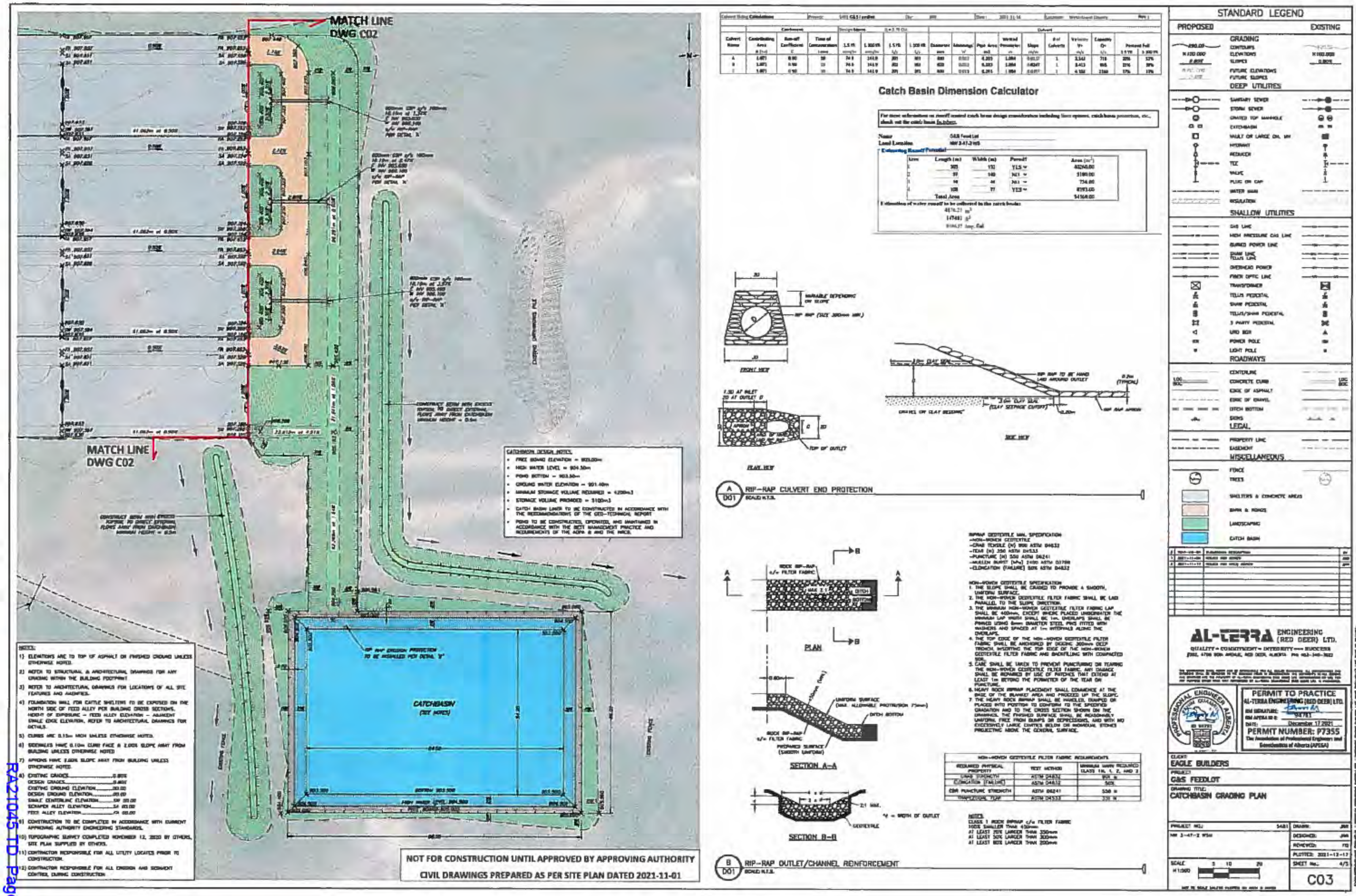
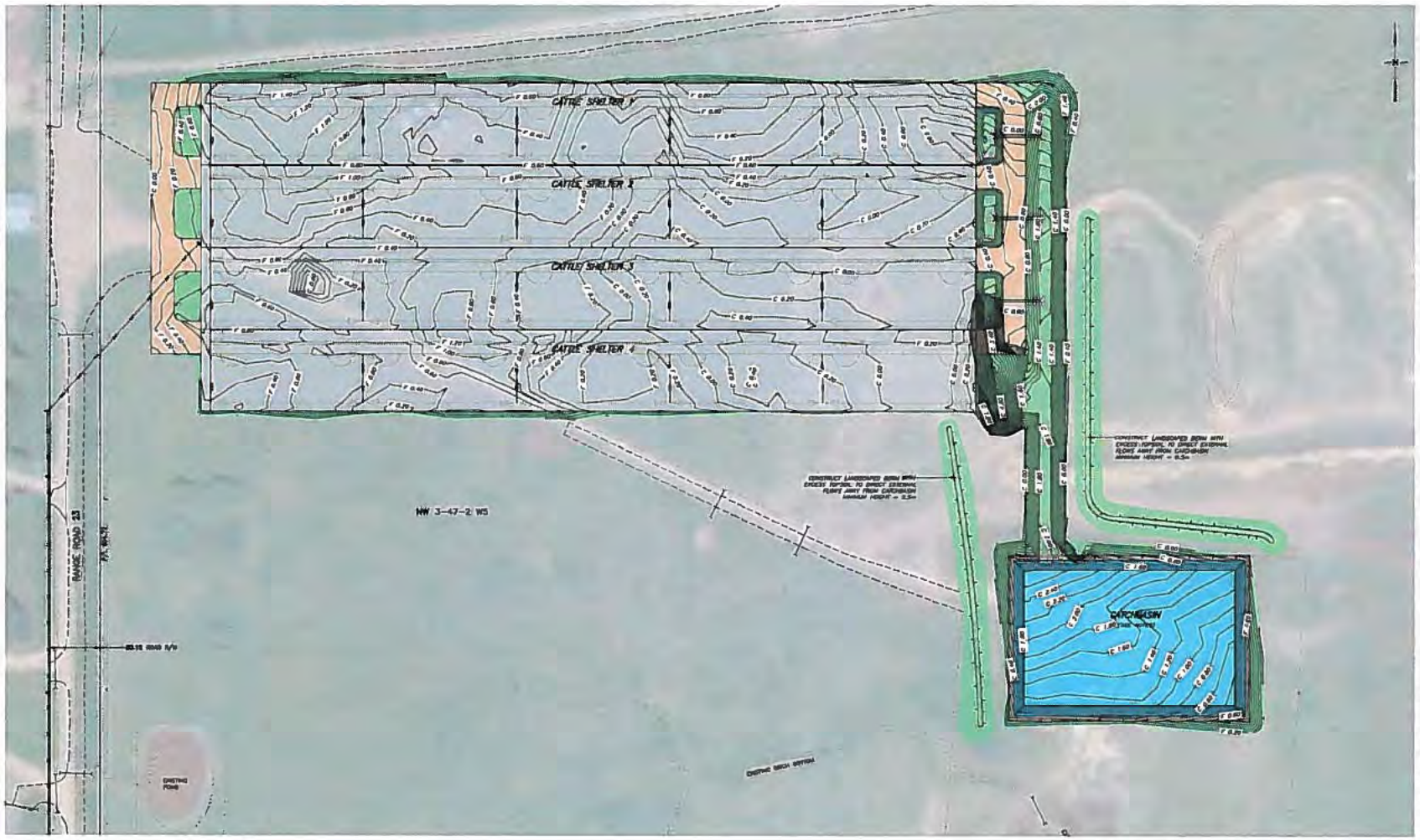

MATCH LINE DWG C02
MATCH LINE DWG C02
CATCHBASIN DESIGN NOTES:
FREE BOARD ELEVATION = 905.00m
HIGH WATER LEVEL = 904.30m
POND BOTTOM = 903.30m
GROUND WATER ELEVATION = 901.40m
MINIMUM STORAGE VOLUME REQUIRED = 4200m3
STORAGE VOLUME PROVIDED = 5100m3
CATCH BASIN LINER TO BE CONSTRUCTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEO-TECHNICAL REPORT
POND TO BE CONSTRUCTED, OPERATED, AND MAINTAINED IN ACCORDANCE WITH THE BEST MANAGEMENT PRACTICE AND REQUIREMENTS OF THE AOPA & AND THE NRCB.
CATCHBASIN
Catch Basin Dimension Calculator
Name G&S Feed Lot
Land Location NW 3-47-2 W5
Total Area 54568.00
Estimation of water runoff to be collected in the catch basin:
RIP-RAP CULVERT END PROTECTION
FRONT VIEW
PLAN VIEW
SIDE VIEW
PLAN
SECTION A-A
SECTION B-B
RIP-RAP OUTLET/CHANNEL REINFORCEMENT
NOTES:
STANDARD LEGEND
PROPOSED
EXISTING
GRADING
DEEP UTILITIES
SHALLOW UTILITIES
ROADWAYS
LEGAL
MISCELLANEOUS
AL-TERRA ENGINEERING (RED DEER) LTD.
PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
December 17 2021
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)
CLIENT:
EAGLE BUILDERS
PROJECT:
G&S FEEDLOT
DRAWING TITLE:
CATCHBASIN GRADING PLAN
PROJECT NO.: 5481
NW 3-47-2 W5M
DRAWN: JAM
DESIGNED: JAM
REVIEWED: FG
PLOTTED: 2021-12-17
SHEET No.: 4/5
SCALE H1:500
C03
NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY
CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01



NOTES:

1) EARTHWORKS VOLUME ESTIMATE (UNADJUSTED FOR SHRINK / SWELL):

TOTAL:
FILL = 13,300 cu.m.
CUT = 17,600 cu.m.
NET = 4,350 cu.m. (CUT)

EARTHWORKS VOLUMES ARE TO SUBGRADE BASED ON PROVIDED STRUCTURES BELOW AND IT WAS ASSUMED THAT 100mm OF TOPSOIL/SITE STRIPPING IS REQUIRED. WHERE THE ACTUAL STRUCTURES DIFFER FROM THE STRUCTURES SHOWN BELOW OR TOPSOIL STRIPPING DIFFERS, VOLUMES WILL NEED TO BE ADJUSTED ACCORDINGLY.

2) STRUCTURE AREAS FOR CUT FILL PURPOSES (APPROXIMATE):
a. SHELTERS & CONCRETE AREAS = 175mm = 10,703m³
b. LANDSCAPE = 150mm = 7808m³
c. LANDSCAPE = 100mm = 7731m³
d. POND = 100mm = 6,536m³

APPROX. TOPSOIL VOLUME (100mm DEPTH) = 5,560m³

3) THE CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
4) THE CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL AND SILT PREVENTION DURING CONSTRUCTION.
5) DUE TO THE POTENTIAL VARIABILITY OF SITE CONDITIONS, CONSTRUCTION METHODS AND MATERIALS, AND SURVEY THESE QUANTITIES SHOULD BE CONSIDERED ESTIMATES AND DISCRETION SHOULD BE APPLIED IN THEIR USE.
6) THE VOLUMES SHOWN ABOVE DO NOT ACCOUNT FOR CONSTRUCTION OF A CLAY LINER.

SHELTERS & CONCRETE AREAS
BARN & ROOFS
LANDSCAPING
CATCH BASIN

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY
CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01

STANDARD LEGEND

PROPOSED	EXISTING
GRADING	
CONTOURS	
ELEVATIONS	
SLOPES	
FUTURE ELEVATIONS	
FUTURE SLOPES	
DEEP UTILITIES	
SANITARY SEWER	
STORM SEWER	
CRATED TOP MANHOLE	
CATCHBASIN	
VAULT OR LARGE DIA. MH	
HYDRANT	
REDUCER	
TEE	
VALVE	
PLUG OR CAP	
WATER MAIN	
INSULATION	
SHALLOW UTILITIES	
GAS LINE	
HIGH PRESSURE GAS LINE	
BURIED POWER LINE	
TELUS LINE	
OVERHEAD POWER	
FIBER OPTIC LINE	
TRANSFORMER	
TELUS PEDESTAL	
SHAW PEDESTAL	
TELUS/SHAW PEDESTAL	
3 PARTY PEDESTAL	
UNI BOX	
POWER POLE	
LIGHT POLE	
ROADWAYS	
CENTERLINE	
CONCRETE CURB	
EDGE OF ASPHALT	
EDGE OF GRAVEL	
DITCH BOTTOM	
SIGNS	
LEGAL	
PROPERTY LINE	
EASEMENT	
MISCELLANEOUS	
FENCE	
TREES	

2	2021-11-15	ISSUED FOR REVIEW
1	2021-11-04	ISSUED FOR REVIEW
0	2021-10-19	ISSUED FOR AHSA REVIEW

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SIGNATURE:
PERMIT #:
DATE: December 17 2021
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: EAGLE BUILDERS
PROJECT: G&S FEEDLOT
DRAWING TITLE: CUT/FILL PLAN

PROJECT NO.: 5481
NW 3-47-2 W5M
DRAWN: JMR
DESIGNED: JMR
REVIEWED: FG
PLOTTED: 2021-12-17
SCALE: H 1:750 (10 20 40)
SHEET No.: 5/5
C04

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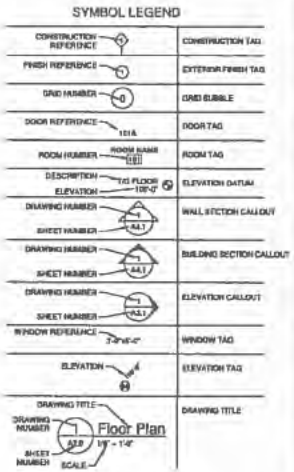
G&S Cattle

SYMBOL LEGEND



DRAWING INDEX

Wetaskiwin County, Alberta Feedlot

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
C	REVISED CATCH BASIN	2021-08-15
D	REVISED PEN SPACING	2021-07-16
E	ISSUED FOR PRELIMINARY REVIEW	2021-08-18
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
G	ISSUED FOR PRELIMINARY REVIEW	2021-08-25
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22
K	REVISED SITE PLAN	2021-10-29
L	WELL LOCATIONS NOTED	2021-12-17

G&S Cattle
Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

EAGLE BUILDERS
THE PRECAST CONCRETE CONNECTION

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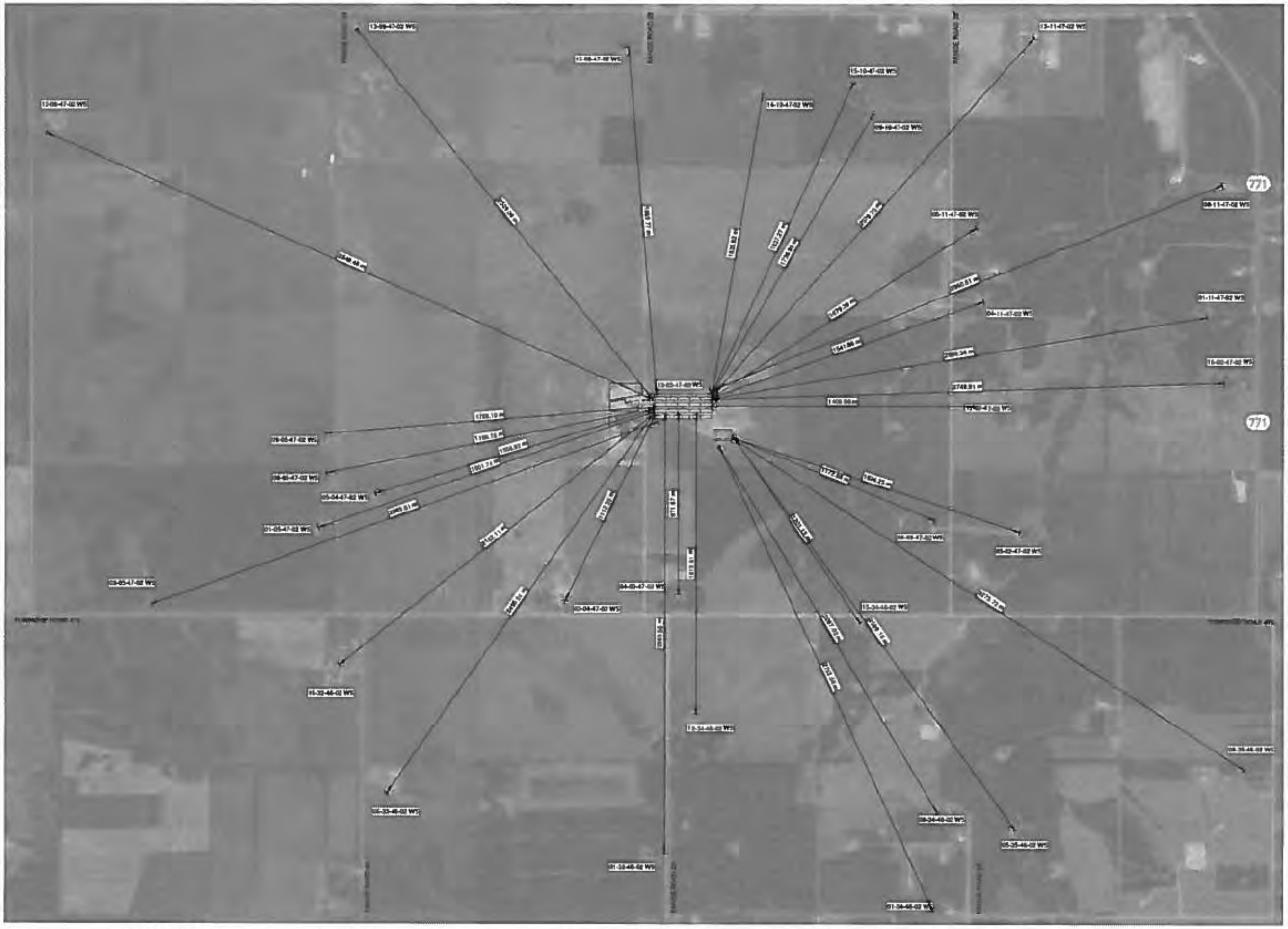
Index

A0.0

Project number:	T21282
Date:	2021-12-17 1:19:05 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated



1 A1.0 | 1 : 18000 Neighbour Setback Plan

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
C	REVISED CATCH BASIN	2021-07-15
D	REVISED PEN SPACING	2021-07-16
E	ISSUED FOR PRELIMINARY REVIEW	2021-07-28
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22
K	REVISED SITE PLAN	2021-10-29

G&S Cattle Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

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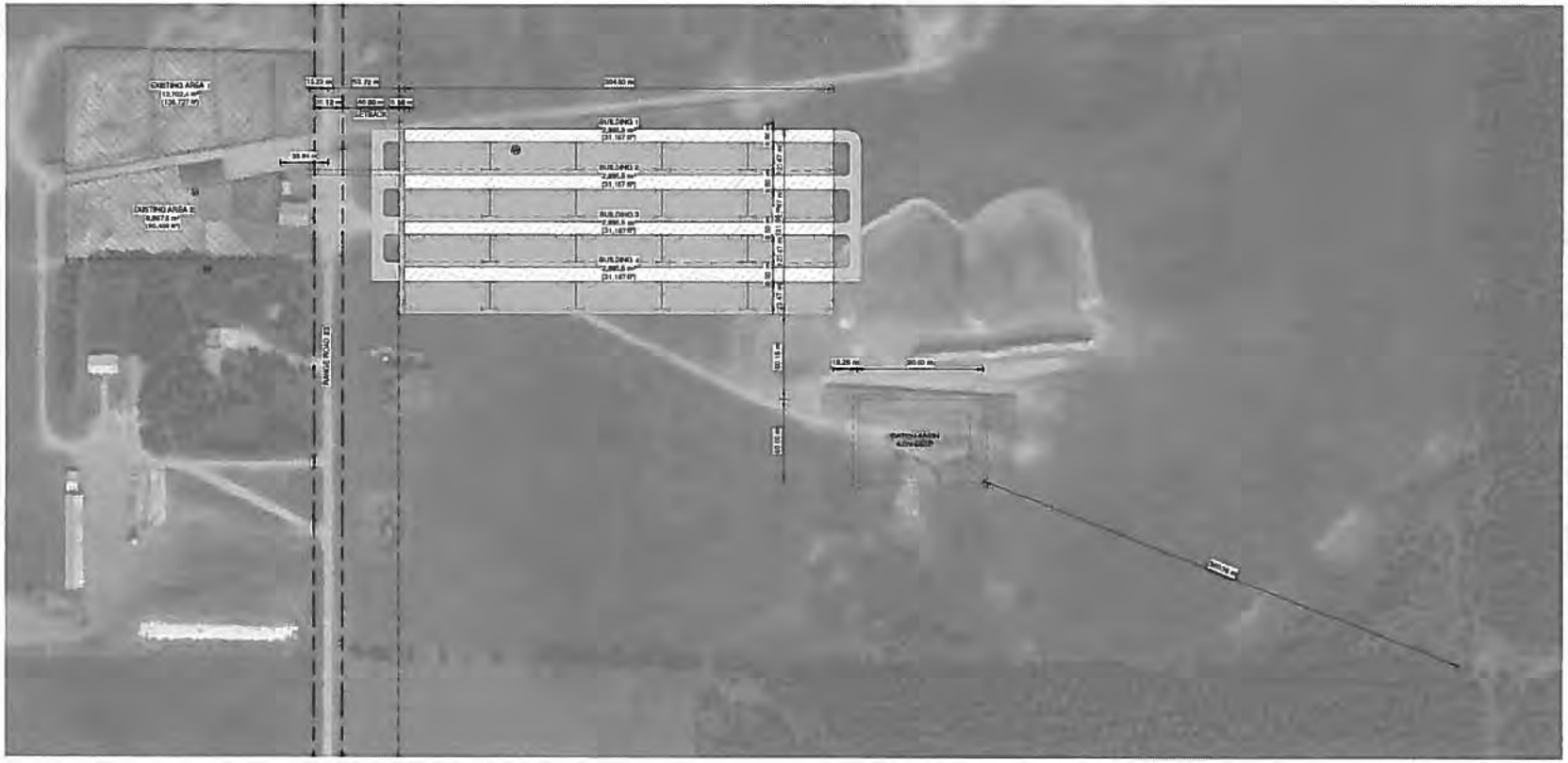
Neighbour Setback Plan

A1.0

Project number:	T21282
Date:	2021-12-17 1:19:07 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated

NOTES CONFIRMING BUILDING LOCATION

1. THIS SITE PLAN IS BASED ON INFORMATION PROVIDED BY THE OWNER, AND NOT A SURVEY OR ACTUAL SITE MEASUREMENTS. ENGINEER IS TO BE ADVISED BEFORE START OF CONSTRUCTION OF ANY UN-KNOWN FEATURES ON THIS OR THE ADJACENT SITES THAT MIGHT IMPACT ON THE PROJECT EITHER DURING CONSTRUCTION OR FUTURE USE.
2. THE 'NORTH' ORIENTATION REFERS TO NOMINAL NORTH RATHER THAN TRUE OR MAGNETIC NORTH.
3. ANY DIMENSIONS THAT SHOW THE LOCATION OF EXISTING FEATURES ARE APPROXIMATE ONLY, AND ARE TO BE CONFIRMED BEFORE CONSTRUCTION START AS REQUIRED BY A CERTIFIED ALBERTA LAND SURVEYOR.
4. LANDSCAPING IS SUBJECT TO CHANGE.



SITE PLAN LEGEND

PROPERTY LINE	
SETBACK LINE	
RIGHT OF WAY LINE	
RIGHT OF WAY HATCH	
PROPOSED BUILDING	
FENCE	
MAN DOOR	
OVERHEAD DOOR	
BARRIER FREE ENTRANCE	

SITE SCHEDULE

ON SITE		
GRAVEL	31,239.68 ft²	2,902.3 m²
	31,239.68 ft²	2,902.3 m²
Grand total	31,239.68 ft²	2,902.3 m²

SITE MATERIAL LEGEND

- APRON
- SIDEWALK
- LIGHT DUTY ASPHALT
- HEAVY DUTY ASPHALT
- GRAVEL
- LANDSCAPING
- HARD LANDSCAPING
- MULCH
- (W) WELL

VISUAL SCALE 1:1500

1 Site Plan
A1.1 1 : 1500

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
C	REVISED CATCH BASIN	2021-07-15
D	REVISED PEN SPACING	2021-07-16
E	ISSUED FOR PRELIMINARY REVIEW	2021-07-23
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
G	ISSUED FOR PRELIMINARY REVIEW	2021-08-25
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22
K	REVISED SITE PLAN	2021-10-29
L	WELL LOCATIONS NOTED	2021-12-17

G&S Cattle Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

EAGLE BUILDERS
THE PRECAST CONCRETE CONNECTION

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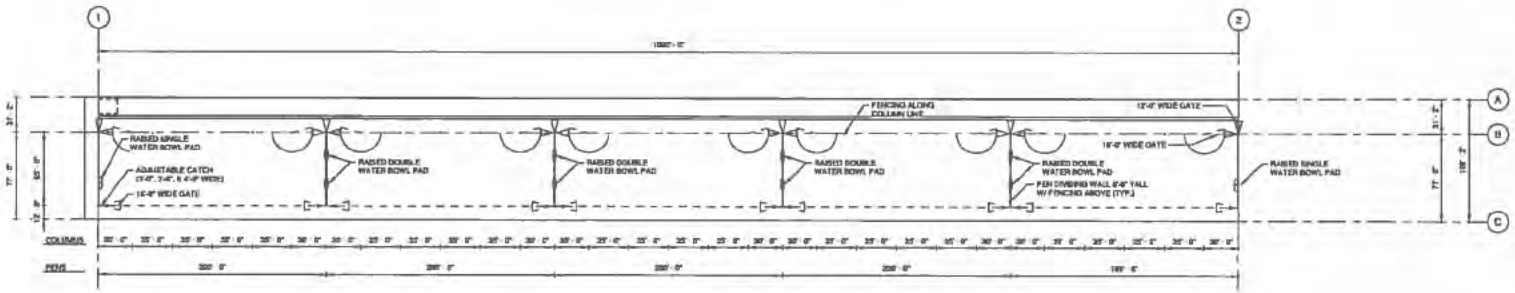
Site Plan

A1.1

Project number:	T21282
Date:	2021-12-17 1:19:09 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated



1 A2.0 Overall Floor Plan
1" = 50'-0"

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
D	REVISED PEN SPACING	2021-08-16
E	ISSUED FOR PRELIMINARY REVIEW	2021-07-28
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
G	ISSUED FOR PRELIMINARY REVIEW	2021-08-25
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22

G&S Cattle Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

EAGLE BUILDERS
THE PRECAST CONCRETE CONNECTION

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Floor Plan Overall

A2.0

Project number:	T21282
Date:	2021-12-17 1:15:09 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated

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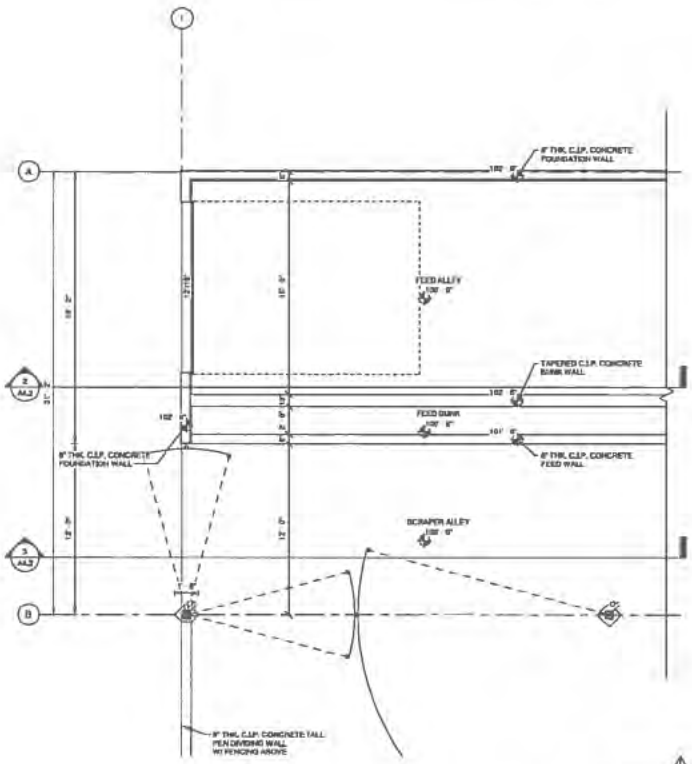
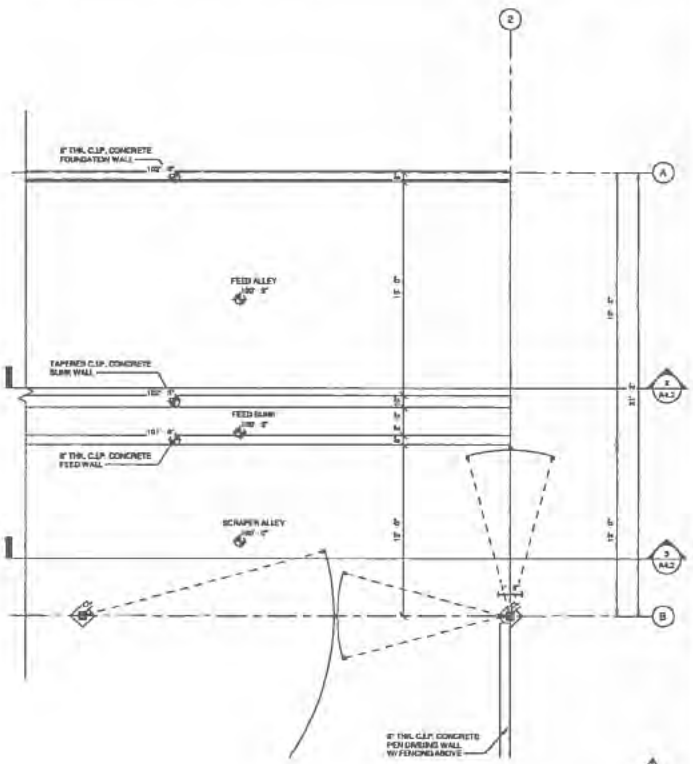


3 A2.1 Enlarged Floor Plan - West
1/4" = 1'-0"



2 A2.1 Enlarged Floor Plan - East
1/4" = 1'-0"

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-03-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-03-15
E	ISSUED FOR PRELIMINARY REVIEW	2021-03-28
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-12

G&S Cattle Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

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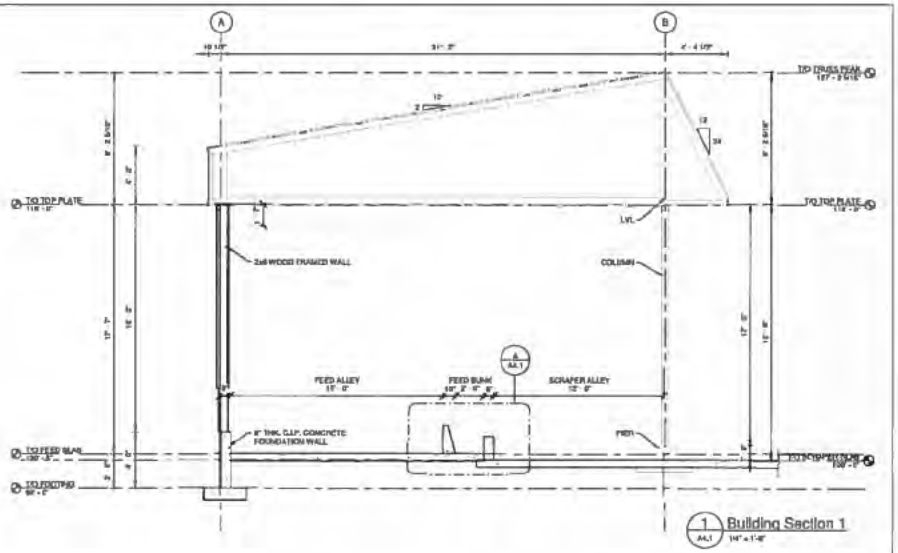
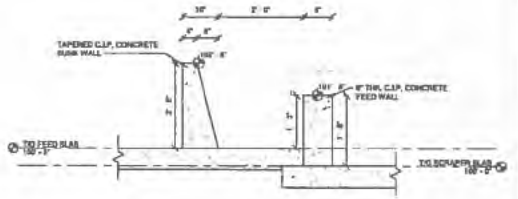
Floor Plan Enlarged

A2.1

Project number:	T21282
Date:	2021-12-17 1:15:09 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated



1 A4.1 Building Section 1
1/4" = 1'-0"



A A4.1 Feed Bunk Section
3/4" = 1'-0"

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
E	ISSUED FOR PRELIMINARY REVIEW	2021-07-28
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24

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12-03-47-02 W5

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Building Sections

A4.1

Project number:	T21282
Date:	2021-12-17 1:15:10 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated

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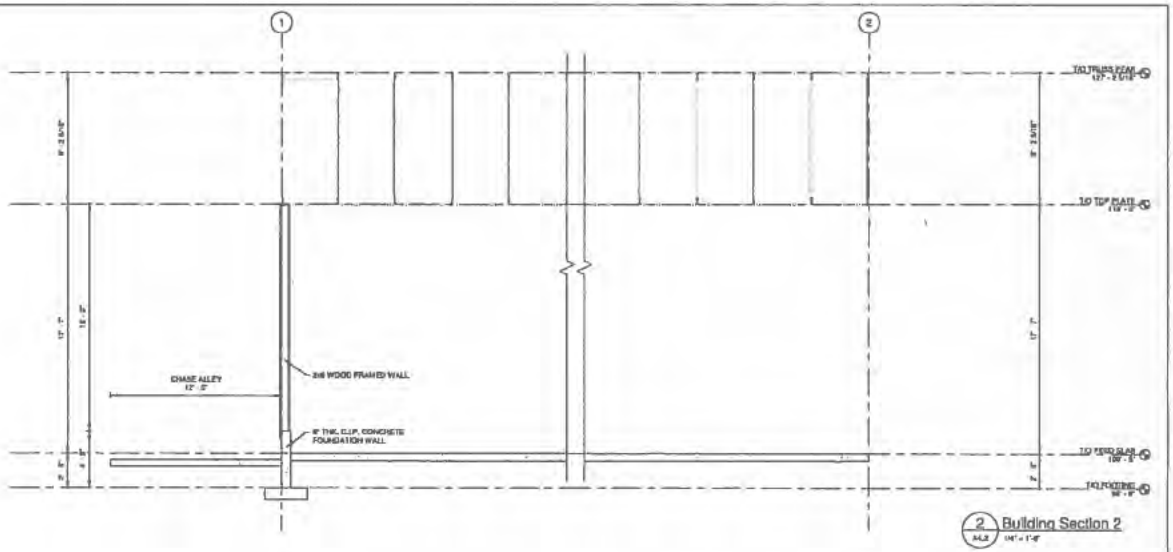
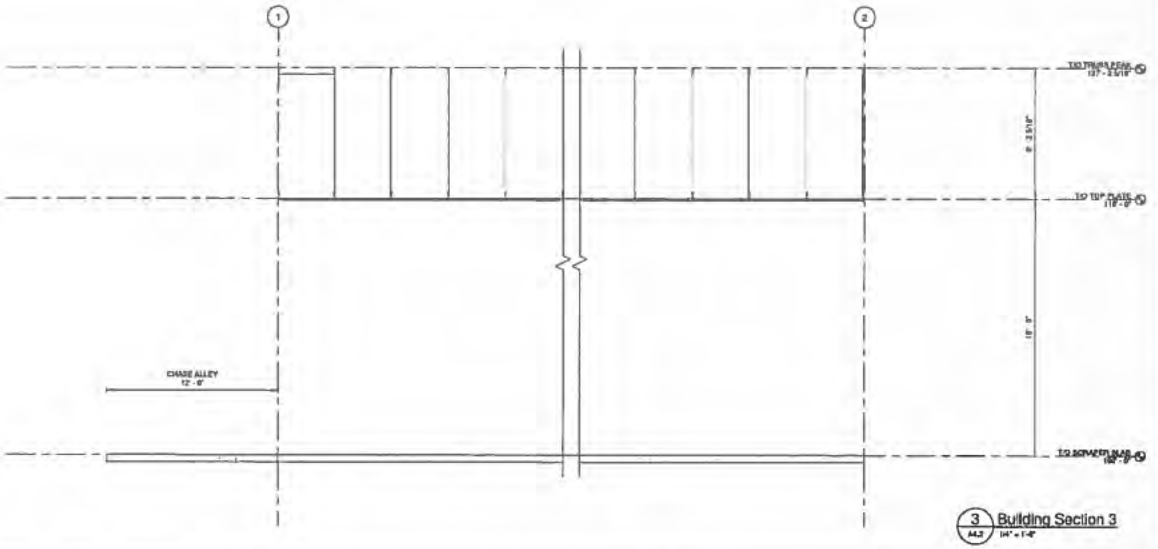


2 Building Section 2
1/4" = 1'-0"



3 Building Section 3
1/4" = 1'-0"

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
Z	ISSUED FOR PRELIMINARY REVIEW	2021-07-28
Y	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22

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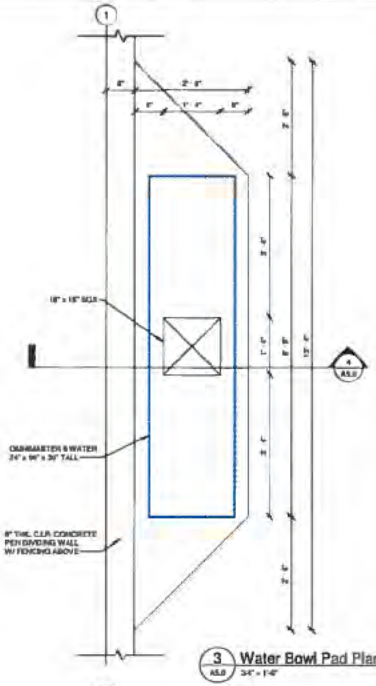
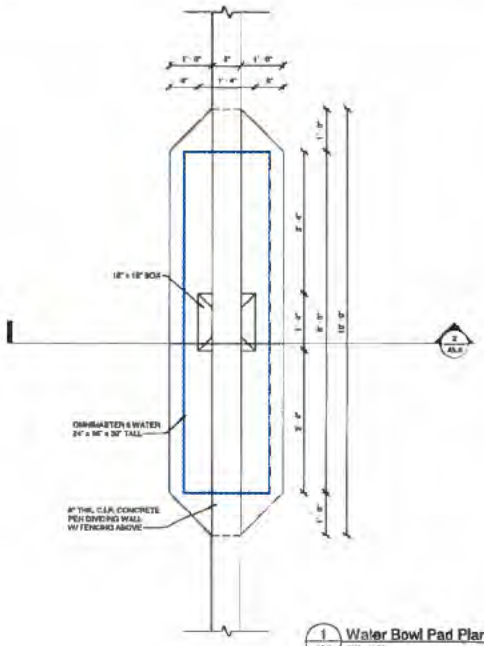
Building Sections

A4.2

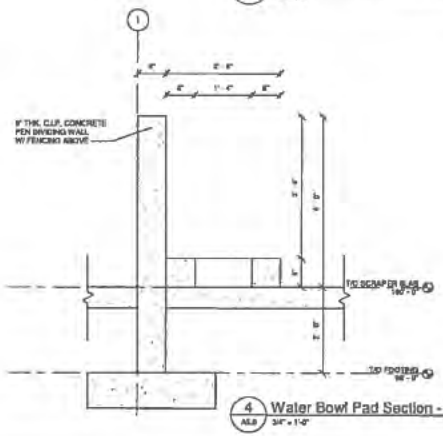
Project number:	T21282
Date:	2021-12-17 1:15:12 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated



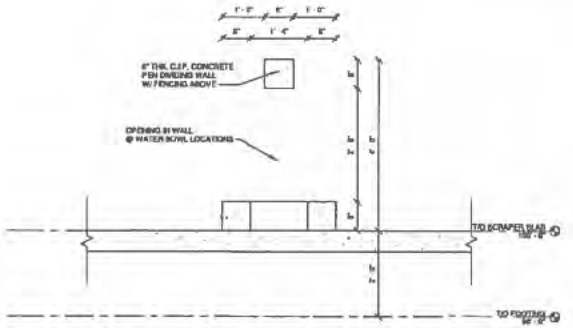
3 Water Bowl Pad Plan - Single
A5.0 3/4" = 1'-0"



1 Water Bowl Pad Plan - Double
A5.0 3/4" = 1'-0"



4 Water Bowl Pad Section - Single
A5.0 3/4" = 1'-0"



2 Water Bowl Pad Section - Double
A5.0 3/4" = 1'-0"

NO.	DESCRIPTION	DATE
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
G	ISSUED FOR PRELIMINARY REVIEW	2021-08-25

G&S Cattle
Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

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Architectural Details

A5.0

Project number:	T21282
Date:	2021-12-17 1:15:13 PM
Drawn by:	JC
Checked by:	JC
Scale:	As Indicated

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Approval Officer Note: UPDATED DRAWINGS ADDED BEGINNING HERE

G&S Cattle

SYMBOL LEGEND

CONSTRUCTION REFERENCE — 1	CONSTRUCTION TAG
FINISH REFERENCE — 1	EXTERIOR FINISH TAG
GRID NUMBER — 0	GRID BUBBLE
DOOR REFERENCE — 101A	DOOR TAG
ROOM NUMBER — ROOM NAME 101	ROOM TAG
DESCRIPTION — T/O FLOOR; ELEVATION — 100'-0"	ELEVATION DATUM
DRAWING NUMBER — 1; SHEET NUMBER — A4.1	WALL SECTION CALLOUT
DRAWING NUMBER — 1; SHEET NUMBER — A4.1	BUILDING SECTION CALLOUT
DRAWING NUMBER — 1; SHEET NUMBER — A3.1	ELEVATION CALLOUT
WINDOW REFERENCE — 3'-0"x6'-0"	WINDOW TAG
ELEVATION — 100'-0"	ELEVATION TAG
DRAWING TITLE — Floor Plan; DRAWING NUMBER — 1; SHEET NUMBER — A2.0; SCALE — 1/8" = 1'-0"	DRAW NG TITLE

DRAWING INDEX

Wetaskiwin County, Alberta Feedlot

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
C	REVISED CATCH BASIN	2021-07-15
D	REVISED PEN SPACING	2021-07-16
E	ISSUED FOR PRELIMINARY REVIEW	2021-07-28
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
G	ISSUED FOR PRELIMINARY REVIEW	2021-08-25
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22
K	REVISED SITE PLAN	2021-10-29
L	WELL LOCATIONS NOTED	2021-12-17

G&S Cattle
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Wetaskiwin County, Alberta

12-03-47-02 W5

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Index

A0.0

Project number:	T21282
Date:	2021-12-17 1:19:05 PM
Drawn by:	JC
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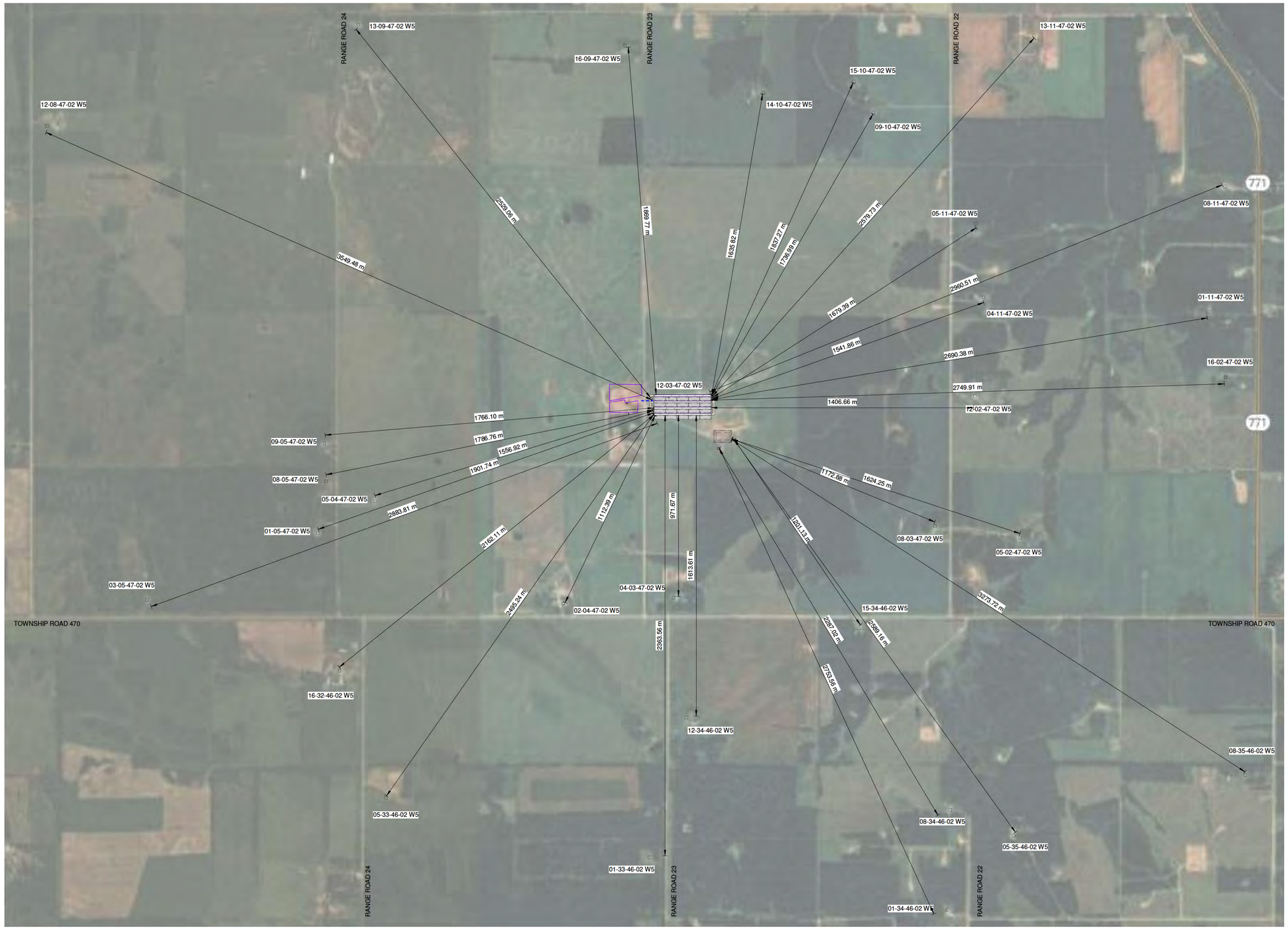
W:\G\G & S Cattle\2021 Feedlot (T21282)\Work\G&S Cattle Feedlot - Site.rvt



1 A1.0 Neighbour Setback Plan
1 : 10000

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
C	REVISED CATCH BASIN	2021-07-15
D	REVISED PEN SPACING	2021-07-16
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H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22
K	REVISED SITE PLAN	2021-10-29

G&S Cattle Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

EAGLE BUILDERS
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Neighbour Setback Plan

A1.0

Project number:	T21282
Date:	2021-12-17 1:19:07 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated

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https://bit.ly/3wwdFCj

0m 30m 60m 90m 120m 150m

VISUAL SCALE 1:1500

1 / A1.1 Site Plan
1 : 1500

NOTES CONCERNING BUILD NG LOCATION

1. THIS SITE PLAN IS BASED ON INFORMATION PROVIDED BY THE OWNER, AND NOT A SURVEY OR ACTUAL SITE MEASUREMENTS. ENGINEER IS TO BE ADVISED BEFORE START OF CONSTRUCTION OF ANY UN-KNOWN FEATURES ON THIS OR THE ADJACENT SITES THAT MIGHT MPACT ON THE PROJECT EITHER DURING CONSTRUCTION OR FUTURE USE.
2. THE "NORTH" ORIENTATION REFERS TO NOMINAL NORTH RATHER THAN TRUE OR MAGNETIC NORTH.
3. ANY DIMENSIONS THAT SHOW THE LOCATION OF EXISTING FEATURES ARE APPROXIMATE ONLY, AND ARE TO BE CONFIRMED BEFORE CONSTRUCTION START AS REQUIRED BY A CERT FIED ALBERTA LAND SURVEYOR.
4. LANDSCAPING IS SUBJECT TO CHANGE.

SITE PLAN LEGEND

PROPERTY L NE	
SETBACK LINE	
RIGHT OF WAY LINE	
RIGHT OF WAY HATCH	
PROPOSED BUILDING	
FENCE	
MAN DOOR	
OVERHEAD DOOR	
BARRIER FREE ENTRANCE	

SITE SCHEDULE

ON SITE

GRAVEL	31,239.88 ft²	2,902.3 m²
	31,239.88 ft²	2,902.3 m²
Grand total	31,239.88 ft²	2,902.3 m²

SITE MATERIAL LEGEND

- APRON
- S DEWALK
- LIGHT DUTY ASPHALT
- HEAVY DUTY ASPHALT
- GRAVEL
- LANDSCAP NG
- HARD LANDSCAPING
- MULCH
- W — WELL

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
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G	ISSUED FOR PRELIMINARY REVIEW	2021-08-25
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22
K	REVISED SITE PLAN	2021-10-29
L	WELL LOCATIONS NOTED	2021-12-17

G&S Cattle Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

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Site Plan

A1.1

Project number:	T21282
Date:	2021-12-17 1:19:09 PM
Drawn by:	JC
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Scale:	As indicated

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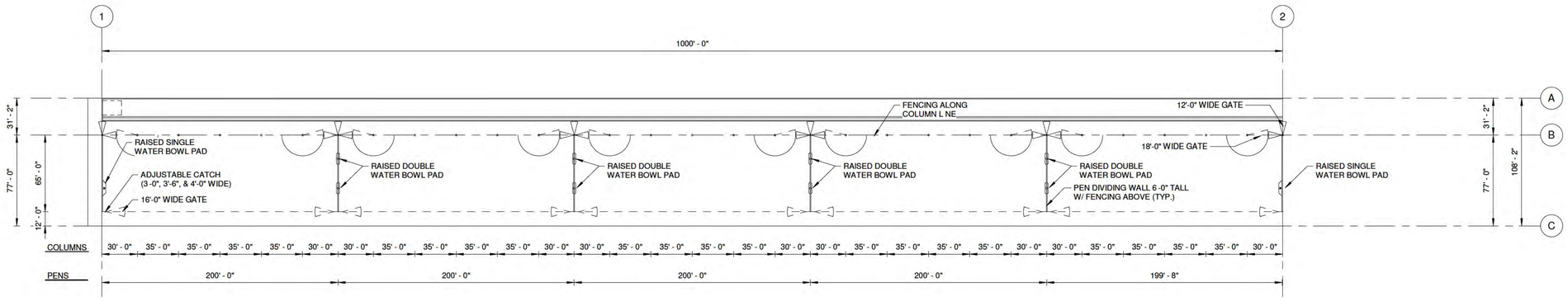

1 A2.0 **Overall Floor Plan**
1" = 50'-0"

N

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
D	REVISED PEN SPACING	2021-07-16
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G	ISSUED FOR PRELIMINARY REVIEW	2021-08-25
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22

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12-03-47-02 W5

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Floor Plan Overall

A2.0

Project number:	T21282
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Drawn by:	JC
Checked by:	JC
Scale:	As indicated

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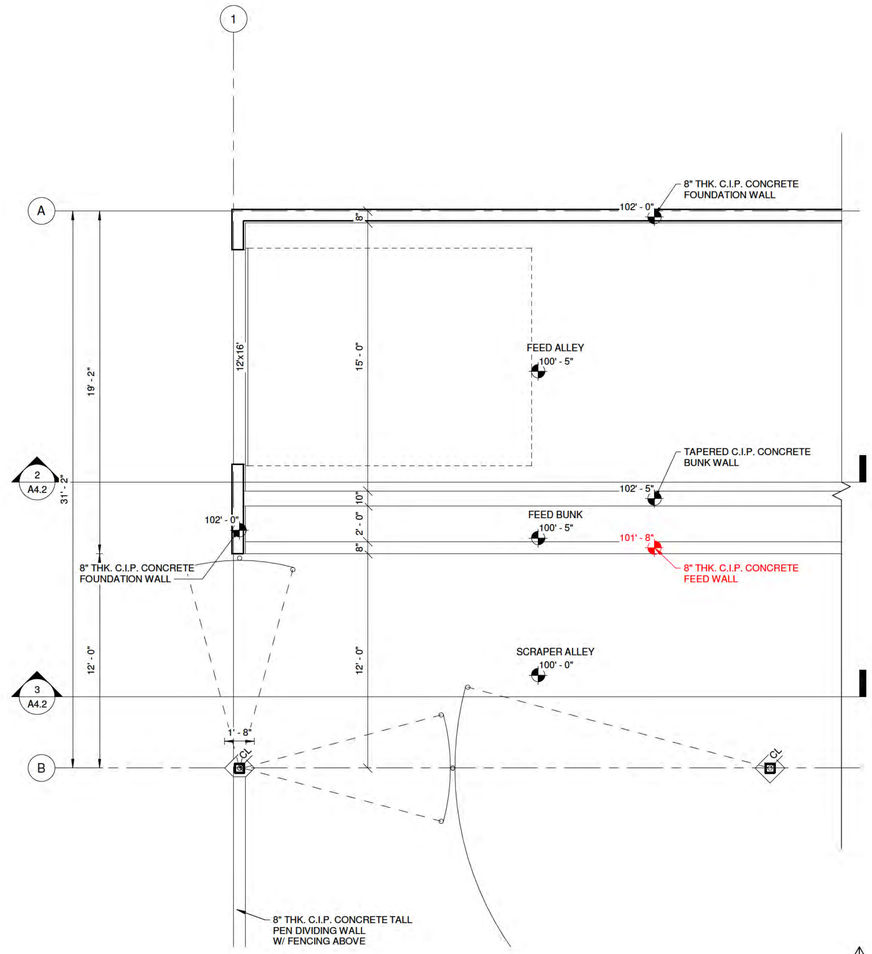
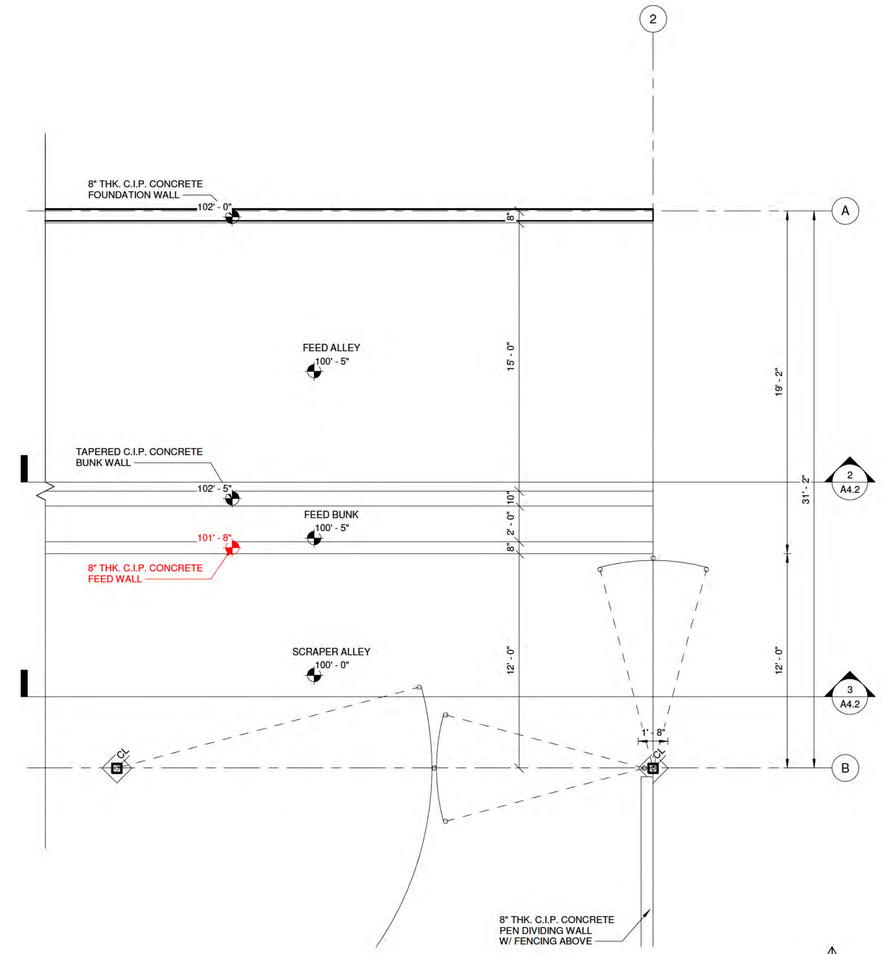


3 A2.1 Enlarged Floor Plan - West
1/4" = 1'-0"



2 A2.1 Enlarged Floor Plan - East
1/4" = 1'-0"

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
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F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
I	ISSUED FOR PRELIMINARY REVIEW	2021-09-21
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22

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Floor Plan Enlarged

A2.1

Project number:	T21282
Date:	2021-12-17 1:15:09 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated

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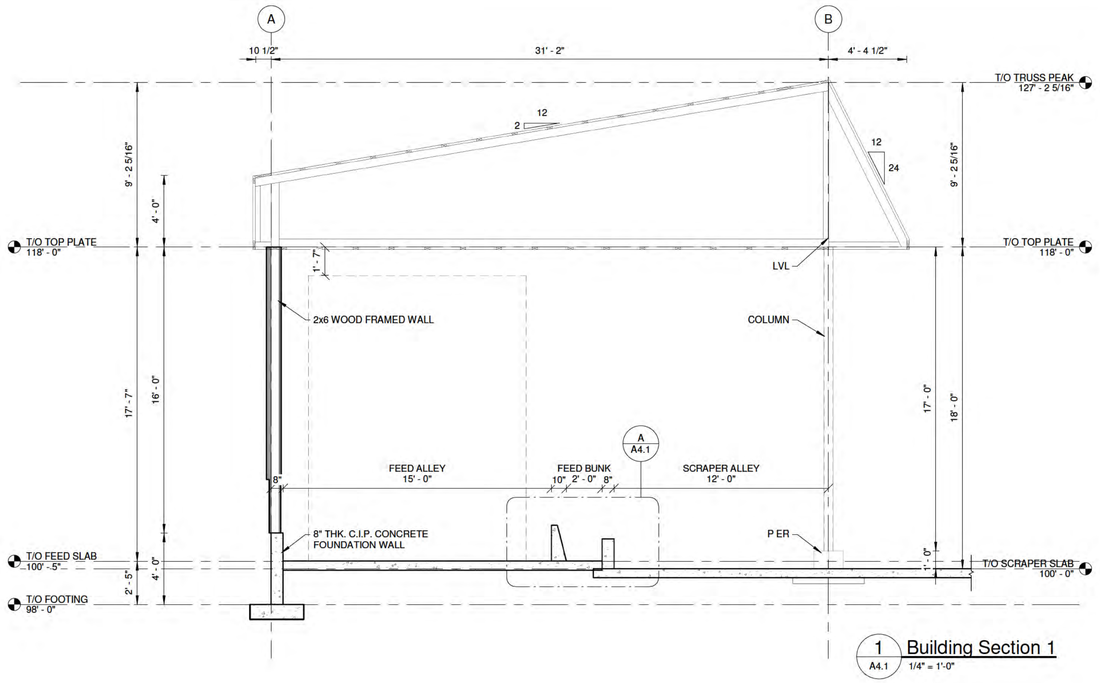
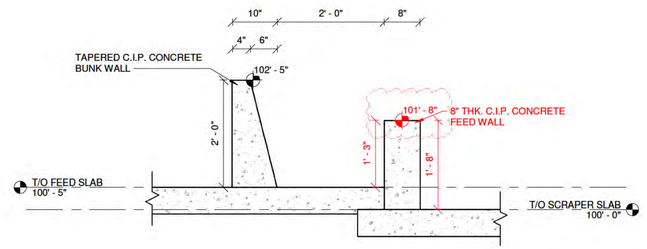


1 A4.1 **Building Section 1**
1/4" = 1'-0"



A A4.1 **Feed Bunk Section**
3/4" = 1'-0"

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
B	ISSUED FOR PRELIMINARY REVIEW	2021-07-13
E	ISSUED FOR PRELIMINARY REVIEW	2021-07-28
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24

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Building Sections

A4.1

Project number:	T21282
Date:	2021-12-17 1:15:10 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated

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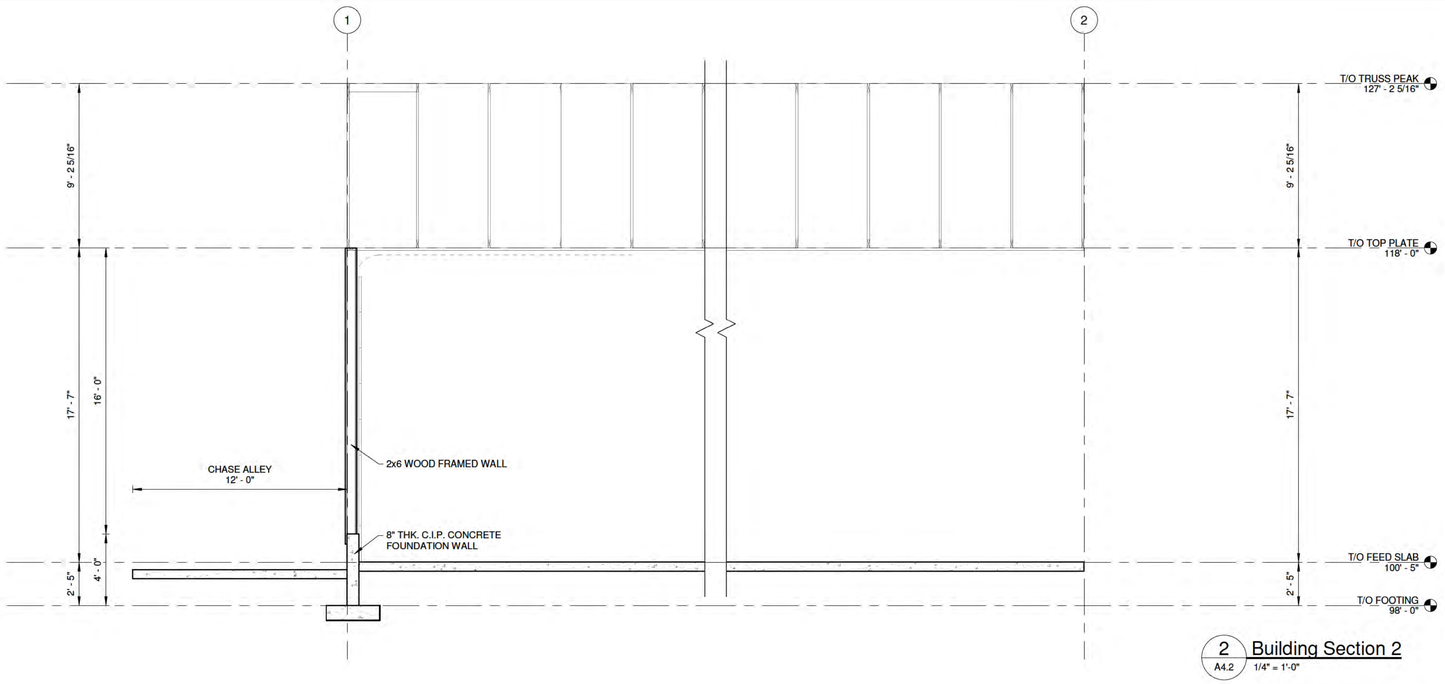
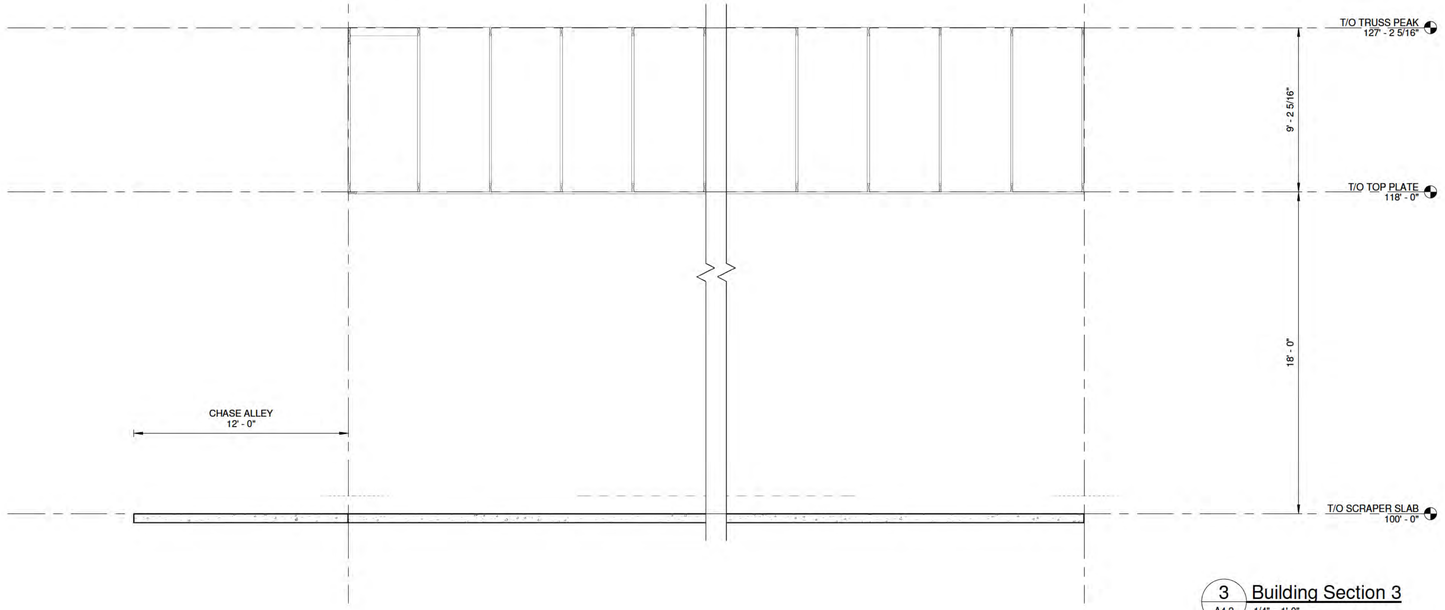


2 A4.2 Building Section 2
1/4" = 1'-0"



3 A4.2 Building Section 3
1/4" = 1'-0"

NO.	DESCRIPTION	DATE
A	ISSUED FOR PRELIMINARY REVIEW	2021-07-12
E	ISSUED FOR PRELIMINARY REVIEW	2021-07-28
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
H	ISSUED FOR PRELIMINARY REVIEW	2021-09-07
J	ISSUED FOR PRELIMINARY REVIEW	2021-09-22

G&S Cattle Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

EAGLE BUILDERS
THE PRECAST CONCRETE CONNECTION

Stamp:

PRELIMINARY

NOT FOR CONSTRUCTION

aggregate design studio ltd.
(403) 885-5525 P.O. BOX 1690 BLACKFALDS, AB, T0M 0J0

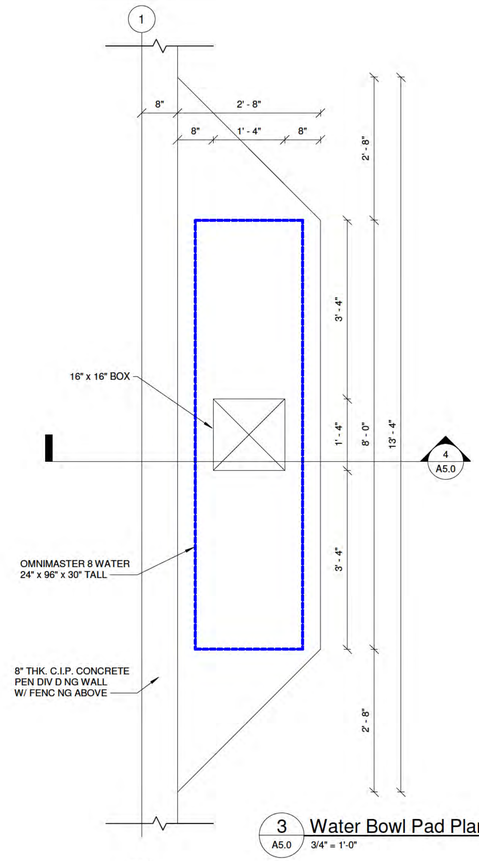
DO NOT SCALE DRAWING
VERIFY ALL DIMENSIONS, DATUMS AND LEVELS PRIOR TO COMMENCEMENT OF WORK. REPORT ANY DISCREPANCIES OR OMISSIONS TO THE ARCHITECT IMMEDIATELY.
ALL WORK MUST COMPLY WITH THE MOST RECENT EDITION OF THE APPLICABLE BUILDING CODE AND ANY OTHER GOVERNING AUTHORITIES.
THIS IS A COPYRIGHT DRAWING AND SHALL NOT BE REPRODUCED OR REVISED WITHOUT THE WRITTEN CONSENT OF THE CONSULTANT.

Building Sections

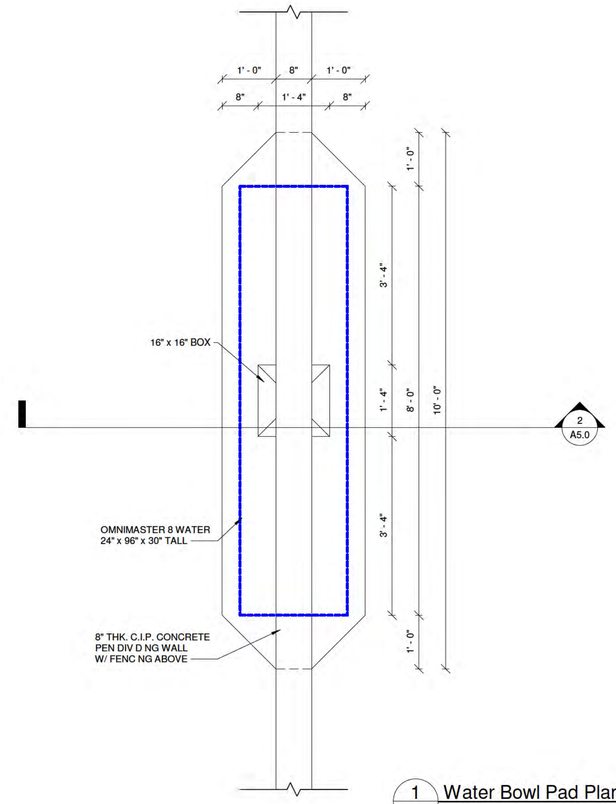
A4.2

Project number:	T21282
Date:	2021-12-17 1:15:12 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated

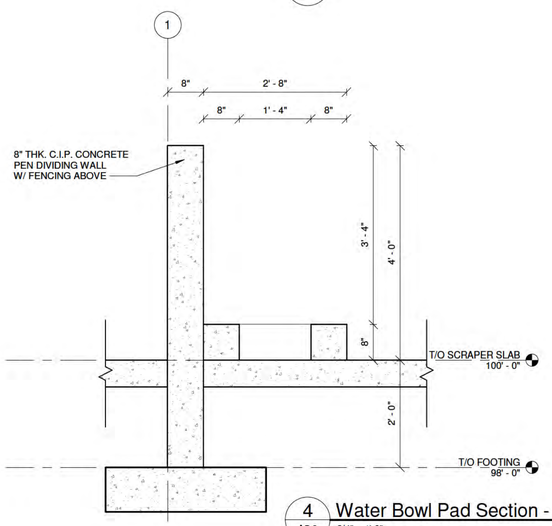
W:\G\G & S Cattle\2021 Feedlot (T21282)\Revit\G&S Cattle Feedlot - Building.rvt



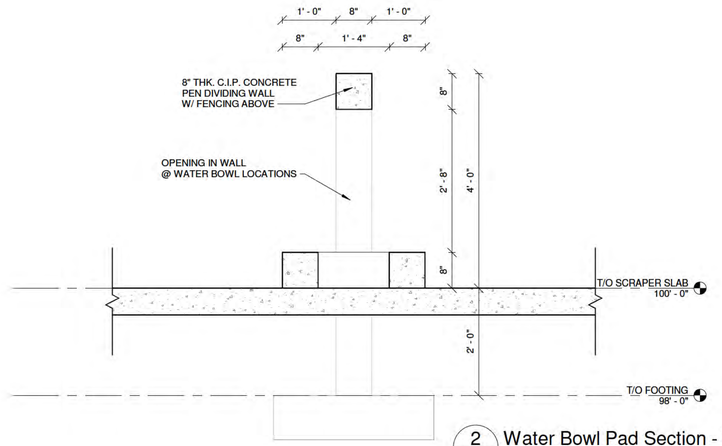
3 A5.0 Water Bowl Pad Plan - Single
3/4" = 1'-0"



1 A5.0 Water Bowl Pad Plan - Double
3/4" = 1'-0"



4 A5.0 Water Bowl Pad Section - Single
3/4" = 1'-0"



2 A5.0 Water Bowl Pad Section - Double
3/4" = 1'-0"

NO.	DESCRIPTION	DATE
F	ISSUED FOR PRELIMINARY REVIEW	2021-08-24
G	ISSUED FOR PRELIMINARY REVIEW	2021-08-25

G&S Cattle Feedlot

Wetaskiwin County, Alberta

12-03-47-02 W5

EAGLE BUILDERS
THE PRECAST CONCRETE CONNECTION

Stamp:

PRELIMINARY

NOT FOR CONSTRUCTION

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(403) 885-5525 P.O. BOX 1690 BLACKFALDS, AB, T0M 0J0

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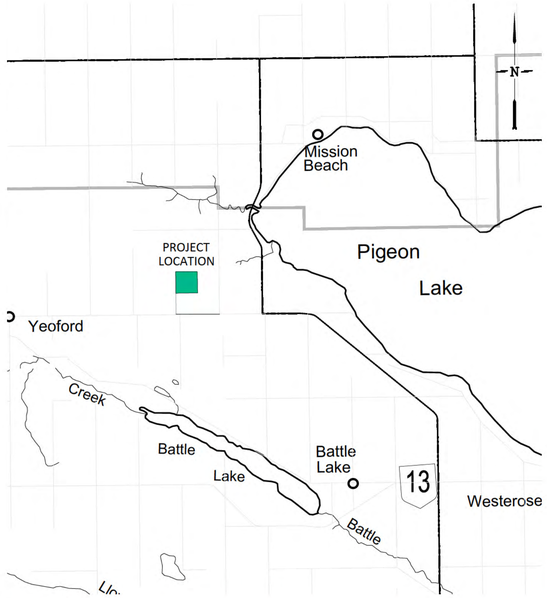
Architectural Details

A5.0

Project number:	T21282
Date:	2021-12-17 1:15:13 PM
Drawn by:	JC
Checked by:	JC
Scale:	As indicated

W:\G\G & S Cattle\2021 Feedlot (T21282)\Work\G&S Cattle Feedlot - Building.rvt



GENERAL NOTES:
1) TOPOGRAPHIC SURVEY COMPLETED SEPTEMBER 23, 2021 BY AL-TERRA ENGINEERING. SITE PLAN SUPPLIED BY OTHERS.
2) SEE DRAWING C01 FOR DETAIL EXISTING CONDITIONS & REMOVAL
3) SEE DRAWING C02 FOR DETAILED FEED LOT GRADING
4) SEE DRAWING C03 FOR CATCHBASIN GRADING & SIZING.

P/L 808.05

P/L 803.29

NW 3-47-2 W5

CATTLE SHELTER 1

CATTLE SHELTER 2

CATTLE SHELTER 3

CATTLE SHELTER 3

PROPOSED FEED LOT DEVELOPMENT ALL RUN-OFF IS SELF CONTAINED

CATCH BASIN

RANGE ROAD 23

P/L 804.72

20.12 ROAD R/W

WATER BODY 30m OFFSET

EXISTING DRAINAGE

EXISTING DRAINAGE

EXISTING POND

EXISTING POND

P/L 804.63

SW 3-47-2 W5

RR 23

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01

STANDARD LEGEND

PROPOSED		EXISTING
	GRADING	
890.00	CONTOURS	890.00
×100.000	ELEVATIONS	×100.000
0.80%	SLOPES	0.80%
×100.000	FUTURE ELEVATIONS	
0.80%	FUTURE SLOPES	
	DEEP UTILITIES	
	SANITARY SEWER	
	STORM SEWER	
	GRATED TOP MANHOLE	
	CATCHBASIN	
	VAULT OR LARGE DIA. MH	
	HYDRANT	
	REDUCER	
	TEE	
	VALVE	
	PLUG OR CAP	
	WATER MAIN	
	INSULATION	
	SHALLOW UTILITIES	
GAS	GAS LINE	GAS
XP GAS	HIGH PRESSURE GAS LINE	XP GAS
PWR	BURIED POWER LINE	PWR
CATV / TEL	SHAW LINE / TELUS LINE	CATV / TEL
OHP	OVERHEAD POWER	OHP
F/O	FIBER OPTIC LINE	F/O
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	URD BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOC BOC	CONCRETE CURB	LOC BOC
	EDGE OF ASPHALT	
	EDGE OF GRAVEL	
	DITCH BOTTOM	
	SIGNS	
	LEGAL	
	PROPERTY LINE	
	EASEMENT	
	MISCELLANEOUS	
	FENCE	
	TREES	
	SHELTERS & CONCRETE AREAS	
	BARN & ROADS	
	LANDSCAPING	
	CATCH BASIN	

#	YEAR-MO-DA	SUBMISSION DESCRIPTION	BY
1	2021-11-04	ISSUED FOR REVIEW	JRR
2	2021-11-17	ISSUED FOR NRCB REVIEW	JRR
3	2022-07-18	ISSUED FOR NRCB REVIEW - REV 1 MOVE CATCHBASIN NORTH	JRR

AL-TERRA ENGINEERING (RED DEER) LTD.
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#202, 4708 50th AVENUE, RED DEER, ALBERTA PH: 403-340-3022

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PROFESSIONAL ENGINEER ALBERTA — ERWIN QUAMME — ID 94781

PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
RM SIGNATURE:
RM APEGA ID #: 94781
DATE: July 18 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: **EAGLE BUILDERS**

PROJECT: **G&S FEEDLOT**

DRAWING TITLE: **SITE LOCATION & OVERALL DRAINAGE PLAN**

PROJECT NO.: 5481	DRAWN: JRR
NW 3-47-2 W5M	DESIGNED: JRR
	REVIEWED: FQ
	PLOTTED: 2022-07-18
SCALE H 1:2000 (25 50 100)	SHEET No.: 1/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER	C00

Z:\PROJECTS\5481-G&S FEEDLOT\DWG - DESIGN\DA PRODUCTIONS SHEETS\1 C00 - SITE LOCATION & OVERALL DRAINAGE PLAN.DWG, LAST SAVED 2022-07-18, LAST SAVED BY JRR#12

GENERAL NOTES:

1) TOPOGRAPHIC SURVEY COMPLETED SEPTEMBER 23, 2021 BY AL-TERRA ENGINEERING. SITE PLAN SUPPLIED BY OTHERS.
2) REMOVALS SHOWN IN ORANGE ARE MINIMUMS REQUIRED AND ARE SHOWN FOR REFERENCE PURPOSES. ACTUAL EXTENTS & LIMITS OF REMOVAL WORK AS WELL AS ANY REQUIRED RECONNECTIONS OR REPAIRS TO BE COORDINATED & COMPLETED BY OTHERS

N

EXISTING FENCE

EXISTING 300mm CULVERT
8.24m @ 1.00%
TO BE REMOVED

EXISTING DITCH BOTTOM

EXISTING DITCH BOTTOM

EXISTING 300mm CULVERT
11.26m @ 2.54%

EXISTING FENCE

EXISTING FENCE

EXISTING CONC. PAD

EXISTING CONC. WATERER TO BE REMOVED

EXISTING FENCE TO BE REMOVED

EXISTING OHPL TO BE REMOVED

APPROXIMATE EXTENTS OF CONSTRUCTION

EXISTING BINS TO BE REMOVED

EXISTING SHED

NW 3-47-2 W5

EXISTING FENCE TO BE REMOVED

EXISTING ROAD TO BE REMOVED

EXISTING CONC.

EXISTING 300mm CULVERT
12.40m @ 1.44%

EXISTING DITCH BOTTOM

EXISTING DITCH BOTTOM

EXISTING EARTHWORKS PILE TO BE REMOVED

EXISTING EARTHWORKS PILE

EXISTING OHPL

EXISTING FENCE

EXISTING SHED

EXISTING ASPHALT APPROACH

RANGE ROAD 23

P/L 804.72

EXISTING DITCH BOTTOM

EXISTING 300mm CULVERT
11.37m @ 0.86%

EXISTING DITCH BOTTOM

EXISTING 200MM CULVERT
11.38m @ 0.18%

EXISTING FENCE TO BE REMOVED

EXISTING GRAVEL ROAD TO BE REMOVED

EXISTING DITCH BOTTOM

20.12 ROAD R/W

EXISTING FENCE

WATER BODY
30m OFFSET

EXISTING 200mm CULVERT
14.31m @ 0.16%

EXISTING DITCH BOTTOM

EXISTING FENCE

EXISTING DITCH BOTTOM

EXISTING 400mm CULVERT
12.0m @ 3.06%

EXISTING 500mm CULVERT
14.72m @ 1.70%

EXISTING POND

EXISTING DITCH BOTTOM

EXISTING 1250mm CULVERT
10.64m @ 0.85%

EXISTING 250mm CULVERT
12.31m @ 1.93%

EXISTING OHPL

EXISTING FENCE

EXISTING FENCE

WATER BODY
30m OFFSET

EXISTING DITCH BOTTOM

EXISTING EPHEMERAL DRAW

EXISTING EPHEMERAL DRAW

EXISTING POWERPOLE

EXISTING EDGE OF GRAVEL

EXISTING DITCH BOTTOM

EXISTING DITCH BOTTOM

EXISTING EMPHEMERAL DRAW

EXISTING POND

EXISTING DITCH BOTTOM

EXISTING EDGE OF GRAVEL

EXISTING FENCE

P/L 804.63

EXISTING TREELINE

EXISTING TREELINE

EXISTING DITCH BOTTOM

EXISTING FENCE

EXISTING TREELINE

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01

STANDARD LEGEND

PROPOSED		EXISTING
	GRADING	
890.00	CONTOURS	890.00
×100.000	ELEVATIONS	×100.000
0.80%	SLOPES	0.80%
×100.000	FUTURE ELEVATIONS	
0.80%	FUTURE SLOPES	
	DEEP UTILITIES	
	SANITARY SEWER	
	STORM SEWER	
	GRATED TOP MANHOLE	
	CATCHBASIN	
	VAULT OR LARGE DIA. MH	
	HYDRANT	
	REDUCER	
	TEE	
	VALVE	
	PLUG OR CAP	
	WATER MAIN	
	INSULATION	
	SHALLOW UTILITIES	
GAS GAS	GAS LINE	GAS GAS
XP GAS	HIGH PRESSURE GAS LINE	XP GAS
PWR PWR	BURIED POWER LINE	PWR PWR
CATV CATV	SHAW LINE	CATV CATV
TEL TEL	TELUS LINE	TEL TEL
OHP OHP	OVERHEAD POWER	OHP OHP
F/O F/O	FIBER OPTIC LINE	F/O F/O
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	URD BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOC BOC	CONCRETE CURB	LOC BOC
	EDGE OF ASPHALT	
	EDGE OF GRAVEL	
	DITCH BOTTOM	
	SIGNS	
	LEGAL	
	PROPERTY LINE	
	EASEMENT	
	MISCELLANEOUS	
	FENCE	
	TREES	
	SHELTERS & CONCRETE AREAS	
	BARN & ROADS	
	LANDSCAPING	
	CATCH BASIN	

#	YEAR-MO-DA	SUBMISSION DESCRIPTION	BY
1	2021-11-04	ISSUED FOR REVIEW	AWS
2	2021-11-17	ISSUED FOR NRCB REVIEW	JRR
3	2022-07-18	ISSUED FOR NRCB REVIEW – REV 1 MOVE CATCHBASIN NORTH	JRR

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PROFESSIONAL ENGINEER ALBERTA — JOHNA QUARRELL — ID 94781 — July 18 2022

PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
RM SIGNATURE:
RM APEGA ID #: 94781
DATE: July 18 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

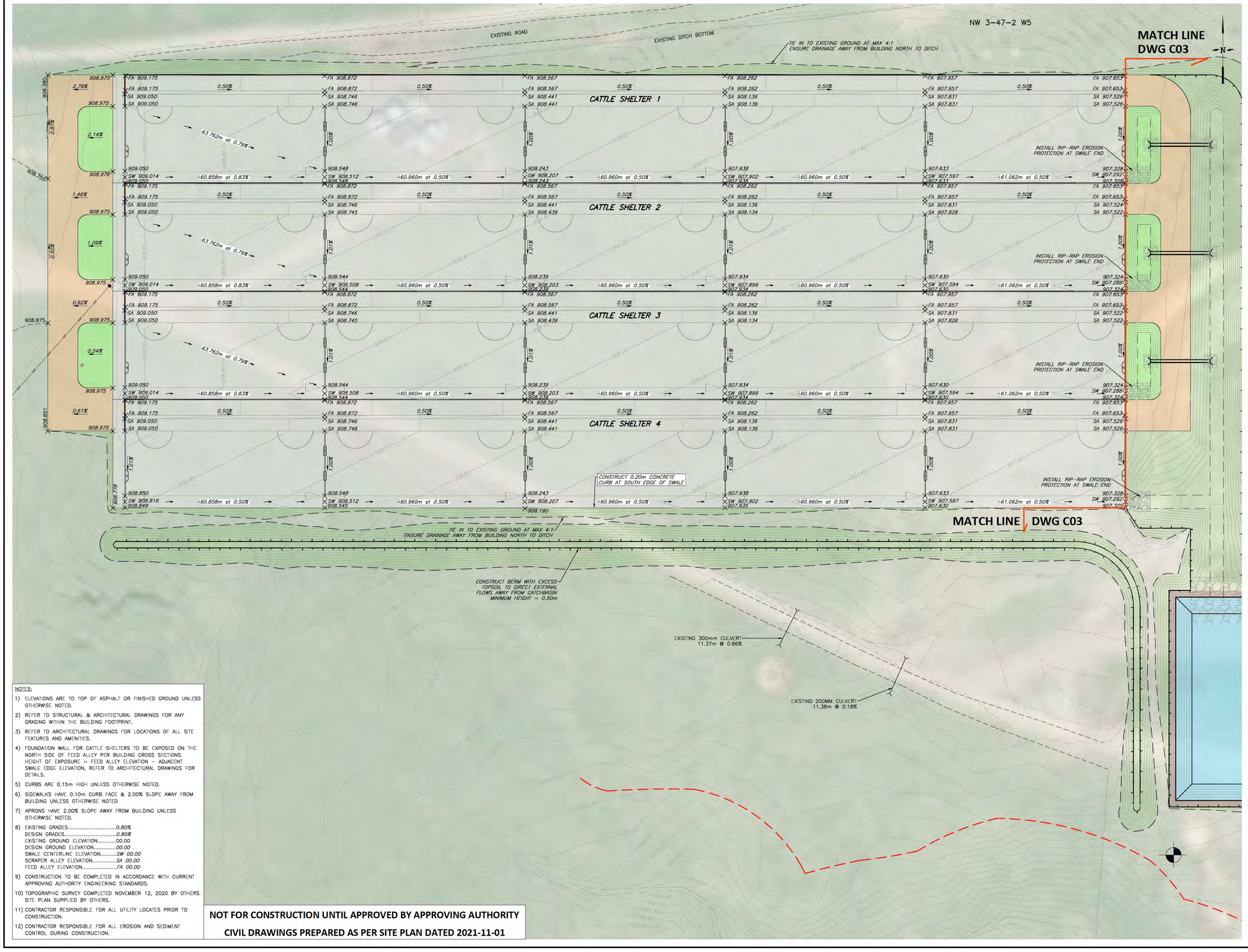
CLIENT: **EAGLE BUILDERS**

PROJECT: **G&S FEEDLOT**

DRAWING TITLE: **EXISTING CONDITIONS & REMOVALS PLAN**

PROJECT NO.: 5481	DRAWN: JRR
NW 3-47-2 W5M	DESIGNED: JRR
	REVIEWED: FQ
	PLOTTED: 2022-07-18
SCALE H 1:2000 (25 50 100)	SHEET No.: 2/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER	C01

J:\PROJECTS\5481-G&S FEEDLOT\10-DESIGN\04 PRODUCTION SHEETS\C01 - EXISTING CONDITIONS & REMOVALS PLAN.DWG, LAST SAVED BY JRR ON 2022-07-18, LAST PLOTTED BY JRR ON 2022-07-18



NOTES:

1) ELEVATIONS ARE TO TOP OF ASPHALT OR FINISHED GROUND UNLESS OTHERWISE NOTED.
2) REFER TO STRUCTURAL & ARCHITECTURAL DRAWINGS FOR ANY GRADING WITHIN THE BUILDING FOOTPRINT.
3) REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF ALL SITE FEATURES AND AMENITIES.
4) FOUNDATION WALL FOR CATTLE SHELTERS TO BE EXPOSED ON THE NORTH SIDE OF FEED ALLEY PER BUILDING CROSS SECTIONS. HEIGHT OF EXPOSURE = FEED ALLEY ELEVATION – ADJACENT SWALE EDGE ELEVATION, REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.
5) CURBS ARE 0.15m HIGH UNLESS OTHERWISE NOTED.
6) SIDEWALKS HAVE 0.10m CURB FACE & 2.00% SLOPE AWAY FROM BUILDING UNLESS OTHERWISE NOTED
7) APRONS HAVE 2.00% SLOPE AWAY FROM BUILDING UNLESS OTHERWISE NOTED.
8) EXISTING GRADES.....0.80%
   DESIGN GRADES.....*0.80%*
   EXISTING GROUND ELEVATION.....00.00
   DESIGN GROUND ELEVATION.....*00.00*
   SWALE CENTERLINE ELEVATION.....*SW 00.00*
   SCRAPER ALLEY ELEVATION.....*SA 00.00*
   FEED ALLEY ELEVATION.....*FA 00.00*
9) CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH CURRENT APPROVING AUTHORITY ENGINEERING STANDARDS.
10) TOPOGRAPHIC SURVEY COMPLETED NOVEMBER 12, 2020 BY OTHERS. SITE PLAN SUPPLIED BY OTHERS.
11) CONTRACTOR RESPONSIBLE FOR ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
12) CONTRACTOR RESPONSIBLE FOR ALL EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION.

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01

STANDARD LEGEND

PROPOSED		EXISTING
	GRADING	
890.00	CONTOURS	890.00
×100.000	ELEVATIONS	×100.000
0.80%	SLOPES	0.80%
×100.000	FUTURE ELEVATIONS	
0.80%	FUTURE SLOPES	
	DEEP UTILITIES	
	SANITARY SEWER	
	STORM SEWER	
	GRATED TOP MANHOLE	
	CATCHBASIN	
	VAULT OR LARGE DIA. MH	
	HYDRANT	
	REDUCER	
	TEE	
	VALVE	
	PLUG OR CAP	
	WATER MAIN	
	INSULATION	
	SHALLOW UTILITIES	
GAS	GAS LINE	GAS
HP GAS	HIGH PRESSURE GAS LINE	HP GAS
PWR	BURIED POWER LINE	PWR
CATV / TEL	SHAW LINE / TELUS LINE	CATV / TEL
OHP	OVERHEAD POWER	OHP
F/O	FIBER OPTIC LINE	F/O
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	URD BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOG / BOC	CONCRETE CURB	LOG / BOC
	EDGE OF ASPHALT	
	EDGE OF GRAVEL	
	DITCH BOTTOM	
	SIGNS	
	LEGAL	
	PROPERTY LINE	
	EASEMENT	
	MISCELLANEOUS	
	FENCE	
	TREES	
	SHELTERS & CONCRETE AREAS	
	BARN & ROADS	
	LANDSCAPING	
	CATCH BASIN	

#	YEAR-MO-DA	SUBMISSION DESCRIPTION	BY
1	2021-11-04	ISSUED FOR REVIEW	JRR
2	2021-11-17	ISSUED FOR NRCB REVIEW	JRR
3	2022-07-18	ISSUED FOR NRCB REVIEW – REV 1 MOVE CATCHBASIN NORTH	JRR

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#202, 4708 50th AVENUE, RED DEER, ALBERTA PH: 403-340-3022

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PROFESSIONAL ENGINEER ALBERTA — ERHIN QUARRIE — ID 94781 — JULY 18 2022

PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
RM SIGNATURE:
RM APEGA ID #: 94781
DATE: July 18 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

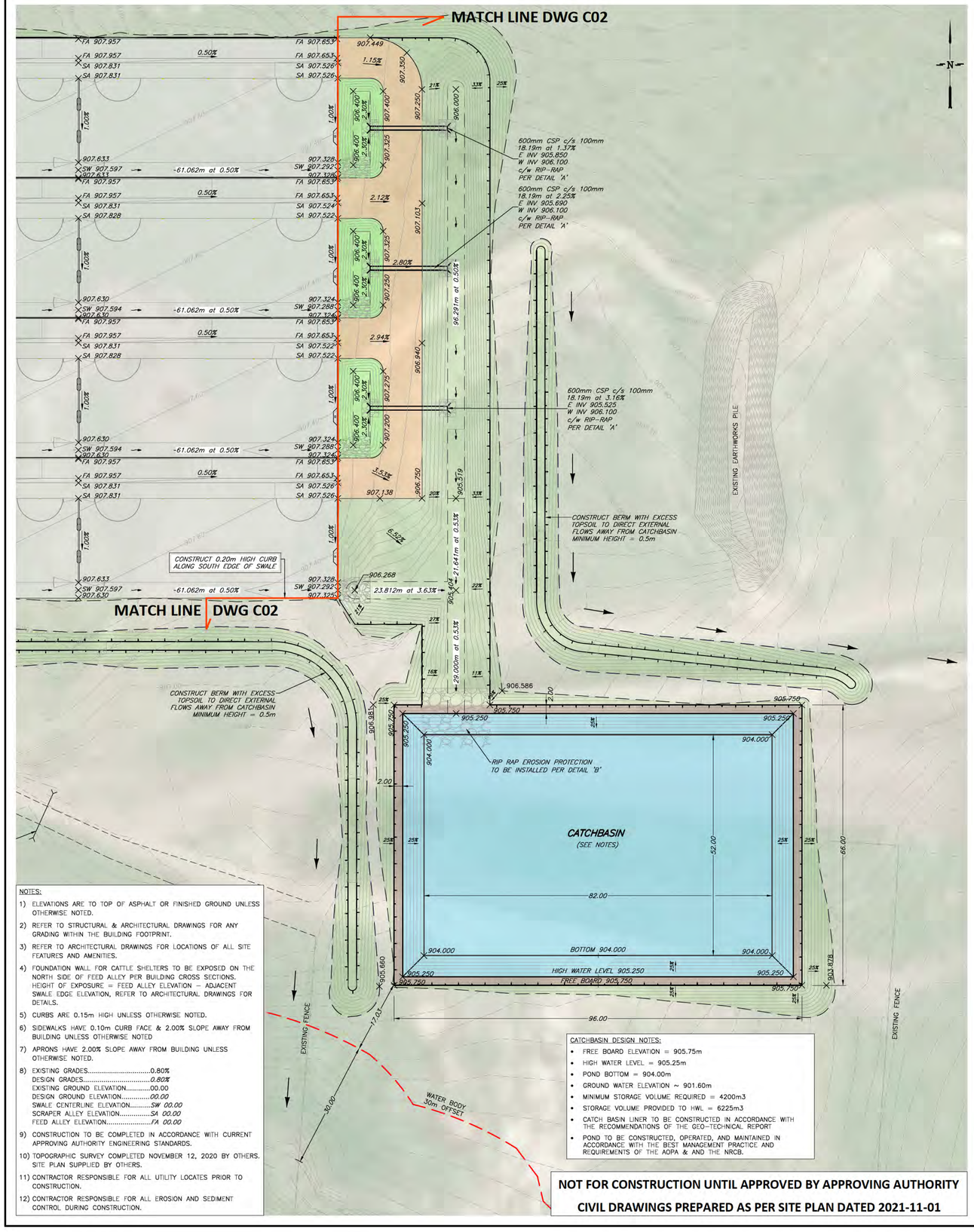
CLIENT: **EAGLE BUILDERS**

PROJECT: **G&S FEEDLOT**

DRAWING TITLE: **FEED LOT GRADING PLAN**

PROJECT NO.: 5481	DRAWN: JRR
NW 3-47-2 W5M	DESIGNED: JRR
	REVIEWED: FQ
	PLOTTED: 2022-07-18
SCALE H 1:500 (5 10 20)	SHEET No.: 3/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER	C02

Z:\PROJECTS\5481-G&S FEEDLOT\DWG - DESIGN\04 PRODUCTION SHEETS\C02 - FEED LOT GRADING PLAN.DWG, LAST SAVED 2022-07-18, LAST SAVED BY JRR



NOTES:

1) ELEVATIONS ARE TO TOP OF ASPHALT OR FINISHED GROUND UNLESS OTHERWISE NOTED.
2) REFER TO STRUCTURAL & ARCHITECTURAL DRAWINGS FOR ANY GRADING WITHIN THE BUILDING FOOTPRINT.
3) REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF ALL SITE FEATURES AND AMENITIES.
4) FOUNDATION WALL FOR CATTLE SHELTERS TO BE EXPOSED ON THE NORTH SIDE OF FEED ALLEY PER BUILDING CROSS SECTIONS. HEIGHT OF EXPOSURE = FEED ALLEY ELEVATION – ADJACENT SWALE EDGE ELEVATION, REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.
5) CURBS ARE 0.15m HIGH UNLESS OTHERWISE NOTED.
6) SIDEWALKS HAVE 0.10m CURB FACE & 2.00% SLOPE AWAY FROM BUILDING UNLESS OTHERWISE NOTED
7) APRONS HAVE 2.00% SLOPE AWAY FROM BUILDING UNLESS OTHERWISE NOTED.
8) EXISTING GRADES.....0.80%
   DESIGN GRADES.....*0.80%*
   EXISTING GROUND ELEVATION.....00.00
   DESIGN GROUND ELEVATION.....*00.00*
   SWALE CENTERLINE ELEVATION.....*SW 00.00*
   SCRAPER ALLEY ELEVATION.....*SA 00.00*
   FEED ALLEY ELEVATION.....*FA 00.00*
9) CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH CURRENT APPROVING AUTHORITY ENGINEERING STANDARDS.
10) TOPOGRAPHIC SURVEY COMPLETED NOVEMBER 12, 2020 BY OTHERS. SITE PLAN SUPPLIED BY OTHERS.
11) CONTRACTOR RESPONSIBLE FOR ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
12) CONTRACTOR RESPONSIBLE FOR ALL EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION.

CATCHBASIN DESIGN NOTES:

- FREE BOARD ELEVATION = 905.75m
- HIGH WATER LEVEL = 905.25m
- POND BOTTOM = 904.00m
- GROUND WATER ELEVATION ~ 901.60m
- MINIMUM STORAGE VOLUME REQUIRED = 4200m3
- STORAGE VOLUME PROVIDED TO HWL = 6225m3
- CATCH BASIN LINER TO BE CONSTRUCTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEO-TECHNICAL REPORT
- POND TO BE CONSTRUCTED, OPERATED, AND MAINTAINED IN ACCORDANCE WITH THE BEST MANAGEMENT PRACTICE AND REQUIREMENTS OF THE AOPA & AND THE NRCB.

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01

Culvert Sizing Calculations	Project: 5481-G&S Feedlot	By: JRR	Date: 2021-11-16	Location: Wetaskiwin County	Rev 1

		Catchment		Design Storm		Q = 2.78 CIA		Culvert								
Culvert Name	Contributing Area A (ha)	Run-off Coefficient C	Time of Concentration t min	1:5 YR mm/hr	1:100 YR mm/hr	1:5 YR L/s	1:100 YR L/s	Diameter mm	Mannings' 'n'	Pipe Area m2	Wetted Perimeter m	Slope m/m	# of Culverts	Velocity V= m/s	Capacity Q= L/s	Percent Full 1:5 YR	Percent Full 1:100 YR
A	1.073	0.90	10	74.9	141.9	201	381	600	0.013	0.283	1.884	0.0137	1	2.542	718	28%	53%
B	1.073	0.90	10	74.9	141.9	201	381	600	0.013	0.283	1.884	0.0225	1	3.257	921	22%	41%
C	1.073	0.90	10	74.9	141.9	201	381	600	0.013	0.283	1.884	0.0316	1	3.860	1091	18%	35%

Catch Basin Dimension Calculator

For more information on runoff control catch basin design consideration including liner options, catch basin protection, etc., check out the catch basin factsheet.

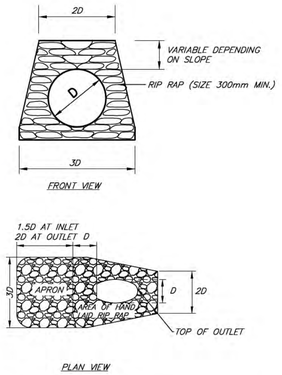
Name G&S Feed Lot
Land Location NW 3-47-2 W5

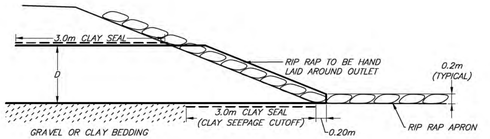
Estimating Runoff Potential

Area	Length (m)	Width (m)	Paved?	Area (m^2)
1	305	132	YES	40260.00
2	37	140	NO	5180.00
3	16	46	NO	736.00
4	109	77	YES	8393.00
	Total Area			54569.00

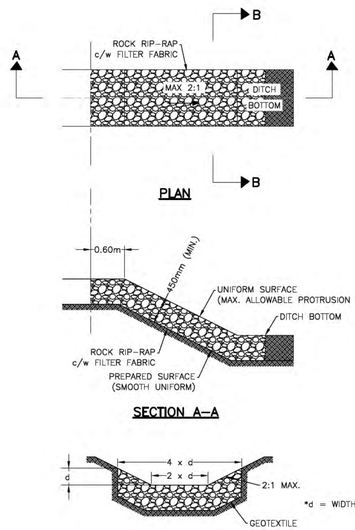
Estimation of water runoff to be collected in the catch basin:

4176.21 m^3
147481 ft^3
918637 Imp. Gal





A D01 RIP-RAP CULVERT END PROTECTION
SCALE: N.T.S.



RIPRAP GEOTEXTILE MIN. SPECIFICATION
- NON-WOVEN GEOTEXTILE
- GRAB TENSILE (N) 900 ASTM D4632
- TEAR (N) 350 ASTM D4533
- PUNCTURE (N) 550 ASTM D6241
- MULLEN BURST (xPo) 2400 ASTM D3786
- ELONGATION (FAILURE) 50% ASTM D4632

NON-WOVEN GEOTEXTILE SPECIFICATION
1. THE SLOPE SHALL BE GRADED TO PROVIDE A SMOOTH, UNIFORM SURFACE.
2. THE NON-WOVEN GEOTEXTILE FILTER FABRIC SHALL BE LAID PARALLEL TO THE SLOPE DIRECTION.
3. THE MINIMUM NON-WOVEN GEOTEXTILE FILTER FABRIC LAP SHALL BE 400mm, EXCEPT WHERE PLACED UNDERWATER THE MINIMUM LAP WIDTH SHALL BE 1m. OVERLAPS SHALL BE PINNED USING 6mm DIAMETER STEEL PINS FITTED WITH WASHERS AND SPACED AT 1m INTERVALS ALONG THE OVERLAPS.
4. THE TOP EDGE OF THE NON-WOVEN GEOTEXTILE FILTER FABRIC SHALL BE ANCHORED BY DIGGING 300mm DEEP TRENCH, INSERTING THE TOP EDGE OF THE NON-WOVEN GEOTEXTILE FILTER FABRIC AND BACKFILLING WITH COMPACTED SOIL.
5. CARE SHALL BE TAKEN TO PREVENT PUNCTURING OR TEARING THE NON-WOVEN GEOTEXTILE FILTER FABRIC. ANY DAMAGE SHALL BE REPAIRED BY USE OF PATCHES THAT EXTEND AT LEAST 1m BEYOND THE PERIMETER OF THE TEAR OR PUNCTURE.
6. HEAVY ROCK RIPRAP PLACEMENT SHALL COMMENCE AT THE BASE OF THE BLANKET AREA AND PROCEED UP THE SLOPE.
7. THE HEAVY ROCK RIPRAP SHALL BE HANDLED, DUMPED OR PLACED INTO POSITION TO CONFORM TO THE SPECIFIED GRADATION AND TO THE CROSS SECTION SHOWN ON THE DRAWINGS. THE FINISHED SURFACE SHALL BE REASONABLY UNIFORM, FREE FROM BUMPS OR DEPRESSIONS, AND WITH NO EXCESSIVELY LARGE CAVITIES BELOW OR INDIVIDUAL STONES PROJECTING ABOVE THE GENERAL SURFACE.

NON-WOVEN GEOTEXTILE FILTER FABRIC REQUIREMENTS		
REQUIRED PHYSICAL PROPERTY	TEST METHOD	MINIMUM MARV REQUIRED CLASS 1M, 1, 2, AND 3
GRAB STRENGTH	ASTM D4632	900 N
ELONGATION (FAILURE)	ASTM D4632	50%
CBR PUNCTURE STRENGTH	ASTM D6241	550 N
TRAPEZOIDAL TEAR	ASTM D4533	350 N

NOTES:
CLASS 1 ROCK RIPRAP c/w FILTER FABRIC
100% SMALLER THAN 450mm
AT LEAST 20% LARGER THAN 350mm
AT LEAST 50% LARGER THAN 300mm
AT LEAST 80% LARGER THAN 200mm

B D01 RIP-RAP OUTLET/CHANNEL REINFORCEMENT
SCALE: N.T.S.

STANDARD LEGEND

PROPOSED		EXISTING
	GRADING	
890.00	CONTOURS	890.00
×100.000	ELEVATIONS	×100.000
0.80%	SLOPES	0.80%
×100.000	FUTURE ELEVATIONS	
0.80%	FUTURE SLOPES	
	DEEP UTILITIES	
	SANITARY SEWER	
	STORM SEWER	
	GRATED TOP MANHOLE	
	CATCHBASIN	
	VAULT OR LARGE DIA. MH	
	HYDRANT	
	REDUCER	
	TEE	
	VALVE	
	PLUG OR CAP	
	WATER MAIN	
	INSULATION	
	SHALLOW UTILITIES	
GAS	GAS LINE	GAS
HP GAS	HIGH PRESSURE GAS LINE	HP GAS
PWR	BURIED POWER LINE	PWR
CATV / TEL	SHAW LINE / TELUS LINE	CATV / TEL
OHP	OVERHEAD POWER	OHP
F/O	FIBER OPTIC LINE	F/O
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	URD BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOC / BOC	CONCRETE CURB	LOC / BOC
	EDGE OF ASPHALT	
	EDGE OF GRAVEL	
	DITCH BOTTOM	
	SIGNS	
	LEGAL	
	PROPERTY LINE	
	EASEMENT	
	MISCELLANEOUS	
	FENCE	
	TREES	
	SHELTERS & CONCRETE AREAS	
	BARN & ROADS	
	LANDSCAPING	
	CATCH BASIN	

#	YEAR-MO-DA	SUBMISSION DESCRIPTION	BY
1	2021-11-04	ISSUED FOR REVIEW	JRR
2	2021-11-17	ISSUED FOR NRCB REVIEW	JRR
3	2022-07-18	ISSUED FOR NRCB REVIEW – REV 1 MOVE CATCHBASIN NORTH	JRR

AL-TERRA ENGINEERING (RED DEER) LTD.
QUALITY • COMMITMENT • INTEGRITY • • • SUCCESS
#202, 4708 50th AVENUE, RED DEER, ALBERTA PH: 403-340-3022

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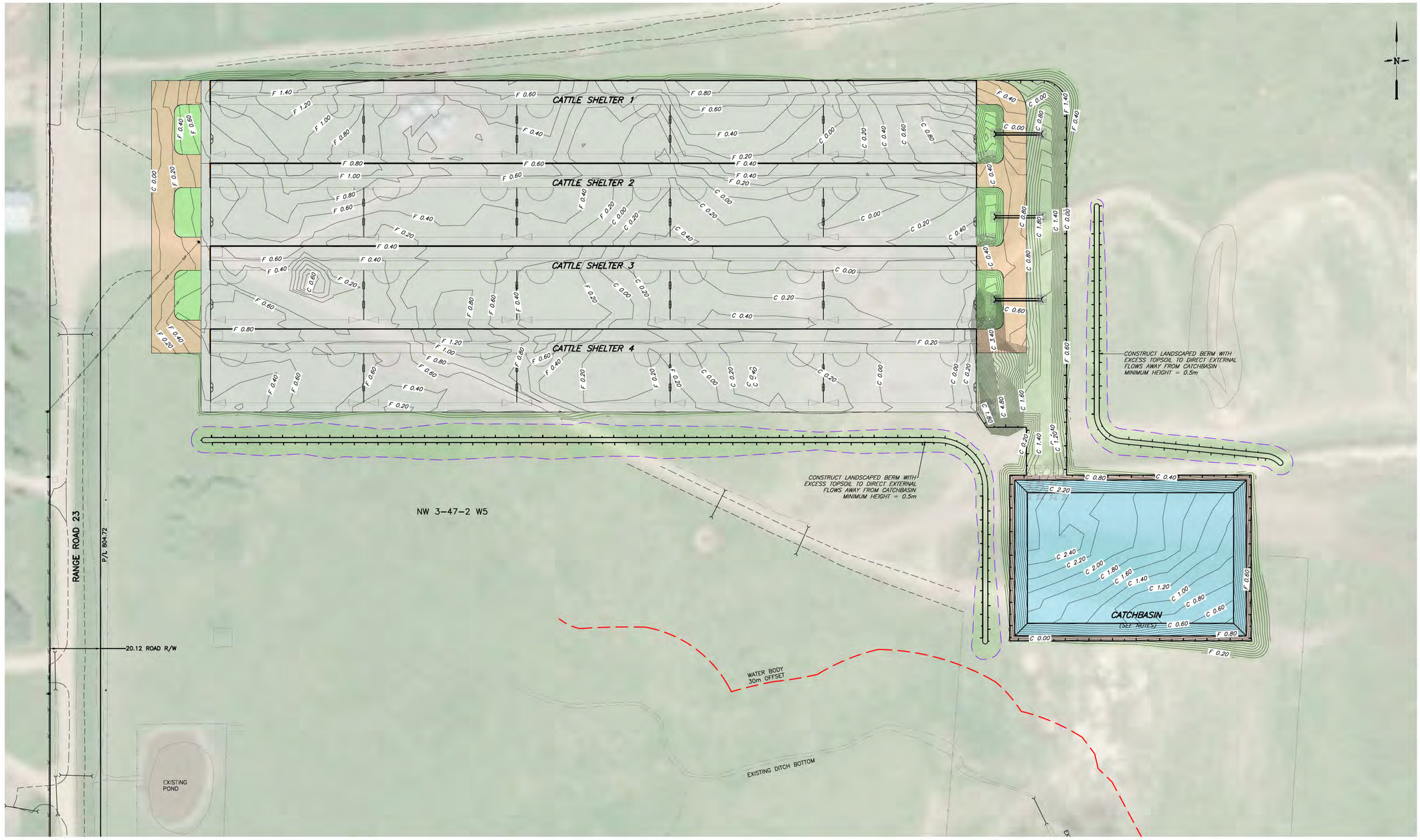
PROFESSIONAL ENGINEER ALBERTA — ID 94781 — JULY 18 2022

PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
RM SIGNATURE:
RM APEGA ID #: 94781
DATE: July 18 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: **EAGLE BUILDERS**
PROJECT: **G&S FEEDLOT**
DRAWING TITLE: **CATCHBASIN GRADING PLAN**

PROJECT NO.:	5481	DRAWN:	JRR
NW 3-47-2 W5M		DESIGNED:	JRR
		REVIEWED:	FQ
		PLOTTED:	2022-07-18
SCALE H 1:500 (5 10 20)		SHEET No.:	4/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER		C03	

Z:\PROJECTS\5481-G&S FEEDLOT\04 - DESIGN\04 PRODUCTION\SHEETS\4 C03 - CATCHBASIN GRADING PLAN.DWG SAVED 2022-07-18, LAST SAVED BY JRR#2.



NOTES:

1) EARTHWORKS VOLUME ESTIMATE (UNADJUSTED FOR SHRINK / SWELL):

TOTAL:
FILL = 15,390 cu.m.
CUT = 17,620 cu.m.
NET = 2,230 cu.m. (CUT)

EARTHWORKS VOLUMES ARE TO SUBGRADE BASED ON PROVIDED STRUCTURES BELOW AND IT WAS ASSUMED THAT 100mm OF TOPSOIL/SITE STRIPPING IS REQUIRED. WHERE THE ACTUAL STRUCTURES DIFFER FROM THE STRUCTURE SHOWN BELOW OR TOPSOIL STRIPPING DIFFERS, VOLUMES WILL NEED TO BE ADJUSTED ACCORDINGLY.

2) STRUCTURE AREAS FOR CUT FILL PURPOSES (APPROXIMATE):
a. SHELTERS & CONCRETE AREAS = 175mm x 40,702m³
b. GRAVEL = 150mm x 2906m³
c. LANDSCAPE = 100mm x 7318m³
d. POND = 00mm x 6174m³

APPROX. TOPSOIL VOLUME (100mm DEPTH) = 5,500m³

3) THE CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
4) THE CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL AND SILT PREVENTION DURING CONSTRUCTION.
5) DUE TO THE POTENTIAL VARIABILITY OF SITE CONDITIONS, CONSTRUCTION METHODS AND MATERIALS, AND SURVEY THESE QUANTITIES SHOULD BE CONSIDERED ESTIMATES AND DISCRETION SHOULD BE APPLIED IN THEIR USE.
6) THE VOLUMES SHOWN ABOVE DO NOT ACCOUNT FOR CONSTRUCTION OF A CLAY LINER.

SHELTERS & CONCRETE AREAS
BARN & ROADS
LANDSCAPING
CATCH BASIN

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2021-11-01

STANDARD LEGEND

PROPOSED		EXISTING
	GRADING	
890.00	CONTOURS	890.00
×100.000	ELEVATIONS	×100.000
0.80%	SLOPES	0.80%
×100.000	FUTURE ELEVATIONS	
0.80%	FUTURE SLOPES	
	DEEP UTILITIES	
	SANITARY SEWER	
	STORM SEWER	
	GRATED TOP MANHOLE	
	CATCHBASIN	
	VAULT OR LARGE DIA. MH	
	HYDRANT	
	REDUCER	
	TEE	
	VALVE	
	PLUG OR CAP	
	WATER MAIN	
	INSULATION	
	SHALLOW UTILITIES	
GAS	GAS LINE	GAS
XP GAS	HIGH PRESSURE GAS LINE	XP GAS
PWR	BURIED POWER LINE	PWR
CATV / TEL	SHAW LINE / TELUS LINE	CATV / TEL
OHP	OVERHEAD POWER	OHP
F/O	FIBER OPTIC LINE	F/O
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	URD BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOG / BOC	CONCRETE CURB	LOG / BOC
	EDGE OF ASPHALT	
	EDGE OF GRAVEL	
	DITCH BOTTOM	
	SIGNS	
	LEGAL	
	PROPERTY LINE	
	EASEMENT	
	MISCELLANEOUS	
	FENCE	
	TREES	

#	YEAR-MO-DA	SUBMISSION DESCRIPTION	BY
1	2021-11-04	ISSUED FOR REVIEW	JRR
2	2021-11-17	ISSUED FOR NRCB REVIEW	JRR
3	2022-07-18	ISSUED FOR NRCB REVIEW - REV 1 MOVE CATCHBASIN NORTH	JRR

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PROFESSIONAL ENGINEER ALBERTA — VENKATA QUANNU — ID 94781

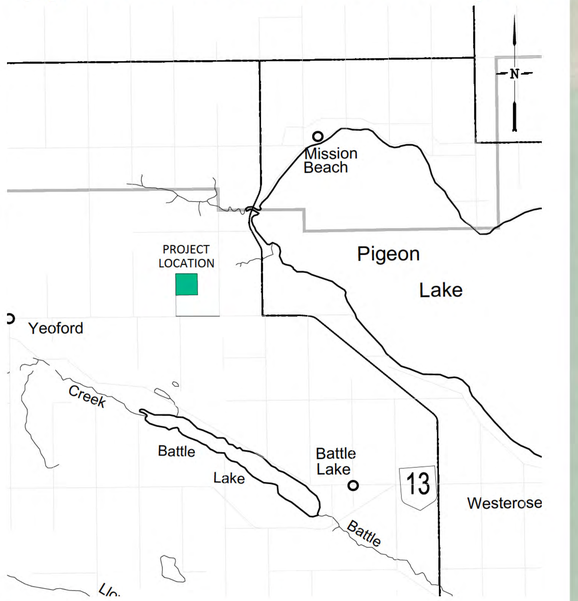
PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
RM SIGNATURE:
RM APEGA ID #: 94781
DATE: July 18 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: **EAGLE BUILDERS**
PROJECT: **G&S FEEDLOT**
DRAWING TITLE: **CUT/FILL PLAN**

PROJECT NO.: 5481	DRAWN: JRR
NW 3-47-2 W5M	DESIGNED: JRR
	REVIEWED: FQ
	PLOTTED: 2022-07-18
SCALE H 1:750 (10 20 40)	SHEET No.: 5/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER	C04

Z:\PROJECTS\5481-G&S FEEDLOT\03 - DESIGN\04 PRODUCTION SHEETS\C04 - CUT-FILL PLAN.DWG, JRR, SAVED 2022-07-18, LAST SAVED BY JRR472

~~Approval Officer Note: Updated drawings submitted August 22, 2022~~



NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2022-08-03

STANDARD LEGEND

PROPOSED		EXISTING
	GRADING	
890.00	CONTOURS	890.00
×100.000	ELEVATIONS	×100.000
0.80%	SLOPES	0.80%
×100.000	FUTURE ELEVATIONS	
0.80%	FUTURE SLOPES	
	DEEP UTILITIES	
	SANITARY SEWER	
	STORM SEWER	
	GRATED TOP MANHOLE	
	CATCHBASIN	
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	TEE	
	VALVE	
	PLUG OR CAP	
	WATER MAIN	
	INSULATION	
	SHALLOW UTILITIES	
	GAS LINE	
	HIGH PRESSURE GAS LINE	
	BURIED POWER LINE	
	SHAW LINE / TELUS LINE	
	OVERHEAD POWER	
	FIBER OPTIC LINE	
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	URD BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOC BOC	CONCRETE CURB	LOC BOC
	EDGE OF ASPHALT	
	EDGE OF GRAVEL	
	DITCH BOTTOM	
	SIGNS	
	LEGAL	
	PROPERTY LINE	
	EASEMENT	
	MISCELLANEOUS	
	FENCE	
	TREES	
	SHELTERS & CONCRETE AREAS	
	BARN & ROADS	
	LANDSCAPING	
	CATCH BASIN	

#	YEAR-MO-DA	SUBMISSION DESCRIPTION	BY
1	2021-11-04	ISSUED FOR REVIEW	JRR
2	2021-11-17	ISSUED FOR NRCB REVIEW	JRR
3	2022-07-18	ISSUED FOR NRCB REVIEW – REV 1 MOVE CATCHBASIN NORTH	JRR
4	2022-08-16	ISSUED FOR NRCB REVIEW – REV 3 SHIFT BUILDINGS SOUTH	JRR

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PROFESSIONAL ENGINEER ALBERTA — JOHN M. QUAMME — ID 94781 — August 16 2022

PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
RM SIGNATURE:
RM APEGA ID #: 94781
DATE: August 16 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: **EAGLE BUILDERS**

PROJECT: **G&S FEEDLOT**

DRAWING TITLE: **SITE LOCATION & OVERALL DRAINAGE PLAN**

PROJECT NO.: 5481	DRAWN: JRR
NW 3-47-2 W5M	DESIGNED: JRR
	REVIEWED: FQ
	PLOTTED: 2022-08-16
SCALE H 1:2000 (25 50 100)	SHEET No.: 1/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER	C00

J:\PROJECTS\5481-G&S FEEDLOT\30 - DESIGN\04 PRODUCTIONS SHEETS\1 C00 - SITE LOCATION & OVERALL DRAINAGE PLAN.DWG, LAST SAVED 2022-08-16, LAST SAVED BY JRR472.

GENERAL NOTES:

1) TOPOGRAPHIC SURVEY COMPLETED SEPTEMBER 23, 2021 BY AL-TERRA ENGINEERING. SITE PLAN SUPPLIED BY OTHERS.
2) REMOVALS SHOWN IN ORANGE ARE MINIMUMS REQUIRED AND ARE SHOWN FOR REFERENCE PURPOSES. ACTUAL EXTENTS & LIMITS OF REMOVAL WORK AS WELL AS ANY REQUIRED RECONNECTIONS OR REPAIRS TO BE COORDINATED & COMPLETED BY OTHERS

N

EXISTING FENCE
EXISTING 300mm CULVERT 8.24m @ 1.00% TO BE REMOVED
EXISTING DITCH BOTTOM
EXISTING DITCH BOTTOM
EXISTING 300mm CULVERT 11.26m @ 2.54%
EXISTING CONC. PAD
EXISTING FENCE TO BE REMOVED
EXISTING CONC. WATERER
EXISTING BINS TO BE REMOVED
EXISTING SHED TO BE REMOVED
APPROXIMATE EXTENTS OF CONSTRUCTION
NW 3-47-2 W5
EXISTING FENCE
EXISTING FENCE TO BE REMOVED
EXISTING ROAD TO BE REMOVED
EXISTING 300mm CULVERT 12.40m @ 1.44%
EXISTING CONC.
EXISTING DITCH BOTTOM
EXISTING DITCH BOTTOM
EXISTING EARTHWORKS PILE TO BE REMOVED
EXISTING EARTHWORKS PILE
PROPOSED BERM
EXISTING OHPL
EXISTING FENCE
EXISTING SHED
EXISTING ASPHALT APPROACH
RANGE ROAD 23
P/L 804.72
PROPOSED BERM
EXISTING 300mm CULVERT 11.37m @ 0.86%
EXISTING 200MM CULVERT 11.38m @ 0.18%
EXISTING FENCE TO BE REMOVED
EXISTING GRAVEL ROAD TO BE REMOVED
EXISTING DITCH BOTTOM
EXISTING DITCH BOTTOM
20.12 ROAD R/W
EXISTING FENCE
WATER BODY 30m OFFSET
EXISTING 200mm CULVERT 14.31m @ 0.16%
EXISTING DITCH BOTTOM
EXISTING FENCE
EXISTING DITCH BOTTOM
EXISTING 400mm CULVERT 12.0m @ 3.06%
EXISTING 500mm CULVERT 14.72m @ 1.70%
EXISTING POND
EXISTING DITCH BOTTOM
EXISTING 1250mm CULVERT 10.64m @ 0.85%
EXISTING FENCE
EXISTING OHPL
EXISTING FENCE
EXISTING DITCH BOTTOM
WATER BODY 30m OFFSET
EXISTING FENCE
EXISTING EPHEMERAL DRAW
EXISTING 250mm CULVERT 12.31m @ 1.93%
EXISTING POWERPOLE
EXISTING DITCH BOTTOM
EXISTING EDGE OF GRAVEL
EXISTING EDGE OF GRAVEL
EXISTING DITCH BOTTOM
EXISTING EPHEMERAL DRAW
EXISTING EMPHEMERAL DRAW
EXISTING POND
EXISTING DITCH BOTTOM
EXISTING FENCE
P/L 804.63
EXISTING TREELINE
EXISTING TREELINE
EXISTING DITCH BOTTOM
EXISTING FENCE
EXISTING TREELINE

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2022-08-03

STANDARD LEGEND

PROPOSED		EXISTING
	GRADING	
890.00	CONTOURS	890.00
×100.000	ELEVATIONS	×100.000
0.80%	SLOPES	0.80%
×100.000	FUTURE ELEVATIONS	
0.80%	FUTURE SLOPES	
	DEEP UTILITIES	
	SANITARY SEWER	
	STORM SEWER	
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	INSULATION	
	SHALLOW UTILITIES	
GAS	GAS LINE	GAS
XP GAS	HIGH PRESSURE GAS LINE	XP GAS
PWR	BURIED POWER LINE	PWR
CATV / TEL	SHAW LINE / TELUS LINE	CATV / TEL
OHP	OVERHEAD POWER	OHP
F/O	FIBER OPTIC LINE	F/O
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	URD BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOC / BOC	CONCRETE CURB	LOC / BOC
	EDGE OF ASPHALT	
	EDGE OF GRAVEL	
	DITCH BOTTOM	
	SIGNS	
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	EASEMENT	
	MISCELLANEOUS	
	FENCE	
	TREES	
	SHELTERS & CONCRETE AREAS	
	BARN & ROADS	
	LANDSCAPING	
	CATCH BASIN	

#	YEAR-MO-DA	SUBMISSION DESCRIPTION	BY
1	2021-11-04	ISSUED FOR REVIEW	AWS
2	2021-11-17	ISSUED FOR NRCB REVIEW	JRR
3	2022-07-18	ISSUED FOR NRCB REVIEW – REV 1 MOVE CATCHBASIN NORTH	JRR
4	2022-08-16	ISSUED FOR NRCB REVIEW – REV 3 SHIFT BUILDINGS SOUTH	JRR

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#202, 4708 50th AVENUE, RED DEER, ALBERTA PH: 403-340-3022

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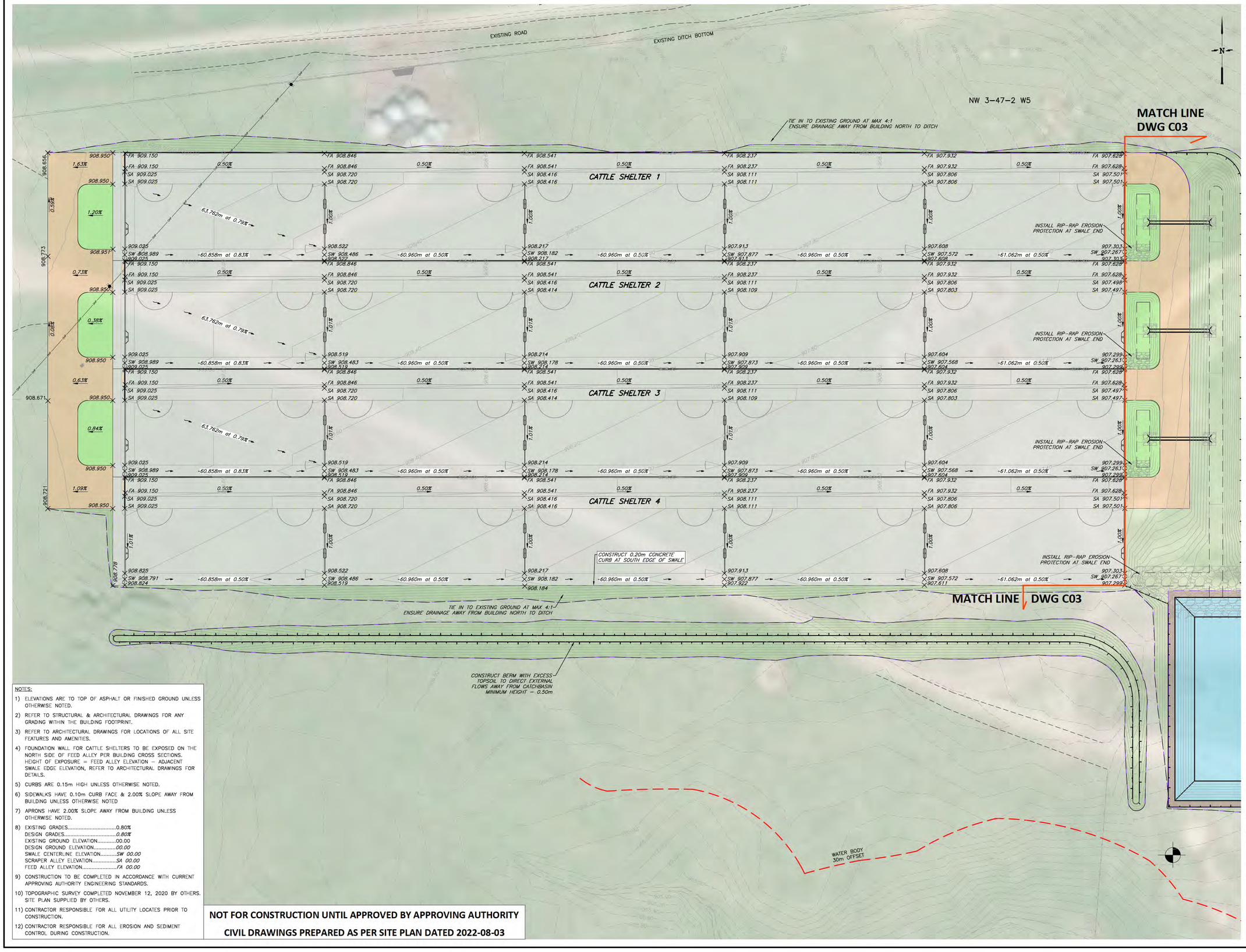
PROFESSIONAL ENGINEER ALBERTA — ERWIN QUAMME — ID 94781

PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
RM SIGNATURE:
RM APEGA ID #: 94781
DATE: August 16 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: **EAGLE BUILDERS**
PROJECT: **G&S FEEDLOT**
DRAWING TITLE: **EXISTING CONDITIONS & REMOVALS PLAN**

PROJECT NO.: 5481	DRAWN: JRR
NW 3-47-2 W5M	DESIGNED: JRR
	REVIEWED: FQ
	PLOTTED: 2022-08-16
SCALE H 1:2000 (25 50 100)	SHEET No.: 2/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER	C01

Z:\PROJECTS\5481-G&S FEEDLOT\30 - DESIGN\04 PRODUCTION SHEETS\3 C01 - EXISTING CONDITIONS & REMOVALS PLANING, LAST SAVED 2022-08-16, LAST SAVED BY JRR.ATZ



NOTES:

1) ELEVATIONS ARE TO TOP OF ASPHALT OR FINISHED GROUND UNLESS OTHERWISE NOTED.
2) REFER TO STRUCTURAL & ARCHITECTURAL DRAWINGS FOR ANY GRADING WITHIN THE BUILDING FOOTPRINT.
3) REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF ALL SITE FEATURES AND AMENITIES.
4) FOUNDATION WALL FOR CATTLE SHELTERS TO BE EXPOSED ON THE NORTH SIDE OF FEED ALLEY PER BUILDING CROSS SECTIONS. HEIGHT OF EXPOSURE = FEED ALLEY ELEVATION – ADJACENT SWALE EDGE ELEVATION, REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.
5) CURBS ARE 0.15m HIGH UNLESS OTHERWISE NOTED.
6) SIDEWALKS HAVE 0.10m CURB FACE & 2.00% SLOPE AWAY FROM BUILDING UNLESS OTHERWISE NOTED
7) APRONS HAVE 2.00% SLOPE AWAY FROM BUILDING UNLESS OTHERWISE NOTED.
8) EXISTING GRADES.....0.80%
   DESIGN GRADES.....*0.80%*
   EXISTING GROUND ELEVATION.....00.00
   DESIGN GROUND ELEVATION.....*00.00*
   SWALE CENTERLINE ELEVATION.....*SW 00.00*
   SCRAPER ALLEY ELEVATION.....*SA 00.00*
   FEED ALLEY ELEVATION.....*FA 00.00*
9) CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH CURRENT APPROVING AUTHORITY ENGINEERING STANDARDS.
10) TOPOGRAPHIC SURVEY COMPLETED NOVEMBER 12, 2020 BY OTHERS. SITE PLAN SUPPLIED BY OTHERS.
11) CONTRACTOR RESPONSIBLE FOR ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
12) CONTRACTOR RESPONSIBLE FOR ALL EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION.

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2022-08-03

STANDARD LEGEND

PROPOSED		EXISTING
	GRADING	
890.00	CONTOURS	890.00
×100.000	ELEVATIONS	×100.000
0.80%	SLOPES	0.80%
×100.000	FUTURE ELEVATIONS	
0.80%	FUTURE SLOPES	
	DEEP UTILITIES	
	SANITARY SEWER	
	STORM SEWER	
	GRATED TOP MANHOLE	
	CATCHBASIN	
	VAULT OR LARGE DIA. MH	
	HYDRANT	
	REDUCER	
	TEE	
	VALVE	
	PLUG OR CAP	
	WATER MAIN	
	INSULATION	
	SHALLOW UTILITIES	
GAS	GAS LINE	GAS
HP GAS	HIGH PRESSURE GAS LINE	HP GAS
PWR	BURIED POWER LINE	PWR
CATV / TEL	SHAW LINE / TELUS LINE	CATV / TEL
OHP	OVERHEAD POWER	OHP
F/O	FIBER OPTIC LINE	F/O
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	URD BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOG BOC	CONCRETE CURB	LOG BOC
	EDGE OF ASPHALT	
	EDGE OF GRAVEL	
	DITCH BOTTOM	
	SIGNS	
	LEGAL	
	PROPERTY LINE	
	EASEMENT	
	MISCELLANEOUS	
	FENCE	
	TREES	
	SHELTERS & CONCRETE AREAS	
	BARN & ROADS	
	LANDSCAPING	
	CATCH BASIN	

#	YEAR-MO-DA	SUBMISSION DESCRIPTION	BY
1	2021-11-04	ISSUED FOR REVIEW	JRR
2	2021-11-17	ISSUED FOR NRCB REVIEW	JRR
3	2022-07-18	ISSUED FOR NRCB REVIEW – REV 1 MOVE CATCHBASIN NORTH	JRR
4	2022-08-16	ISSUED FOR NRCB REVIEW – REV 3 SHIFT BUILDINGS SOUTH	JRR

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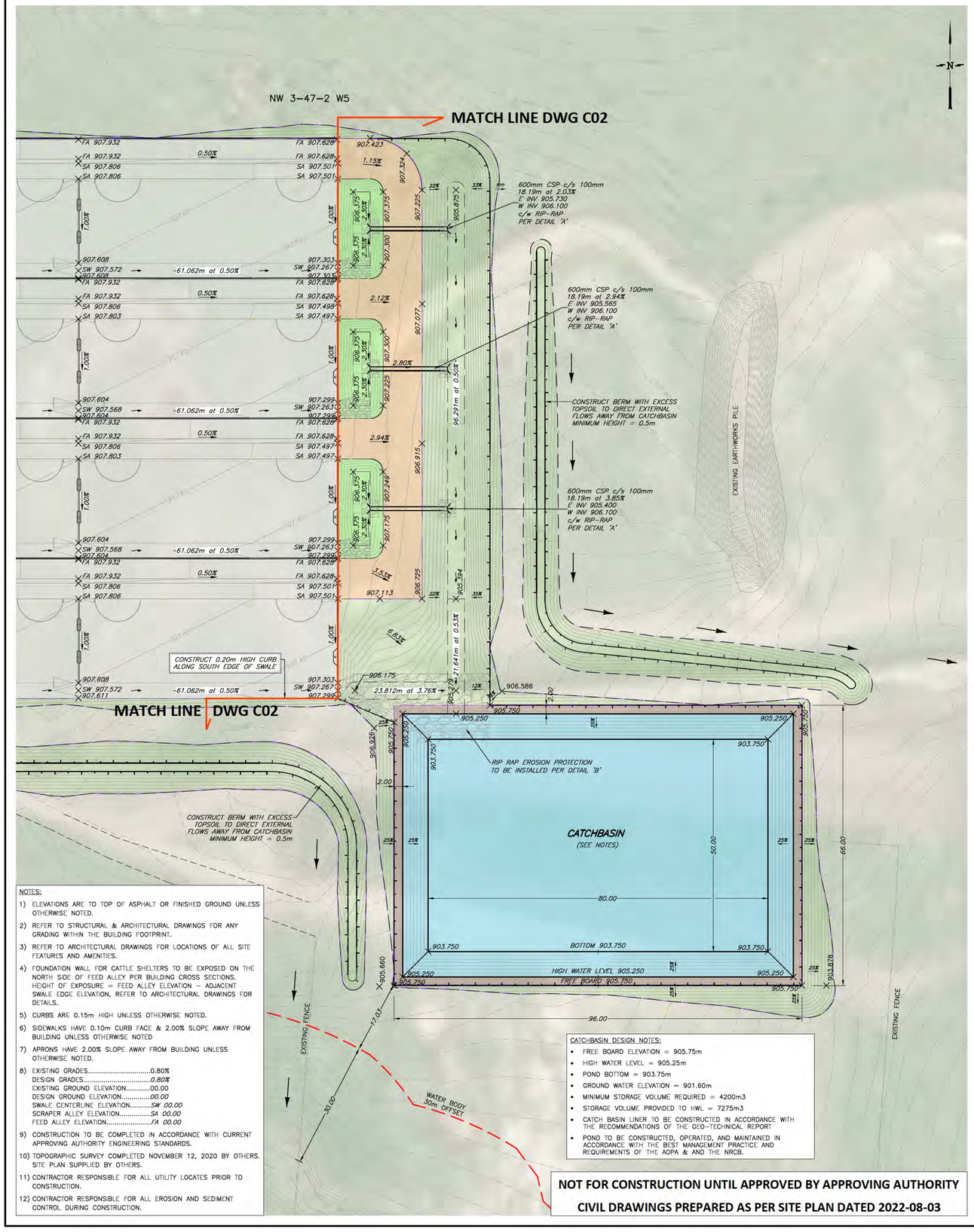
PROFESSIONAL ENGINEER ALBERTA — ERWIN QUAMME — ID 94781

PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
RM SIGNATURE:
RM APEGA ID #: 94781
DATE: August 16 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: **EAGLE BUILDERS**
PROJECT: **G&S FEEDLOT**
DRAWING TITLE: **FEED LOT GRADING PLAN**

PROJECT NO.: 5481	DRAWN: JRR
NW 3-47-2 W5M	DESIGNED: JRR
	REVIEWED: FQ
	PLOTTED: 2022-08-16
SCALE H 1:500 (5 10 20)	SHEET No.: 3/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER	C02

Z:\PROJECTS\5481-G&S FEEDLOT\3D - DESIGN\04 PRODUCTION SHEETS\3 C02 - FEED LOT GRADING PLAN.DWG, LAST SAVED 2022-08-16, LAST SAVED BY JRR(Z)



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CATCHBASIN DESIGN NOTES:

- FREE BOARD ELEVATION = 905.75m
- HIGH WATER LEVEL = 905.25m
- POND BOTTOM = 903.75m
- GROUND WATER ELEVATION ~ 901.60m
- MINIMUM STORAGE VOLUME REQUIRED = 4200m3
- STORAGE VOLUME PROVIDED TO HWL = 7275m3
- CATCH BASIN LINER TO BE CONSTRUCTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEO-TECHNICAL REPORT
- POND TO BE CONSTRUCTED, OPERATED, AND MAINTAINED IN ACCORDANCE WITH THE BEST MANAGEMENT PRACTICE AND REQUIREMENTS OF THE AOPA & AND THE NRCB.

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2022-08-03

Culvert Sizing Calculations	Project:	5481-G&S Feedlot	By:	JRR	Date:	2021-11-16	Location:	Wetaskiwin County	Rev 1

		Catchment		Design Storm		Q = 2.78 CIA		Culvert								
Culvert Name	Contributing Area A (ha)	Run-off Coefficient C	Time of Concentration t min	1:5 YR mm/hr	1:100 YR mm/hr	1:5 YR L/s	1:100 YR L/s	Diameter mm	Mannings' 'n'	Pipe Area m2	Wetted Perimeter m	Slope m/m	# of Culverts	Velocity V= m/s	Capacity Q= L/s	Percent Full 1:5 YR	Percent Full 1:100 YR
A	1.073	0.90	10	74.9	141.9	201	381	600	0.013	0.283	1.884	0.0203	1	3.094	874	23%	44%
B	1.073	0.90	10	74.9	141.9	201	381	600	0.013	0.283	1.884	0.0294	1	3.724	1052	19%	36%
C	1.073	0.90	10	74.9	141.9	201	381	600	0.013	0.283	1.884	0.0385	1	4.261	1204	17%	32%

Catch Basin Dimension Calculator

For more information on runoff control catch basin design consideration including liner options, catch basin protection, etc., check out the catch basin factsheet.

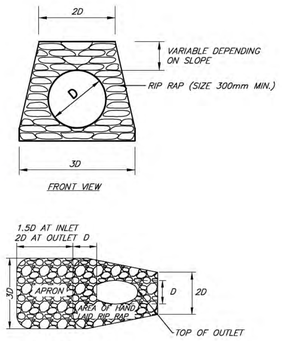
Name G&S Feed Lot
Land Location NW 3-47-2 W5

Estimating Runoff Potential

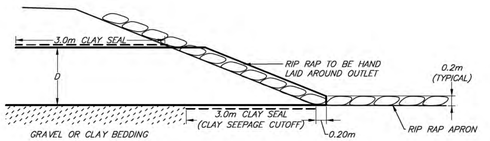
Area	Length (m)	Width (m)	Paved?	Area (m^2)
1	305	132	YES	40260.00
2	37	140	NO	5180.00
3	16	46	NO	736.00
4	109	77	YES	8393.00
	Total Area			54569.00

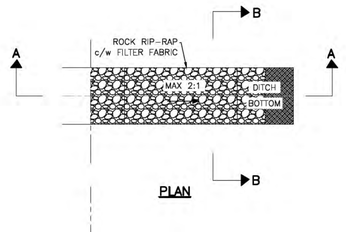
Estimation of water runoff to be collected in the catch basin:

4176.21 m^3
147481 ft^3
918637 Imp. Gal



A D01 RIP-RAP CULVERT END PROTECTION
SCALE: N.T.S.





B D01 RIP-RAP OUTLET/CHANNEL REINFORCEMENT
SCALE: N.T.S.

RIPRAP GEOTEXTILE MIN. SPECIFICATION
- NON-WOVEN GEOTEXTILE
- GRAB TENSILE (N) 900 ASTM D4632
- TEAR (N) 350 ASTM D4533
- PUNCTURE (N) 550 ASTM D6241
- MULLEN BURST (kPa) 2400 ASTM D3786
- ELONGATION (FAILURE) 50% ASTM D4632

NON-WOVEN GEOTEXTILE SPECIFICATION
1. THE SLOPE SHALL BE GRADED TO PROVIDE A SMOOTH, UNIFORM SURFACE.
2. THE NON-WOVEN GEOTEXTILE FILTER FABRIC SHALL BE LAID PARALLEL TO THE SLOPE DIRECTION.
3. THE MINIMUM NON-WOVEN GEOTEXTILE FILTER FABRIC LAP SHALL BE 400mm, EXCEPT WHERE PLACED UNDERWATER THE MINIMUM LAP WIDTH SHALL BE 1m. OVERLAPS SHALL BE PINNED USING 6mm DIAMETER STEEL PINS FITTED WITH WASHERS AND SPACED AT 1m INTERVALS ALONG THE OVERLAPS.
4. THE TOP EDGE OF THE NON-WOVEN GEOTEXTILE FILTER FABRIC SHALL BE ANCHORED BY DIGGING 300mm DEEP TRENCH, INSERTING THE TOP EDGE OF THE NON-WOVEN GEOTEXTILE FILTER FABRIC AND BACKFILLING WITH COMPACTED SOIL.
5. CARE SHALL BE TAKEN TO PREVENT PUNCTURING OR TEARING THE NON-WOVEN GEOTEXTILE FILTER FABRIC. ANY DAMAGE SHALL BE REPAIRED BY USE OF PATCHES THAT EXTEND AT LEAST 1m BEYOND THE PERIMETER OF THE TEAR OR PUNCTURE.
6. HEAVY ROCK RIPRAP PLACEMENT SHALL COMMENCE AT THE BASE OF THE BLANKET AREA AND PROCEED UP THE SLOPE.
7. THE HEAVY ROCK RIPRAP SHALL BE HANDLED, DUMPED OR PLACED INTO POSITION TO CONFORM TO THE SPECIFIED GRADATION AND TO THE CROSS SECTION SHOWN ON THE DRAWINGS. THE FINISHED SURFACE SHALL BE REASONABLY UNIFORM, FREE FROM BUMPS OR DEPRESSIONS, AND WITH NO EXCESSIVELY LARGE CAVITIES BELOW OR INDIVIDUAL STONES PROJECTING ABOVE THE GENERAL SURFACE.

NON-WOVEN GEOTEXTILE FILTER FABRIC REQUIREMENTS		
REQUIRED PHYSICAL PROPERTY	TEST METHOD	MINIMUM MARV REQUIRED CLASS 1M, 1, 2, AND 3
GRAB STRENGTH	ASTM D4632	900 N
ELONGATION (FAILURE)	ASTM D4632	50%
CBR PUNCTURE STRENGTH	ASTM D6241	550 N
TRAPEZOIDAL TEAR	ASTM D4533	350 N

NOTES:
CLASS 1 ROCK RIPRAP c/w FILTER FABRIC
100% SMALLER THAN 450mm
AT LEAST 20% LARGER THAN 350mm
AT LEAST 50% LARGER THAN 300mm
AT LEAST 80% LARGER THAN 200mm

STANDARD LEGEND

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890.00	CONTOURS	890.00
×100.000	ELEVATIONS	×100.000
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	SHALLOW UTILITIES	
GAS	GAS LINE	GAS
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PWR	BURIED POWER LINE	PWR
CATV / TEL	SHAW LINE / TELUS LINE	CATV / TEL
OHP	OVERHEAD POWER	OHP
F/O	FIBER OPTIC LINE	F/O
	TRANSFORMER	
	TELUS PEDESTAL	
	SHAW PEDESTAL	
	TELUS/SHAW PEDESTAL	
	3 PARTY PEDESTAL	
	URD BOX	
	POWER POLE	
	LIGHT POLE	
	ROADWAYS	
	CENTERLINE	
LOC / BOC	CONCRETE CURB	LOC / BOC
	EDGE OF ASPHALT	
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	DITCH BOTTOM	
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	FENCE	
	TREES	
	SHELTERS & CONCRETE AREAS	
	BARN & ROADS	
	LANDSCAPING	
	CATCH BASIN	

#	YEAR-MO-DA	SUBMISSION DESCRIPTION	BY
1	2021-11-04	ISSUED FOR REVIEW	JRR
2	2021-11-17	ISSUED FOR NRCB REVIEW	JRR
3	2022-07-18	ISSUED FOR NRCB REVIEW – REV 1 MOVE CATCHBASIN NORTH	JRR

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#202, 4708 50th AVENUE, RED DEER, ALBERTA PH: 403-340-3022

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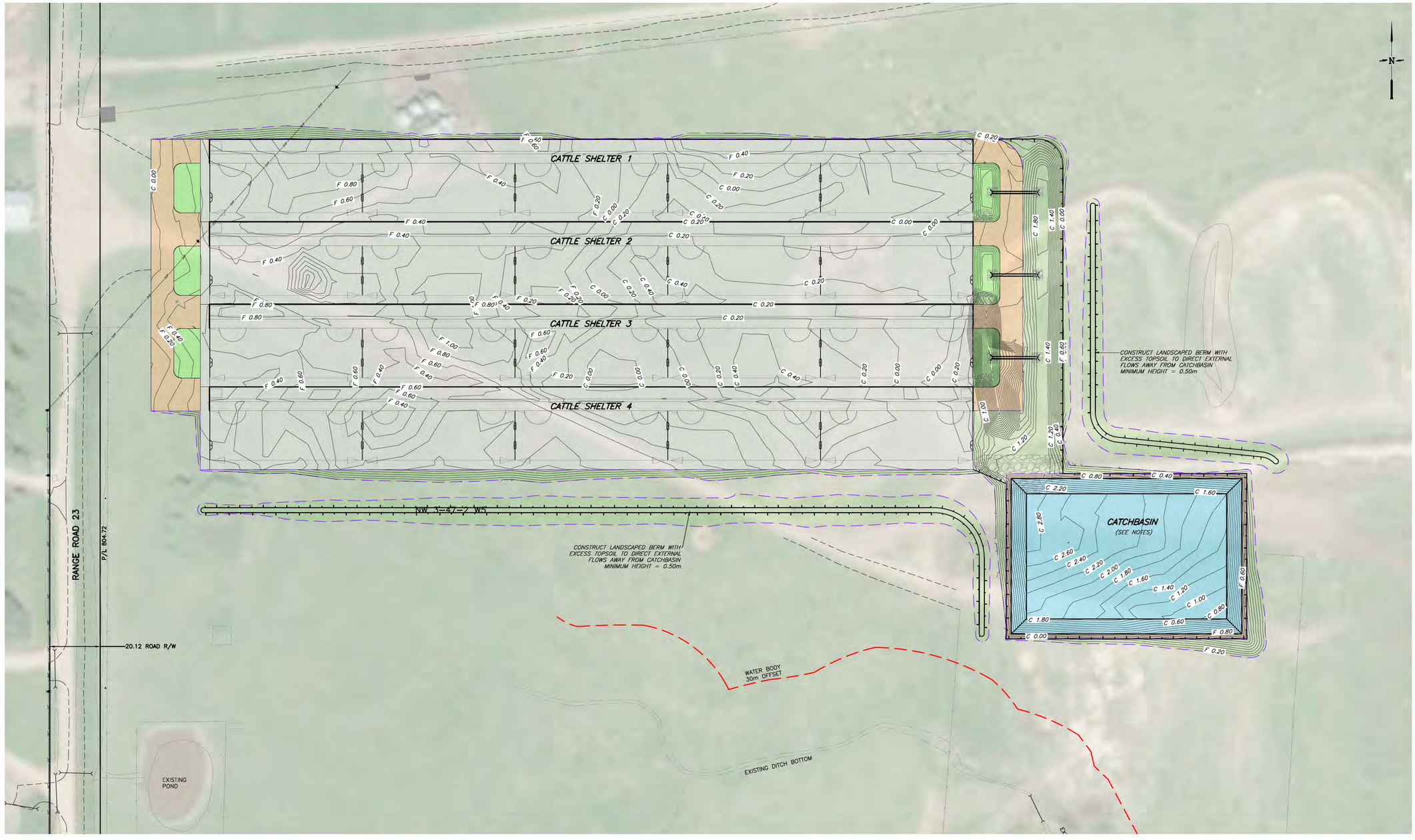
PROFESSIONAL ENGINEER ALBERTA — ERMIN QUAMME — ID 94781 — PERMIT TO PRACTICE — 2022 AUG 16

PERMIT TO PRACTICE
AL-TERRA ENGINEERING (RED DEER) LTD.
RM SIGNATURE:
RM APEGA ID #: 94781
DATE: August 16 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: **EAGLE BUILDERS**
PROJECT: **G&S FEEDLOT**
DRAWING TITLE: **CATCHBASIN GRADING PLAN**

PROJECT NO.: 5481	DRAWN: JRR
NW 3-47-2 W5M	DESIGNED: JRR
	REVIEWED: FQ
	PLOTTED: 2022-08-16
SCALE H 1:500 (5 10 20)	SHEET No.: 4/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER	C03

Z:\PROJECTS\5481-G&S FEEDLOT\DWG\C03 - CATCHBASIN GRADING PLAN.DWG, LAST SAVED 2022-08-16, LAST SAVED BY JRR472.



NOTES:

1) EARTHWORKS VOLUME ESTIMATE (UNADJUSTED FOR SHRINK / SWELL):

TOTAL:
FILL = 15,850 cu.m.
CUT = 17,880 cu.m.
NET = 2,030 cu.m. (CUT)

EARTHWORKS VOLUMES ARE TO SUBGRADE BASED ON PROVIDED STRUCTURES BELOW AND IT WAS ASSUMED THAT 100mm OF TOPSOIL/SITE STRIPPING IS REQUIRED. WHERE THE ACTUAL STRUCTURES DIFFER FROM THE STRUCTURE SHOWN BELOW OR TOPSOIL STRIPPING DIFFERS, VOLUMES WILL NEED TO BE ADJUSTED ACCORDINGLY.

2) STRUCTURE AREAS FOR CUT FILL PURPOSES (APPROXIMATE):
a. SHELTERS & CONCRETE AREAS = 175mm x 40,702m²
b. GRAVEL = 150mm x 2906m²
c. LANDSCAPE = 100mm x 7083m²
d. POND = 00mm x 6174m²

APPROX. TOPSOIL VOLUME (100mm DEPTH) = 5,500m³

3) THE CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
4) THE CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL AND SILT PREVENTION DURING CONSTRUCTION.
5) DUE TO THE POTENTIAL VARIABILITY OF SITE CONDITIONS, CONSTRUCTION METHODS AND MATERIALS, AND SURVEY THESE QUANTITIES SHOULD BE CONSIDERED ESTIMATES AND DISCRETION SHOULD BE APPLIED IN THEIR USE.
6) THE VOLUMES SHOWN ABOVE DO NOT ACCOUNT FOR CONSTRUCTION OF A CLAY LINER.

SHELTERS & CONCRETE AREAS
BARN & ROADS
LANDSCAPING
CATCH BASIN

NOT FOR CONSTRUCTION UNTIL APPROVED BY APPROVING AUTHORITY

CIVIL DRAWINGS PREPARED AS PER SITE PLAN DATED 2022-08-03

STANDARD LEGEND

PROPOSED		EXISTING
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RM SIGNATURE:
RM APEGA ID #: 94781
DATE: August 16 2022
PERMIT NUMBER: P7355
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CLIENT: **EAGLE BUILDERS**
PROJECT: **G&S FEEDLOT**
DRAWING TITLE: **CUT/FILL PLAN**

PROJECT NO.:	5481	DRAWN:	JRR
NW 3-47-2 W5M		DESIGNED:	JRR
		REVIEWED:	FQ
		PLOTTED:	2022-08-16
SCALE H 1:750 (10 20 40)		SHEET No.:	5/5
NOT TO SCALE UNLESS PLOTTED ON ARCH D PAPER		C04	

Z:\PROJECTS\5481-G&S ITTER\DWG - DESIGN\04 PRODUCTION\SHEETS\5 C04 - CUT-FILL PLAN.DWG, LAST SAVED 2022-08-16, LAST SAVED BY JRR472

Union Street Geotechnical

9th November, 2021
File No. USG1177.1

Eagle Builders LP
27312 - 17 Twp. Rd. 394
Aspelund Industrial Park
Blackfalds, Alberta
T0M 0J0

ATTENTION: Mr. Craig Haan, Project Manager

Dear Mr. Haan,

SUBJECT: G & S Cattle Ltd.
Proposed Confined Feedlot Expansion
N.W. ¼ of 03-47-02 W5
Wetaskiwin County, Alberta

1 INTRODUCTION

Union Street Geotechnical Ltd. (Union Street) was retained by Eagle Builders LP (Eagle Builders) to perform a field investigation, and subsequent laboratory testing on the subgrade, to aid in the design and construction of a proposed confined feedlot expansion at G & S Cattle Ltd. located within the N.W. ¼ of 03-47-02 W5 in Wetaskiwin County, Alberta, as shown on Drawing No. A1. Seven boreholes were advanced in the proposed pen and catch basin development footprint for liner design purposes. Based on the boreholes advanced, it was determined that the upper subgrade is predominantly composed of till overlying mudstone.

2 PREVIOUS INVESTIGATIONS

A previously completed geotechnical investigation letter, completed by Union Street Geotechnical Ltd., was provided by the client.

- Tomaszewski, Neil, Wilson, Joshua, *"Proposed Feedlot Expansion, N.W. 03 & N.E. 04 of 47-02 W5, Wetaskiwin County, Alberta"*, prepared for Mr.

4726 - 78A Street Close
Red Deer, Alberta
T4P 2J2

Bus: 403-350-9688
www.unionstreetgeo.ca

Craig Haan of Eagle Builders LP by Union Street Geotechnical Ltd., File No. USG1177, 21 June, 2021.

The findings of the referenced report indicated the till subgrade in Borehole BH102 at 0.91 m below grade had a permeability value of 3.54 x 10^{-8} cm/s and was suitable to use as a native liner for feedlot pens. During the second investigation, Union Street encountered a similar stratigraphy, till overlying mudstone, to that previously encountered.

3 DESCRIPTION OF THE PROJECT AND SITE

3.1 SITE DESCRIPTION

The site is located approximately 3.2 km northwest of the intersection of Highway 771 and Township Road 470, within the N.W. ¼ of 03-47-02 W5 in Wetaskiwin County, Alberta, as shown on Drawing No. A1. The proposed feedlot development site within the N.W. ¼ was relatively flat draining to a gully to the south with the geological drainage of the area sloping east/northeast towards Pigeon Lake, located approximately 4.0 km northeast of the site.

The proposed development footprint is currently utilized as agricultural land, or for agricultural activities, and is bordered by agricultural land to the north, east, and south, with the existing G & S Cattle Ltd. feedlot located across Range Road 23 to the west. Photographs depicting the proposed feedlot footprint are attached to this report.

3.2 PROPOSED DEVELOPMENT

The proposed development consists of feedlot pens, catch basin, and infrastructure typically associated with a development of this type. Specific development details are unknown at the time of this report writing but are assumed to be typical to those in the area and for developments of this nature.

Recommendations contained in this report have been given for the above described development and those typical of a development of this nature. If there are any changes to the proposed development, or their locations, these changes should be

reviewed by Union Street personnel to confirm the applicability of this report to the revised development plans.

4 FIELD INVESTIGATION AND LABORATORY ANALYSIS

The field investigation program included drilling seven boreholes at the locations shown on Drawing No. A2. The borehole locations were established by Union Street personnel based on a discussion with the owner, proposed development footprint, utility clearance, and access. No formal surveying of the borehole locations or site were completed and therefore, all drawings, locations, measurements, and legal descriptions are approximate and conceptual in nature.

On 30th September, 2021, seven boreholes (designated as BH101 to BH107) were advanced using a track-mounted auger drill utilizing 150 mm diameter, continuous flight augers, operated by All Type Drilling Ltd. The boreholes were advanced to depths ranging from 1.83 m to 7.62 m below ground surface.

4.1 GENERAL STRATIGRAPHY

The subsurface conditions were relatively uniform in all seven borehole locations for liner design purposes. In general, and to the depths drilled, the soil conditions encountered at the borehole locations generally consisted of, in descending order; topsoil, till, and mudstone. Topsoil was encountered at surface in all seven boreholes but was thin, barely discernible, and was considered negligible. Till, with varying clay, silt, and sand content was generally encountered underlying the topsoil in the boreholes which extended to an average depth of 1.83 m below grade in the pen footprint (Boreholes BH101 to BH104) and 4.73 m below grade in the catch basin footprint (Boreholes BH105 to BH107). It was yellowish brown (10YR 5/8) to very dark grey (10YR 3/1), oxidized, moist, firm to hard, massive, contained gravel, silt pocket, and coal chip inclusions, and was calcareous. An approximately 1.83 m thick sand seam was encountered overlying the till in Borehole BH103. Mudstone was encountered underlying the till in all seven boreholes which extended to the maximum exploration depth. The mudstone generally consisted of silty, sandy clay. Observations made during the field investigation, visual descriptions of the soils, and the results of laboratory analysis are presented in the attached Borehole Logs and

Laboratory Test Results.

Undisturbed samples were collected within the till encountered in Borehole BH102 to aid in the proposed feedlot liner design and within the till encountered in Borehole BH105 to aid in the catch basin liner design. Sample NT3B, obtained from Borehole BH102 at 0.76 m below grade, was submitted for hydraulic conductivity testing which indicated a permeability value of 4.51×10^{-8} cm/s. Sample NT12, obtained from Borehole BH105 at 4.57 m below grade, was submitted for hydraulic conductivity testing which indicated a permeability value of 7.44×10^{-9} cm/s.

Two MUSC tests were performed on till samples obtained from Boreholes BH101 and BH106. The MUSC results are summarized in Table 3.1.

TABLE 3.1: SUMMARY OF TILL MODIFIED UNIFIED SOILS CLASSIFICATION TEST RESULTS

Sample No. and Depth	Borehole No.	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Moisture Content (%)	MUSC – Soil Type
NT1 - 0.76 m	BH101	41.5	15.6	25.9	19.6	CI
NT18 - 0.76 m	BH106	42.8	14.2	28.6	16.5	CI
Average:		42.2	14.9	27.3	18.1	CI

Based on the results in Table 3.1 the till has an average MUSC of "CI" - Silts or Clays of medium plasticity.

Two Particle Size Analyses (PSA's) and two Mechanical Wash Sieves (MWSs) were performed on till samples obtained from Borehole BH101, BH103, BH105, and BH106. The MWS sieve results are summarized in Table 3.2.

TABLE 3.2: SUMMARY OF TILL MWS AND PSA TEST RESULTS

Sample No. and Depth	Borehole No.	Gravel Content (%)	Sand Content (%)	Silt Content (%)	Clay Content (%)
NT1 - 0.76 m	BH101	0.8	40.0	59.2	
NT5 - 0.76 m	BH103	0.0	49.4	16.3	34.3
NT11 - 3.81 m	BH105	0.0	19.8	31.0	49.2
NT18 - 5.33 m	BH106	2.3	29.8	67.8	
Average:		**0.8**	**34.7**	**27.7**	**36.8**

Notes:
1 - The fines results of NT1/NT18 were split 50/50 in the average.

Cobbles and boulders were not encountered during drilling, but as till is a heterogeneous mixture of all grain sizes, cobbles and boulders may be encountered during construction.

4.2 GROUNDWATER

Seepage was not observed during drilling, however, four piezometers were installed following drilling activities. The groundwater elevation was recorded on the 14th October, 2021, 14 days following drilling, and the results are summarized in Table 3.3.

TABLE 3.3: SUMMARY OF GROUNDWATER MEASUREMENTS

Borehole No.	Borehole Depth (m)	Groundwater Level[1] (m), 14th October, 2021
BH101	3.05	Dry
BH102	3.05	3.03
BH105	7.62	4.97
BH106	6.10	2.97
Average:		**3.66**

Notes:
1 - Below existing grade.

Based on seepage encountered during drilling and the groundwater elevations recorded in the piezometers, the average groundwater table is likely (approx.) 2.9 m to 3.9 m below ground surface. Groundwater levels are subject to meteorological

events, seasonal variations, site gradient, and other salient factors resulting in the water table varying with time.

5 REFERENCES

The following was referenced while composing this letter:

- Province of Alberta, "*Agricultural Operation Practices Act and Regulations*", Revised Statutes of Alberta 2000, Chapter A-7, Alberta Queen's Printer, 2010;
- Province of Alberta, "*Agricultural Operation Practices Act and Regulations*", Standards and Administration Regulation, Part 2, Alberta Queen's Printer, 2017;
- Alberta Government, "*Catch Basin Design and Management*", Technical Guideline Agdex 096-101, August 2012; and,
- Natural Resources Conservation Board, "*Determining Equivalent Protective Layers and Constructed Liners*", Technical Guideline Agdex 096-61, May 2013.

6 FEEDLOT PENS

6.1 STRIPPING

All organic soil, vegetation, sand, etc. should be stripped from the feedlot footprint prior to the start of feedlot grading construction activities.

6.2 NATURALLY OCCURRING LINER

The Natural Resources Conservation Board (NRCB) requires naturally occurring protective layers for solid manure collection and storage facilities, such as feedlots, to have a minimum thickness of 2.0 m and a maximum hydraulic conductivity of 1.0×10^{-6} cm/s. Based on the average thickness of the till stratum encountered in the four boreholes advanced in/near the proposed feedlot footprint, 1.83 m, and the

factored hydraulic conductivity test result of the till in Borehole BH102, $4.51x10^{7}$ cm/s, the encountered native till in the vicinity of Borehole BH102 meets the naturally occurring protective layer requirement utilizing a liner equivalency of 0.70 m thick.

6.3 Compacted Soil Liner

The NRCB requires compacted soil liners for solid manure collection and storage facilities, such as feedlot pens, to have a minimum thickness of 0.5 m and a maximum hydraulic conductivity of $5.0x10^{-7}$ cm/s. A hydraulic conductivity analysis was performed on a native till sample obtained from Borehole BH102 at 0.76 m below grade and which had a factored result of $4.51x10^{-7}$ cm/s at a dry density of 1,818 kg/m^3. Native till utilized as fill obtained from the vicinity of Borehole BH102 compacted to a minimum 1,818 kg/m^3 dry density at ±18.2% moisture content will be suitable as a soil liner across the feedlot and meets NRCBs soil liner requirement.

If a compacted soil liner is utilized, the NRCB requires the bottom of the soil liner to be equal or greater than 1.0 m from the groundwater table at the time of construction.

6.4 Concrete Liner

The client has indicated that the pens will likely utilize a concrete liner. If concrete is utilized, it must offer the equivalent protection of a 0.50 m thick soil liner with a permeability of not more than $5.0x10^{-7}$ cm/s. The type of concrete proposed for the liner is unknown at this time, but is expected to well exceed this requirement.

6.5 Grading

The base of the pens must be positively graded, to ensure liquids don't pond on the subgrade, to a catch basin or other runoff control system. It is assumed that till, from cut/fill grading activities, will be utilized during construction if fill is required. The native till encountered is recommended for areas requiring structural fill.

Fill, composed of native till, should be placed in lifts not exceeding 200 mm and compacted to a minimum 98% of its Standard Proctor Dry Density (SPDD) at moisture contents ±2% of optimum for general grading (fill utilized for liners should be compacted to a higher density). The local soils may require moisture conditioning

to achieve the required degrees of compaction. The degree to which moisture conditioning of the fill would be required may vary with the local soils and construction season. There may also be some localized areas where the native soils may require drying, or blending with drier soils, in order to achieve the required degrees of compaction.

7 CATCH BASIN

7.1 CAPACITY

For preliminary design purposes, the design volume of the catch basin must have a storage capacity that can accommodate a 1 in 30 year rainfall. For the Calmar region a 1 in 30 year event equates to approximately 95 mm of rainfall. The drainage area of the feedlot, including the proposed catch basin, is approximately 80,000 m^2. The following was utilized to determine the catch basins minimum required capacity.

$$V_{30} = D_A \times R_{30} \times C_R$$

Where:

V_{30} = One Day Rainfall Volume (m^3);
D_A = Drainage Area (m^2);
R_{30} = One Day Rainfall (m); and,
C_R = Runoff Coefficient (1.0 for a paved area).

Based on the referenced formula, it has been determined that the expected one day rainfall volume for the site is approximately 7,600 m^3. However, to ensure the liners integrity due to drying out and cracking, and to increase the timeframe between emptying, the design capacity of the catch basin should be greater than the 1 in 30 year rainfall volume. Union Street recommends increasing the total volume capacity by approximately 60% of the 1 in 30 year rainfall minimum volume to approximately 12,160 m^3.

The catch basin must have a marker that is clearly visible at all times indicating the minimum volume required to accommodate a 1 in 30 year one day rainfall event.

7.2 Sizing & Location

Based on a drawing provided by the client, it is understood that the proposed catch basin will be 90 m by 60 m by 4.0 m deep. These dimensions provide a total capacity of 15,168 m^3, but accounting for the required 0.5 m of freeboard, will provide a design capacity of 12,579 m^3.

The proposed catch basin location is shown on Drawing No. A2. This location was selected by the client.

The size and capacity of the catch basin may change depending on the liner option selected as, for example, a synthetic liner may allow a deeper catch basin, allowing a reduced footprint, reducing the required capacity. Therefore, although the general footprint will remain similar, the size and location of the catch basin shown on the attached drawing may slightly differ from that actually constructed.

7.3 Stripping

All organic soil and vegetation should be stripped from the catch basin footprint prior to the start of catch basin construction activities.

7.4 Catch Basin Excavation

All till material from the catch basin excavation that is determined to be suitable for reuse should be stockpiled.

The banks of the catch basin should be cut at no steeper than 3H:1V. The capacity of the catch basin should designed ensuring a minimum 0.5 m freeboard. It is the responsibility of the contractor to remove water from trenches and excavations, regardless of origin. If while constructing the slopes of the catch basin subsurface, groundwater begins eroding the slopes and entering the catch basin, construction will need to be halted immediately and dewatering techniques will need to be implemented before construction continues. It is anticipated that potential groundwater problems can be resolved with well graded ditching and the installation of subgrade sumps around the perimeter of the site. If extreme groundwater seepage becomes present, more advanced dewatering techniques can be implemented. Although possible, it is not expected that seepage and sloughing will be encountered

during construction unless excavations exceeds 2.97 m in depth.

Pumps and other materials necessary to keep the excavation free of water while work is in progress should be provided. Provisions should be made in case of accidental stoppage of dewatering equipment to prevent damage to the work area. The excavations must be protected against flooding and damage from surface run-off. Water removed from the site is to be disposed of in a manner that will not damage the work area or other property or persons.

Materials will be excavated and removed to the depths necessary for the construction of the structure and drainage system. Care must be taken to minimize the disturbance to the supporting soil. After the excavation has been shaped, any over-excavated areas will be backfilled and compacted to a density equal to or greater than the undisturbed soil. All slopes in the subgrade are to be uniform and in a condition suitable for a catch basin.

7.5 EMBANKMENTS AND FILL

An embankment/berm is recommended to be constructed around the perimeter of the feedlot to divert and minimize surface runoff from outside the operation from flowing into the catch basin. Additionally, a berm is recommended along the perimeter of the catch basin to prevent accidental effluent release outside of the operation and ensure a minimum 0.5 m freeboard. The exterior slope of a catch basin wall should be no steeper than 4H:1V. Any fills required can be constructed from the till subgrade encountered on-site. If an insufficient quantity of suitable on-site subgrade fill is not available, it will have to be analyses, imported, and compacted.

Areas requiring fills will be uniformly graded, scarified and re-compacted to the necessary density prior to being filled. Common excavated materials will be placed in the embankments, and in over-excavations if approved by the Geotechnical Engineer. Fills should be placed in lifts not exceeding 200 mm and compacted to minimum 98% of the SPDD at ±2% Moisture. Fill material may require moisture conditioning prior to compaction.

7.6 LINER

7.6.1 Naturally Occurring Soil Liner

Following a review of the referenced NRCB documentation, it is understood that a naturally occurring protective layer for a catch basin must have a minimum thickness of 5.0 m and a maximum hydraulic conductivity of $1.0x10^{-6}$ cm/s. Additionally, the groundwater table must be 1.0 m below the bottom of the naturally occurring liner. Laboratory testing was conducted on an undisturbed till sample in Borehole BH105 indicating a hydraulic conductivity of $7.44x10^{-9}$ cm/s. However, NRCB requires laboratory permeability results to be reduced by an order of magnitude. When reduced by this magnitude, the design hydraulic conductivity of the till in the catch basin location is assumed to be $7.44x10^{-8}$ cm/s. Based on the average thickness of the till stratum encountered in Boreholes BH105 to BH107 (boreholes advanced in/near the proposed catch basin footprint) and the factored hydraulic conductivity of the till, 4.73 m and $7.44x10^{-8}$ cm/s respectively, a naturally occurring till layer 0.36 m thick offers the equivalent protection of a 5.0 m thick layer with a permeability of $1.0x10^{-6}$ cm/s. However, a naturally occurring layer that is thinner than the regulations, but meets the hydraulic conductivity requirements indicated above, must be at least 0.5 m thick to ensure the layer's structural integrity.

Once the lagoon is excavated, it is recommended that the exposed surface is compacted with a packer weighing a minimum 3,500 kg.

If a naturally occurring soil layer is utilized, the NRCB requires the bottom of the soil liner to be equal or greater than 1.0 m from the groundwater table at the time of construction.

7.6.2 Compacted Soil Liner

A compacted soil liner could be utilized at this site, but as the till's naturally occurring permeability meets the referenced requirements, it is likely that the owner will utilize the naturally occurring soil as a protective layer. If utilized or required in specific areas, where sand pockets have been excavated or for a berm for example, the fill, comprised of native till excavated from the catch basin, can be used as a compacted soil liner.

It is understood that a compacted soil liner must offer the equivalent protection of a minimum 1.0 m thick liner with a maximum hydraulic conductivity of $5x10^{-7}$ cm/s.

A flexible wall permeameter analysis performed on a sample of the till obtained from Borehole BH105 at a dry density of 1,823 kg/m^3 indicated a factored hydraulic conductivity of $7.44x10^{-8}$ cm/s. Therefore, a 0.5 m thick compacted soil liner compromised from the encountered native till in Borehole BH105, compacted to a minimum 1,823 kg/m^3 with a moisture content within +2% of 17.8%, is recommended as it offers equivalent protection to the referenced regulation.

For clay liners, the bottom of the liner must be at least 1.0 m from the groundwater table at the time of construction.

7.6.3 Geomembrane

A synthetic liner could also be utilized for the proposed catch basin. If utilized, all geomembrane products should be handled, stored, and placed in accordance with the manufacturer's recommendations. Materials should be stored so that they do not come into contact with substances that may affect their physical or chemical properties such as fuel, exhausts, or petroleum products.

The installation contractor should be a contractor approved by the civil engineer who is trained to install the manufacturer's geomembrane. Installation should be performed by personnel experienced in seaming the materials under the constant supervision of the manufacturer. It is recommended that the installation contractor provide a written report on the completed installation certifying that the liner was installed in accordance with the requirements of the manufacturer's specifications, the liner is ready for operation, and the warranty is in effect.

Geotextiles should be sufficiently anchored and deployed in a manner that will reduce folds and wrinkles. In the presence of wind, geotextiles should be weighted with sandbags or equivalent ballast. Geotextiles are to be cut using an approved cutter. Care should be taken in the installation process not to entrap excessive dust or stones that could damage the geomembrane.

The contactor should submit a panel layout proposal for the geomembrane to the

engineer prior to the geomembrane placement. Care should be taken in the method used to unroll the panels so that damage to the liner or the supporting soil and/or geomembrane. Sand bags or equivalent ballast that will not damage the liner should be placed on the liner to prevent uplift. No equipment or tools that could damage the liner or underlying surfaces by handling or other means should be used. No personnel working on the liner will wear damaging shoes or engage in activities that could harm the liner, including smoking. All defects and damage will be documented and marked for repair. Repairs will be conducted in a manner suitable to the geomembrane manufacturer.

No NRCB technical specifications regarding synthetic liner were found. If utilized, it is recommended to discuss the liner requirements with the manufacturer and once a product has been selected, to discuss the technical specifications with the NRCB.

Pumping may be required during liner placement if the excavation starts to fill with groundwater. It is recommended that the means be available to prevent "bubbling" of the liner if groundwater starts to form below the liner in the catch basin footprint.

Seepage and sloughing may be encountered in the till subgrade depending upon the base elevation of the catch basin.

If a synthetic liner is utilized, the NRCB requires the bottom of the liner to be equal or greater than 1.0 m from the groundwater table at the time of construction.

7.7 Quality Control / Quality Assurance

As part of the quality control program, it is recommended that a geotechnical engineer or representative be on-site to inspect the excavation and compaction required. The geotechnical engineer will be able to provide immediate on-site recommendations to potential difficulties that may arise during construction.

7.8 Inlet Pipe

It is likely that a single inlet pipe will be utilized for the construction of the catch basin. The inlet pipe must be sealed to ensure liquid manure doesn't seep back along the pipe extrusion, creating a potential source of contamination. Bentonite chips or concrete are typically utilized around the inlet pipe to create the required seal.

7.9 EROSION

Due to the catch basin's size or liner type, these measures may not be necessary, but unchecked erosion can lead to slope and berm failure and erosion preventative measures may be required. Placing riprap is normally the most cost effective erosion protection material, placed on the waterward side, due to its effectiveness, durability and availability.

Additionally, exposed soil should be graded to the required slope, overlain with topsoil, and seeded or hydroseeded with grass. Trees and shrubs planting is not recommended as tree roots detrimentally affect berms by root penetration and shrubs cause obstructions in viewing piping, seepage, and burrowing animals. The vegetation will serve to protect the upper portions of the slope from erosion by surface runoff water and will also increase the stability of the slope. The grass should be trimmed regularly as to not obstruct the inspectors view.

7.10 FENCE

It is recommended that continuous fencing around the perimeter of the catch basin is constructed. A fence will help prevent unauthorized entry to the catch basin and will also help reduce the detrimental effects of burrowing animals such as beavers, muskrats, gophers, etc.

7.11 INSPECTIONS

It is the responsibility of the owner to conduct routine and periodic inspections and to maintain and repair the catch basin to acceptable standards. It is recommended that the catch basin is inspected on a regular basis or as per the Natural Resources Conservation Board. The inspector shall note, but not be limited to noting, the presence or absence of settlement, seepage, burrowing animals, erosion, freeboard level, erosion protection performance and condition, fence condition, vegetation growth that my lead to a decreased performance of the liner, and general berm and catch basin condition.

8 CLOSURE

Union Street Geotechnical Ltd. prepared this report for the exclusive use of Eagle Builders LP, and their agents, to aid in the design and construction of the proposed G & S Cattle Ltd. feedlot located within the N.W. ¼ of 03-47-02 W5 in Wetaskiwin County, Alberta. The content reflect Union Street's best judgement available to it at the time of preperation. Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibility of such third party and Union Street accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Our recommendations and conclusions are based upon the information obtained from the subsurface exploration. The borings and associated laboratory testing indicate subsurface conditions only at the time and to the depth, of the specific boring location investigated and only for the soil properties tested. The subsurface conditions may vary between the boreholes and over time. The interpretation of subsurface conditions provided is a professional opinion of encountered conditions and is not a certification or guarantee of site conditions. If variations, or other latent conditions become evident, Union Street should be notified immediately so that our conclusions and recommendations can be re-evaluated. Although subsurface conditions have been explored, we have not conducted investigations, sampling, field or laboratory testing, evaluations, or modelling of the site or subsurface conditions with respect to the presence of contaminated soil or groundwater or slope stability conditions.

This report contains the results of our geotechnical investigation as well as certain recommendations arising from our investigation. The general recommendations herein do not constitute a design, in whole or in part, of any of the structural elements of the proposed work. Incorporation of any or all of our general recommendations into the design of any such element does not constitute us as designers or co-designers of such elements, nor does it mean that such design is appropriate in geotechnical terms. The designers of such elements must consider the appropriateness of our general recommendations in light of all design criteria known to them, many of which are not known by us. Our mandate has been to perform a geotechnical investigation and provide general site suitability recommendations, which we have completed by means of this report. We have had no mandate to

design, or review the design of any elements of the proposed work and accept no responsibility for such design or design review.

This report has been prepared in accordance with generally accepted geotechnical engineering practice common to the local area. No other warranty, expressed or implied, is made.

This document, and the information contained within, are the confidential property of Eagle Builders LP and any disclosure of same is governed by the provisions of each of the applicable provincial or territorial Freedom of Information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch. II "2", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch. I "1", as such legislation may be amended or replaced from time to time.

Yours truly,

Union Street Geotechnical Ltd.

Prepared By:

Neil Tomaszewski, E.I.T.
Project Engineer

Reviewed By:

PROFESSIONAL ENGINEER ALBERTA
JOSHUA M. WILSON
ID 80317

9th Nov, 2021

Joshua Wilson, P.Eng.
Geotechnical Manager

Union Street Geotechnical Ltd.
APEGA Permit No. P12644

9th October, 2021
APEGA ID# 80317

Union Street Geotechnical

ATTACHMENTS

DRAWINGS

Drawing No. A1 - Site Location Plan

Drawing No. A2 - Borehole Location Plan

PHOTOGRAPHS

Photographs No. 1 & 2

BOREHOLE LOGS

Boreholes No. BH101 to BH107, inclusive

LABORATORY TEST RESULTS

Flexible Wall Permeameter - Sample No. NT3B

Flexible Wall Permeameter - Sample No. NT12

Laboratory Hydrometer - Sample No. NT5

Laboratory Hydrometer - Sample No. NT11

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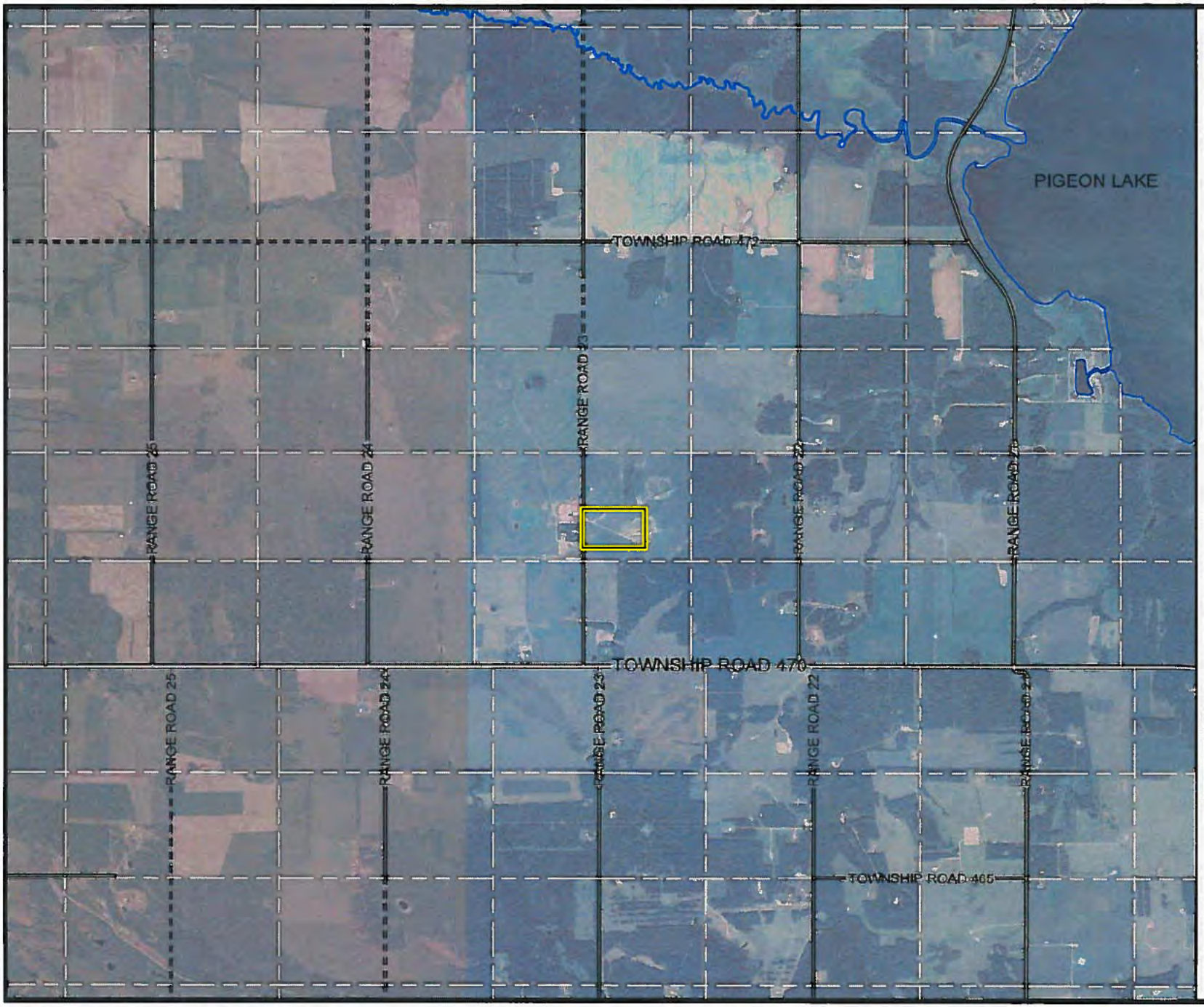
Drawings



LEGEND:

- DEVELOPMENT BOUNDARY
- ROADWAY
- PROPERTY LINE (WHITE)

GENERAL NOTES

1 DRAWINGS COMPLIED FROM

MULTIPLE VECTOR AND RASTER GIS FIELDS AS PUBLISHED BY THE GOVERNMENT OF CANADA, THE GOVERMENT OF ALBERTA, NATURAL RESOURCES CANADA, EARTH SCIENCES SECTOR, CANADA CENTRE FOR MAPPING AND EARTH OBSERVATION, WETASKIWIN COUNTY NO. 10,

AREIAL PHOTOGRAPH (C) 2020 MAXAR TECHNOLOGIES (C) GOOGLE EARTH PRO,

PDF SKETCH PROVIDED BY THE CLIENT,

& UNION STREET GEOTECHNICAL SITE INVESTIGATION

2 LEGAL ADDRESS
N.W. 1/4 OF 03-47-02-W5

0 200 400 600 800 m
0 400 800 1200 1600 2000 2400 ft
SCALE 1:40,000

N

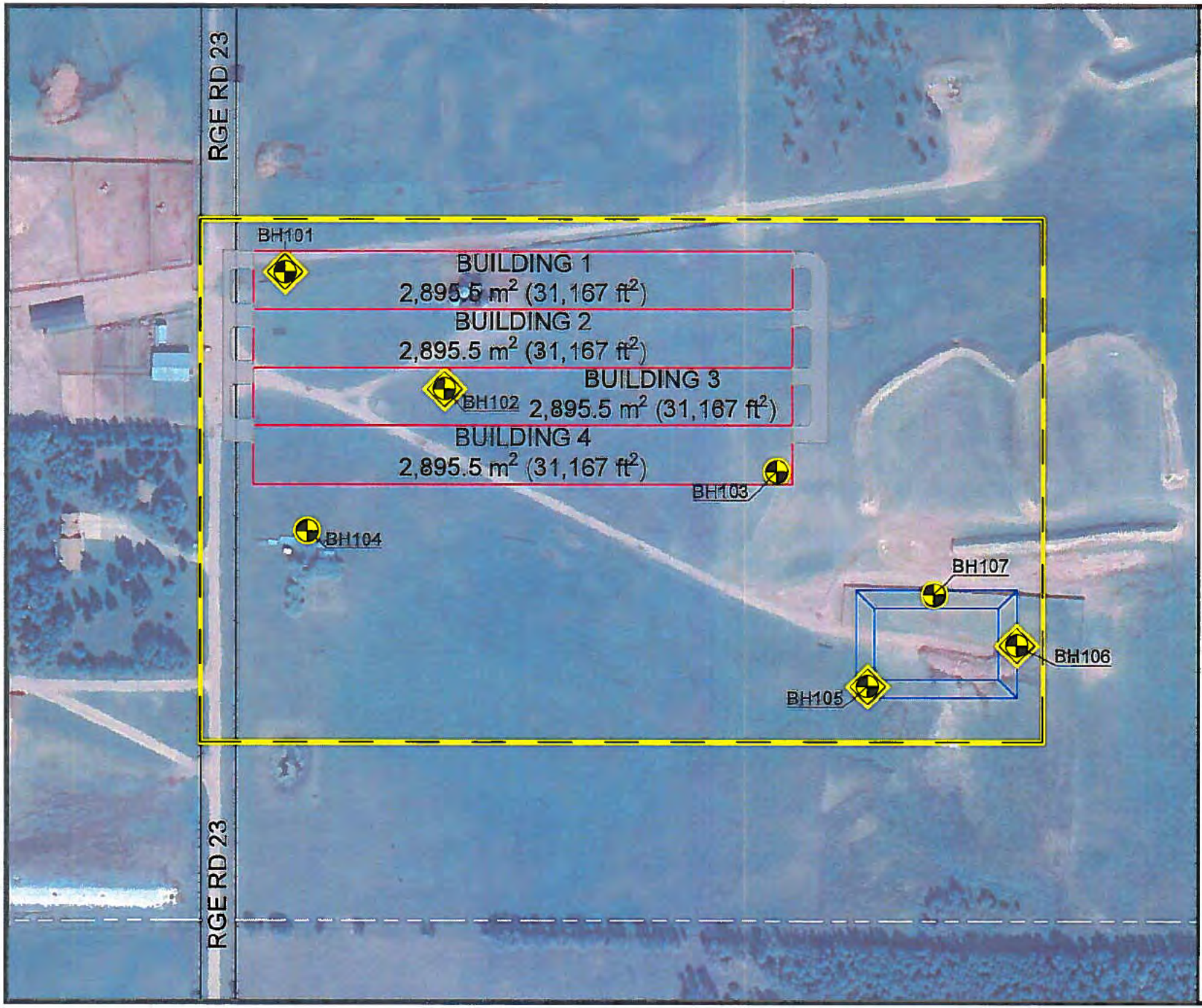
No.	REVISION/ISSUE	DATE

UNION STREET GEOTECHNICAL LTD.
Union Street Geotechnical

PROJECT NAME AND ADDRESS
GEOTECHNICAL INVESTIGATION
G&S CATTLE
N.W. 1/4 OF 03-47-02-W5
WETASKIWIN COUNTY NO. 10
ALBERTA

PROJECT: GEOTECHNICAL INVESTIGATION	SHEET: A1
PROJECT NUMBER: USG1177.1	
DATE: 2021.11.09	
DRAWING NAME: SITE LOCATION PLAN	

USG1177.1 - Drawing.dwg



LEGEND:

- DEVELOPMENT BOUNDARY
- PROPERTY LINE (WHITE)
- ROADWAY
- PROPOSED BUILDING

BOREHOLE LOCATION | PIEZOMETER LOCATION

GENERAL NOTES

1 DRAWINGS COMPLIED FROM:

MULTIPLE VECTOR AND RASTER GIS FIELDS AS PUBLISHED BY THE GOVERMENT OF CANADA: THE GOVERMENT OF ALBERTA; NATURAL RESOURCES CANADA, EARTH SCIENCES SECTOR; CANADA CENTRE FOR MAPPING AND EARTH OBSERVATION, WETASKIWIN COUNTY NO. 10,

AREIAL PHOTOGRAPH (C) 2020 MAXAR TECHNOLOGIES (C) GOOGLE EARTH PRO,

PDF SKETCH PROVIDED BY THE CLIENT,

& UNION STREET GEOTECHNICAL SITE INVESTIGATION

2 LEGAL ADDRESS
N.W. 1/4 OF 03-47-02-W5

SCALE 1:3,000

No.	REVISION/ISSUE	DATE

UNION STREET GEOTECHNICAL LTD.
Union Street Geotechnical

PROJECT NAME AND ADDRESS
GEOTECHNICAL INVESTIGATION
G&S CATTLE
N.W. 1/4 OF 03-47-02-W5
WETASKIWIN COUNTY NO. 10
ALBERTA

PROJECT	SHEET
GEOTECHNICAL INVESTIGATION	A2
PROJECT NUMBER: USG1177.1	
DATE: 2021.11.07	
DRAWING NAME: BOREHOLE LOCATION PLAN	

USG1177.1 - Drawing.dwg
30.09.2020

Union Street Geotechnical

Photographs

Photographs - Geotechnical Investigation
G & S Cattle Ltd.
Wetaskiwin County, Alberta

Photograph No. 1: Photograph taken from near Borehole BH103, facing northwest, showing the majority of the proposed feedlot expansion footprint, existing feedlot and associated infrastructure, site grading, and site conditions at the time of drilling. Photograph taken on the 30th September, 2021.

Photograph No. 2: Photograph taken from near the southeast corner of the proposed catch basin, facing northwest, showing the potential catch basin footprint, site grading, existing infrastructure, and site conditions observed at the time of drilling. Photograph taken on the 30th September, 2021.

Borehole Logs

FIELD BOREHOLE LOG

BOREHOLE NUMBER: BH101

PROJECT NUMBER: USG1177.1
PROJECT NAME: Geotechnical Investigation
LOCATION: NW-03-47-02 W5, Wetaskiwin County, Alberta
CLIENT: Eagle Builders LP
DRILLING METHOD: 150 mm Solid Stem Auger
LOGGED BY: N.T.
DATE BEGUN: 30 September, 2021
DATE COMPLETED: 30 September, 2021

CASING STICKUP: N/A
TOTAL DEPTH: 3.05 m
GROUND SURFACE ELEVATION: N/A

Union Street Geotechnical

DEPTH (m)	LITHOLOGY	DESCRIPTION	SAMPLE TYPE	SAMPLE No.	SPT "N"	POCKET PEN (kPa)	MOISTURE CONT. (%)	SULPHATE (%)	USC	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	WELL INSTALLATION
0.0		TILL: Clay and sand, silty. Dark greyish brown (10YR 4/2). Oxidized. Moist. Very stiff. Massive. Coal chip inclusions. Calcareous.		NT1		120	19.6		CI	41.5	15.6	Flush (broken). Bentonite cap. Solid 25 mm PVC casing.
1.0				NT1B		168	-					Auger cuttings.
2.0		MUDSTONE: Clay and sand, silty. Yellowish brown (10YR 5/6). Non-oxidized. Dry to moist. Hard. Massive. Calcareous.		NT2		215	16.8					Hand slotted 25 mm PVC.
3.0		NOTES: End of borehole at 3.05 m below surface. No seepage or sloughing encountered during drilling. Piezometer installed, annulus backfilled to surface with auger cuttings and capped with bentonite. Piezometer dry on 14 October, 2021.										
4.0												
5.0												

FIELD BOREHOLE LOG

BOREHOLE NUMBER: BH102

PROJECT NUMBER: USG1177.1
PROJECT NAME: Geotechnical Investigation
LOCATION: NW-03-47-02 W5, Wetaskiwin County, Alberta
CLIENT: Eagle Builders LP
DRILLING METHOD: 150 mm Solid Stem Auger
LOGGED BY: N.T.
DATE BEGUN: 30 September, 2021
DATE COMPLETED: 30 September, 2021

CASING STICKUP: 1.03 m
TOTAL DEPTH: 3.05 m
GROUND SURFACE ELEVATION: N/A

Union Street Geotechnical

DEPTH (m)	LITHOLOGY	DESCRIPTION	SAMPLE TYPE	SAMPLE No.	SPT "N"	POCKET PEN (kPa)	MOISTURE CONT. (%)	SULPHATE (%)	USC	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	WELL INSTALLATION
0.0		TILL: Clay and sand, silty. Yellowish brown (10YR 5/4). Oxidized. Moist. Stiff to very stiff. Massive. Coal chip inclusions. Calcareous.		NT3		96	15.5					Cap.
1.0				NT3B		156	-					Bentonite cap.
2.0		MUDSTONE: Clay and sand, silty. Light yellowish brown (10YR 6/4). Non-oxidized. Dry. Hard. Massive. Calcareous.		NT4		-	11.0					Solid 25 mm PVC casing.
3.0		NOTES: End of borehole at 3.05 m below surface. No seepage or sloughing encountered during drilling. Piezometer installed, annulus backfilled to surface with auger cuttings and capped with bentonite. Water level at 3.03 m below grade on the 14 October, 2021.										Auger cuttings.
4.0												Hand slotted 25 mm PVC.

FIELD BOREHOLE LOG

BOREHOLE NUMBER: BH103

PROJECT NUMBER: USG1177.1
PROJECT NAME: Geotechnical Investigation
LOCATION: NW-03-47-02 W5, Wetaskiwin County, Alberta
CLIENT: Eagle Builders LP
DRILLING METHOD: 150 mm Solid Stem Auger
LOGGED BY: N.T.
DATE BEGUN: 30 September, 2021
DATE COMPLETED: 30 September, 2021

CASING STICKUP: N/A
TOTAL DEPTH: 1.83 m
GROUND SURFACE ELEVATION: N/A

Union Street Geotechnical

DEPTH (m)	LITHOLOGY	DESCRIPTION	SAMPLE TYPE	SAMPLE No.	SPT "N"	POCKET PEN (kPa)	MOISTURE CONT. (%)	SULPHATE (%)	USC	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	WELL INSTALLATION
0.0		SAND: Trace clay, trace silt. Yellowish brown. Oxidized. Moist. Compact. Massive.										
		TILL: Clay and sand, some silt. Brown (10YR 4/3). Oxidized. Moist. Very stiff. Massive. Coal chip inclusions. Calcareous.		NT5		120	18.5					Auger cuttings.
1.0		MUDSTONE: Clay and sand, silty. White (10YR 8/1). Non-oxidized. Dry. Hard. Massive. Calcareous.		NT6		-	6.3					
		NOTES: Drilling refusal encountered at 1.83 m below surface. No seepage or sloughing encountered during drilling. Borehole backfilled to surface with auger cuttings.										
2.0												

FIELD BOREHOLE LOG

BOREHOLE NUMBER: BH104

PROJECT NUMBER: USG1177.1
PROJECT NAME: Geotechnical Investigation
LOCATION: NW-03-47-02 W5, Wetaskiwin County, Alberta
CLIENT: Eagle Builders LP
DRILLING METHOD: 150 mm Solid Stem Auger
LOGGED BY: N.T.
DATE BEGUN: 30 September, 2021
DATE COMPLETED: 30 September, 2021

CASING STICKUP: N/A
TOTAL DEPTH: 3.05 m
GROUND SURFACE ELEVATION: N/A

Union Street Geotechnical

DEPTH (m)	LITHOLOGY	DESCRIPTION	SAMPLE TYPE	SAMPLE No.	SPT "N"	POCKET PEN (kPa)	MOISTURE CONT. (%)	SULPHATE (%)	USC	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	WELL INSTALLATION
0.0		TILL: Sand, some clay, some silt. Dark yellowish brown (10YR 4/4). Oxidized. Moist. Compact. Massive. Calcareous.										
		@ 0.61 m, clay, silty, sandy.		NT7		48	20.2					
1.0												Auger cuttings.
2.0		MUDSTONE: Clay and sand, silty. Yellowish brown (10YR 5/6). Non-oxidized. Dry. Hard. Massive. Calcareous.		NT8		215	18.4					
3.0		NOTES: End of borehole at 3.05 m below surface. No seepage or sloughing encountered during drilling. Borehole backfilled to surface with auger cutting.										
4.0												
5.0												

FIELD BOREHOLE LOG

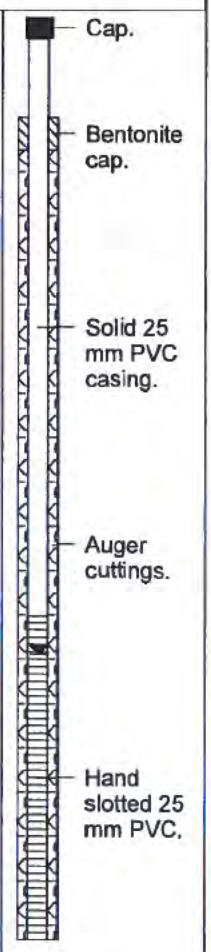
BOREHOLE NUMBER: BH105

PROJECT NUMBER: USG1177.1
PROJECT NAME: Geotechnical Investigation
LOCATION: NW-03-47-02 W5, Wetaskiwin County, Alberta
CLIENT: Eagle Builders LP
DRILLING METHOD: 150 mm Solid Stem Auger
LOGGED BY: N.T.
DATE BEGUN: 30 September, 2021
DATE COMPLETED: 30 September, 2021

CASING STICKUP: 0.93 m
TOTAL DEPTH: 7.62 m
GROUND SURFACE ELEVATION: N/A

Union Street Geotechnical

DEPTH (m)	LITHOLOGY	DESCRIPTION	SAMPLE TYPE	SAMPLE No.	SAMPLE SPT "N"	POCKET PEN (kPa)	MOISTURE CONT. (%)	SULPHATE (%)	USC	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	WELL INSTALLATION
1.0		TILL: Clay and sand, some silt. Yellowish brown (10YR 5/8) to brown (10YR 5/3) . Oxidized. Moist. Firm to very stiff. Massive. Coal chip inclusions. Calcareous.		NT9		48	14.6					
2.0		@ 1.52 m, clay, silty, some sand.		NT10		48	22.3					
4.0				NT11		215	21.3					
5.0		MUDSTONE: Clay and sand, silty. Brownish yellow (10YR 6/8). Non-oxidized. Dry. Hard. Massive. Calcareous.		NT12		215	-					
6.0		NOTES: End of borehole at 7.62 m below surface. No seepage or sloughing encountered during drilling. Piezometer installed, annulus backfilled to surface with auger cuttings and capped with bentonite. Water level at 4.97 m below grade on the 14 October, 2021.		NT13		215	21.8					
7.0				NT14		-	17.2					



FIELD BOREHOLE LOG

BOREHOLE NUMBER: BH106

PROJECT NUMBER: USG1177.1
PROJECT NAME: Geotechnical Investigation
LOCATION: NW-03-47-02 W5, Wetaskiwin County, Alberta
CLIENT: Eagle Builders LP
DRILLING METHOD: 150 mm Solid Stem Auger
LOGGED BY: N.T.
DATE BEGUN: 30 September, 2021
DATE COMPLETED: 30 September, 2021

CASING STICKUP: N/A
TOTAL DEPTH: 6.10 m
GROUND SURFACE ELEVATION: N/A

Union Street Geotechnical

DEPTH (m)	LITHOLOGY	DESCRIPTION	SAMPLE TYPE	SAMPLE No.	SPT "N"	POCKET PEN (kPa)	MOISTURE CONT. (%)	SULPHATE (%)	USC	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	WELL INSTALLATION
0.0		TILL: Clay, silty, sandy. Yellow brown (10YR 5/6) to very dark grey (10YR 3/1). Oxidized. Moist. Firm to hard. Massive. Gravel and coal chip inclusions. Calcareous.		NT15		48	19.6					Flush (broken).
1.0												Bentonite cap.
2.0				NT16		72	20.6					Solid 25 mm PVC casing.
3.0												Auger cuttings.
4.0				NT17		215	15.5					
5.0												Hand slotted 25 mm PVC.
6.0		MUDSTONE: Clay and sand, silty. Yellowish brown. Non-oxidized. Dry. Hard. Massive.		NT18		215	16.5		CI	42.8	14.2	
7.0		NOTES: End of borehole at 6.10 m below surface. No seepage or sloughing encountered during drilling. Piezometer installed, annulus backfilled to surface with auger cuttings and capped with bentonite. Water level at 2.97 m below grade on the 14 October, 2021.										
8.0												
9.0												
10.0												

FIELD BOREHOLE LOG

BOREHOLE NUMBER: BH107

PROJECT NUMBER: USG1177.1
PROJECT NAME: Geotechnical Investigation
LOCATION: NW-03-47-02 W5, Wetaskiwin County, Alberta
CLIENT: Eagle Builders LP
DRILLING METHOD: 150 mm Solid Stem Auger
LOGGED BY: N.T.
DATE BEGUN: 30 September, 2021
DATE COMPLETED: 30 September, 2021

CASING STICKUP: N/A
TOTAL DEPTH: 4.57 m
GROUND SURFACE ELEVATION: N/A

Union Street Geotechnical

DEPTH (m)	LITHOLOGY	DESCRIPTION	SAMPLE TYPE	SAMPLE No.	SAMPLE SPT "N"	POCKET PEN (kPa)	MOISTURE CONT. (%)	SULPHATE (%)	USC	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	WELL INSTALLATION
0.0		TILL: Clay and sand, some silt. Yellowish brown (10YR 5/6). Oxidized. Moist. Firm to very stiff. Massive. Calcareous.										
1.0		@ 0.91 m, clay, silty, sandy.		NT19		48	19.1					
2.0				NT20		168	16.7					Auger cuttings.
3.0		MUDSTONE: Clay and sand, silty. Yellowish brown (10YR 5/8). Non-oxidized. Dry. Firm to very stiff. Massive. Calcareous.										
4.0				NT21		-	17.0					
5.0		NOTES: End of borehole at 4.57 m below surface. No seepage or sloughing encountered during drilling. Borehole backfilled to surface with auger cuttings.										

Laboratory Test Results

Project Name:		Depth:	0.76 m
Project Number:	USG1177.1	Testing Company:	Union Street Geo.
Client:		Field Technician:	E.G.
Testhole:	BH102	Sample Date:	
Location:		Lab Technician:	B.B.
Sample Number:	NT3B	Date Tested:	17 October, 2021

Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Material and Test Description

Material Description:

Clay Till - silty, some sand, trace gravel, oxide inclusion, coal, alkalines, light brown

Test Type:	Constant Head
Mould Size:	Flexible Wall
Sample Source:	Shelby Tube
Fluid Used:	Deaired Water
Fluid Reservoir:	Burrettes

Remoulding Details	
Max Dry Density (kg/m^3):	-
Proctor ID:	-
Percent Max (%):	-
Target Dry Density (kg/m^3):	-

Initial Sample Characteristics

Water Content	
Wet + Tare (g):	706.4
Dry + Tare (g):	599.7
Tare (g):	13.6
Water Content (%):	18.2%

Sample Size					
Trial	1	2	3	4	Average
Diameter (mm):	72.9	72.7	72.7	72.9	72.8
Length (mm):	76.7	77	76.7	77	76.9
Weight (g)	687.6				

Area (cm^2):	41.6	Specific Gravity (Note 2):	2.74
Volume (cm^3):	319.9	Void Ratio:	50.5%
Wet Density (kg/m^3):	2150	Saturation:	98.7%
Dry Density (kg/m^3):	1818	Porosity:	33.5%

Final Sample Characteristics

Water Content	
Wet + Tare (g):	502.9
Dry + Tare (g):	426.1
Tare (g):	12.2
Water Content (%):	18.6%

Sample Size					
Trial	1	2	3	4	Average
Diameter (mm):	73	72.6	73.2	73.0	73.0
Length (mm):	77.1	77.3	77	76.8	77.1
Weight (g)	692.9				

Area (cm^2):	41.8	Specific Gravity (Note 1):	2.74
Volume (cm^3):	322.0	Void Ratio:	50.8%
Wet Density (kg/m^3):	2152	Saturation:	100.0%
Dry Density (kg/m^3):	1815	Porosity:	33.7%

Note 1: Specific gravity for final sample characteristics calculation adjusted to result in 100.0% saturation.

Note 2: Specific gravity for initial sample characteristics calculation set equal to that of the final.

Project Name:		Depth:	0.76 m
Project Number:	USG1177.1	Testing Company:	Union Street Geo.
Client:		Field Technician:	E.G.
Testhole:	BH102	Sample Date:	
Location:		Lab Technician:	B.B.
Sample Number:	NT3B	Date Tested:	17 October, 2021

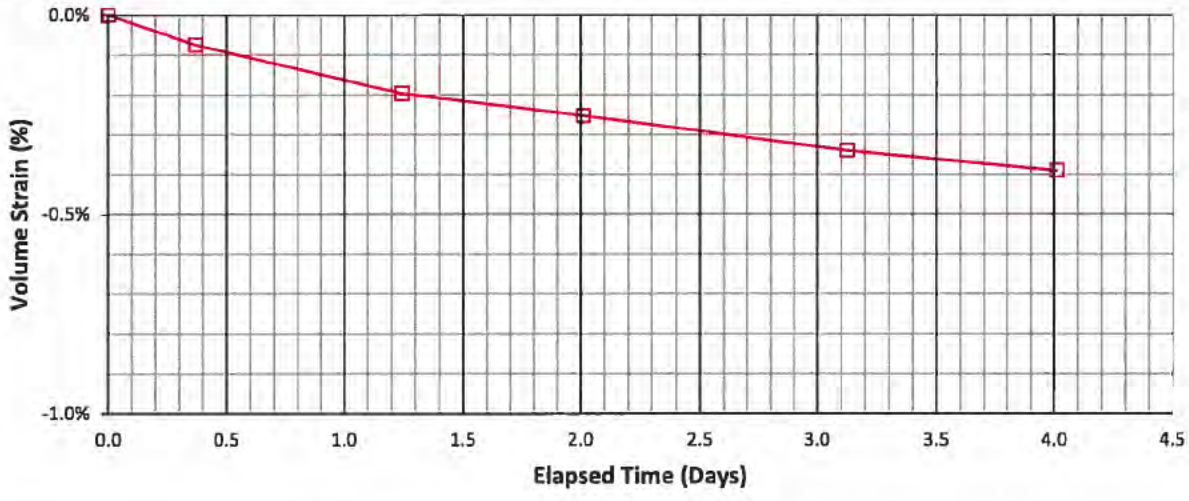
Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Saturation Data

Cell Pressure (kPa):	160.0	Top Pressure (kPa):	130.0
Bottom Pressure (kPa):	130.0	Pressure Difference (kPa):	-

Date & Time	Elapsed Time (Days)	Room Temp (°C)	Top Burret (mL)	Bottom Burret (mL)	Cell (mL)	Total Vol. Change (mL)	Volume Strain (%)
10/17/21 7:57	0.00	21.0	3.3	3.3	12.4	0	0.00%
10/17/21 16:46	0.37	21.0	3.2	3.1	12.9	-0.24	-0.08%
10/18/21 13:48	1.24	21.0	3.3	3.0	13.3	-0.63	-0.20%
10/19/21 8:12	2.01	21.0	3.4	3.0	13.4	-0.81	-0.25%
10/20/21 10:54	3.12	21.0	3.4	3.1	13.6	-1.09	-0.34%
10/21/21 8:11	4.01	21.0	3.4	3.1	13.7	-1.25	-0.39%
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-



Project Name:		Depth:	0.76 m
Project Number:	USG1177.1	Testing Company:	Union Street Geo.
Client:		Field Technician:	E.G.
Testhole:	BH102	Sample Date:	
Location:		Lab Technician:	B.B.
Sample Number:	NT3B	Date Tested:	17 October, 2021

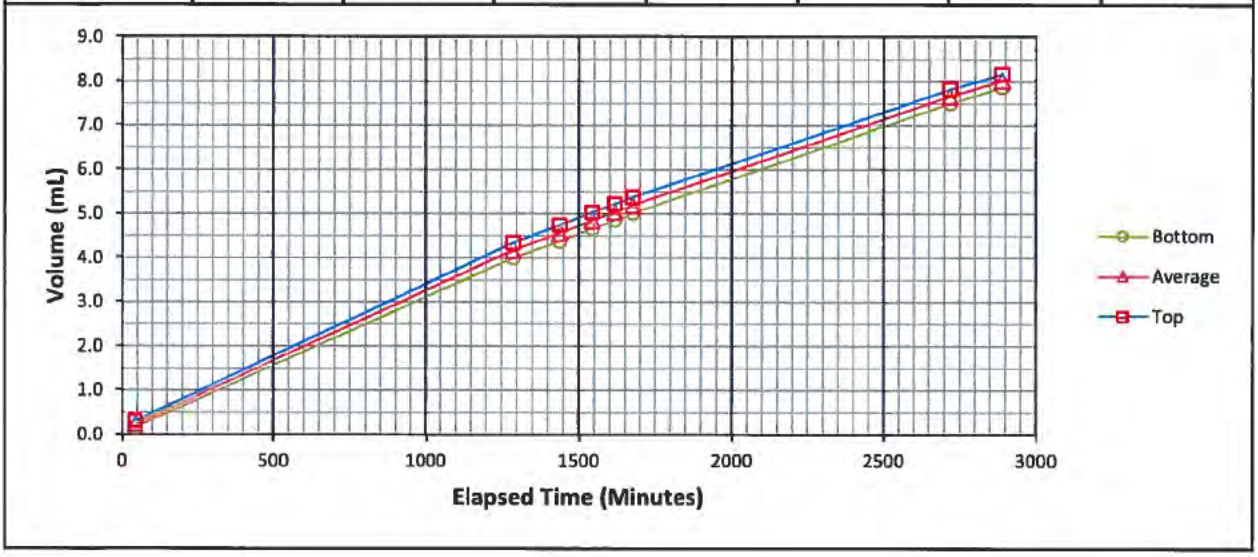
Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Permeation Data

Cell Pressure (kPa):	160.0	Top Pressure (kPa):	120.0
Bottom Pressure (kPa):	140.0	Pressure Difference (kPa):	20.0

Date & Time	Elapsed Time (Minutes)	Room Temp (°C)	Top Burret (mL)	Bottom Burret (mL)	Top Vol. Change (mL)	Bottom Vol. Change (mL)	Average Vol. Change (mL)
10/21/21 10:28	0	21.0	9.86	0.30	0.00	0.00	0.00
10/21/21 11:11	43	21.0	9.56	0.47	0.30	0.17	0.23
10/22/21 7:56	1288	21.0	5.52	4.29	4.34	3.99	4.17
10/22/21 10:26	1438	21.0	5.12	4.67	4.74	4.37	4.56
10/22/21 12:12	1544	21.0	4.83	4.96	5.03	4.66	4.85
10/22/21 13:24	1616	21.0	4.64	5.15	5.22	4.85	5.04
10/22/21 14:24	1676	21.0	4.49	5.31	5.37	5.01	5.19
10/23/21 7:47	2719	21.0	2.04	7.80	7.82	7.50	7.66
10/23/21 10:38	2890	21.0	1.69	8.17	8.17	7.87	8.02
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-



Project Name:		Depth:	0.76 m
Project Number:	USG1177.1	Testing Company:	Union Street Geo.
Client:		Field Technician:	E.G.
Testhole:	BH102	Sample Date:	
Location:		Lab Technician:	B.B.
Sample Number:	NT3B	Date Tested:	17 October, 2021

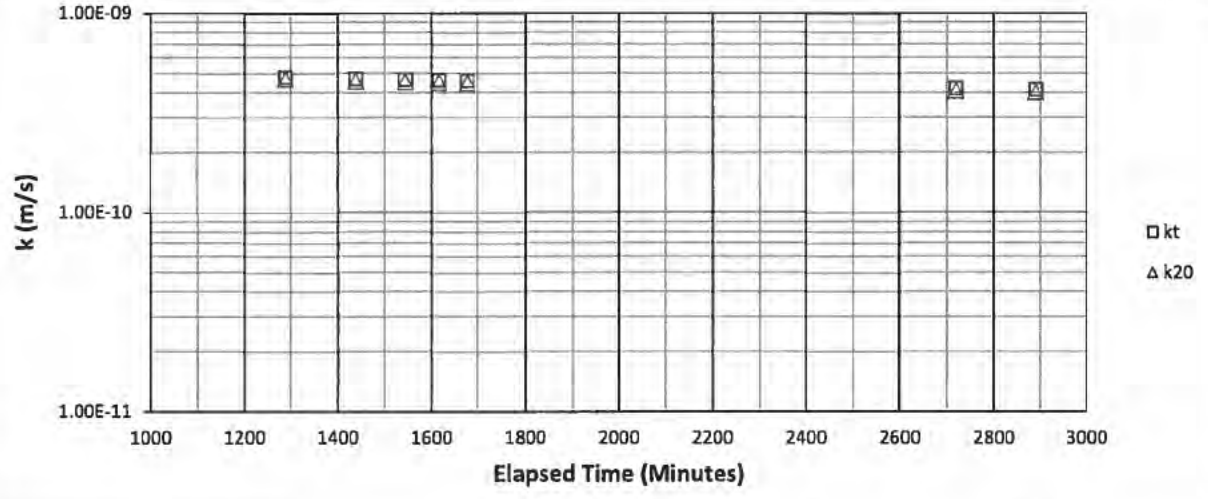
Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Permeation Data

Head Difference (m):	2.0	Area of Sample (m^2)	4.171E-03
Length of Sample (m):	7.695E-02	Gradient, i	2.651E+01

Elapsed Time (Minutes)	Average Volume Change (mL)	Average Temperature (°C)	k_t (m/s)	R_T	k_{20} (m/s)
1288	4.17	21.0	4.759E-10	0.976	4.644E-10
1438	4.56	21.0	4.668E-10	0.976	4.556E-10
1544	4.85	21.0	4.630E-10	0.976	4.519E-10
1616	5.04	21.0	4.600E-10	0.976	4.490E-10
1676	5.19	21.0	4.574E-10	0.976	4.464E-10
2719	7.66	21.0	4.183E-10	0.976	4.082E-10
2890	8.02	21.0	4.122E-10	0.976	4.023E-10
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	AVERAGE	4.505E-10		4.397E-10



Project Name:		Depth:	4.57 m
Project Number:	USG1177.1	Testing Company:	Union Street Geo.
Client:		Field Technician:	E.G.
Testhole:	BH105	Sample Date:	
Location:		Lab Technician:	B.B.
Sample Number:	NT12	Date Tested:	17 October, 2021

Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Material and Test Description

Material Description:

Clay Till - silty, some sand, trace gravel, oxide inclusion, coal, alkalines, light brown

Test Type:	Constant Head
Mould Size:	Flexible Wall
Sample Source:	Shelby Tube
Fluid Used:	Deaired Water
Fluid Reservoir:	Burrettes

Remoulding Details	
Max Dry Density (kg/m^3):	-
Proctor ID:	-
Percent Max (%):	-
Target Dry Density (kg/m^3):	-

Initial Sample Characteristics

Water Content	
Wet + Tare (g):	557
Dry + Tare (g):	474.8
Tare (g):	13.0
Water Content (%):	17.8%

Sample Size					
Trial	1	2	3	4	Average
Diameter (mm):	72.8	73.1	72.9	72.8	72.9
Length (mm):	77.9	77.7	77.6	77.9	77.8
Weight (g)	697				

Area (cm^2):	41.7
Volume (cm^3):	324.6
Wet Density (kg/m^3):	2147
Dry Density (kg/m^3):	1823

Specific Gravity (Note 2):	2.72
Void Ratio:	49.1%
Saturation:	98.6%
Porosity:	32.9%

Final Sample Characteristics

Water Content	
Wet + Tare (g):	730.3
Dry + Tare (g):	609.6
Tare (g):	12.8
Water Content (%):	20.2%

Sample Size					
Trial	1	2	3	4	Average
Diameter (mm):	73.9	73.8	74	73.9	73.9
Length (mm):	79.2	79.3	79.4	79.2	79.3
Weight (g)	716.9				

Area (cm^2):	42.9
Volume (cm^3):	340.0
Wet Density (kg/m^3):	2108
Dry Density (kg/m^3):	1754

Specific Gravity (Note 1):	2.72
Void Ratio:	54.9%
Saturation:	100.0%
Porosity:	35.5%

Note 1: Specific gravity for final sample characteristics calculation adjusted to result in 100.0% saturation.

Note 2: Specific gravity for initial sample characteristics calculation set equal to that of the final.

Project Name:		Depth:	4.57 m
Project Number:	USG1177.1	Testing Company:	Union Street Geo.
Client:		Field Technician:	E.G.
Testhole:	BH105	Sample Date:	
Location:		Lab Technician:	B.B.
Sample Number:	NT12	Date Tested:	17 October, 2021

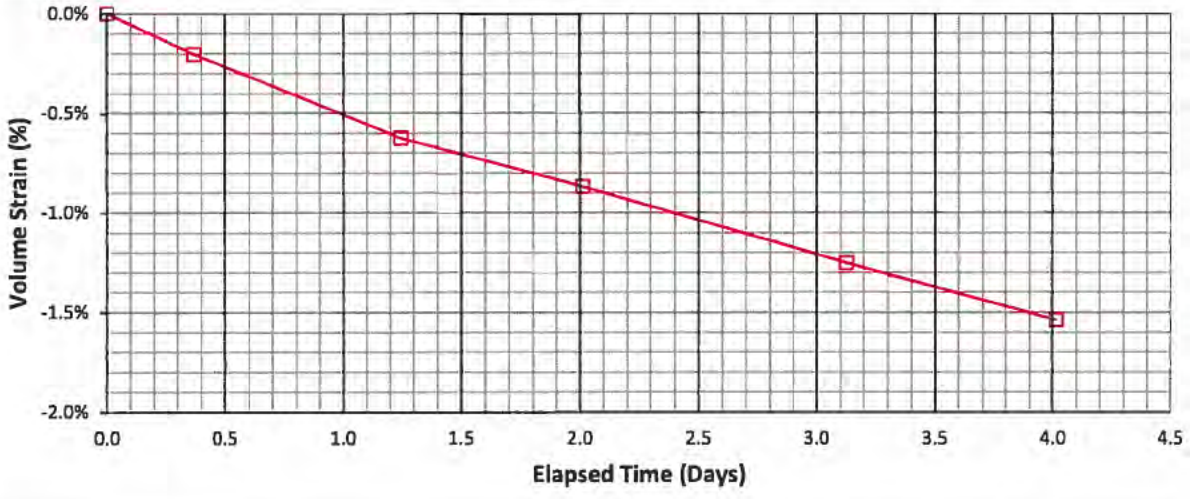
Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Saturation Data

Cell Pressure (kPa):	160.0	Top Pressure (kPa):	130.0
Bottom Pressure (kPa):	130.0	Pressure Difference (kPa):	-

Date & Time	Elapsed Time (Days)	Room Temp (°C)	Top Burret (mL)	Bottom Burret (mL)	Cell (mL)	Total Vol. Change (mL)	Volume Strain (%)
10/17/21 7:56	0.00	21.0	3.4	3.4	12.1	0	0.00%
10/17/21 16:45	0.37	21.0	3.7	3.8	12.1	-0.66	-0.20%
10/18/21 13:47	1.24	21.0	4.2	4.4	12.3	-2.03	-0.63%
10/19/21 8:10	2.01	21.0	4.4	4.7	12.6	-2.82	-0.87%
10/20/21 10:53	3.12	21.0	4.6	5.0	13.4	-4.06	-1.25%
10/21/21 8:14	4.01	21.0	4.7	5.1	14.1	-4.99	-1.54%
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-



Project Name:		Depth:	4.57 m
Project Number:	USG1177.1	Testing Company:	Union Street Geo.
Client:		Field Technician:	E.G.
Testhole:	BH105	Sample Date:	
Location:		Lab Technician:	B.B.
Sample Number:	NT12	Date Tested:	17 October, 2021

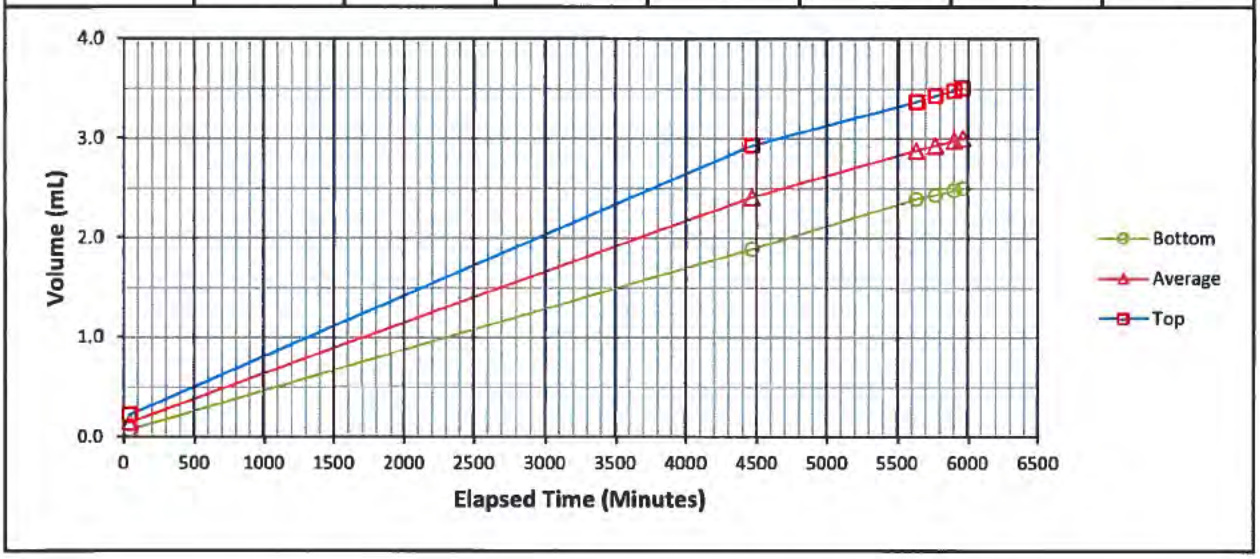
Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Permeation Data

Cell Pressure (kPa):	160.0	Top Pressure (kPa):	120.0
Bottom Pressure (kPa):	140.0	Pressure Difference (kPa):	20.0

Date & Time	Elapsed Time (Minutes)	Room Temp (°C)	Top Burret (mL)	Bottom Burret (mL)	Top Vol. Change (mL)	Bottom Vol. Change (mL)	Average Vol. Change (mL)
10/21/21 10:28	0	21.0	9.89	0.26	0.00	0.00	0.00
10/21/21 11:10	42	21.0	9.67	0.33	0.22	0.07	0.15
10/24/21 12:54	4466	21.0	6.96	2.15	2.93	1.89	2.41
10/25/21 8:21	5633	21.0	6.52	2.65	3.37	2.39	2.88
10/25/21 10:37	5769	21.0	6.46	2.69	3.43	2.43	2.93
10/25/21 12:51	5903	21.0	6.41	2.74	3.48	2.48	2.98
10/25/21 13:51	5963	21.0	6.38	2.76	3.51	2.50	3.01
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-



Project Name:		Depth:	4.57 m
Project Number:	USG1177.1	Testing Company:	Union Street Geo.
Client:		Field Technician:	E.G.
Testhole:	BH105	Sample Date:	
Location:		Lab Technician:	B.B.
Sample Number:	NT12	Date Tested:	17 October, 2021

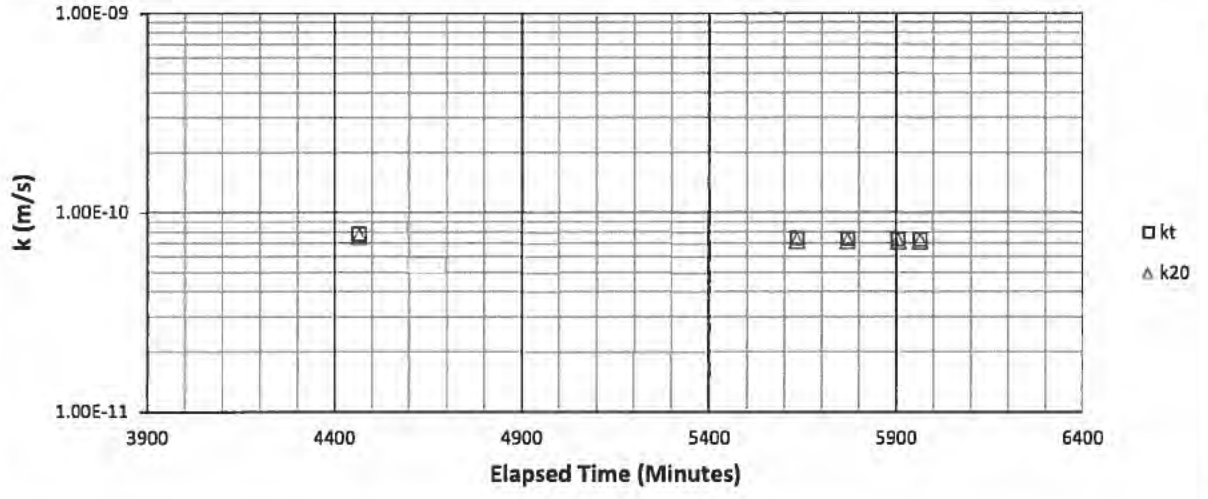
Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Permeation Data

Head Difference (m):	2.0	Area of Sample (m^2)	4.232E-03
Length of Sample (m):	7.853E-02	Gradient, i	2.597E+01

Elapsed Time (Minutes)	Average Volume Change (mL)	Average Temperature (°C)	k_t (m/s)	R_T	k_{20} (m/s)
4466	2.41	21.0	7.764E-11	0.976	7.577E-11
5633	2.88	21.0	7.418E-11	0.976	7.240E-11
5769	2.93	21.0	7.374E-11	0.976	7.197E-11
5903	2.98	21.0	7.335E-11	0.976	7.159E-11
5963	3.01	21.0	7.325E-11	0.976	7.149E-11
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	AVERAGE	7.443E-11		7.264E-11



Laboratory Hydrometer — Sample No.: NT05

Sample Information

Date: 30-Sep-21 **By:** N.T. **of:** USG **Type:** Pail / Bag

Location: G & S Cattle, Pigeon Lake, Alberta **Specification:** ASTM D 422

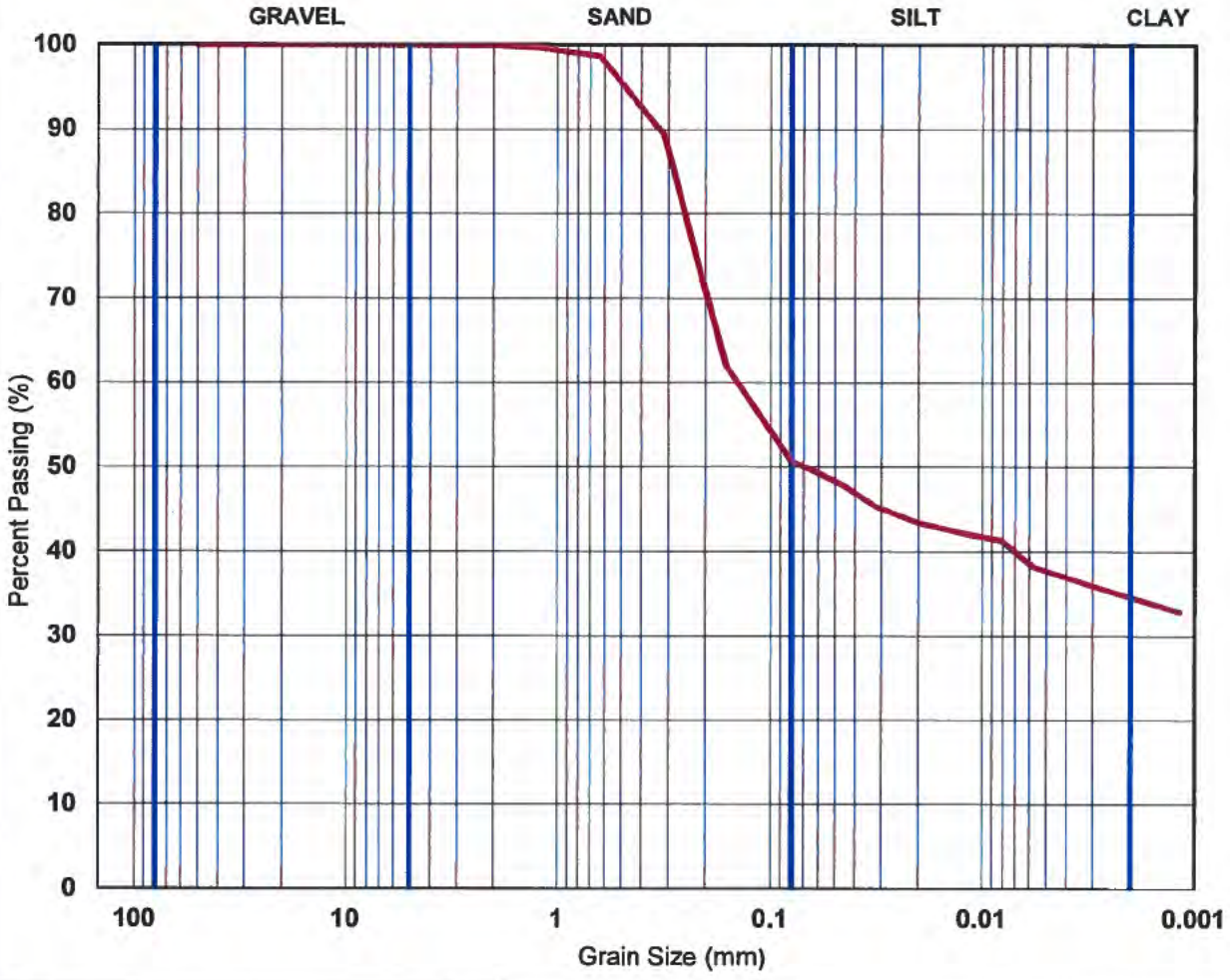
Description: Sand and clay, some sand (BH103, 0.76 m)

Specifications: Laboratory Specifications as per ASTM D 422.

Comments:

Sieve Results:

By Type (%): Gravel = **0.0** Sand = **49.4** Silt = **16.3** Clay = **34.3**



Union Street Geotechnical

CLIENT:	Eagle Builders LP	**FILE No.:**	USG1177.1
PROJECT:	2021 Geotech Inv.	**DATE:**	30-Sep-21
LOCATION:	Red Deer, Alberta	**TECH:**	E.G.

Laboratory Hydrometer — Sample No.: NT11

Sample Information

Date: 30-Sep-21 **By:** N.T. **of:** USG **Type:** Pail / Bag

Location: G & S Cattle, Pigeon Lake, Alberta **Specification:** ASTM D 422

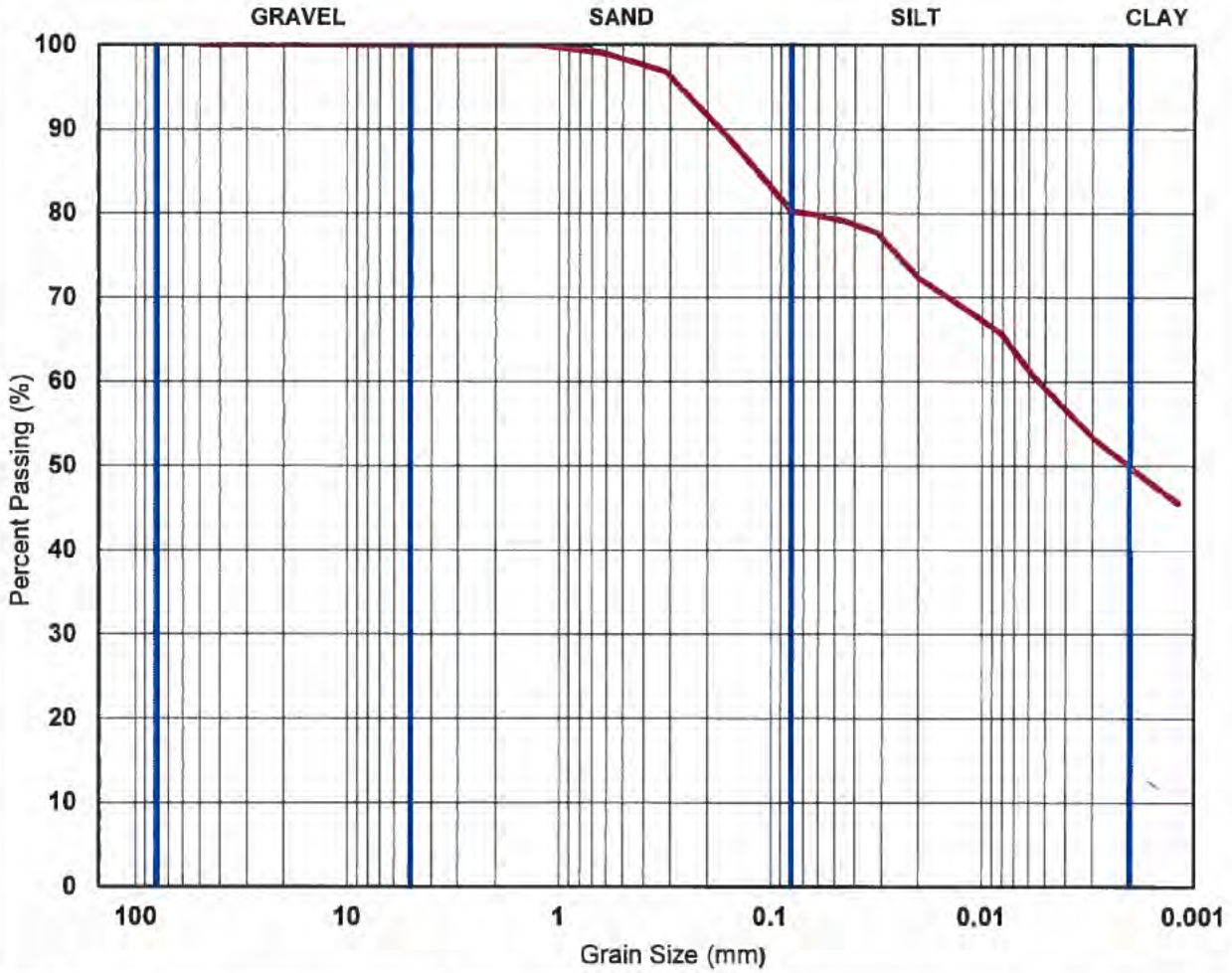
Description: Clay, silty, some sand (BH105, 3.81 m)

Specifications: Laboratory Specifications as per ASTM D 422.

Comments:

Sieve Results:

By Type (%): Gravel = **0.0** Sand = **19.8** Silt = **31.0** Clay = **49.2**



Union Street Geotechnical

CLIENT: Eagle Builders LP **FILE No.:** USG1177.1

PROJECT: 2021 Materials Testing **DATE:** 30-Sep-21

LOCATION: Red Deer, Alberta **TECH:** E.G.