



ADDENDUM A-02

Project:	Tender No. 22.06.20A - Drumheller Resiliency and Flood Mitigation – Midland Dike Upgrade Project
Addendum:	A-02
Date:	July 11, 2022
Location:	Drumheller, Alberta

To All Bidders:

1. General

- 1.1. This addendum shall be read in conjunction with Tender No. 22.06.20A Drumheller Resiliency and Flood Mitigation – Midland Dike Upgrade Project.
- 1.2. Where inconsistent with the above, this addendum shall govern. This addendum forms an integral part of the Contract Documents and shall be included therein.
- 1.3. No consideration shall be allowed for increases (extras) to the CONTRACT PRICE due to the failure of the Contractor or Subcontractor not being familiar with this addendum.
- 1.4. The Bidder shall insert in the Tender Form the number(s) of the addenda received by them during the tendering period and taken into account by them in preparing their tender.

2. Instructions to Proponents

The Instructions to Proponents in the Contract Documents are hereby amended as follows:

2.1 Section 1.4 – Town of Drumheller Authorized Representatives – Project Enquiries

- .1 REVISE the deadline for written questions and inquiries to 4:30 pm (local time), July 13, 2022. The Issuing Office will formally respond to inquiries by no later than July 15, 2022.

3. Tender Forms

The Tender Forms in the Contract Documents are hereby amended as follows:

3.1 Section 2.5 – Unit Price Schedule

- .1 REPLACE the form in its entirety with the revised Unit Price Schedule appended to this Addendum.

4. Special Provisions

The Special Provisions in the Contract Documents are hereby amended as follows:

4.1 Clause 5.10 – Project Interim Completion Dates

- .1 DELETE the following text: General Specification 1.2.20, “Failure to Complete on Time”.

4.2 Clause 5.21 – Project Identification/Grant Signs

- .1 REPLACE the section in its entirety with the following:

The Town has supplied and installed Project Identification/Grant Signs. These signs are located at key points within the Town for public awareness and information and shall remain in place for the duration of construction.

Sign and signposts maintenance and removal and disposal at construction completion is the responsibility of the Contractor. This is considered incidental to the work and no separate payment will be made.

5. Specifications

The Specifications in the Contract Documents are hereby amended as follows:

5.1 Section 01110 – Summary of Work

- .1 ADD Clause 2.4.3 as follows:

2.4.3 Provide unhindered access across the alley to 1200 1Avenue NW throughout the duration of construction.

5.2 Section 01280 – Measurement Schedule

- .1 REPLACE the section in its entirety with the revised Section 01280 appended to this Addendum.

5.3 Section 02220 – Demolition, Salvage, and Removal

.1 REPLACE Clause 2.3.1 as follows:

- .1 Demolish and remove the following existing structures. Note some structures may be partially demolished:

Existing Structure	Approximate Station
Headwall (7)	1+350, 2+050, 2+140, 2+207.68, 2+260, 2+580, 2+650
300 mm concrete storm sewer (72 m)	1+350, 2+260
400 mm concrete storm sewer (7 m)	2+140
600 mm CSP storm sewer (14 m)	2+580
500 mm PVC storm sewer (20 m)	2+650
Manhole (1)	2+050
Asphalt Pathway (1100 m)	1+200 to 1+500 2+000 to 2+800
Grated Inlet (1)	2+580
Catchbasin (2)	1+350
Precast jersey barrier (60 m)	2+030, 2+140

.2 ADD Clause 2.3.2 as follows:

- .1 Abandon in place the following structures:

Existing Structure	Approximate Station
300 mm CSP storm sewer (9 m)	2+050

.3 REPLACE Clause 2.4.1 as follows:

- .1 The Contractor is to remove the following structures and reinstall at a location specified by the Owner and Engineer of Record (if deemed suitable for re-use by the Owner and Engineer of Record).

Existing Structure	Approximate Station	Note
Memorial Benches (7)	1+200, 1+300, 2+000,	Remove as required to perform work and reinstall
Garbage Bins	1+300	Remove as required to perform work and reinstall
Sign	1+300	Salvage and reinstall
Flap Gate (9)	1+350, 2+050, 2+140, 2+210, 2+260, 2+580, 2+650	Salvage and reinstall/return to the Owner

.4 ADD Clause 2.8 as follows:

2.8 Abandon In Place

1. Abandon existing storm sewers in place at the locations identified by filling with flowable concrete. Concrete design strength to be 2 MPa at 28 days.
2. Place flowable concrete in a manner to fully fill the storm sewer and voids that may exist outside of the storm sewer. Placement of flowable concrete shall be done in one continuous operation.
3. Provide venting as required to maintain atmospheric pressure within the culvert while filling with concrete.
4. Monitor and record the rate of filling, total concrete volume, and pressure of application continuously throughout the operation. Cease operations only with the approval of the Engineer of Record.

5.4 Section 02330 – Earthwork Materials

.1 ADD Clause 2.1.6 Zone 4A Road Gravel

1. Reasonably well-graded crushed gravel and sand with a gradation that falls completely within the upper and lower bounds of the envelope defined by straight lines drawn directly between the following points plotted on a standard semi-log soil grain size distribution plot:

Sieve Size	Percent Passing by Mass
25 mm	100%
20 mm	82% – 97%
16 mm	70% – 94%
10 mm	52% – 79%
5 mm	35% – 64%
1.25 mm	18% – 43%
630µm	12% – 34%
315µm	8% – 26%
160µm	5% – 18%
80µm	2% – 10%

2. At least 60% by mass of the particles retained on the 5 mm and larger sieves to have 2 or more fractured faces.

5.5 Section 02930 – Soil Erosion Protection

.1 ADD Section 02930 appended to this Addendum

6. Drawings

The Drawings in the Contract Documents are hereby amended as follows:

6.1 ADD the following drawings, appended to this Addendum:

- .1 G-003 Haul Routes
- .2 L-100 Landscape Cover Sheet & Key Plan
- .3 L-101 Landscape Master Plan
- .4 L-102 Landscape Master Plan
- .5 L-103 Landscape Master Plan
- .6 L-104 Landscape Master Plan
- .7 L-105 Landscape Master Plan
- .8 L-106 Landscape Master Plan
- .9 L-301 Layout & Grading Plan
- .10 L-302 Layout & Grading Plan
- .11 L-303 Layout & Grading Plan
- .12 L-304 Layout & Grading Plan
- .13 L-305 Layout & Grading Plan
- .14 L-306 Layout & Grading Plan
- .15 L-307 Layout & Grading Plan
- .16 L-308 Layout & Grading Plan
- .17 L-309 Layout & Grading Plan
- .18 L-310 Layout & Grading Plan
- .19 L-311 Layout & Grading Plan
- .20 L-312 Layout & Grading Plan
- .21 L-401 Seeding Plan
- .22 L-402 Seeding Plan
- .23 L-403 Seeding Plan
- .24 L-404 Seeding Plan
- .25 L-405 Seeding Plan
- .26 L-406 Seeding Plan
- .27 L-407 Seeding Plan
- .28 L-408 Seeding Plan
- .29 L-409 Seeding Plan
- .30 L-410 Seeding Plan
- .31 L-411 Seeding Plan
- .32 L-412 Seeding Plan
- .33 L-413 Seeding Notes
- .34 L-901 Landscape Details

6.2 Drawing C-101

- .1 DELETE the text "LAYDOWN AREA", south of 1 AVE NW and east of 14 ST NW

6.3 Drawing C-502

- .1 DELETE reference to EROSION CONTROL BLANKET on the land side of the dike.

7. Questions

The following questions were raised in the pre-tender meeting or received prior to the close of questions. The responses are provided as follows:

Question 1: Please clarify how liquidated damages apply to this tender. In the SP's, it is noted that there are no liquidated damages. In another section of the tender specifications, it states that the AT specification of \$3,000 per day will apply. Also note, the latest AT section is 1.2.40 (not 1.2.20).

Response: Liquidated damages will not be assessed. The Contract Documents have been amended to reflect this in this Addendum.

Question 2: It is noted in the tender specifications that all highway and local roadway restrictions and bans shall apply. Will construction traffic be able to permit our hauling operations to allow 100% axle weights within the town limits?

Response: For purposes of bidding, assume that 100% axle weights are permitted within the town limits. The Town is planning to conduct a condition assessment of the haul routes prior to the start of construction; one of the outcomes of this assessment is to determine the adequacy of the streets to carry construction traffic. If less than 100% axle weights are permitted as a result of this assessment, the impact on construction and associated costs will be negotiated with the contractor.

Question 3: Can the Town provide a central location for temporary material stockpiling?

Response: The Town will not provide any additional areas. The contractor is responsible to secure additional work areas as required for their activities. Also, note the drawing revisions included in this Addendum related to laydown areas that were shown in error and are not available to the contractor.

Question 4: Please confirm that costs associated with access pads for entering/exiting site can be covered under the temporary roads cost allowance.

Response: Yes, the costs associated with access pads for entering/exiting the site will be included in the Temporary Roads cash allowance.

Question 5: Is a site office for the consultant required?

Response: A site office for the consultant is required, but a separate office is not necessarily required. The contractor is required to provide a dedicated work space for the consultant with climate control (air conditioning and heat), desk, chair, wireless internet access, and weekly housekeeping. It is satisfactory if this workspace is provided within the contractor's site office. Note that an area suitable to hold construction meetings, including a table and adequate number of chairs, must also be provided. This is included in the mobilization/demobilization line item.

Question 6: Will mulching of cleared trees be acceptable?

Response: Yes, this is acceptable; however, elm and black-knot infested material cannot be mulched and must be disposed of in accordance with the contract requirements. The Town will accept clean wood chips at the old Public Works Yard located at 117 7th Avenue SE.

Question 7: Is the excavation volume included in the fill volume for replacement? If not, what is the intended use of the 5,000 m³ of excavation?

Response: No, the excavation volume is not included in the fill volume for replacement. The excavation includes material from the partial cutoff and the railroad embankment and is not expected to meet the specifications of Impervious Fill Zone 1A. The excavation material is to be disposed of.

Question 8: Please confirm the intent of the partial cut-off. What is to be done with the excavated material?

Response: The partial cut-off provides an investigation of the foundation materials along the full length of the dike and provides a seepage cut-off. Refer to the response to Question 7 related to the use of the excavated material.

Question 9: Please provide a quantity for asphalt trails that will be required to be disposed of. Will the town take the removed material? Does the trail need to be replaced? How will these activities be paid?

Response: The approximate length of asphalt trail to be removed is included in Specification Section 02220 – Demolition, Salvage, and Removal. The Town will receive milled asphalt material at the storage yard adjacent to the landfill, located at 2500 Highway 10 East. The material must be weighed at the landfill scale prior to dumping and stockpiling. Otherwise, the material is to be disposed of. Removal of pathways is paid under the Demolition and Removal lump sum bid item. Details of new pathways and associated bid line items and measurement scope have been included as part of this Addendum.

Question 10: Are both project information and construction advisory signs incidental to the work?

Response: Yes, in accordance with Special Provisions 5.21 and 5.22, these are considered incidental to the work and no separate payment will be made. Note that the Town will supply the project information signs. Refer to the revision to the Special Provision earlier in this addendum.

Question 11: Is all the clearing that was needed to be done complete? Please confirm no additional clearing is required. Please confirm the limits of clearing is to the limits of ground disturbance needed.

Response: The dike footprint has been cleared. There will be a small amount of additional clearing required, such as at pathway ramps, storm sewer outlets, and the extent determined during construction. This will be measured and paid for in the Clearing and Grubbing line item.

Question 12: Catch basins are to be removed and replaced. Please clarify where the replacement of the curb for those locations will be paid. Is there a location that the removed concrete (pipe/manhole and curb/gutter) material can be discarded?

Response: Catchbasins have been added as individual bid items and curb replacement will be included in the lump sum price. A revised bid schedule has been included with this Addendum. The material must be disposed off site. No material may be discarded on site.

Question 13: Please provide additional detail on what is to be done with abandoned storm sewer lines.

Response: Sections of storm sewer below the dike must be removed and backfilled with Impervious Fill Zone 1A. Otherwise, storm sewer will be abandoned in place by filling with concrete. This work is included in the Demolition and Removal bid item. This has been incorporated into this Addendum.

Question 14: Please provide additional detail for the removal of existing headwalls. What will need to be done with the excavation of the area after? How will that be paid?

Response: Removal of headwalls is to be done in accordance with the Demolition, Salvage, and Removal specification. The excavated area will be filled with Impervious Fill Zone 1A material and paid as such.

Question 15: Please confirm what material is to be used for rip rap bedding.

Response: Riprap bedding is Bedding 5B material as specified in Specification Section 02330 – Earthwork Materials.

Question 16: What laydown areas are available for use?

Response: Laydown areas identified by the Town are presented in the drawings. Note the drawing revisions elsewhere in this Addendum that identify laydown areas that were shown in error and are not available to the contractor.

Question 17: Please confirm there will not be any restrictions with access to the site using adjacent roads, and that Contractors will be able to use any public roads which lead to the work area.

Response: Access to the site within local residential streets will be restricted to those shown on the appended haul routes drawing.

Question 18: Are there tipping fees for stumps brought to the landfill? Does ALL tree debris need to be removed (ie. Including mulch)?

Response: Yes, tipping fees should be expected. All tree debris, including mulch, must be removed.

Question 19: Is excavated topsoil to be reused? Will this be paid under the import topsoil item, even if it is reused from onsite? Can mulch be mixed with topsoil and replaced? Incorporating mulch into topsoil is a proven method of reducing erosion, as it aids in anchoring soil after roots have been established?

Response: Yes, stripped topsoil is to be reused for topsoil placement. This quantity is excluded from the imported topsoil line item. Mixing mulch with topsoil prior to placement may be considered and will be discussed following contract award. For the purposes of bidding, assume that all mulch must be hauled off site.

Question 20: Can an ACP trail removal quantity be provided?

Response: Refer to the response provided for Question 9.

Question 21: Please confirm any excavated material will be considered waste. If not, can it be used as berm fill? How will disposal of waste material be paid?

Response: If excavated material meets the material requirements for Impervious Fill Zone 1A, it may be used as dike fill. However, it is expected that the excavation material will not

meet these requirements and must be disposed of. Disposal is to be included in the Excavation unit price. Refer to Clarification 7.3 provided in this Addendum for disposal location.

Question 22: Are there any areas on the project which are considered wetlands? Will a wildlife sweep be needed prior to ground disturbance in any area?

Response: There are no areas considered wetlands. A wildlife sweep is required prior to the start of construction and will be completed by the Town's Consultant.

Question 23: For removal and replacement of existing CBs, will we be able to close the sections of road and detour traffic?

Response: Residential streets may be closed to through traffic, but local access for residents must be maintained.

Question 24: Please provide information regarding working around the high-pressure gas line within the work area. Are there any crossing restrictions? Is there a crossing/proximity agreement already in place?

Response: Discussions are ongoing with APEX and any additional requirements that may be required are presently unknown. It is anticipated that a crossing agreement will be in place prior to the start of construction. If specific measures are determined to be required to work in the vicinity of the gas line, these will be considered and paid for as extra work.

Question 25: How will the removal and replacement of concrete curb/gutter/walks be paid? Will there be a line item created, or should it be included as incident with an existing item?

Response: This will be included in the associated catchbasin line items.

Question 26: What is to be done with the jersey barriers included in the current berm? Do they need to be reinstalled? (some are cracking). If not, where are they to be disposed of?

Response: The jersey barriers are to be removed and disposed of in accordance with Specification Section 02220 – Demolition, Salvage, and Removal.

Question 27: Two CBs are existing at Sta. 2+650. Please confirm what is to be done with the CB which is not being upgraded.

Response: This is to be confirmed in the field. Any additional work will be paid through the "Repairs to Existing Storm Sewer System" Cash Allowance

Question 28: Please confirm site access location points for the Midland berm construction.

Response: A plan showing access has been prepared and is appended to this Addendum.

Question 29: Is all of the old railbed material to stay onsite (salvaged and reused as embankment fill)?

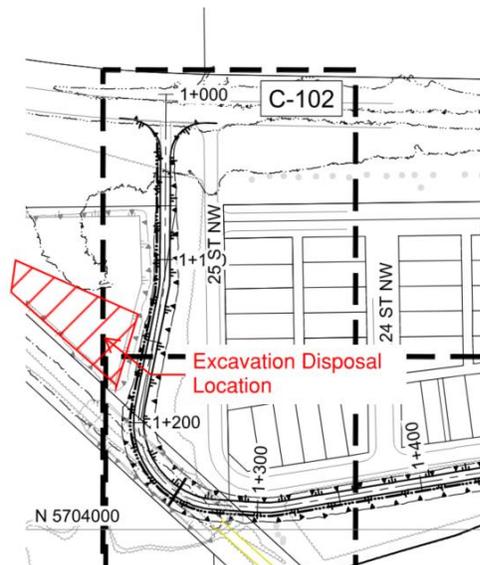
Response: All of the old railbed material is to be disposed of. Refer to Clarification 7.1 and 7.3 provided in this Addendum for additional information.

Question 30: There is a concrete vault at approx. Sta. 1+285. Is there anything to be done to this vault (ie. raise or lower)?

Response: The barrel riser on this vault is to be raised. This work will require investigation and will be paid through the “Repairs to Existing Storm Sewer System” Cash Allowance.

8. Clarifications

- 8.1 The CN railroad embankment shall be fully excavated to the lines shown on the drawings. This material is expected to be unusable for fill placement and shall be disposed of off-site. If contaminants are encountered, testing shall be conducted, and the manner of disposal determined based on this testing. The cost of testing and any additional disposal requirements will be paid as an extra cost.
- 8.2 Fill for access ramps beyond the lines and grades of the dike is Impervious Fill Zone 1A material.
- 8.3 The laydown area shown south of 1 Avenue NW and east of 14 Street NW is an error. This area is not available to the Contractor.
- 8.4 Photos of the shoreline at the location of the instream riprap installation are appended to this Addendum. Care must be taken to minimize the removal of existing riparian vegetation.
- 8.5 Pavement, curb, and gutter restoration shall be done in accordance with Alberta Transportation Standard Specifications for Highway Construction. Pavement shall conform to Type L1.
- 8.6 Excavation material is to be disposed of in the parcel of land located west of the flood dike along 25th Street NW as shown in the image below. Note that this land is owned by Alberta Environment and Parks and placement of the material is subject to the issuance of a Temporary Field Authorization. Limit stockpile geometry to 1.5 m in height and slopes no steeper than 3H:1V (horizontal to vertical).



Tender No. 22.06.20A

Midland Dike Upgrades Project

ADDENDUM No. A-02

9. Attachments

9.1 The following documents are appended to and form part of this Addendum:

- .1 Unit Price Schedule (4 pages)
- .2 Technical Specification Section 01280 – Measurement Schedule (11 pages)
- .3 Technical Specification Section 02930 – Soil Erosion Protection (3 pages)
- .4 Drawing G-003 – Haul Routes (1 drawing)
- .5 Landscape Tender Package (33 drawings)
- .6 Shoreline Photos (1 drawing)

10. Acknowledgement

10.1 Bidders shall acknowledge receipt of this Addendum where required on Form 2.4 Addenda Received.

11. Tender Submission Deadline

11.1 The Tender Submission Deadline remains unchanged.

End of Addendum A-02

2.5 UNIT PRICE SCHEDULE (ADDENDUM No. A-02)**TOWN OF DRUMHELLER****Drumheller Resiliency and Flood Mitigation****FOR****Town of Drumheller****Midland Dike Upgrades Project****Tender No.: 22.06.20A****KLOHN CRIPPEN BERGER LTD. PROJECT No.: A03409A05**

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL BID
1. GENERAL REQUIREMENTS					
1.1	Mobilization and Demobilization	Lump Sum	1	\$	\$
1.2	Existing and Temporary Access Roads	Lump Sum	1	\$	\$
2. SITE WORK					
2.1	Demolition and Removal	Lump Sum	1	\$	\$
2.2	Demolition and Salvage	Lump Sum	1	\$	\$
2.3	Clearing and Grubbing	sq. m.	21,000	\$	\$
2.4	Topsoil and Subsoil Stripping	sq. m.	1,850	\$	\$
2.5	Excavation	cu. m.	6,000	\$	\$
2.6	Impervious Fill Zone 1A	cu. m.	30,000	\$	\$

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL BID
2.7	Topsoil Placement	cu. m.	3,700	\$	\$
2.8	Imported Topsoil	cu. m.	1,850	\$	\$
2.9	Bedding 5B	cu. m.	175	\$	\$
2.10	Riprap Class 1	cu. m.	40	\$	\$
2.11	Riprap Class 2	cu. m.	300	\$	\$
2.12	Ø 300 mm PVC Pipe	lin. m.	15	\$	\$
2.13	Ø 450 mm Concrete Pipe	lin. m.	45	\$	\$
2.14	Ø 600 mm Concrete Pipe	lin. m.	115	\$	\$
2.15	1S Manhole 1.2 x 1.2	each	2	\$	\$
2.16	1S Manhole 1.5 x 1.5	each	1	\$	\$
2.17	5A Manhole	each	1	\$	\$
2.18	Ø 450 mm Concrete Headwall	each	2	\$	\$
2.19	Ø 600 mm Concrete Headwall	each	14	\$	\$
2.20	Ø 300 mm Tideflex Valve (TF-1)	each	1	\$	\$
2.21	Ø 600 mm Tideflex Valve (TF-1)	each	5	\$	\$

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL BID
2.22	Ø 450 mm Sluice Gate	each	2	\$	\$
2.23	Ø 600 mm Sluice Gate	each	1	\$	\$
2.24	Ø 600 mm Grated Inlet	each	5	\$	\$
2.25	Willow Plantings	lin. m.	26	\$	\$
2.26	Hydroseed	sq. m.	20,000	\$	\$
2.27	Vehicle Access Control Gates	each	2	\$	\$
2.28	Catchbasin	each	2	\$	\$
2.29	Erosion Control Blanket	sq. m.	7,300	\$	\$
2.30	Asphalt For Pathways	tonne	600	\$	\$
2.31	Gravel For Pathways	tonne	1,200	\$	\$
2.32	Root Barrier	sq. m.	3,800	\$	\$
3. MAINTENANCE					
3.1	Landscape Maintenance Year 1	year	1	\$	\$
3.2	Landscape Maintenance Year 2	year	1	\$	\$
4. CASH ALLOWANCES					

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL BID
4.1	Care of Water and Turbidity Barriers	Cash Allowance			\$ 50,000.00
4.2	Repairs to Existing Storm Sewer	Cash Allowance			\$ 100,000.00
TOTAL TENDER AMOUNT:					

Contractor's Representative Signature

Contractor's Name (Print)

Print Name

Position in Company

Witness or Seal

Contractor's G.S.T. No.

Date

1.0 GENERAL

1.1 MEASUREMENT SCHEDULE

.1 Schedule: See next page.

.2 Quantity Calculations – Scheduled Lump Sum items.

.1 When an interim payment is to be a specified percentage of a lump sum item, and is calculated based on the ratio of the value of Work completed to the interim date, and the Contract Bid Amount, that specified percentage will be included in the calculation of the value of the Work completed to that interim date.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
1. GENERAL REQUIREMENTS		
1.1	Mobilization and Demobilization	<p>.1 Scope: Mobilization includes supplying and transporting to the Site, labour, equipment, products and incidentals; providing and maintaining temporary facilities and controls, temporary buildings including site office, utilities, safety and security measures including temporary fencing, and other construction necessary for Contractor's methods carried out during performance of the Contract and which does not remain as part of the Permanent Work; preparing, supplying materials for, and implementing the ECO and ESC Plans; monitoring, rectifying any non-compliance; and reporting as required by the ECO and ESC Plans, and; all related work and materials for which payment is not included elsewhere.</p> <p>Demobilization includes removing and transporting from the Site, labour equipment, products, and other items not required to remain upon Total Performance of the work; cleaning up of the Site and laydown; and all related work and materials for which payment is not included elsewhere.</p> <p>Mobilization and Demobilization includes interim and partial mobilization and demobilization activities required to perform the Work of the Contract.</p> <p>.2 Payment: Lump Sum paid in accordance with the following schedule. The total amount of such payments shall not exceed the amount bid for this item.</p> <p>.1 Payment of 25% of the Lump Sum amount after completion of Work for 5% of the Contract Bid amount.</p> <p>.2 Payment of another 25% of the Lump Sum amount after completion of Work for 25% of the Contract Bid amount.</p> <p>.3 Payment of another 25% of the Lump Sum amount after completion of Work for 50% of the Contract Bid amount.</p> <p>.4 Payment of the remaining 25% of the Lump Sum amount after completion of all Work of the Contract and issuance of the Construction Completion Certificate.</p>
1.2	Existing and Temporary Access Roads	<p>.1 Scope: Includes providing earthwork materials, designing, preparing, installing, constructing, maintaining during construction and removing when required of existing and temporary roads including: access roads, haul road and detour, pathways, trails, construction facilities and laydown areas, parking areas required for and used by Contractor-generated traffic. Includes providing surface protection measured, barriers, signage, flag persons, dust control, and other measures to safely regulate traffic for all detours and existing and temporary roads</p>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		<p>required for, as a result of, or used by Contract generated traffic, conducting video surveys or other means accepted by the Owner Representative to document pre-construction conditions, removing snow from existing and temporary roads and detours, preparing submittals, obtaining approvals, paying all levies required by the Town, and all related work and materials for which payment is not included elsewhere.</p> <p>Earthwork materials incorporated into these works will not be paid for under any other item. Other materials incorporated into these works will not be paid for under any other item.</p> <p>.2 Payment: Lump Sum paid in accordance with the following schedule. The total amount of such payments shall not exceed the amount bid for this item.</p> <p>.1 Payment of 25% of the Lump Sum amount after completion of Work for 5% of the Contract Bid amount.</p> <p>.2 Payment of another 25% of the Lump Sum amount after completion of Work for 25% of the Contract Bid amount.</p> <p>.3 Payment of another 25% of the Lump Sum amount after completion of Work for 50% of the Contract Bid amount.</p> <p>.4 Payment of the remaining 25% of the Lump Sum amount after completion of all Work of the Contract and issuance of the Construction Completion Certificate.</p>
2. SITE WORK		
2.1	Demolition and Removal	<p>.1 Scope: Includes demolishing and disposing of existing pathways (paved and gravel), existing concrete headwalls, existing storm sewers as identified on the Drawings; all work associated with the demolition including saw cutting, breaking, demolishing; excavating, removing, temporary stockpiling and rehandling of demolished materials; loading, hauling, and disposing of demolished materials including asphalt concrete pavement, concrete, and debris, at an off-Site disposal facility; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Payment: Lump Sum paid in accordance with the following schedule. The total amount of such payments shall not exceed the amount bid for this item.</p>
2.2	Demolition and Salvage	<p>.1 Scope: Includes salvaging, removing, temporary stockpiling and rehandling of existing signs, sign posts, benches, barriers, waste bins, and flap gates; loading, hauling, unloading and stockpiling salvaged materials at the on-Site storage area; repair, cleaning or replacement of damaged components, providing new posts,</p>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		<p>foundations or anchoring mechanisms and loading, hauling, handling, reinstalling, remounting, supporting, backfilling and affixing existing signs, sign posts, benches, flap gates, and associated anchoring mechanisms; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Payment: Lump Sum paid in accordance with the following schedule. The total amount of such payments shall not exceed the amount bid for this item.</p>
2.3	Clearing and Grubbing	<p>.1 Scope: Includes all labour, equipment and material needed to cut, grub, removing, load, haul, and dispose at an off-Site disposal facility, of logs, trees, brush, stumps, roots, and other deleterious material from designated areas; protect and treat trees and shrubs that are to remain; protect roots designated by the Owner to remain; protect existing facilities designated by the Owner to remain; level, grad and finish of cleared areas; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be the area of Clearing and Grubbing as measured by survey.</p> <p>.3 Payment: Unit price per square metre.</p>
2.4	Topsoil and Subsoil Stripping	<p>.1 Scope: Includes labour, equipment and resources to strip, sort, load, haul, dump, and stockpile Topsoil in specified areas, and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be cubic meters of stripped soil volume between the original ground surface and the stripped ground surface as measured by survey.</p> <p>.3 Payment: Unit Price per cubic metre.</p>
2.5	Excavation	<p>.1 Scope: Includes excavating; shaping and trimming to finished excavation surfaces; temporary stockpiling and rehandling, if required; sorting, loading, hauling, dumping, initial spreading of suitable materials in fill placement areas; temporary stockpiling, rehandling, loading, hauling, and disposing of materials where designated; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be the excavated volume between the stripped ground or base of gravel subgrade surface as measured by survey and the excavation lines, grades, and elevations specified in the Contract Documents or as adjusted by the Owner.</p> <p>.3 Payment: Unit Price per cubic metre.</p>
2.6	Impervious Fill Zone 1A	<p>.1 Scope: Includes all labour, equipment, and resources required to investigate, test, verify suitable quality, provide submittals and quality control, paying royalties, supply, load, haul, temporary</p>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		<p>stockpile, rehandle, place, and compact Impervious Fill Zone 1A to the design lines, grades, and elevations as shown on Drawings and in the Contract Documents; and all related work and materials for which payment is not included elsewhere. It is the responsibility of the Contractor to determine a suitable fill source location. Material that does not meet requirements of Impervious Fill Zone 1A delivered to site will not be compensated for. Overages in fill delivered to site will not be compensated for.</p> <p>.2 Measurement: Shall be cubic meters of suitable Impervious Fill Zone 1A fill, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents.</p> <p>.3 Payment: Unit Price per cubic meter.</p>
2.7	Topsoil Placement	<p>.1 Scope: Includes obtaining Topsoil from temporary onsite stockpiles; preparing receiving surfaces; dumping, spreading, grading, scarifying, cultivating, and preparing Topsoil obtained from Stockpile; removing and disposing of rocks and deleterious materials; and all related work for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be the in-place volume of Topsoil as determined from the top surface area of the Topsoil measured by survey multiplied by the thickness specified in the Contract Documents or as adjusted by the Engineer of Record.</p>
2.8	Imported Topsoil	<p>.1 Scope: Includes paying royalties, supplying, transporting to site and temporarily stockpiling imported Topsoil; preparing receiving surfaces; rehandling from temporary stockpile, hauling, dumping, spreading, grading, scarifying, cultivating Imported Topsoil; removing and disposing of rocks and deleterious materials; and all related work for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be the in-place volume of Imported Topsoil as determined from the top surface area of the Imported Topsoil measured by survey multiplied by the thickness specified in the Contract Documents or as adjusted by the Engineer of Record.</p>
2.9	Bedding 5B	<p>.1 Scope: Includes preparing receiving surfaces; supplying, paying royalties, sizing, screening, quality control testing, loading, hauling, temporary stockpiling, placing, and trimming of Bedding 5B; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be the in-place volume of Bedding Gravel 5B between the fill lines, grades, slopes, elevations and dimensions specified in the Contract Documents or as adjusted by the Engineer of Record.</p>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
2.10	Riprap Class 1	<p>.1 Scope: Includes all labour, equipment, and resources required supply and place Riprap Class 1 to the design lines, grades, and elevations as shown on Drawings and in the Contract Documents; supply and place geotextile; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be cubic meters of Class 1 Riprap, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents.</p> <p>.3 Payment: Unit Price per cubic meter.</p>
2.11	Riprap Class 2	<p>.1 Scope: Includes all labour, equipment, and resources required supply and place Riprap Class 2 to the design lines, grades, and elevations as shown on Drawings and in the Contract Documents; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be cubic meters of Class 2 Riprap, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents.</p> <p>.3 Payment: Unit Price per cubic meter.</p>
2.12	Ø 300 mm PVC Pipe	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 300 mm PVC pipe, as shown in the Design Drawings and specifications, including: supplying, transporting, and storing pipe; preparing receiving surfaces, installing pipe sections, and backfill; pavement restoration, including subgrade preparation, supply, placement, and compaction of base course and asphalt; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be meter of pipe placed, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents or as adjusted by The Owner Representative.</p> <p>.3 Payment: Unit Price per meter.</p>
2.13	Ø 450 mm Concrete Pipe	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 450 mm concrete pipe, as shown in the Design Drawings and specifications, including: supplying, transporting, and storing pipe; preparing receiving surfaces, installing pipe sections, and backfill; pavement restoration, including subgrade preparation, supply, placement, and compaction of base course and asphalt; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be meter of pipe placed, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents or as adjusted by The Owner Representative.</p>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		.3 Payment: Unit Price per meter.
2.14	Ø 600 mm Concrete Pipe	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 600 mm concrete pipe, as shown in the Design Drawings and specifications, including: supplying, transporting, and storing pipe; preparing receiving surfaces, installing pipe sections, and backfill; pavement restoration, including subgrade preparation, supply, placement, and compaction of base course and asphalt; all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be meter of pipe placed, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents or as adjusted by The Owner Representative.</p> <p>.3 Payment: Unit Price per meter.</p>
2.15	1S Manhole 1.2x1.2	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install 1S (1.2m x 1.2m) concrete manhole as shown in the Design Drawings, including excavation, base preparation, manhole installation of barrel, backfill, risers, lid/grate/hatch, flap gate, and all other and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per manhole installed as inspected by Engineer of Record.</p> <p>.3 Payment: Unit Price per manhole.</p>
2.16	1S Manhole 1.5x1.5	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install 1S (1.5m x 1.5m) concrete manhole as shown on the Design Drawings, including excavation, base preparation, manhole installation of barrel, backfill, risers, lid/grate/hatch, flap gate, and all other and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per manhole installed as inspected by Engineer of Record.</p> <p>.3 Payment: Unit Price per manhole.</p>
2.17	5A Manhole	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install 5A concrete manhole rise extension on existing manhole(s) as shown in the Design Drawings, and all related work and materials for which payment is not included elsewhere incl. excavation.</p> <p>.2 Measurement: Shall be per manhole installed as inspected by Engineer of Record.</p> <p>.3 Payment: Unit Price per manhole.</p>
2.18	Ø 450 mm Concrete Headwall	.1 Scope: Includes all labour, equipment, and materials required to supply and install precast concrete headwall for Ø 450 mm pipe

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		<p>as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere. This includes supply and install of bedding gravel and all bedding preparatory work.</p> <p>.2 Measurement: Shall be per concrete headwall for Ø 450 mm pipe</p> <p>.3 Payment: Unit Price per concrete headwall for Ø 450 mm pipe</p>
2.19	Ø 600 mm Concrete Headwall	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install precast concrete headwall for Ø 600 mm pipe as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere. This includes supply and install of bedding gravel and all bedding preparatory works.</p> <p>.2 Measurement: Shall be per concrete headwall for Ø 600 mm pipe</p> <p>.3 Payment: Unit Price per concrete headwall for Ø 600 mm pipe</p>
2.20	Ø 300 mm Tideflex Valve (TF-1)	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 300 mm Tideflex Check-Valve (TF-1) as shown in the Design Drawings and specifications, and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per Ø 300 mm Tideflex Check-Valve (TF-1)</p> <p>.3 Payment: Unit Price per Ø 300 mm Tideflex Check-Valve (TF-1)</p>
2.21	Ø 600 mm Tideflex Valve (TF-1)	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 600 mm Tideflex Check-Valve (TF-1) as shown in the Design Drawings and specifications, and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per Ø 600 mm Tideflex Check-Valve (TF-1)</p> <p>.3 Payment: Unit Price per Ø 600 mm Tideflex Check-Valve (TF-1)</p>
2.22	Ø 450 mm Sluice Gate	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 450 mm sluice gate as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per Ø 450 mm sluice gate.</p> <p>.3 Payment: Unit Price per Ø 450 mm sluice gate.</p>
2.23	Ø 600 mm Sluice Gate	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 600 mm sluice gate as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per Ø 600 mm sluice gate.</p>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		.3 Payment: Unit Price per Ø 600 mm sluice gate.
2.24	Ø 600 mm Grated Inlet	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 600 mm grated inlet/outlet as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per grated inlet/outlet for Ø600 mm pipe.</p> <p>.3 Payment: Unit Price per Ø 600 mm grated inlet/outlet.</p>
2.25	Willow Plantings	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install willow planting as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be measured along the alignment of plantings as determined by survey or hand measurements.</p> <p>.3 Payment: Unit Price per lineal metre.</p>
2.26	Hydroseed	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install hydroseed as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be the in-place area of seeding. No separate measurement will be made for applications of different seed mixes.</p> <p>.2 Payment: Unit Price per square metre of hydroseeding.</p>
2.27	Vehicle Access Control Gates	<p>.1 Scope: Includes all labour, equipment, and materials required to supply vehicle access control gates, fill concrete, and all associated accessories, drilling post holes and backfilling with fill concrete, fabricating, painting, supplying, storing, handling, and installing vehicle access control gates, and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per vehicle access control gate.</p> <p>.3 Payment: Unit Price per each vehicle access control gate installed.</p>
2.28	Catchbasin	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install catchbasin as shown on the Design Drawings, including excavation, base preparation, installation of catchbasin, grade and associated accessories; restoration of curb, gutter, sidewalk, and pavement; and all other and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per catchbasin installed as inspected by Engineer of Record.</p> <p>.3 Payment: Unit Price per catchbasin.</p>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
2.29	Erosion Control Blanket	<p>.1 Scope: Includes supplying, storing, installing, trimming, factory seaming, protecting, joining, and anchoring natural fibre blanket over finished topsoil and seeded areas; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be the in-place area of Erosion Control Blankets excluding overlaps. No separate measurement shall be made for folds, seams, allowances for slack, or trimming of excess material.</p> <p>.3 Payment: Unit Price per square metre.</p>
2.30	Asphalt for Pathways	<p>.1 Scope: Includes all labour, equipment, and resources required to supply and install asphalt pathways to the lines, grades, and elevations as shown in the Contract Documents and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per tonne as determined by load scale tickets.</p> <p>.3 Payment: Unit Price per tonne.</p>
2.31	Gravel for Pathways	<p>.1 Scope: Includes all labour, equipment, and resources required to supply and install gravel as base course for asphalt pathways and for gravelled pathways to the lines, grades, and elevations as shown in the Contract Documents and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per tonne as determined by load scale tickets.</p> <p>.3 Payment: Unit Price per tonne.</p>
2.32	Root Barrier	<p>.1 Scope: Includes all labour, equipment, and resources required to supply and install root barrier under specified pathways as shown in the Contract Documents; and all related work and materials for which payment is not included elsewhere.</p> <p>.2 Measurement: Shall be per square meter of asphalt pathway or gravel pathway as determined by survey.</p> <p>.3 Payment: Unit Price per square metre.</p>
3. MAINTENANCE		
3.1	Landscape Maintenance Year 1	<p>.1 Scope: Includes watering, controlling weed growth, protecting and ensuring acceptable establishment of seeded area and plants; reseeding and replanting areas that fail to thrive; replacing defective plants; mowing grass, picking up and removing litter; preparing monthly maintenance reports and implementing corrective and preventative measures to achieve acceptable establishment; and all related work and materials for which payment is not included elsewhere.</p>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		<p>Starting date for Year 1 begins at the date of issuance of the Construction Completion Certificate.</p> <p>No measurement will be made until the required maintenance reports have been submitted.</p> <p>.2 Measurement: Shall be for monthly maintenance work completed as determined from inspections by the Engineer of Record.</p> <p>.3 Payment: Shall be per year.</p>
3.2	Landscape Maintenance Year 2	<p>.1 Scope: Includes watering, controlling weed growth, protecting and ensuring acceptable establishment of seeded area and plants; reseeding and replanting areas that fail to thrive; replacing defective plants; mowing grass, picking up and removing litter; preparing monthly maintenance reports and implementing corrective and preventative measures to achieve acceptable establishment; and all related work and materials for which payment is not included elsewhere.</p> <p>Starting date for Year 1 begins at the date of issuance of the Construction Completion Certificate.</p> <p>No measurement will be made until the required maintenance reports have been submitted.</p> <p>.2 Measurement: Shall be for monthly maintenance work completed as determined from inspections by the Engineer of Record.</p> <p>.3 Payment: Shall be per year.</p>
4. CASH ALLOWANCES		
4.1	Care of Water and Turbidity Barriers	<p>.1 Scope: Includes designing, supplying, installing, constructing, operating, maintaining, monitoring and removing care of water provisions, isolation measures such as turbidity barriers, fish capture and release, and turbidity monitoring, required to perform the work, and all related work and materials for which payment is not included elsewhere according to contractor's ECO Plan and regulatory conditions.</p> <p>.2 Payment: Cash Allowance.</p>
4.2	Repairs to Existing Storm Sewers	<p>.1 Scope: Includes inspection by CCTV and preparing and submitting inspection records; implementing possible repairs to existing storm sewer, including excavation, supply and installation of pipe and repair couplers; supply, placement, and compaction of bedding and backfill materials; surface restoration, and; and other work identified by the Engineer of Record.</p> <p>.2 Payment: Cash Allowance.</p>

END OF SECTION

1.0 GENERAL**1.1 REFERENCES**

- .1 Provide soil erosion protection in accordance with the following standards (latest revision) except where specified otherwise.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus.
 - .2 ASTM D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
 - .3 ASTM D4595 Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - .4 ASTM D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 - .5 ASTM D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile.
 - .6 ASTM D4833 Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
- .3 Alberta Transportation, Erosion and Sediment Control Manual 2011.
- .4 The City of Calgary Water Resources, Erosion and Sediment Control Guidelines 2017.

1.2 SUBMITTALS

- .1 Provide the product data two weeks before delivering the materials to the Site.

1.3 DELIVERY, STORAGE, AND HANDLING

- .1 Inspect each shipment of material and timely replace any damaged materials.
- .2 Handle and store products in accordance with the manufacturer's recommendations and protect them from damage, contamination, or deterioration. Store all packaged or bundled products in their original packaging. Do not remove products from the packaging or bundling until required.

2.0 PRODUCTS**2.1 MATERIALS**

- .1 Provide materials in accordance with the following.

- .2 Straw Wattles:
 - .1 Straw or similar biodegradable material and wrap.
 - .2 Free of weeds and other deleterious substances.
 - .3 305 mm diameter.
- .3 Erosion Control Blankets:
 - .1 Temporary biodegradable blanket consisting of 100% agricultural straw layered with cotton/hemp string nets.
 - .2 Meeting or exceeding the following requirements:

Test Description	Test Method	Test Results
Mass per unit area	ASTM D6475	336 g/m ²
Tensile strength	ASTM D6818	3.8 kN/m @ 14.5 MD, 2.9 kN/m @ 24% TD
Thickness	ASTM D6525	10 mm (minimum)
Light penetration/Ground Cover	ASTM D6567	11.5% / 88.5%
Water Absorption	ASTM D1117 & ECTCTASC 00197	416%
Unvegetated rain splash and runoff	ASTM D7101	Soil Loss Ratio* = 11.8
*Soil Loss Ratio = (soil loss bare soil/soil loss with erosion control)		

- .4 Anchors:
 - .1 50 mm by 50 mm non-treated timber stakes or other anchors recommended by the manufacturer.

3.0 EXECUTION

3.1 INSTALLATION - GENERAL

- .1 The Contractor shall supply, install, maintain, and remove upon completion of the project erosion and sediment control devices as per the ESC Plan, ECO Plan and as specified in the Contract Documents.
- .2 Install soil erosion protection materials in accordance with the manufacturer's written instructions.
- .3 Prepare receiving surfaces and have them inspected by the Design Professional before installing soil erosion protection materials. Rectify defects, including those identified by the Design Professional.
- .4 The Contractor shall ensure sediment control devices are intact and functioning for the duration of the construction period and the duration of landscape establishment.
- .5 Do not allow any construction equipment or vehicles to travel on the soil erosion protection materials. Replace any materials that are damaged or displaced.

3.2 INSTALLING STRAW WATTLES

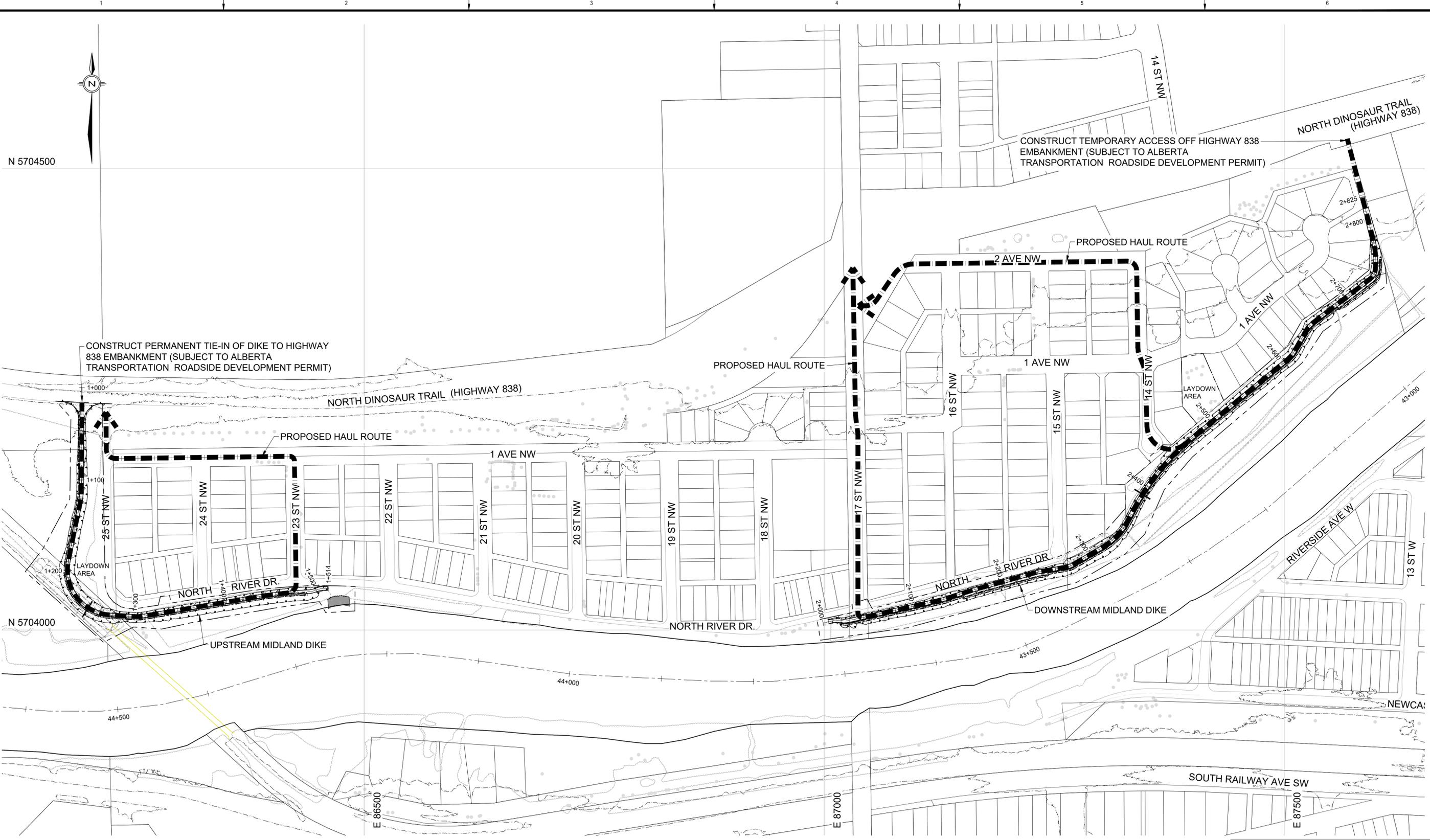
- .1 Anchor the bottom of the wattle by excavating a 50 mm deep trench, placing the wattle, and anchoring with timber stakes.
- .2 Drive stakes into the ground in accordance with the manufacturer's written instructions and specifications, and as required by the Design Professional.
- .3 Inspect and maintain the function of the straw wattles in accordance with the Manufacturer's written instructions, ECO Plan and ESC Plan.
- .4 Install the straw wattles over erosion control blankets or as required by the Design Professional.

3.3 INSTALLING EROSION CONTROL BLANKETS

- .1 Install blankets after Topsoil placement and seeding are completed.
- .2 Anchor the blanket at the top of the slope by excavating a trench, installing the blanket, and backfilling in accordance with the manufacturer's written instructions and specifications, and as required by the Design Professional. Unroll the blankets in a downslope direction.
- .3 Place blankets loosely and in full contact with the ground.
- .4 Overlap the side edges of adjacent blankets so that they are shingled away from the prevailing wind direction. Provide a minimum overlap of 150 mm and stake as required.
- .5 Overlap the bottom edge of the upslope blanket on top of the top edge of the downslope blanket. Provide a minimum overlap of 500 mm and stake as required.
- .6 Staple or anchor edges in accordance with the manufacturer's written instructions and as required by the Design Professional.

END OF SECTION

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ALL SCALE NOTATIONS INDICATED (i.e. 1:1000 etc)
ARE BASED ON 22" X 34" FORMAT DRAWINGS



Rev	Date	Des	Dwn	Chk	Description
A	2022-07-12	JP	SH	RC	ISSUED FOR ADDENDUM No. 2

Rev	Date	Des	Dwn	Chk	Description

DRUMHELLER RESILIENCY & FLOOD MITIGATION OFFICE
MIDLAND PROJECT

HAUL ROUTES

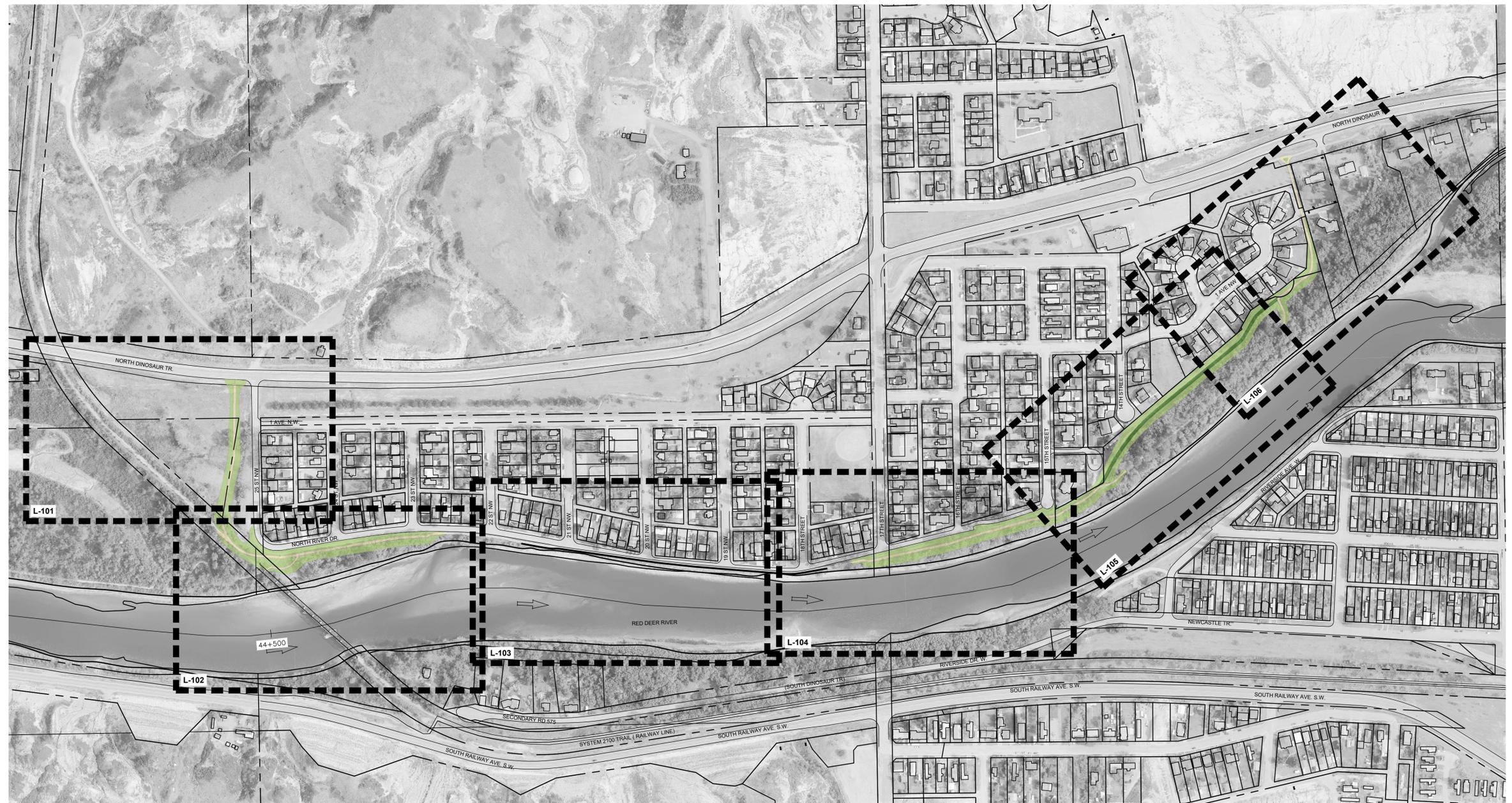
Project No. **22.06.20A** Drawing No. **G-003** Rev. **A**
Group **GENERAL**

TOWN OF DRUMHELLER

MIDLANDS DIKE LANDSCAPE TENDER PACKAGE

DRAWING LIST

DRAWING NO.	DRAWING TITLE
L-100	LANDSCAPE COVER SHEET & KEY PLAN
L-101	LANDSCAPE MASTER PLAN
L-102	LANDSCAPE MASTER PLAN
L-103	LANDSCAPE MASTER PLAN
L-104	LANDSCAPE MASTER PLAN
L-105	LANDSCAPE MASTER PLAN
L-106	LANDSCAPE MASTER PLAN
L-301	LAYOUT & GRADING PLAN
L-302	LAYOUT & GRADING PLAN
L-303	LAYOUT & GRADING PLAN
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L-408	SEEDING PLAN
L-409	SEEDING PLAN
L-410	SEEDING PLAN
L-411	SEEDING PLAN
L-412	SEEDING PLAN
L-413	SEEDING NOTES
L-901	LANDSCAPE DETAILS



PLAN
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1	2022-07-07	BB	MD	EJW	ISSUED FOR ADDENDUM #1

Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

**LANDSCAPE COVER SHEET
& KEY PLAN**

Project No. 133142	Drawing No.
Group LANDSCAPE	L-100
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LEGEND

	EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
	LANDSCAPE SEEDING AT TOP OF DIKE
	ASPHALT PATHWAY
	GRAVEL TRAIL

PLAN
Scale 1:500



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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LANDSCAPE MASTER PLAN

Project No. **133142** Drawing No. **L-101** Rev. **1**

Group **LANDSCAPE**

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MIDLANDS PROVINCIAL PARK
• HIKING TRAIL
CONNECTIONS UNDER
BRIDGE ABUTMENT

EXISTING
TRAIL

2.0m GRAVEL
CONNECTOR TRAIL

3.0m ASPHALT PATH
AT TOP OF DIKE

RED DEER RIVER

NORTH RIVER DR.

24 ST NW

23 ST NW

44+500

SEE L-102
SEE L-103

SEE L-101

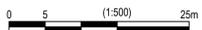
SEE L-102

LEGEND

- EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
- LANDSCAPE SEEDING AT TOP OF DIKE
- ASPHALT PATHWAY
- GRAVEL TRAIL



PLAN
Scale 1:500



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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LANDSCAPE MASTER PLAN

Project No. 133142	Drawing No.	Rev.
Group LANDSCAPE	L-102	1

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LEGEND

- EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
- LANDSCAPE SEEDING AT TOP OF DIKE
- ASPHALT PATHWAY
- GRAVEL TRAIL

SEE L-102
SEE L-103

SEE L-103
SEE L-104

PLAN
Scale 1:500



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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LANDSCAPE MASTER PLAN

Project No. 133142	Drawing No.	Rev.
Group LANDSCAPE	L-103	1

LEGEND

- EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
- LANDSCAPE SEEDING AT TOP OF DIKE
- ASPHALT PATHWAY
- GRAVEL TRAIL



PLAN
Scale 1:500

SEE L-103
SEE L-104

SEE L-104
SEE L-105



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**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LANDSCAPE MASTER PLAN

Project No. 133142	Drawing No.	Rev.
Group LANDSCAPE	L-104	1



LEGEND

	EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
	LANDSCAPE SEEDING AT TOP OF DIKE
	ASPHALT PATHWAY
	GRAVEL TRAIL

SEE L-104
SEE L-105

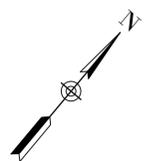
SEE L-105
SEE L-106

NEW ASPHALT CONNECTOR PATH AT EXISTING PATH LOCATION

TIE INTO EXISTING TRAIL

RED DEER RIVER

PLAN
Scale 1:500



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TOWN OF DRUMHELLER MIDLANDS DIKE	
LANDSCAPE MASTER PLAN	
Project No. 133142	Drawing No. L-105
Group LANDSCAPE	Rev. 0

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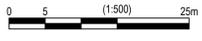
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millimeters



LEGEND

	EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
	LANDSCAPE SEEDING AT TOP OF DIKE
	ASPHALT PATHWAY
	GRAVEL TRAIL

PLAN
Scale 1:500



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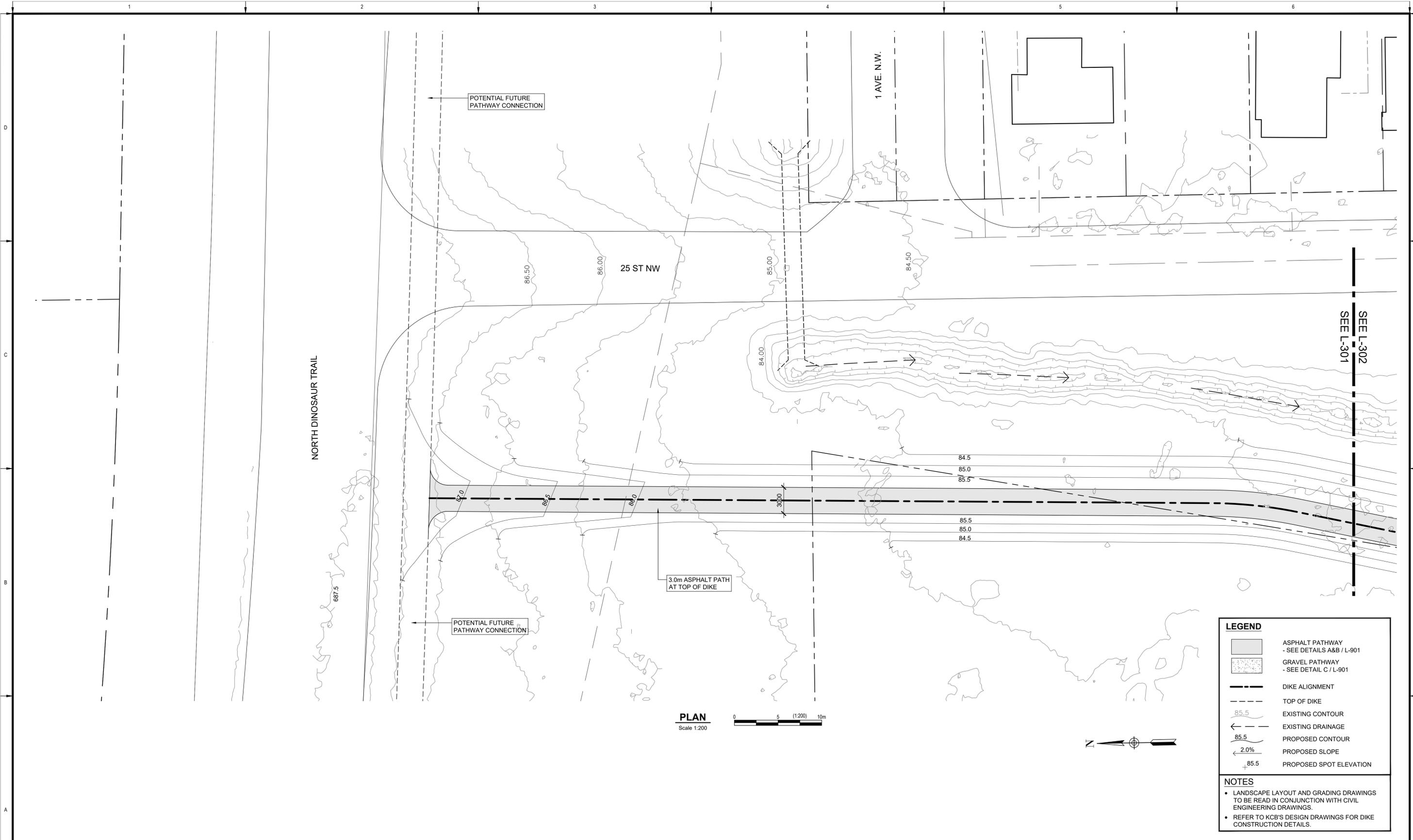
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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LANDSCAPE MASTER PLAN

Project No. 133142	Drawing No.	Rev.
Group LANDSCAPE	L-106	1



PLAN
Scale 1:200



LEGEND

- ASPHALT PATHWAY
- SEE DETAILS A&B / L-901
- GRAVEL PATHWAY
- SEE DETAIL C / L-901
- DIKE ALIGNMENT
- TOP OF DIKE
- 85.5 EXISTING CONTOUR
- 85.5 EXISTING DRAINAGE
- 85.5 PROPOSED CONTOUR
- 2.0% PROPOSED SLOPE
- 85.5 PROPOSED SPOT ELEVATION

NOTES

- LANDSCAPE LAYOUT AND GRADING DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL ENGINEERING DRAWINGS.
- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.



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**TOWN OF DRUMHELLER
MIDLANDS DIKE**

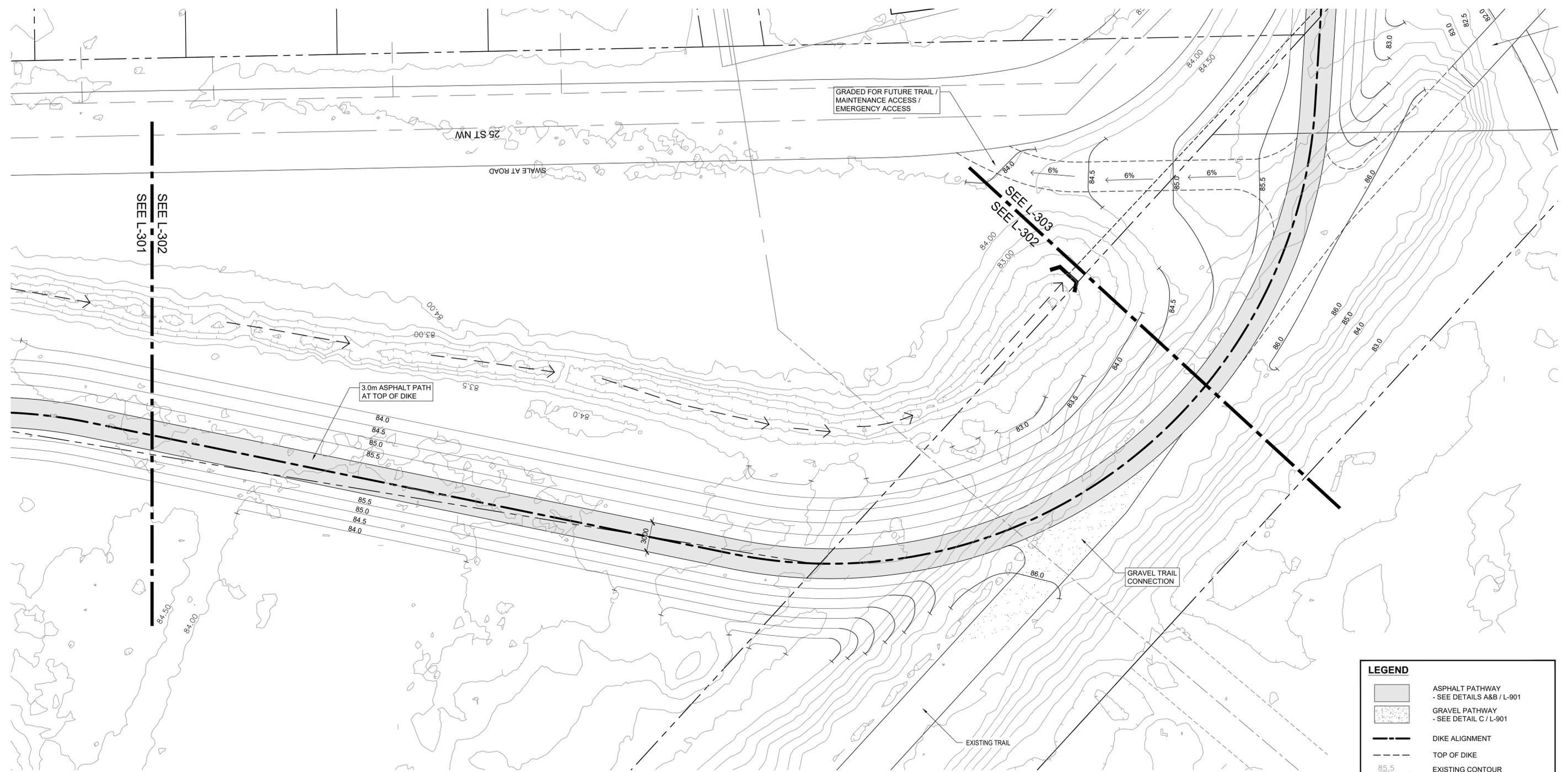
LAYOUT & GRADING PLAN

Project No. **133142** Drawing No. **L-301** Rev. **1**

Group **LANDSCAPE**

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PLAN
Scale 1:200



LEGEND

- ASPHALT PATHWAY
- SEE DETAILS A&B / L-901
- GRAVEL PATHWAY
- SEE DETAIL C / L-901
- DIKE ALIGNMENT
- TOP OF DIKE
- 85.5 EXISTING CONTOUR
- EXISTING DRAINAGE
- 85.5 PROPOSED CONTOUR
- 2.0% PROPOSED SLOPE
- +85.5 PROPOSED SPOT ELEVATION

NOTES

- LANDSCAPE LAYOUT AND GRADING DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL ENGINEERING DRAWINGS.
- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.



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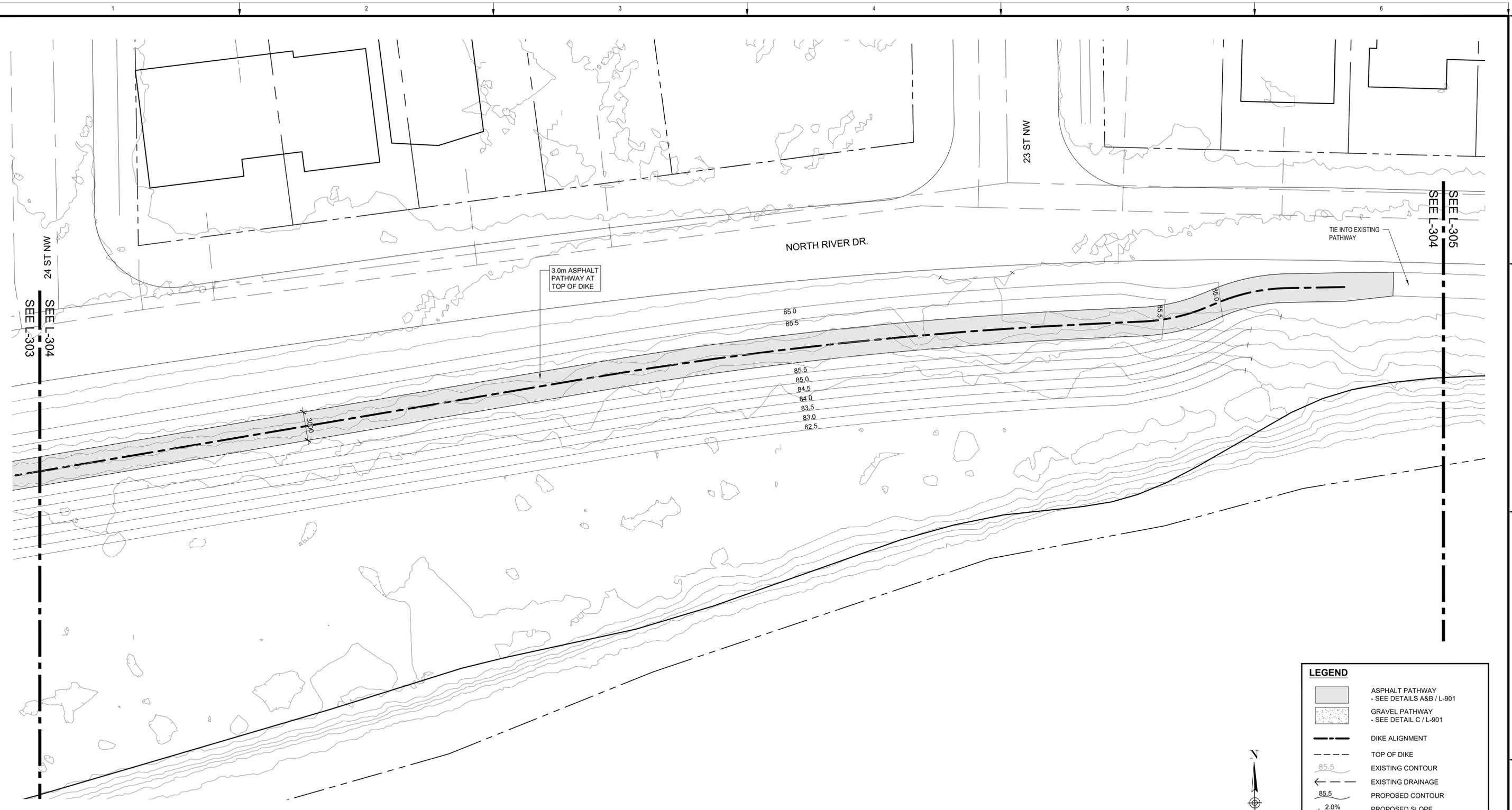
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**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LAYOUT & GRADING PLAN

Project No. **133142** Drawing No. **L-302** Rev. **1**

Group **LANDSCAPE**



PLAN
 Scale 1:200



LEGEND

- ASPHALT PATHWAY
- SEE DETAILS A&B / L-901
- GRAVEL PATHWAY
- SEE DETAIL C / L-901
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
- EXISTING DRAINAGE
- PROPOSED CONTOUR
- PROPOSED SLOPE
- PROPOSED SPOT ELEVATION

NOTES

- LANDSCAPE LAYOUT AND GRADING DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL ENGINEERING DRAWINGS.
- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.



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**TOWN OF DRUMHELLER
 MIDLANDS DIKE**

LAYOUT & GRADING PLAN

Project No. **133142** Drawing No. **L-304** Rev. **1**

Group **LANDSCAPE**



SEE L-304
SEE L-305

22 ST NW

EXISTING PATHWAY

NORTH RIVER DR.

EXISTING WALL

PLAN
Scale 1:200



LEGEND

- ASPHALT PATHWAY
- SEE DETAILS A&B / L-901
- GRAVEL PATHWAY
- SEE DETAIL C / L-901
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
85.5
- EXISTING DRAINAGE
←
- PROPOSED CONTOUR
85.5
- PROPOSED SLOPE
← 2.0%
- PROPOSED SPOT ELEVATION
+ 85.5

NOTES

- LANDSCAPE LAYOUT AND GRADING DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL ENGINEERING DRAWINGS.
- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.



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TOWN OF DRUMHELLER
MIDLANDS DIKE

LAYOUT & GRADING PLAN

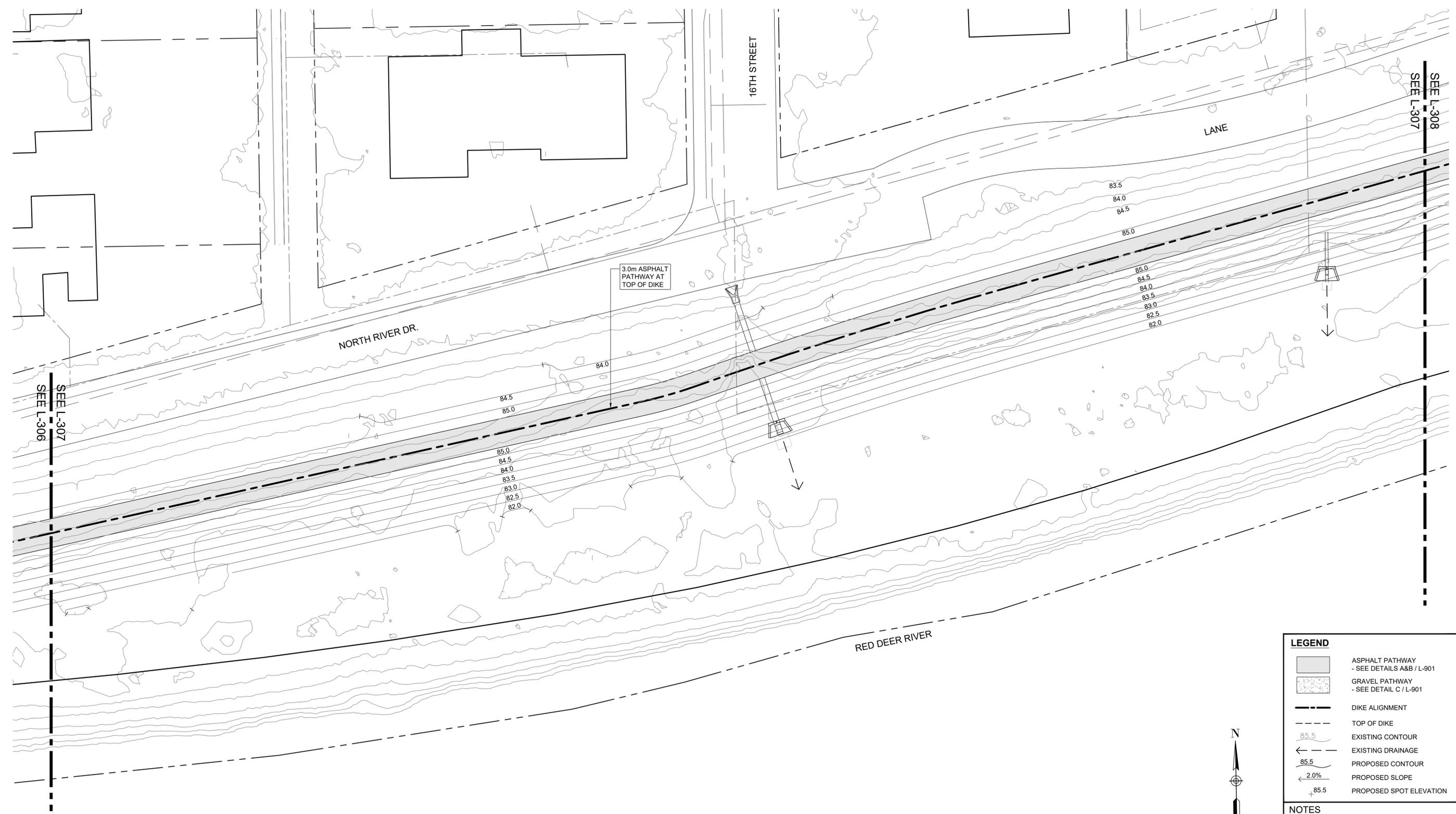
Project No. 133142
Group LANDSCAPE

Drawing No.

Rev. 1
L-305

11:47 AM 2022/07/07 2022

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PLAN
Scale 1:200



LEGEND

- ASPHALT PATHWAY
- SEE DETAILS A&B / L-901
- GRAVEL PATHWAY
- SEE DETAIL C / L-901
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
- EXISTING DRAINAGE
- PROPOSED CONTOUR
- PROPOSED SLOPE
- PROPOSED SPOT ELEVATION

NOTES

- LANDSCAPE LAYOUT AND GRADING DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL ENGINEERING DRAWINGS.
- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.



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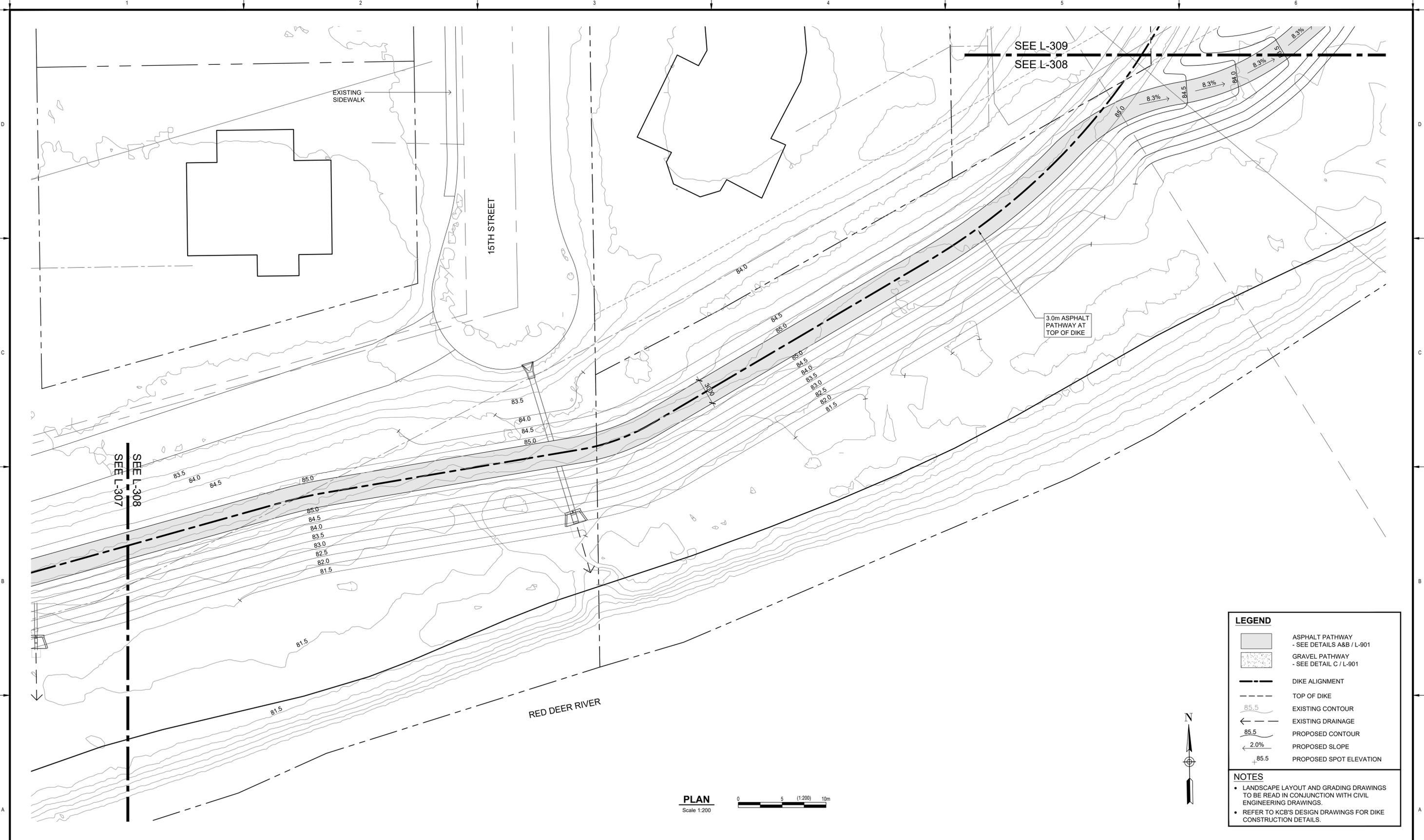
**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LAYOUT & GRADING PLAN

Project No. **133142** Drawing No. **L-307** Rev. **1**

Group **LANDSCAPE**

1700
1:50
0 10 50 100
millimeters



SEE L-309
SEE L-308

SEE L-308
SEE L-307

3.0m ASPHALT
PATHWAY AT
TOP OF DIKE

LEGEND

- ASPHALT PATHWAY - SEE DETAILS A&B / L-901
- GRAVEL PATHWAY - SEE DETAIL C / L-901
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
- EXISTING DRAINAGE
- PROPOSED CONTOUR
- PROPOSED SLOPE
- PROPOSED SPOT ELEVATION

NOTES

- LANDSCAPE LAYOUT AND GRADING DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL ENGINEERING DRAWINGS.
- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.

PLAN
Scale 1:200



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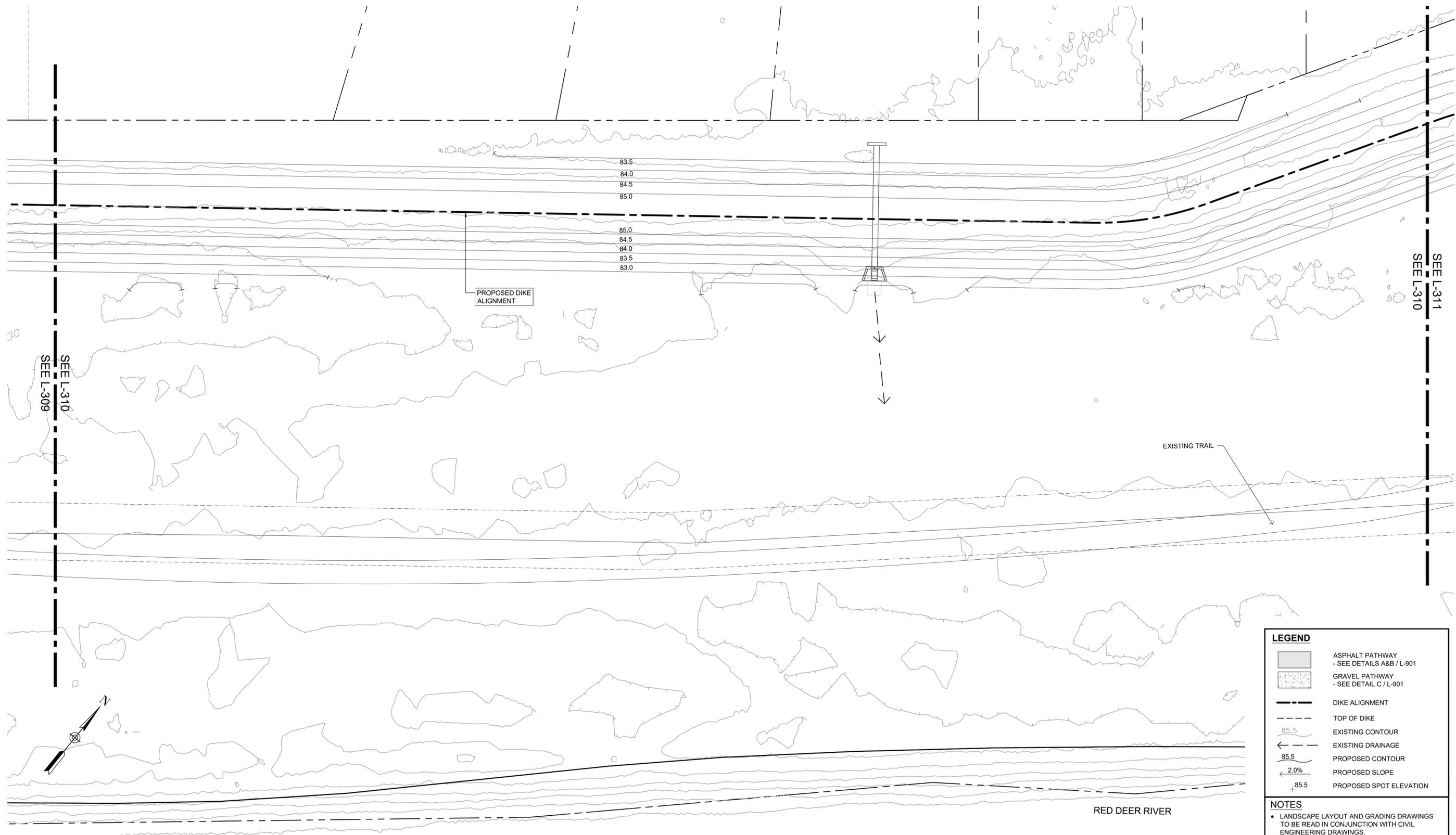
Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LAYOUT & GRADING PLAN

Project No. **133142** Drawing No. **L-308** Rev. **1**

Group **LANDSCAPE**



LEGEND

- ASPHALT PATHWAY
- SEE DETAILS A&B / L-901
- GRAVEL PATHWAY
- SEE DETAIL C / L-901
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
- EXISTING DRAINAGE
- PROPOSED CONTOUR
- PROPOSED SLOPE
- PROPOSED SPOT ELEVATION

NOTES

- LANDSCAPE LAYOUT AND GRADING DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL ENGINEERING DRAWINGS.
- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.

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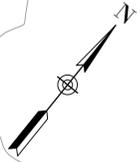
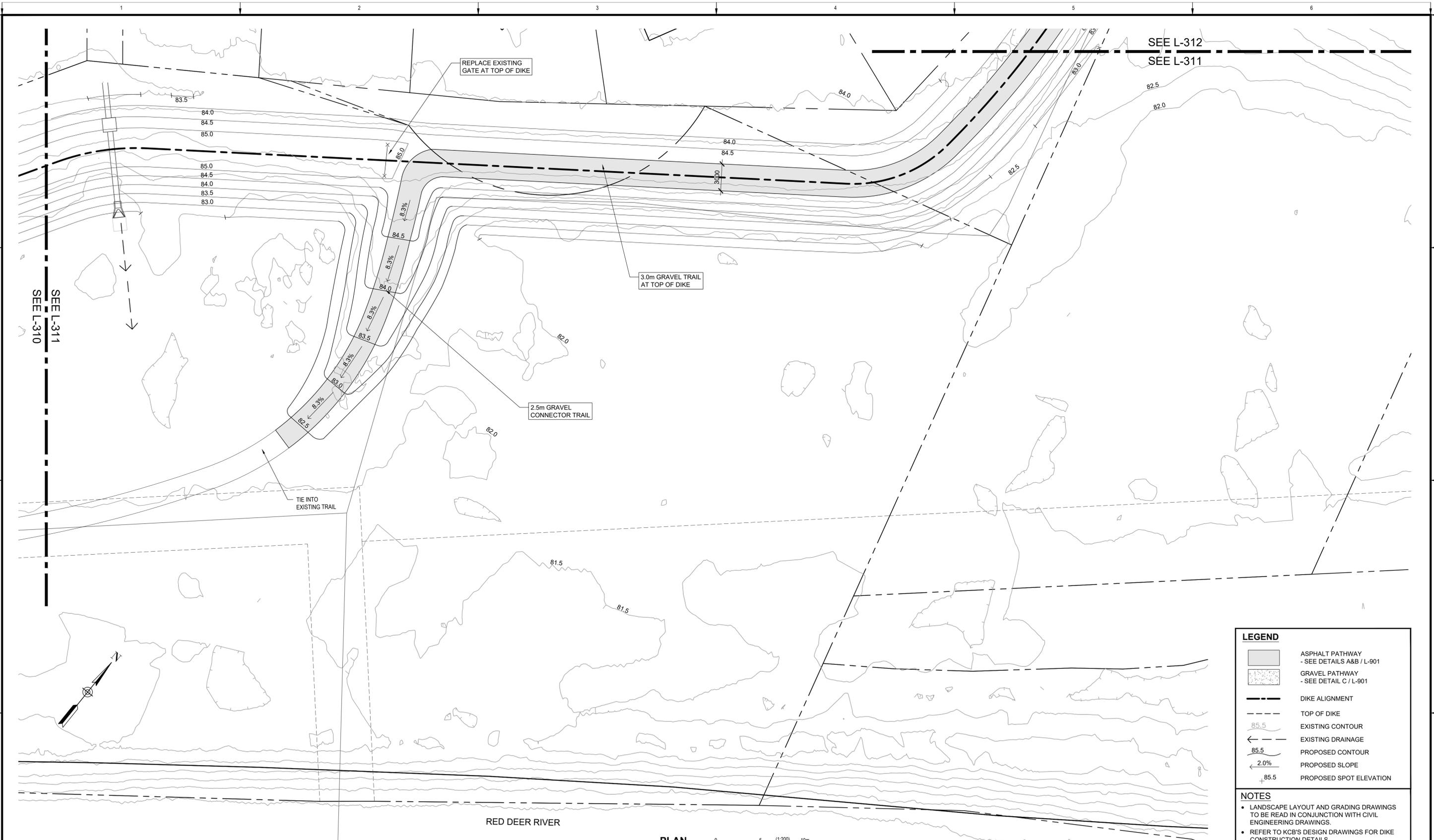
**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LAYOUT & GRADING PLAN

Project No. **133142** Drawing No. **L-310** Rev. **1**
Group **LANDSCAPE**

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PLAN
Scale 1:200

LEGEND

- ASPHALT PATHWAY
- SEE DETAILS A&B / L-901
- GRAVEL PATHWAY
- SEE DETAIL C / L-901
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
- EXISTING DRAINAGE
- PROPOSED CONTOUR
- PROPOSED SLOPE
- PROPOSED SPOT ELEVATION

NOTES

- LANDSCAPE LAYOUT AND GRADING DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL ENGINEERING DRAWINGS.
- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.



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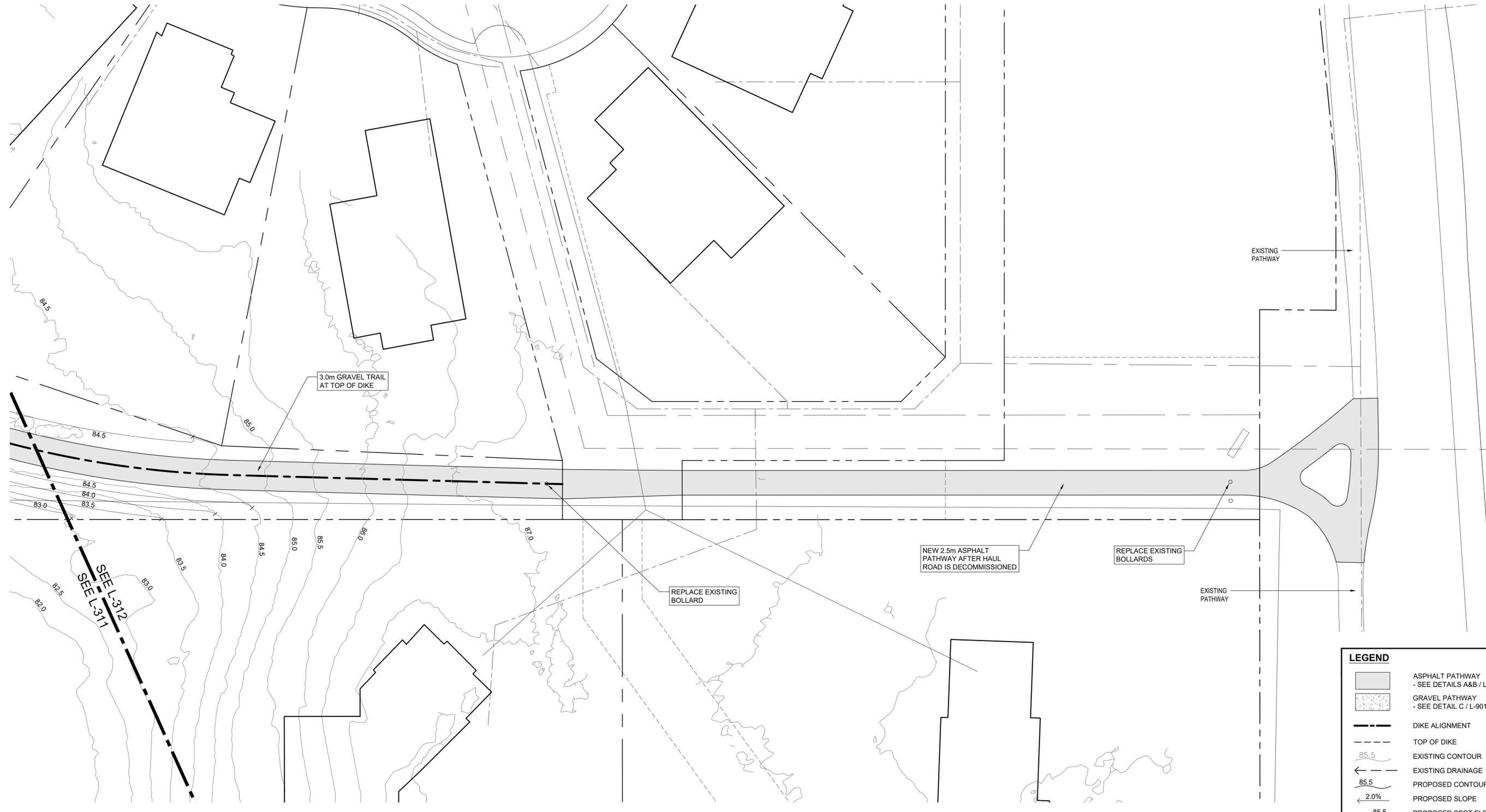
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**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LAYOUT & GRADING PLAN

Project No. **133142** Drawing No. **L-311** Rev. **1**

Group **LANDSCAPE**



PLAN
Scale 1:200

LEGEND	
	ASPHALT PATHWAY - SEE DETAILS A&B / L-901
	GRAVEL PATHWAY - SEE DETAIL C / L-901
	DIKE ALIGNMENT
	TOP OF DIKE
	EXISTING CONTOUR
	EXISTING DRAINAGE
	PROPOSED CONTOUR
	PROPOSED SLOPE
	PROPOSED SPOT ELEVATION

- NOTES**
- LANDSCAPE LAYOUT AND GRADING DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL ENGINEERING DRAWINGS.
 - REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.



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**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LAYOUT & GRADING PLAN

Project No. **133142** Drawing No. **L-312** Rev. **1**
Group **LANDSCAPE**



NORTH DINOSAUR TRAIL

25 ST NW

SEED MIX 2B

SEED MIX 2A

SEE L-401
SEE L-402

PLAN
Scale 1:200



LEGEND	
	EXISTING TREE TO REMAIN
	SEED MIX 2A UPLAND AREAS (WET SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 2B UPLAND AREAS (DRY SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 3 (TOP OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL

- NOTES**
1. ALL WORK SHALL COMPLY WITH TOWN OF DRUMHELLER VALLEY "PRESERVING & ENHANCING THE URBAN FOREST: STANDARDS & TECHNIQUES"
 2. ALL UTILITIES MUST BE INSTALLED/LOCATED PRIOR TO PLANTING ANY EXCAVATION. (SEE CIVIL ENGINEERING DRAWINGS)
 3. REFER TO SHEET L-413 FOR SEED MIX COMPOSITION AND SEEDING NOTES.



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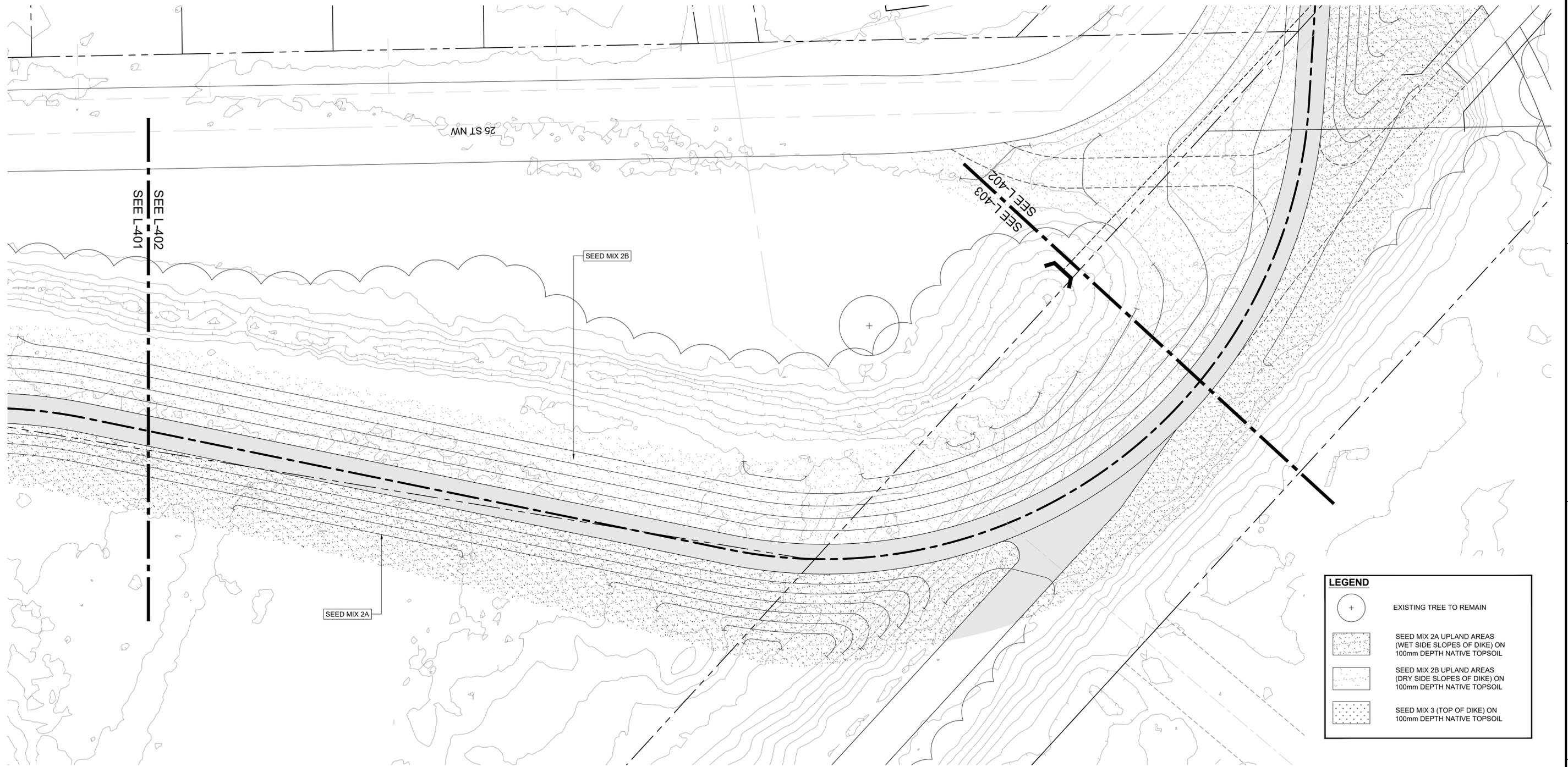
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**TOWN OF DRUMHELLER
MIDLANDS DIKE**

SEEDING PLAN

Project No. **133142** Drawing No. **L-401** Rev. **1**

Group **LANDSCAPE**



LEGEND	
	EXISTING TREE TO REMAIN
	SEED MIX 2A UPLAND AREAS (WET SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 2B UPLAND AREAS (DRY SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 3 (TOP OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL



PLAN

Scale 1:200



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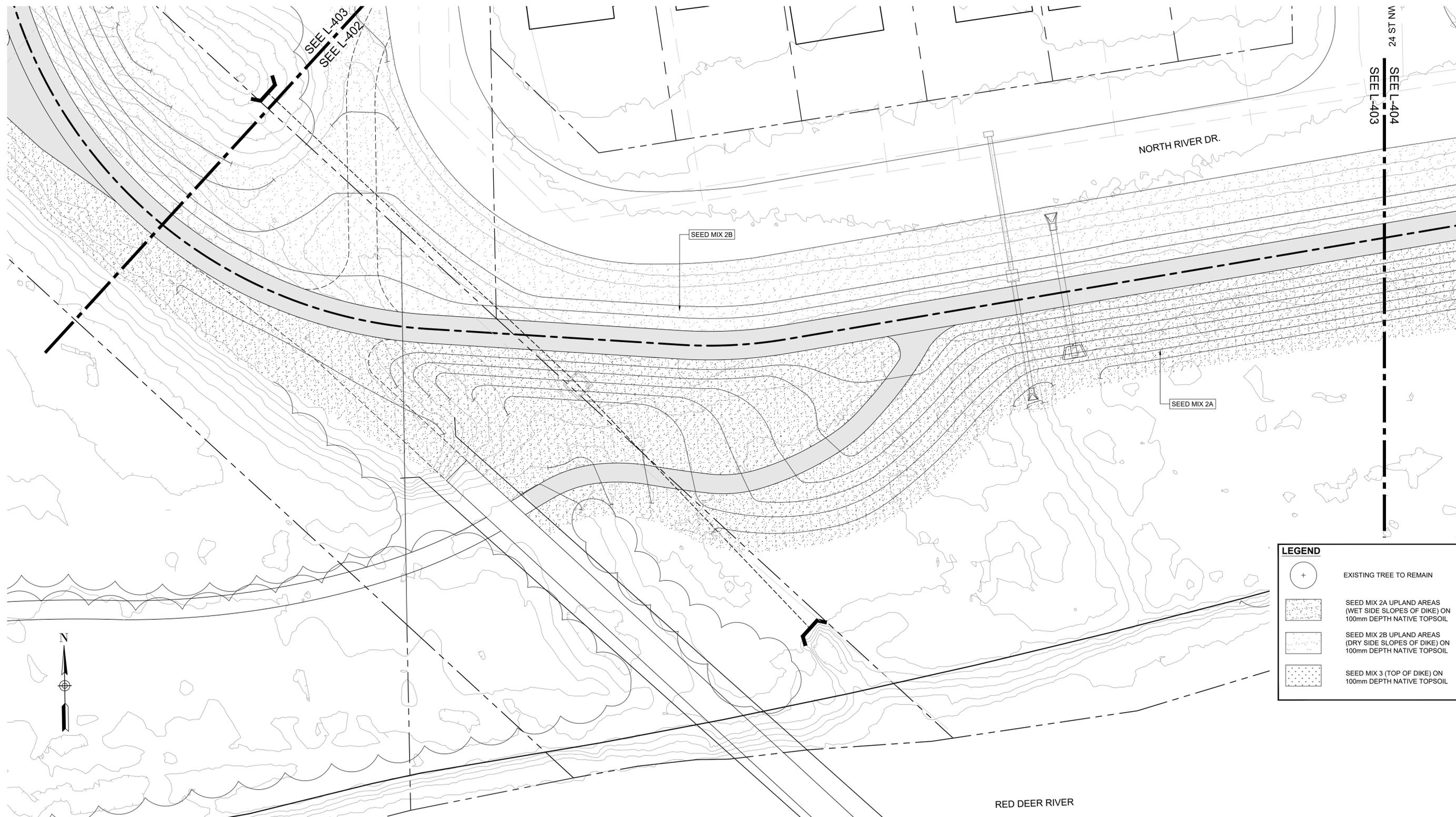
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Rev	Date	Des	Dwn	Chk	Description

TOWN OF DRUMHELLER MIDLANDS DIKE	
SEEDING PLAN	
Project No. 133142	Drawing No. L-402
Group LANDSCAPE	Rev. 1



LEGEND	
	EXISTING TREE TO REMAIN
	SEED MIX 2A UPLAND AREAS (WET SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 2B UPLAND AREAS (DRY SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 3 (TOP OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL

PLAN
Scale 1:200



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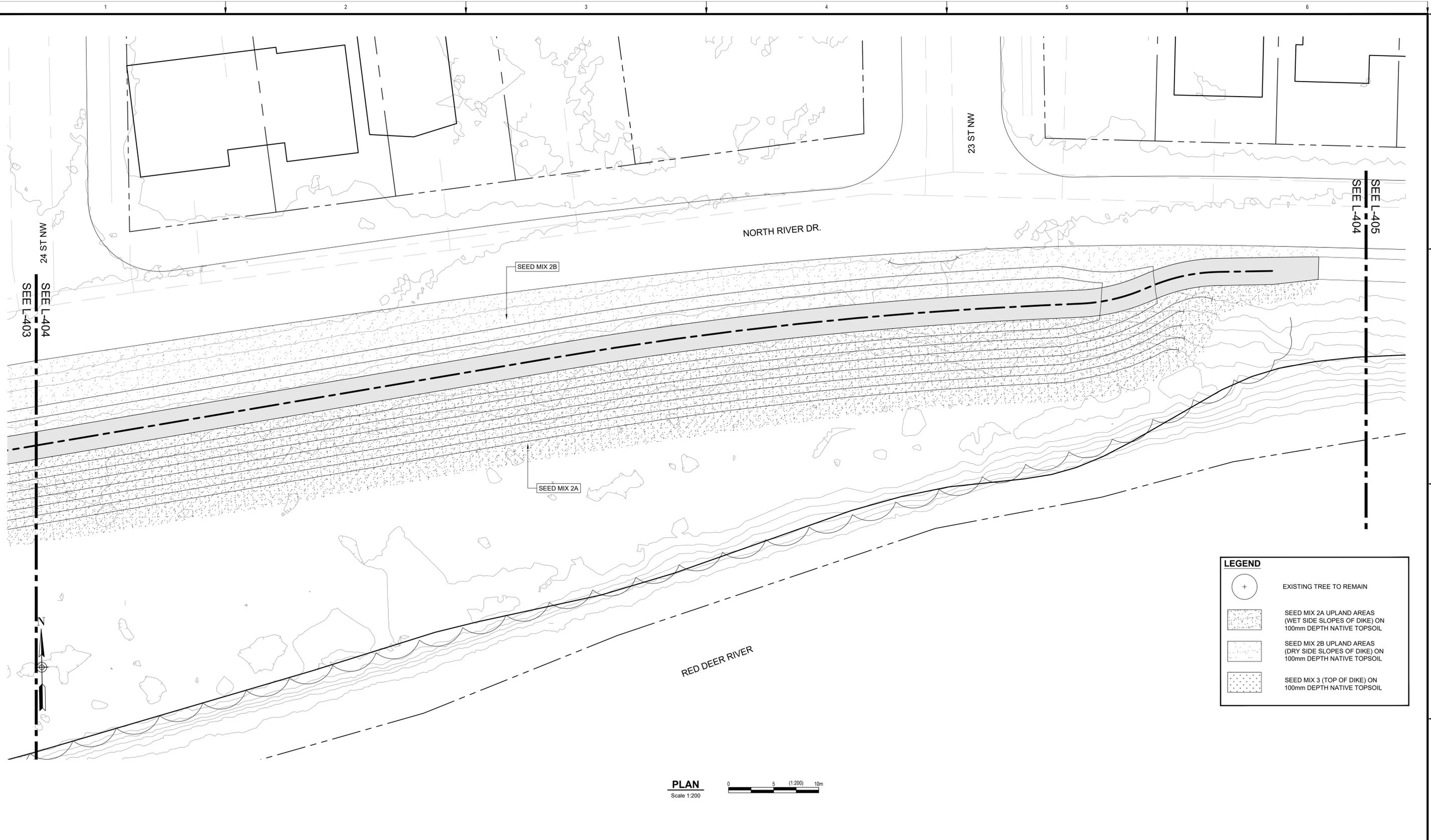
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**TOWN OF DRUMHELLER
MIDLANDS DIKE**

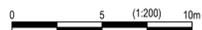
SEEDING PLAN

Project No. **133142** Drawing No. **L-403** Rev. **1**
Group **LANDSCAPE**



LEGEND	
	EXISTING TREE TO REMAIN
	SEED MIX 2A UPLAND AREAS (WET SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 2B UPLAND AREAS (DRY SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 3 (TOP OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL

PLAN
Scale 1:200



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TOWN OF DRUMHELLER MIDLANDS DIKE	
SEEDING PLAN	
Project No. 133142	Drawing No. L-404
Group LANDSCAPE	Rev. 1



SEE L-405
SEE L-404

22 ST NW

NORTH RIVER DR.

PLAN

Scale 1:200



LEGEND	
	EXISTING TREE TO REMAIN
	SEED MIX 2A UPLAND AREAS (WET SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 2B UPLAND AREAS (DRY SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 3 (TOP OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL



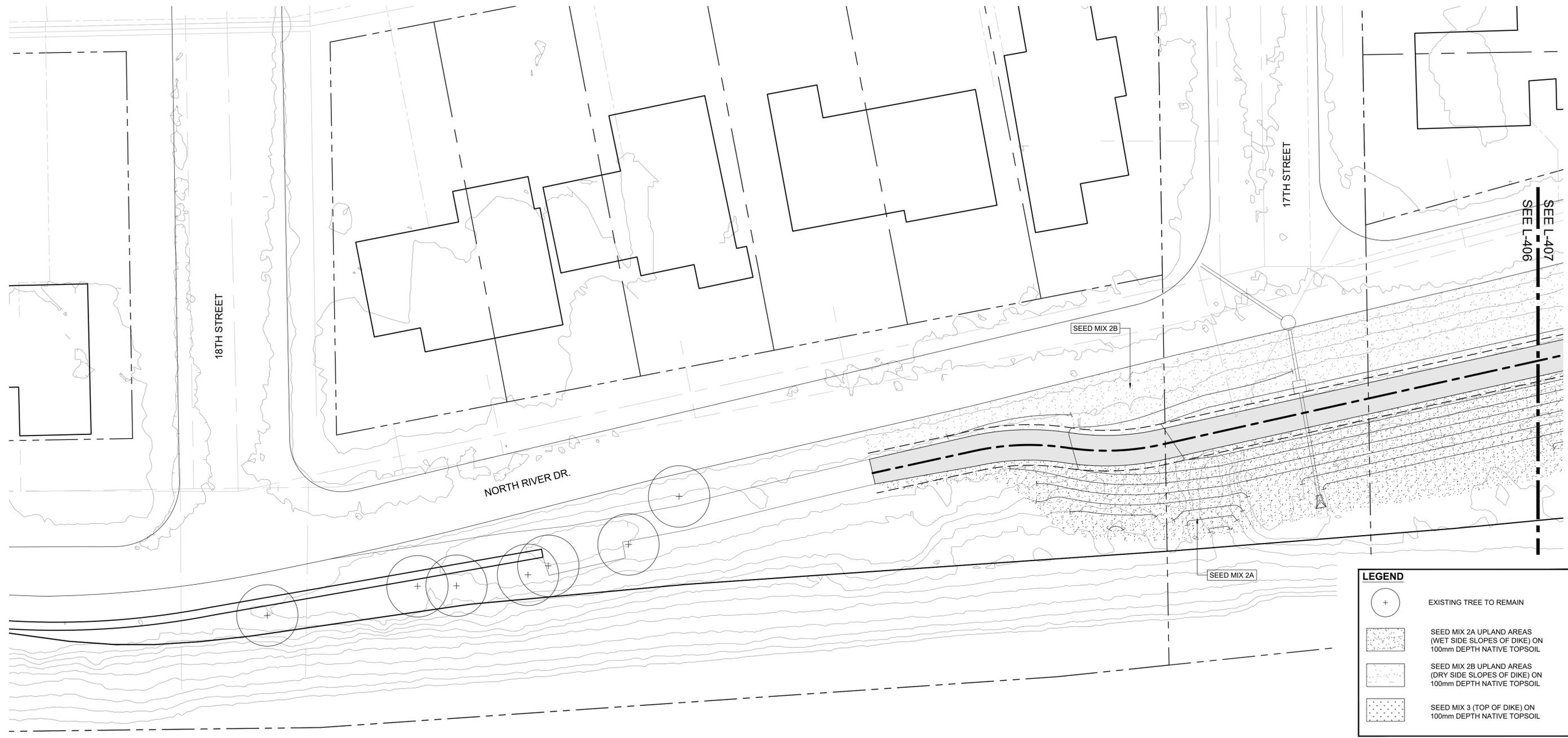
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Rev	Date	Des	Dwn	Chk	Description

TOWN OF DRUMHELLER MIDLANDS DIKE	
SEEDING PLAN	
Project No. 133142	Drawing No. L-405
Group LANDSCAPE	Rev. 1



LEGEND

- EXISTING TREE TO REMAIN
- SEED MIX 2A UPLAND AREAS (WET SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
- SEED MIX 2B UPLAND AREAS (DRY SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
- SEED MIX 3 (TOP OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL

PLAN
Scale 1:200



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1	2022-07-07	BB	MD	EJW	ISSUED FOR ADDENDUM #1

Rev	Date	Des	Dwn	Chk	Description

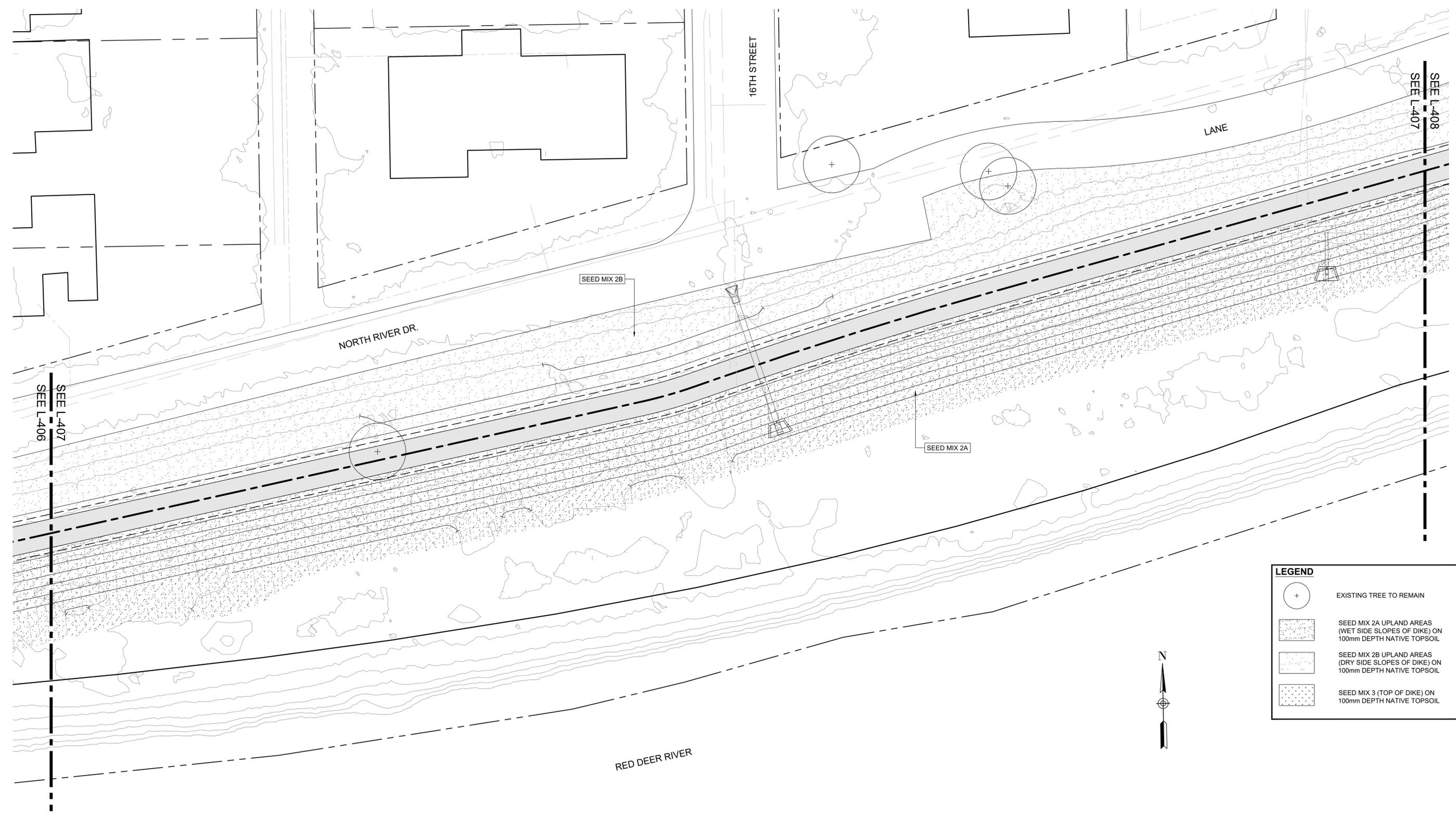
**TOWN OF DRUMHELLER
MIDLANDS DIKE**

SEEDING PLAN

Project No. **133142** Drawing No. **L-406** Rev. **1**
Group **LANDSCAPE**

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LEGEND

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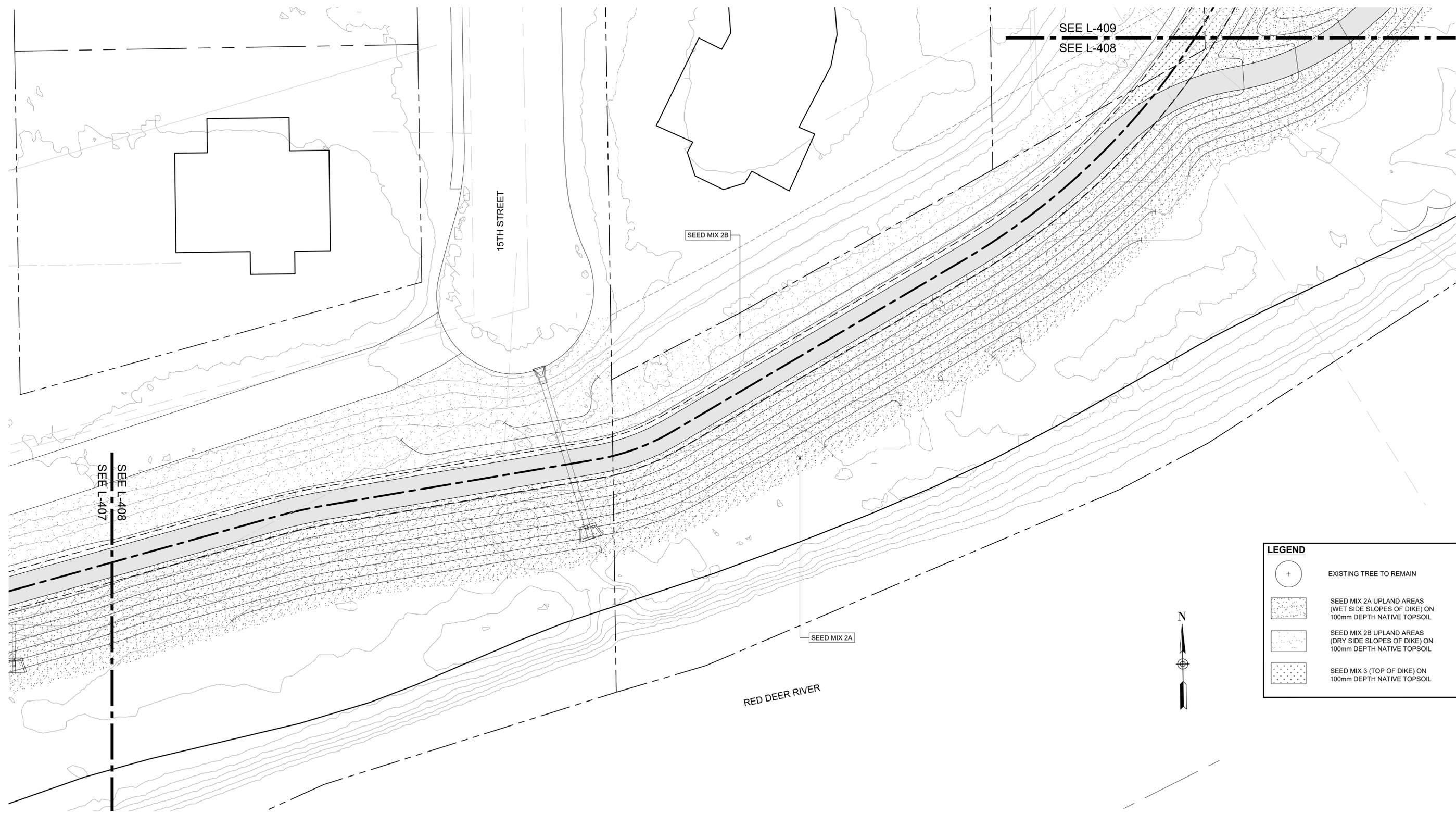
Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

SEEDING PLAN

Project No. **133142** Drawing No. **L-407** Rev. **1**

Group **LANDSCAPE**



LEGEND

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PLAN
Scale 1:200




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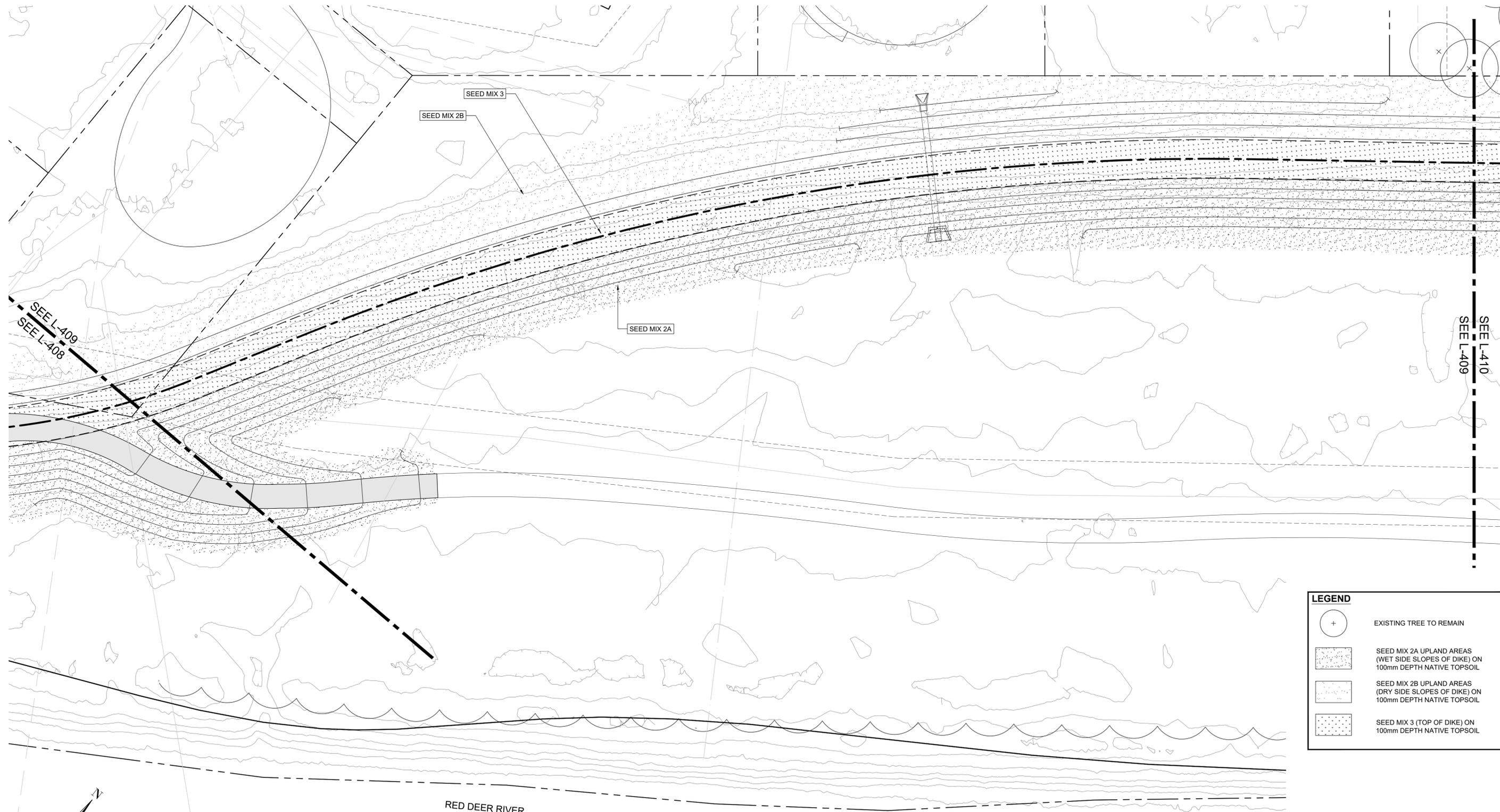
Rev	Date	Des	Dwn	Chk	Description
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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

SEEDING PLAN

Project No. **133142** Drawing No. **L-408** Rev. **1**
Group **LANDSCAPE**



LEGEND	
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	SEED MIX 2B UPLAND AREAS (DRY SIDE SLOPES OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL
	SEED MIX 3 (TOP OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL

RED DEER RIVER

PLAN
Scale 1:200



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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

SEEDING PLAN

Project No. **133142** Drawing No. **L-409** Rev. **1**
Group **LANDSCAPE**

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LEGEND

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PLAN
Scale 1:200



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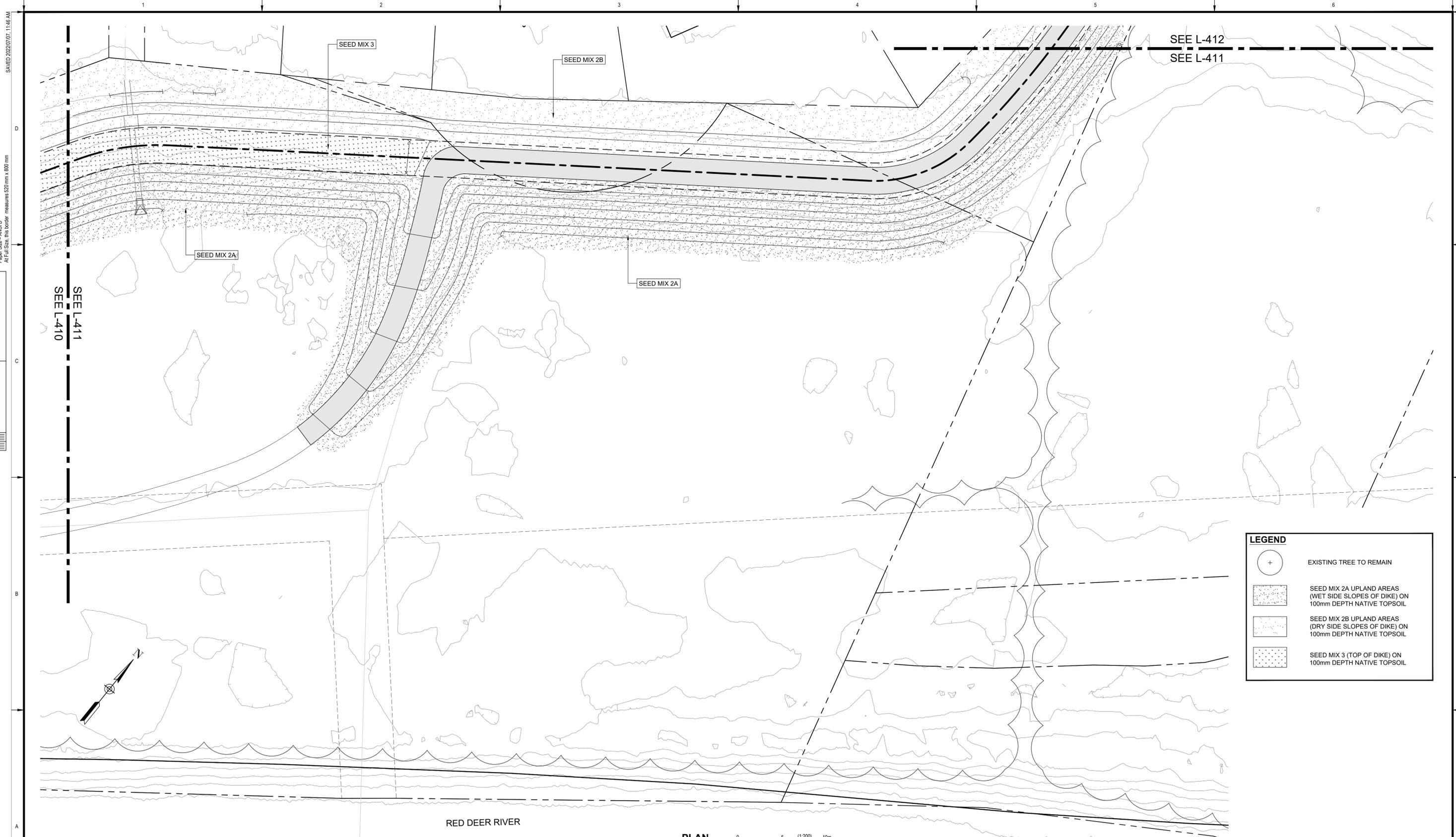
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**TOWN OF DRUMHELLER
MIDLANDS DIKE**

SEEDING PLAN

Project No. **133142** Drawing No. **L-410** Rev. **1**
Group **LANDSCAPE**



SEE L-412
SEE L-411

SEE L-411
SEE L-410

SEED MIX 3

SEED MIX 2B

SEED MIX 2A

SEED MIX 2A

LEGEND

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RED DEER RIVER

PLAN
Scale 1:200



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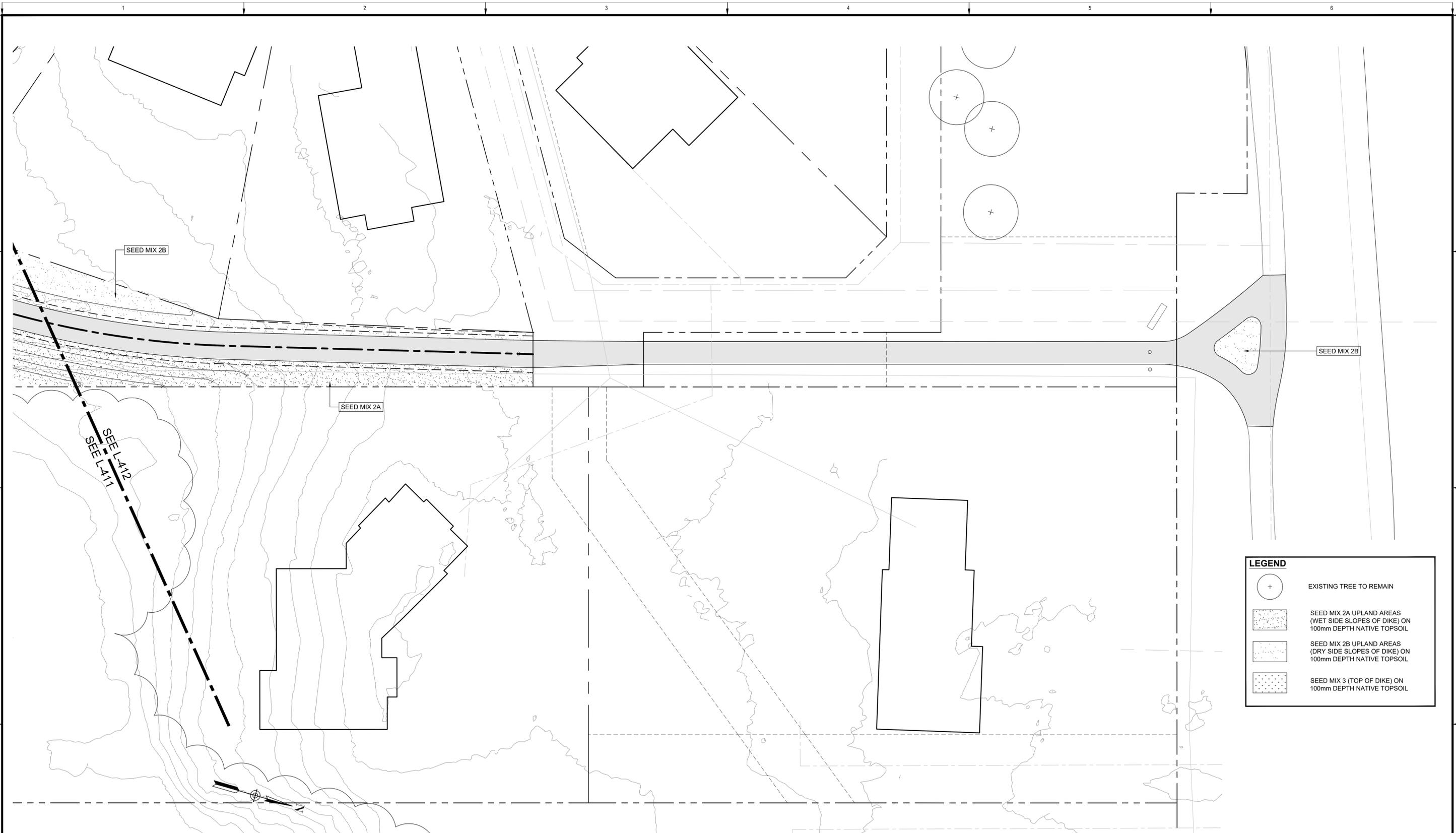
**TOWN OF DRUMHELLER
MIDLANDS DIKE**

SEEDING PLAN

Project No. **133142** Drawing No. **L-411** Rev. **1**
Group **LANDSCAPE**

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LEGEND	
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	SEED MIX 3 (TOP OF DIKE) ON 100mm DEPTH NATIVE TOPSOIL

PLAN
Scale 1:200



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Rev	Date	Des	Dwn	Chk	Description

TOWN OF DRUMHELLER MIDLANDS DIKE	
SEEDING PLAN	
Project No. 133142	Drawing No. L-412
Group LANDSCAPE	Rev. 1

Seed Mix 1 - Wet Tolerant: Seed below 1:2-year high water mark - Application rate of 58 kg / ha.

BOTANICAL NAME	COMMON NAME	TARGET COVER	% OF SEED MIX (PLS)	Kg REQUIRED (PLS)
<i>Deschampsia caespitosa</i>	Tufted Hairgrass	25%	3%	1.97
<i>Pascopyrum smithii</i> / <i>Agropyron smithii</i>	Western Wheatgrass	20%	32%	18.60
<i>Bromus carinatus</i>	Mountain Brome	5%	10%	5.68
<i>Elymus trachycaulus</i> / <i>Agropyron trachycaulum</i> var.	Slender Wheatgrass	10%	11%	6.39
<i>Elymus canadensis</i>	Canada Wildrye	15%	23%	13.34
<i>Spartina pectinata</i>	Alkali Cordgrass	25%	21%	11.66

Cover crop for Seed Mix 1 - Wet Tolerant: Slough Grass - Application rate of 5 kg / ha.

Seed Mix 2A - Upland Areas: Wet side slopes of dike, not likely susceptible to inundation - Application rate of 58 kg / ha.

BOTANICAL NAME	COMMON NAME	TARGET COVER	% OF SEED MIX (PLS)	Kg REQUIRED (PLS)
<i>Elymus lanceolatus</i> / <i>Agropyron dasystachyum</i>	Northern Wheatgrass	15%	16%	9.30
<i>Pascopyrum smithii</i> / <i>Agropyron smithii</i>	Western Wheatgrass	20%	30%	17.36
<i>Elymus trachycaulus</i> / <i>Agropyron trachycaulum</i> var.	Slender Wheatgrass	10%	10%	5.97
<i>Bouteloua gracilis</i>	Blue Grama	10%	2%	0.88
<i>Elymus canadensis</i>	Canada Wildrye	10%	14%	8.30
<i>Nassella viridula</i> / <i>Stipa viridula</i>	Green Needlegrass	25%	27%	15.82
<i>Koeleria macrantha</i>	Junegrass	10%	1%	0.58

Cover crop for Seed Mix 2A - Upland Areas: Annual Ryegrass - application rate of 5 kg / ha.

Seed Mix 2B - Upland Areas with low erosion and low risk of washout - Reinstall native topsoil materials and add crop of *Lolium multiflorum* (Annual Ryegrass) at 10 kg / ha for areas outlined on drawings.

Seed Mix 3 - Top of Dike - application rate of 50 kg / ha.

BOTANICAL NAME	COMMON NAME	TARGET COVER	% OF SEED MIX (PLS)	Kg REQUIRED (PLS)
<i>Elymus lanceolatus</i> / <i>Agropyron dasystachyum</i>	Northern Wheatgrass	23%	46%	22.91
<i>Pascopyrum smithii</i> / <i>Agropyron smithii</i>	Western Wheatgrass	10%	23%	11.16
<i>Bouteloua gracilis</i>	Blue Grama	20%	6%	2.83
<i>Hesperostipa comata</i> / <i>Stipa comata</i>	Needle and Thread	2%	4%	2.13
<i>Poa sandbergii</i>	Sandberg Bluegrass	15%	6%	3.07
<i>Nassella viridula</i> / <i>Stipa viridula</i>	Green Needlegrass	5%	9%	4.24
<i>Koeleria macrantha</i>	Junegrass	23%	4%	2.13
<i>Dalea purpurea</i>	Purple Prairie Clover	2%	2%	1.02

Cover crop for Seed Mix 3 - Top of dike: Annual Ryegrass - application rate of 5 kg / ha.

SEEDING NOTES

- ENSURE SEED MIXTURE IS FREE OF ANY WEED SEEDS LISTED AS "PROHIBITED NOXIOUS" OR "NOXIOUS" UNDER THE WEED CONTROL ACT AND SEEDS OF OTHER SPECIES THAT WILL INTERFERE WITH THE GROWTH OF THE SPECIFIED SEED MIXTURE.
- SOW AT THE RATE INDICATED WITH SEED MIXES, DURING CALM WEATHER AND WHEN SOIL MOISTURE CONTENT IS ADEQUATE FOR GERMINATION.
- FOR SLOPES 2:1 OR FLATTER AREAS TO BE SEEDED THAT ARE EASILY ACCESSIBLE APPLY SEED USING A MECHANICAL DRY SPREAD "BRILLION" SEEDER THAT PLACES SEED AT SPECIFIED DEPTH AND RATE AND ROLLS IN A SINGLE OPERATION.
- FOR STEEPER THAN 2:1 SLOPES OR SLOPES THAT ARE NOT EASILY ACCESSIBLE USE MANUALLY OPERATED BROADCAST SEEDER.
- SOW SEED IN TWO DIRECTIONS, 50% OF SEED IN ONE DIRECTION AND REMAINING 50% OF SEED AT RIGHT ANGLES TO FIRST SEEDING PATTERN, USING SAME METHOD OF SEEDING.
- COVER BROADCASTED SEED BY HAND RAKING AND ATV HARROWING-IN.
- OPTIMAL SEEDING PERIODS FOR NATIVE GRASSES:
 - MID TO LATE MAY, EARLY JUNE - NO LATER THAN JUNE 15TH.
 - LATE SEPTEMBER - AFTER FIRST HARD FROST WHEN PLANTS GO DORMANT. DO NOT SEED NEAR END OF SEASON UNTIL THE RISK OF SEED GERMINATION IS LOW. SEED THAT GERMINATES AND DOES NOT FULLY ESTABLISH PRIOR TO END OF GROWING SEASON WILL LIKELY NOT OVERWINTER.
- WATER THE SEEDED AREAS AFTER SEEDING TO ACHIEVE GERMINATION AND A UNIFORM STAND OF GRASS. THE OWNER WILL DETERMINE THE WATERING SCHEDULE AND WILL PROVIDE THE CONTRACTOR WITH AT LEAST 24 HOURS ADVANCE NOTICE TO COMMENCE WATERING SEEDED AREAS.
- APPLY WATER UNIFORMLY TO SEEDED AREAS WITHOUT CAUSING DISPLACEMENT OR EROSION OF THE MATERIALS AND TOPSOIL.
- MINIMIZE TRAVEL ON SEEDED SURFACES.
- USE WATERING EQUIPMENT AND TECHNIQUES AUTHORIZED BY THE OWNER.



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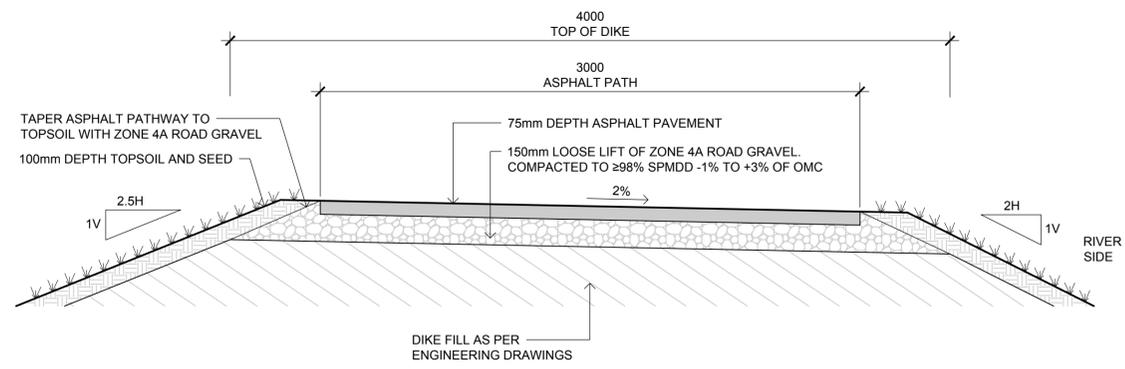
Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER
MIDLANDS DIKE**

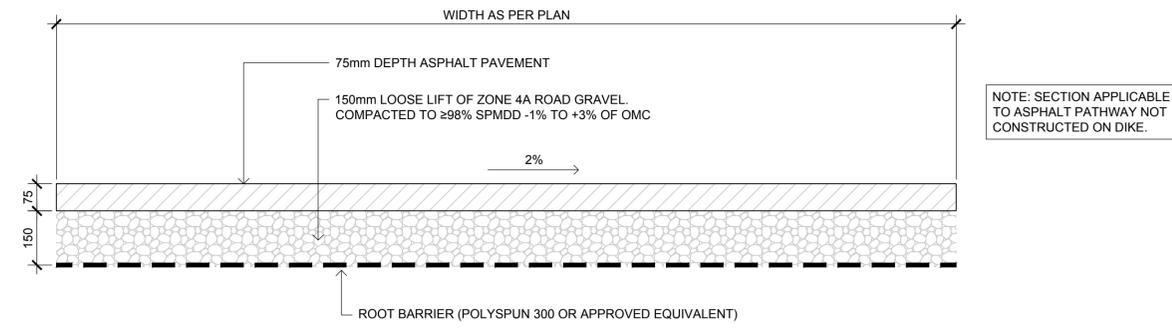
SEEDING NOTES

Project No. 133142	Drawing No. L-413	Rev. 1
Group LANDSCAPE		

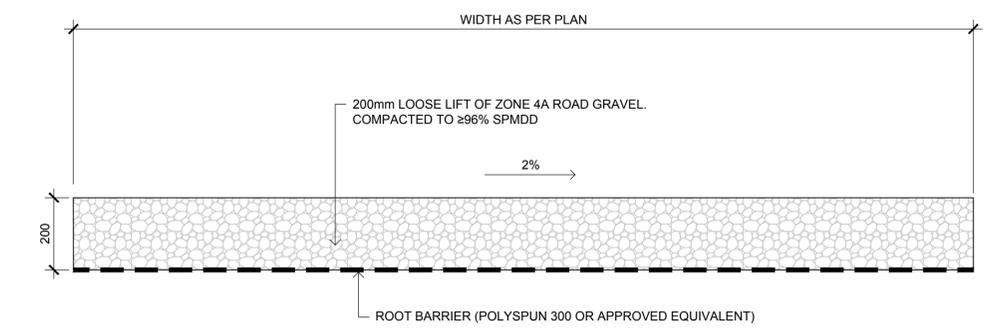
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A ASPHALT PATHWAY AT TOP OF DIKE
L-901 SCALE 1:20



B ASPHALT PATHWAY
L-901 SCALE 1:10



C GRAVEL CONNECTOR TRAIL
L-901 SCALE 1:10



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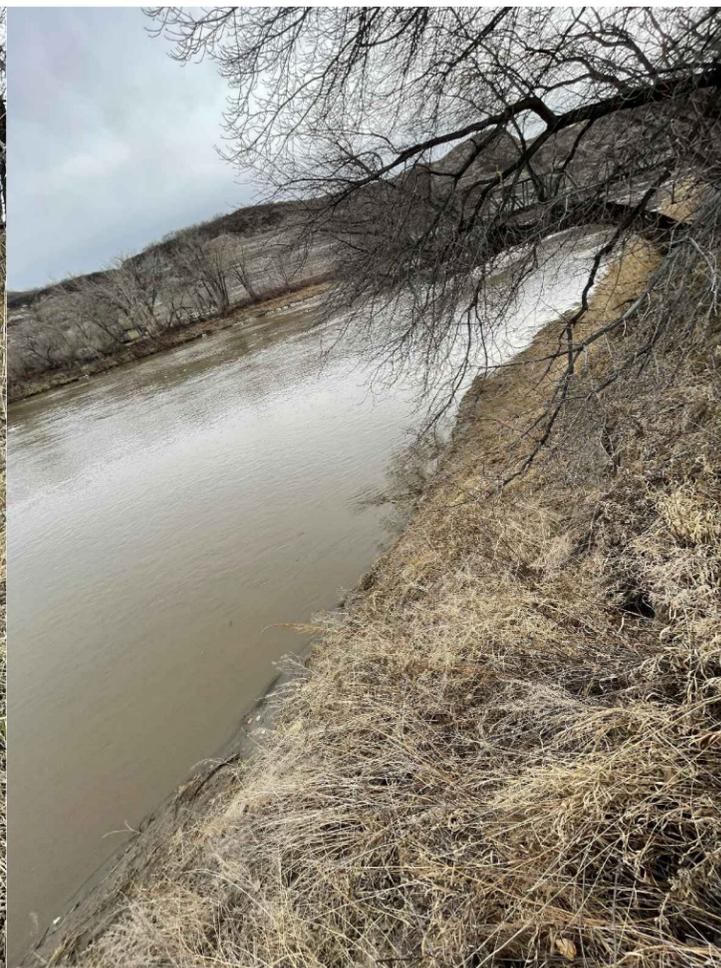
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**TOWN OF DRUMHELLER
MIDLANDS DIKE**

LANDSCAPE DETAILS

Project No. **133142** Drawing No. **L-901** Rev. **1**

Group **LANDSCAPE**



PROPOSED INSTREAM RIPRAP LOCATION
LOOKING UPSTREAM OF THE RED DEER RIVER

PROPOSED INSTREAM RIPRAP LOCATION
LOOKING DOWNSTREAM OF THE RED DEER RIVER

THIS DRAWING MAY HAVE BEEN REDUCED.
ALL SCALE NOTATIONS INDICATED (i.e. 1:1000 etc)
ARE BASED ON 22" X 34" FORMAT DRAWINGS



Seal:

Rev	Date	Des	Dwn	Chk	Description
A	2022-04-08	PB	AL	JP	ISSUED FOR 60% DESIGN

Rev	Date	Des	Dwn	Chk	Description

DRUMHELLER RESILIENCY AND FLOOD MITIGATION PROGRAM			
MIDLAND PROPOSED INSTREAM RIPRAP PROTECTION SITE PHOTOS			
Project No.	A03409A05	Drawing No.	C-103
Group	A02	Rev.	A