GENERAL NOTES

1. All material and workmanship shall conform to the applicable Building Code, and all applicable local codes and ordinances.
2. The contractor shall check all drawings immediately upon their receipt and shall verify all dimensions and site conditions before starting work. Contractor is responsible for coordination of all trades. BAR Engineering shall be notified of any discrepancies or conflicts between drawings.
3. Unless specifically shown on these plans no structural member shall be cut, drilled, nor notched without prior written consent from the Structural Engineer of Record (S.E.O.R).
4. Connections and implied construction assemblies that are not specifically described or detailed shall be constructed using standard construction practices in compliance with the governing codes and ordinances.
5. When details labeled 'Typical' or 'Similar' are given on the drawings, the contractor shall apply the intent of the detail to that specific condition.
6. Written information and dimensions shall take precedence over graphic information. Do not scale drawings. Resolve any conflicts on the plans with the S.E.O.R before proceeding with construction.
7. Structural drawings and specifications for this work have been prepared in accordance with generally accepted engineering standards of practice to meet the minimum requirements of the applicable Building Code. Any omissions or discrepancies on the plans or any deviation from the plans which are necessitated by field conditions or any condition different from those indicated on the plans should be brought to the attention of BAR Engineering prior to continuing construction. All work is to be coordinated so that cooperation between the trades where required is accomplished.
8. Contractor is responsible for all temporary bracing and shoring during construction.
9. Trade names and manufacturers referred to are for quality standards only, equivalent substitutions may be permitted.
10. Project inspectors shall not constitute authority to deviate from the plans and specifications. If at any time as the work progresses, prior to the issuance of the certification of compliance, it is found that modifications or changes are necessary to secure safety or comply with code requirements, the responsible S.E.O.R shall be notified of the necessity for such modifications or changes prior to construction or installation.
11. The structural systems have been designed to carry the superimposed live loads as prescribed by the applicable Building Code and in accordance with the standard engineering practices, with no special provisions to carry concentrated loads from storage and handling of construction materials or from operation of construction equipment.
12. Drawings and Specifications are complementary, not hierarchial. Any discrepancies between drawings and specifications shall be brought to the attention of BAR Engineering prior to commencing work.

EXCAVATION & FILL SITE PREPARATION (U/N IN GEOTECHNICAL REPORT)

1. Vegetation and topsoil within all development areas shall be stripped and removed from the site. Following this removal the areas should be scarified to a minimum depth of 152 mm (6") & moisture conditioned to within 2% of optimum moisture content. Following moisture conditioning, the stripped areas shall be proof-rolled to identify loosened or softened areas. Any soft areas shall be over-excavated and backfilled to 98% standard proctor maximum dry density (SPMDD).
2. Should fill be required to raise the grade elevation, it shall be compacted to 98% standard proctor density (SPD) in lifts not greater than 152 mm (6") in compacted thickness.
3. Provide positive site drainage away from the building, 2% minimum U.O.N.

SUBGRADE PREPARATION (U/N IN GEOTECHNICAL REPORT)

1. Subgrade under all grade supported slabs shall consist of 10 mil. vapour barrier on 152 mm (6") compacted gravel over compacted soil/fill/native material.
2. Measures shall be taken to ensure water is not allowed to pond on the subgrade prior to concrete placement.
3. The exposed subgrade shall not be permitted to dry out prior to concrete placement.
4. If any fill is required to raise the foundation elevations, it shall be placed in accordance with the geotechnical engineer's instructions.
5. Provide & allow for costs of subgrade compaction test.

FOUNDATION

1. Contractor shall verify all foundation dimensions with the architectural plans prior to beginning foundation construction.
2. All footings to bear on undisturbed native material with min. allowable bearing strengths as noted in 'Design Notes' and as approved by Geotechnical Engineer on site.
3. Unless otherwise shown, centre piles under columns, walls and grade beams.
4. Piles shall be placed with the following tolerances:
   a. Not more than 2% of its length out of plumb for vertical piles.
   b. Piles to be centred within 51 mm (2") of location shown on plan.

COLD WEATHER CONCRETE

1. Cold-weather concreting shall be in conformance with clause 7.2.2. of the latest edition of CSA A23.1 Concrete Materials & Methods of Concrete Construction.
2. Concrete shall not be placed against or on frozen ground or surfaces. Frozen materials in trenches and in forms shall be removed or heated to achieve appropriate placement temperatures. Material that is heated shall meet the density and compaction requirements of the code or shall be removed and replaced with suitable, non-frozen material and re-compacted to meet 95% standard proctor density.
3. When the air temperature is at or below 5° C, or when there is a probability of its falling below 5° C within 24 hrs of placing, all materials and equipment needed for adequate protection and curing shall be on hand and ready for use before concrete placement is started. The extent of such preparation shall be in accordance with the requirements of clause 7.2.2.1. of the CSA A23.1.
4. Concrete shall not be placed against ice or snow. Ice or snow shall be removed and the area shall be heated to ensure the foundation soils meet the temperature conditions for placement and that material is of suitable density to meet the compaction requirements.
5. Concrete mixes may be created using heated ingredients.
6. Once concrete or grout has been placed or blocks laid with mortar, temperature conditions shall be maintained to ensure that adequate curing is achieved, as long as is necessary to ensure design strength is achieved.
7. Care must be taken to ensure undesirable drying of concrete surfaces during the curing process.
8. Placement of blankets may be an appropriate alternative when weather and conditions permit. Temperature must be maintained and care must be exercised to ensure against loss of moisture.
9. Curing times stated below are designed to ensure optimum strengths and prevent potential for failure of materials once thawed and loaded. Allowance for reduction in curing times depends entirely on proof of having achieved design strengths at an earlier stage and would require test backup on samples.
10. Concrete, other than high early-strength, shall be maintained above 10° C and in a moist condition for at least the first seven (7) days after placement.
11. High early-strength concrete shall be maintained above 10° C, and in moist condition for at least three (3) days.
12. Accelerated curing may be used. Curing process shall be such as to produce concrete with a durability at least equivalent to the curing methods stated above.
13. Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near-freezing weather.
14. For the purposes of near-freezing conditions, 5° C, forms and curing concrete shall be enclosed by tenting or full accessible enclosures, to be built so that proper inspection may be performed while concrete is properly curing. These enclosures must be capable of maintaining temperature of curing concrete above 10° C for the time periods mentioned above.
15. All concrete material and reinforcement, embeds, forms, fillers, and ground with which concrete is to come in contact shall be free from frost, ice, and snow.
16. Reinforcement shall be thoroughly free of ice and other deleterious coatings and materials.
17. When temperatures fall below 5° C, grout mixing water and aggregates shall be heated to produce grout temperatures between 5° C and 50° C.
18. Masonry to be grouted shall be maintained above freezing during the grouting placement and for at least 24 hours after placement. This means that the blocks must be brought up to temperature before placement of the grout and maintained throughout the placement and cure process.

CONCRETE

1. All concrete is to be manufactured and installed in accordance with the latest addition of CSA-A23.1 Concrete Materials and Methods of Construction, and CSA-A23.2 Method of Test for Concrete.
2. Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA-A23.1.
3. Provide certification that plant, equipment, and materials to be used in concrete, comply with requirements of CSA-A23.1.
4. Unless noted otherwise, concrete curing to conform to the latest addition of CSA-A23.1 as follows:
   - Type 1 - Basic: 3 days ≥ 10°C. and for a time necessary to attain 40% of the specified strength.
   - Type 2 - Additional: 7 days ≥ 10°C. and for a time necessary to attain 70% of the specified strength.
   - Type 3 - Extended: 7 days wet cured ≥ 10°C.
5. Do not embed conduits, pipes, or sleeves other than electrical conduits 25 mm (1") dia. and smaller in structural concrete except where specifically detailed or accepted by the S.E.O.R. Conduits shall be located, minimum 76 mm (3") clear apart.
6. Patch tie holes in all exposed concrete.
7. Concrete properties to be as follows unless noted otherwise on the drawings:

Location / Purpose	Density	Cement Type	Strength @ 28 / 56 Days	Slump (± 20mm)	Exposure Class	Air Entrainment	Aggregrate Size (max.)	Curing Typ.
Exterior Slabs & Sidewalks	Normal	GU	35 MPa	80	C-1	5 - 8 %	20mm	Type II addt'l
Pad / Strip Footings	Normal	HS	35 MPa	80	C-1	5 - 8 %	20mm	Type II addt'l
Retaining Walls	Normal	HS	35 MPa	80	C-1	5 - 8 %	20mm	Type II addt'l

CONCRETE REINFORCEMENT

1. Provide reinforcing steel complying with CSA Standard G30.18 Grade 400 MPa Billet Steel Bars for Concrete Reinforcement.
2. Welded rebar shall be grade 400W, with welding conforming to CSA Standard W186 Welding of Reinforcing Bars in Reinforced Concrete Construction.
3. Concrete cover protection from face of reinforcement:

Use	Cover Distance (U.O.N)
Slab-on-Grade	76 mm (3")
Concrete below grade, formed	51 mm (2")
Concrete below grade, unformed	76 mm (3")
Walls above grade, exposed to weather	51 mm (2")
Walls above grade, not exposed to weather	25 mm (1")
Columns & Beams	38 mm (1 1/2")
Structural Slab (T & B)	25 mm (1")

4. Bend reinforcing steel cold unless authorized by S.E.O.R. Reinforcing bars shall not be re-bent without prior approval from S.E.O.R.
5. Reinforcing steel shall be clean; free of loose scale, mud, oil, dirt, rust, or any other foreign coating affecting bonding with concrete.
6. Secure all reinforcing steel, anchor bolts, inserts, etc. in place prior to placing concrete.
7. Submit reinforcing steel shop drawings indicating reinforcing placement, including splice locations and lengths to S.E.O.R for review. Promptly notify S.E.O.R prior to developing reinforcing steel shop drawings if insufficient clear distances between reinforcing steel or rebar congestion is encountered.
8. Wire fabric shall be electrically welded steel conforming to A.S.T.M. A185. Lap 152 mm (6") at edges.
9. Detailing, fabrication and placing of reinforcing steel shall conform to that set forth in CSA Standard A23.1.
10. Standard hooks shall comply with the recommended sizes as shown in the above standard, unless otherwise noted.
11. Lap reinforcing bars w/ class 'B' lap splices (U.O.N. on drawing), as follows:

Class 'B' Splices				
Bar Size	Concrete Strength			
	25MPa	(3600 psi)	30MPa	(4300 psi)
10M	381	(15")	356	(14")
15M	560	(22")	508	(20")
20M	755	(30")	690	(27")
25M	1170	(46")	1065	(42")

12. Dowels shall have embedment lengths equal to the tension development length, ld, as follows:

Tension Developement, ld				
Bar Size	Concrete Strength			
	25MPa	(3600 psi)	30MPa	(4300 psi)
10M	305	(13")	305	(12")
15M	432	(17")	381	(15")
20M	584	(23")	533	(21")
25M	914	(36")	813	(32")

13. All pipes and ducts through concrete shall be sleeved. Verify openings with Plumber and Electrician.
14. All welded wire fabric shall be 6x6-W4.0 x 4.0 U.O.N. Welded fabric shall be tied at three places to reinforcing dowels (where occur) except locations where slab is designed as an independent slab.
15. Chairs, spacers or other devices shall be used to hold the reinforcing in its true horizontal and vertical positions. These devices shall be sufficiently rigid and numerous to prevent displacement of the reinforcing during the placing of the concrete. Chair material shall not be susceptible to rot nor rust.
16. For wall reinforcement not described within structural drawings provide minimum wall reinforcement as follows:

Minimum Wall Reinforcing			
Wall Thickness	Vertical Bars	Horizontal Bars	Verticals @ Ea. End
152 mm (6")	10M @ 250 (10") o/c	10M @ 250 (10") o/c	1- 15M
203 mm (8")	15M @ 400 (16") o/c	15M @ 400 (16") o/c	1- 20M
254 mm (10")	10M @ 300 (12") o/c ea. face	10M @ 300 (12") o/c ea. face	2- 20M
305 mm (12")	10M @ 250 (10") o/c ea. face	10M @ 250 (10") o/c ea. face	2- 20M
356 mm (14")	15M @ 450 (18") o/c ea. face	15M @ 450 (18") o/c ea. face	2- 25M
406 mm (16")	15M @ 400 (16") o/c ea. face	15M @ 400 (16") o/c ea. face	2- 25M

DESIGN NOTES

1. Foundation Engineering performed by BAR Engineering Co. Ltd.
2. This design conforms to the National Building Code of Canada - Alberta Edition (2019)
3. Climatic Data for Vermilion was used for design:
   a. Importance Category= Normal
   b. Snow load, Ss= 1.7 kPa, Sr= 0.1 kPa
   c. Hourly wind pressure, q1/50=0.36 kPa
4. Soil parameters used in design were assumed:
   a. Bearing pressure =150kPa
5. Site inspections are required to ensure the work is being carried out in general conformity with the intent of the plans and specifications. Please notify BAR Engineering a minimum of two (2) days prior to required inspections.

COMMON ABREVIATIONS

&	and
@	at
c/c	Centre-to-Centre
c/w	Complete With
Ø	Diameter
r/w	Reinforced With
#	Number
o/c	On Centre
o/o	Outsto-Out
t/o	Top Of
b/o	Bottom Of
u/s	Under Side
w/	With
A.B.C	Alberta Building Code
A.H.J	Authority Having Jurisdiction
ARCH.	Architect
ATR.	All Threaded Rod
B.E.W	Bottom Each Way
BF.	Braced Frame
B.F.F	Below Finished Floor
BLDG.	Building
BM.	Beam
BTM.	Bottom Of
B.L.L	Bottom Lower Layer
B.U.L	Bottom Upper Layer
BRKT.	Bracket
BTWN.	Between
CMU	Concrete Masonry Unit
CALCS	Calculations
CLNG.	Ceiling
CLR.	Clear
CNTR.	Centre
COL.	Column
CONC.	Concrete
CONT.	Continuous
DL.	Core Wall
(E)	Existing
Ea.	Each
EXP. J.	Expansion Joint
ELEV..	Elevation
Embed.	Embedment
Eq.	Equal
EXP.	Expansion
EXT.	Exterior
F.F	Finished Floor
FLR.	Floor
FDN.	Foundation
FTG.	Footing
Ga.	Gauge
GALV.	Galvanized
H.E.F	Horizontal Each Face
GYP.	Gypsum board
HD.	Hold Down
HDMR	Heavy Duty Masonry Reinforcement
HORIZ.	Horizontal
HSS	Hollow Structural Steel
HT.	Height
INFO	Information
INSUL.	Insulation
INT.	Interior
INTER.	Intersection
LDH	Long Dimension Horizontal
LL	Live Load
LLH	Long Leg Horizontal
LLV	Long Leg Vertical
LSL	Laminated Strand Lumber
LT. WT.	Light Weight
LVL	Laminated Veneer Lumber
MAX.	Maximum
MECH.	Mechanical
MANUF.	Manufacturer
MIN.	Minimum
(N)	New
N.B.C.	National Building Code
N.I.C	Not In Contract
N.S	Non-Shrink
N.T.S	Not To Scale
OPT.	Optional
PC.	Piece
PL.	Plate
PSF	Pounds per Square Foot
PSL	Parallel Strand Lumber
P.T	Pressure Treated
PAR.	Parallel
PERF.	Perforated
PERP.	Perpindicular
R	Riser
R&R	Remove and Replace
REINF.	Reinforcing / Reingforcement
REQ'D	Required
RM.	Room
SCHED.	Schedule
SIM.	Similar
SMR	Standard Mansory Reinforcement
S.O.G	Slab-On-Grade
STAGG.	Staggered
ST.	Steel
STD.	Standard
SW.	Shearwall
SQ.	Square
T&B	Tie-Joist
THK.	Thick
TJ.	Tie-Joist
TUL	Top Upper Layer
TLL	Top Lower Layer
TYP.	Typical
U.O.N	Unless Otherwise Noted
WD.	Wood
W.W.M	Welded Wire Mesh

BAR ENGINEERING
5237 70 Avenue Lloydminster, AB, T9V 3N6

CLIENT:

VERMILLION RIVER REGIONAL WASTE MANAGEMENT SERVICES & COMMISSION

SEAL:

2023-11-01

PROFESSIONAL ENGINEER ALBERTA DANIEL B. BAR

MEMBER #: 142583

PERMIT:

PERMIT TO PRACTICE
BAR ENGINEERING Company LTD
Signature
Date 2023-11-01
PERMIT NUMBER: P 7266
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

No.	BH	DC	ENG	APR	DESCRIPTION	DATE
0	BY			WS	ISSUED FOR CONSTRUCTION	2023-10-25

PROJECT:

VERMILLION LANDFILL RETAINING WALLS

LOCATION:

SW 5-51-6-W4
VERMILLION, AB.

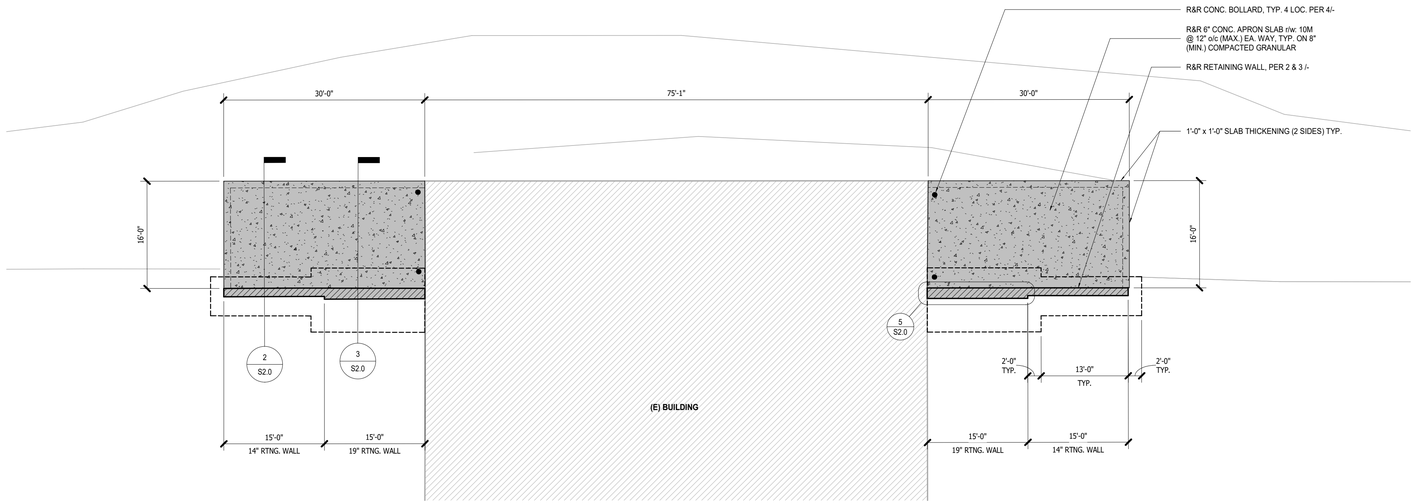
DRAWING NAME:

SPECIFICATIONS

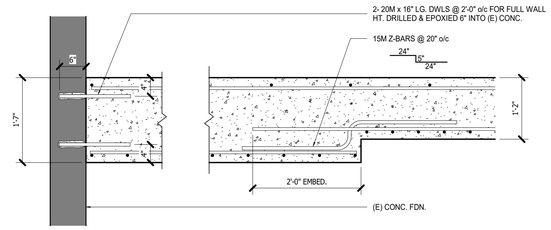
PROJECT NO.: 23MU-568900

DRAWING NO.:

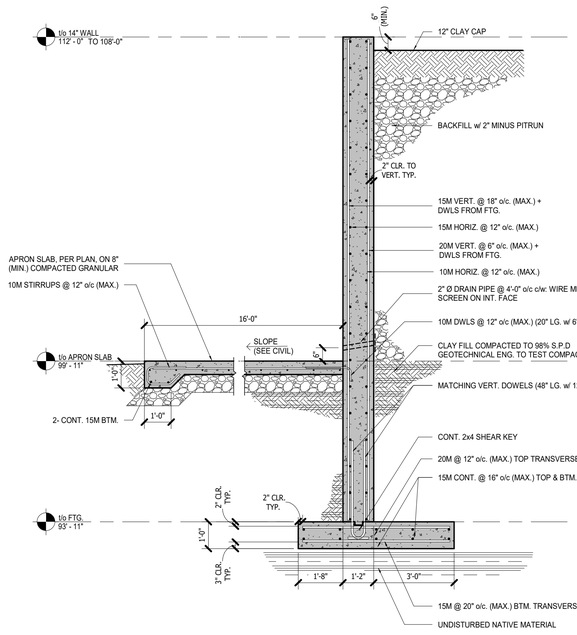
S1.0



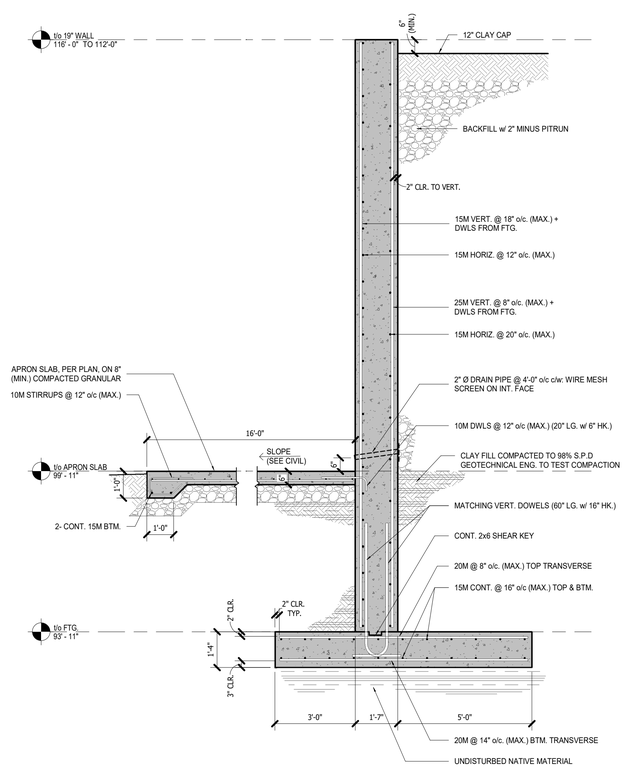
1 RETAINING WALL PLAN
3/32" = 1'-0"



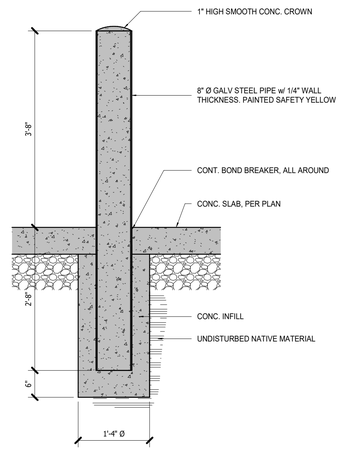
5 PLAN CALLOUT
3/4" = 1'-0"



2 14" RETAINING WALL
3/8" = 1'-0"



3 19" RETAINING WALL
3/8" = 1'-0"



4 TYP. IMPACT BOLLARD
3/4" = 1'-0"

BAR ENGINEERING
5237 70 Avenue Lloydminster, AB, T9V 3N6

CLIENT:

VERMILLION RIVER REGIONAL WASTE MANAGEMENT SERVICES & COMMISSION

SHEET NOTES:

- ALL WORK SHALL COMPLY WITH ALL APPLICABLE LOCAL & PROVINCIAL REGULATIONS AND CODES.
- THE OWNER IS RESPONSIBLE FOR OBTAINING ALL RELATED PERMITS REQUIRED BY THE GOVERNING AGENCIES. THIS PLAN SHALL BE CONSIDERED PRELIMINARY UNTIL APPROVED BY ALL GOVERNING AGENCIES. IMPLEMENTATION OF THIS PLAN SHALL NOT PROCEED UNTIL ISSUANCE OF ALL RELATED PERMITS.
- THE CONTRACTORS SHALL VERIFY THAT ALL DIMENSIONS, DATUMS, & DETAILED INFORMATION SHOWN IS CORRECT PRIOR TO COMMENCING CONSTRUCTION. REPORT ANY DISCREPANCIES TO BAR ENGINEERING IMMEDIATELY.
- REFERENCE THE CIVIL DWGS FOR ALL ON SITE GRADING.
- ALL STRUCTURES ARE TO BE LOCATED BY A QUALIFIED SURVEYOR. CONTRACTOR SHALL LOCATE ALL STRUCTURES & CERTIFY COMPLIANCE w/ SETBACKS PRIOR TO ANY WORK.

SEAL:

2023-11-01

MEMBER #: 142583

PERMIT:

PERMIT TO PRACTICE
BAR ENGINEERING Company LTD
Signature
Date 2023-11-01
PERMIT NUMBER: P 7266
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

No.	BY	ENG	APR	DESCRIPTION	DATE
0	BH	DC	WS	ISSUED FOR CONSTRUCTION	2023-10-25

PROJECT:

VERMILLION LANDFILL RETAINING WALLS

LOCATION:

SW 5-51-6-W4
VERMILLION, AB.

DRAWING NAME:

RETAINING WALL PLAN & DETAILS

PROJECT NO.: 23MU-568900

DRAWING NO.:

S2.0