

Tender No. 22.06.20B

Newcastle Dike Upgrades Project

ADDENDUM No. A-02



## **ADDENDUM A-02**

<b>Project:</b>	<b>Tender No. 22.06.20B - Drumheller Resiliency and Flood Mitigation – Newcastle Dike Upgrade Project</b>
<b>Addendum:</b>	<b>A-02</b>
<b>Date:</b>	<b>July 11, 2022</b>
<b>Location:</b>	<b>Drumheller, Alberta</b>

### **To All Bidders:**

#### **1. General**

- 1.1. This addendum shall be read in conjunction with Tender No. 22.06.20B Drumheller Resiliency and Flood Mitigation – Newcastle 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.

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### **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 1.4.3 as follows:

- 2.4.2 Provide unhindered public access to the Newcastle Park ball diamonds throughout the duration of construction; including for overnight camping during September 2 to 5, 2022.

#### **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
Manhole (1)	4+580
Headwall (1)	3+300
450 mm PVC storm sewer (8 m)	4+580

.2 ADD Clause 2.3.2 as follows:

.1 Abandon in place the following structures:

Existing Structure	Approximate Station
450 mm PVC storm sewer (42 m)	4+580

.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 (4)	4+200, 4+250, 4+700	Remove as required to perform work and reinstall
Garbage Bins	4+200, 4+250, 4+700	Remove as required to perform work and reinstall
Picnic Tables (5)	4+700	Remove as required to perform work and reinstall
Guard Rail (60 m)	3+150, 4+020	Remove as required to perform work and reinstall

.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:

<b>Sieve Size</b>	<b>Percent Passing by Mass</b>
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-401 Seeding Plan
- .21 L-402 Seeding Plan
- .22 L-403 Seeding Plan
- .23 L-404 Seeding Plan
- .24 L-405 Seeding Plan
- .25 L-406 Seeding Plan
- .26 L-407 Seeding Plan
- .27 L-408 Seeding Plan
- .28 L-409 Seeding Plan
- .29 L-410 Seeding Plan
- .30 L-411 Seeding Plan
- .31 L-412 Seeding Notes

6.2 Drawing C-101

- .1 DELETE the text "LAYDOWN AREA", south of 2 Avenue W between 11 Street West and 12 Street West.

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 7<sup>th</sup> 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 m<sup>3</sup> 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

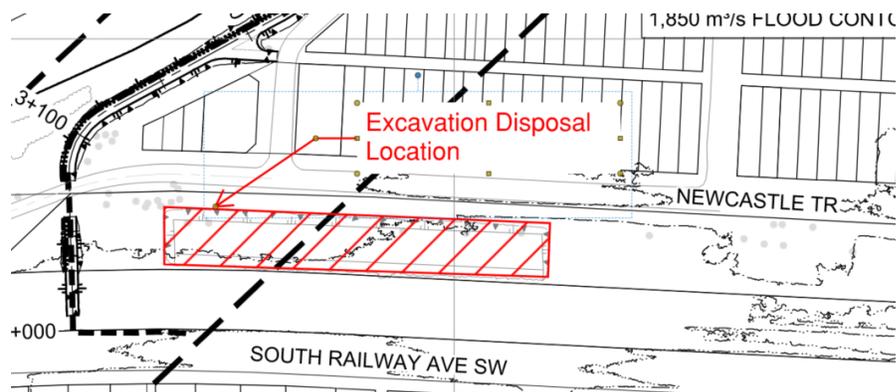
meet these requirements and must be disposed of. Disposal is to be included in the Excavation unit price. Refer to Clarification 7.3 provided in this Addendum for disposal location.

**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.

## 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 Excavation material is to be disposed of in the parcel of land located south of Newcastle Trail near the west end of the project, as shown in the image below. Note that this land is owned by CN Rail and the placement of the material is subject to their approval. Limit stockpile geometry to 1.5 m in height and slopes no steeper than 3H:1V (horizontal to vertical).



- 8.4 The laydown area shown south of 2 Avenue W between 11 Street West and 12 Street West is an error. This area is not available to the Contractor.
- 8.5 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.

## **9. Attachments**

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

- .1 Unit Price Schedule (3 pages)
- .2 Technical Specification Section 01280 – Measurement Schedule (9 pages)
- .3 Technical Specification Section 02930 – Soil Erosion Protection (3 pages)
- .4 Drawing G-003 – Haul Routes (1 drawing)
- .5 Landscape Tender Package (30 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****Newcastle Dike Upgrades Project****Tender No.: 22.06.20B****KLOHN CRIPPEN BERGER LTD. PROJECT No.: A03409A05**

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL BID
<b>1. GENERAL REQUIREMENTS</b>					
1.1	Mobilization and Demobilization	Lump Sum	1	\$	\$
1.2	Existing and Temporary Access Roads	Lump Sum	1	\$	\$
<b>2. SITE WORK</b>					
2.1	Demolition and Removal	Lump Sum	1	\$	\$
2.2	Demolition and Salvage	Lump Sum	1	\$	\$
2.3	Clearing and Grubbing	sq. m.	20,000	\$	\$
2.4	Topsoil and Subsoil Stripping	cu. m.	1,800	\$	\$
2.5	Excavation	cu. m.	2,800	\$	\$
2.6	Impervious Fill Zone 1A	cu. m.	24,000	\$	\$

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL BID
2.7	Topsoil Placement	cu. m.	3,600	\$	\$
2.8	Imported Topsoil	cu. m.	1,800	\$	\$
2.9	Riprap Class 2	cu. m.	240	\$	\$
2.10	Ø 450 mm PVC Pipe	lin. m.	64	\$	\$
2.11	1S Manhole 1.2 x 1.2	each	1	\$	\$
2.12	5A Manhole	each	1	\$	\$
2.13	Ø 500 mm Tideflex Valve (TF-1)	each	1	\$	\$
2.14	Ø 600 mm Sluice Gate	each	1	\$	\$
2.15	Willow Plantings	lin. m.	20	\$	\$
2.16	Hydroseed	sq. m.	23,000	\$	\$
2.17	Vehicle Access Control Gates	each	2	\$	\$
2.18	Erosion Control Blanket	sq. m,	6,000	\$	\$

<b>3. MAINTENANCE</b>					
3.1	Landscape Maintenance Year 1	year	1	\$	\$
3.2	Landscape Maintenance Year 2	year	1	\$	\$
<b>4. CASH ALLOWANCES</b>					
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
<b>TOTAL TENDER AMOUNT:</b>					

\_\_\_\_\_  
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
<b>1. GENERAL REQUIREMENTS</b>		
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>
<b>2. SITE WORK</b>		
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 Site Clearing and Grubbing as measured by survey.</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>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
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 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	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>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		.3 Payment: Unit Price per cubic meter.
2.10	Ø 450 mm PVC Pipe	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 450 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; 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>
2.11	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>
2.12	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>
2.13	Ø 500 mm Tideflex Valve (TF-1)	<p>.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 500 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 500 mm Tideflex Check-Valve (TF-1)</p> <p>.3 Payment: Unit Price per Ø 500 mm Tideflex Check-Valve (TF-1)</p>
2.14	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>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		<p>.2 Measurement: Shall be per sluice gate to be installed inside 1 S manhole.</p> <p>.3 Payment: Unit Price per Ø 600 mm sluice gate.</p>
2.15	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>
2.16	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>
2.17	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>
2.18	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>
<b>3. MAINTENANCE</b>		
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;</p>

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		<p>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>
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>
<b>4. CASH ALLOWANCES</b>		
1.3	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</p>

<b>ITEM No.</b>	<b>ITEM NAME</b>	<b>SCOPE, MEASUREMENT AND PAYMENT</b>
		bedding and backfill materials; surface restoration, and; and other work identified by the Engineer of Record.  .2 Payment: Cash Allowance.

**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 prior to 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 <sup>2</sup>
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 prior to 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 for 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**

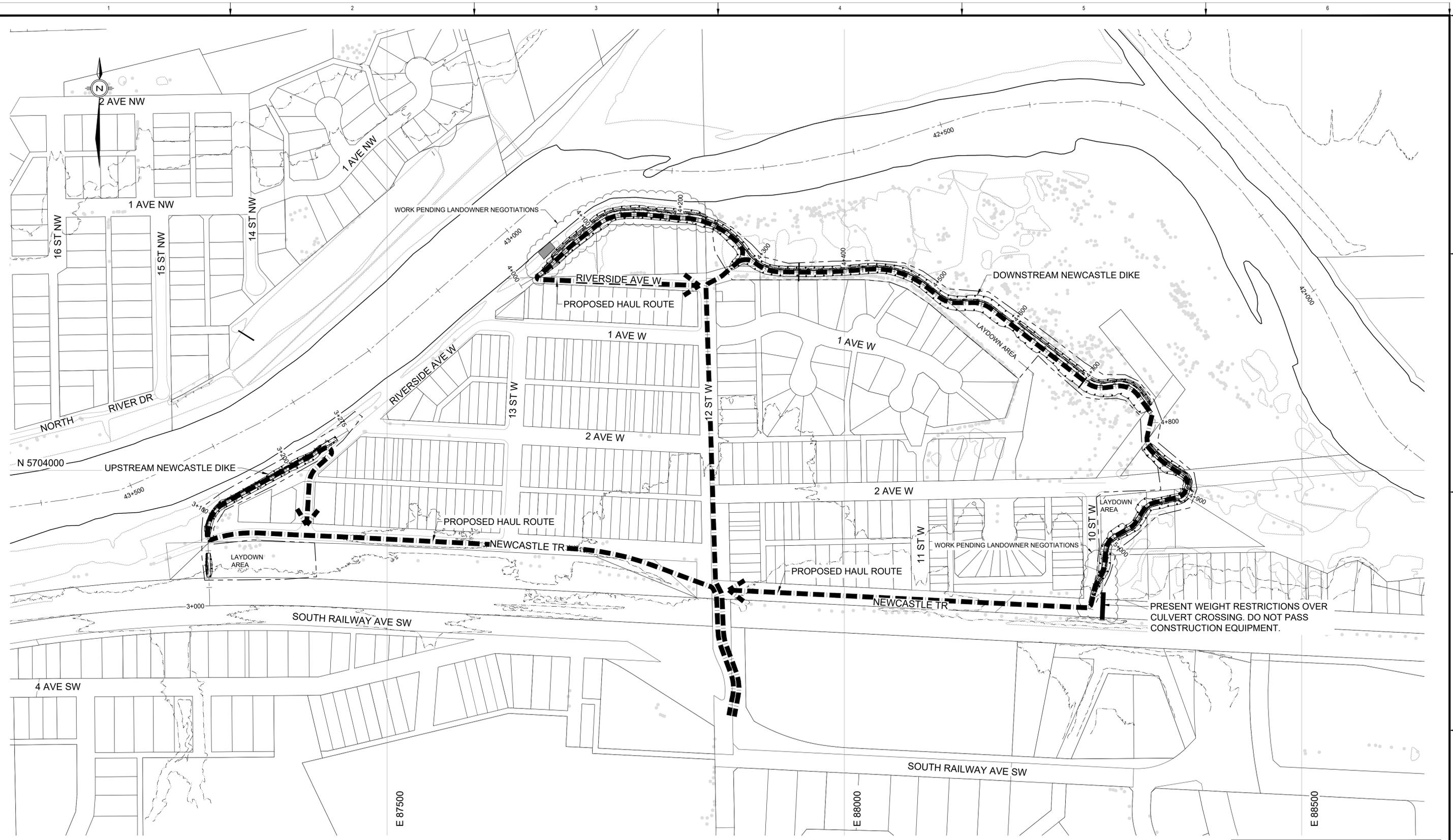
- .1 Anchor the bottom of the wattle by excavating a 50 mm deep trench, placing the wattle, and anchoring with timber stakes.
- .2 Drive stakes into the ground in accordance with the manufacturer's written instructions and specifications, and as required by the Design Professional.
- .3 Inspect and maintain 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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NOT FOR CONSTRUCTION

THIS DRAWING MAY HAVE BEEN REDUCED.  
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  
NEWCASTLE PROJECT

HAUL ROUTES

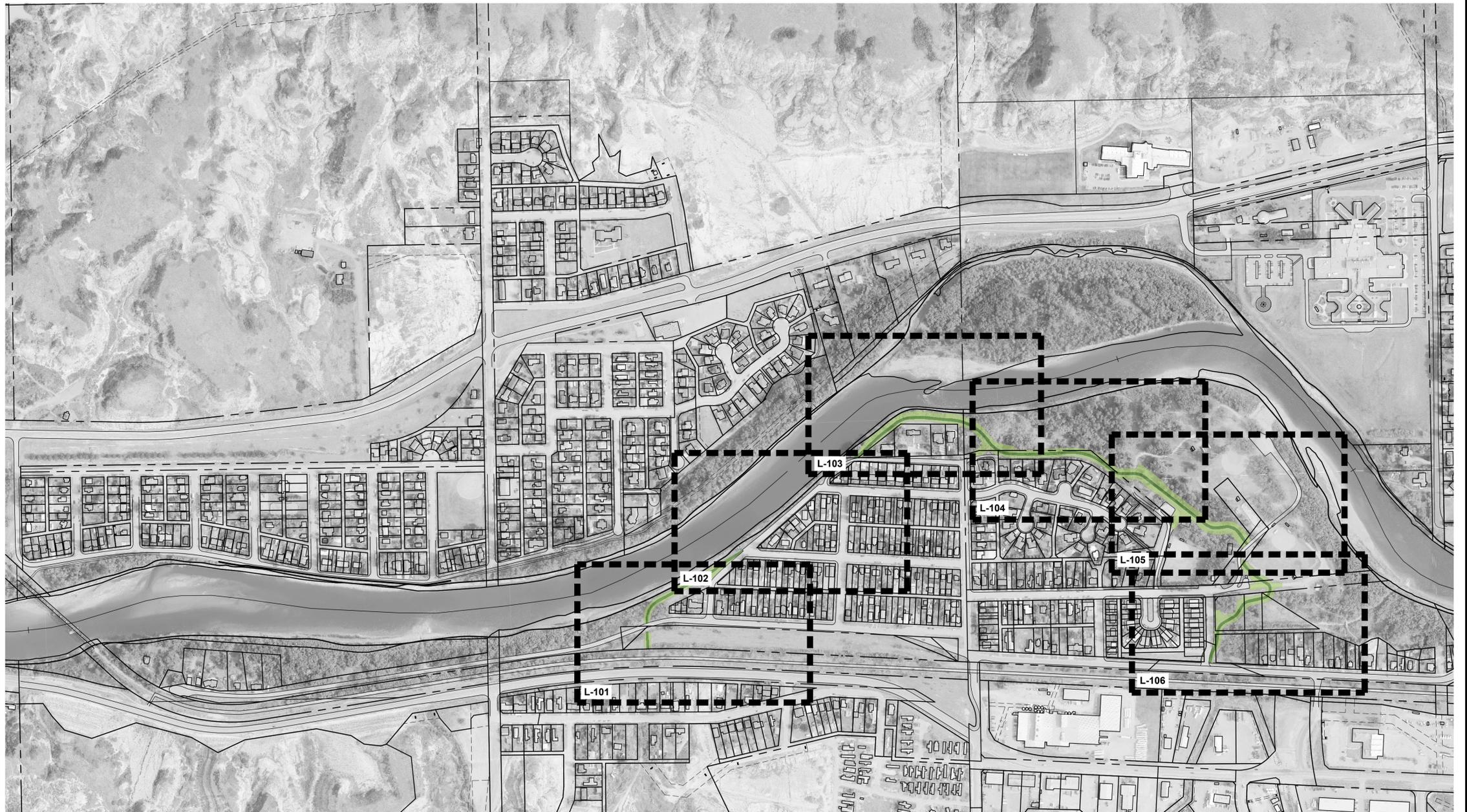
Project No. 22.06.20B Drawing No. G-003 Rev. A  
Group GENERAL

# TOWN OF DRUMHELLER

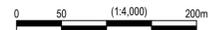
## NEWCASTLE DIKE LANDSCAPE TENDER PACKAGE

### DRAWING LIST

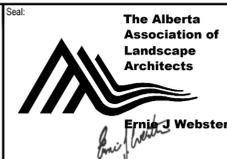
DRAWING NO.	DRAWING TITLE
L-100	LANDSCAPE COVER SHEET & KEY PLAN
L-101	LANDSCAPE MASTER PLAN
L-102	LANDSCAPE MASTER PLAN
L-103	LANDSCAPE MASTER PLAN
L-104	LANDSCAPE MASTER PLAN
L-105	LANDSCAPE MASTER PLAN
L-106	LANDSCAPE MASTER PLAN
L-301	LAYOUT & GRADING PLAN
L-302	LAYOUT & GRADING PLAN
L-303	LAYOUT & GRADING PLAN
L-304	LAYOUT & GRADING PLAN
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L-306	LAYOUT & GRADING PLAN
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L-311	LAYOUT & GRADING PLAN
L-401	SEEDING PLAN
L-402	SEEDING PLAN
L-403	SEEDING PLAN
L-404	SEEDING PLAN
L-405	SEEDING PLAN
L-406	SEEDING PLAN
L-407	SEEDING PLAN
L-408	SEEDING PLAN
L-409	SEEDING PLAN
L-410	SEEDING PLAN
L-411	SEEDING PLAN
L-412	SEEDING NOTES



**PLAN**  
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0	2022-06-29	BB	MD	EJW	ISSUED FOR TENDER
1	2022-07-07	BB	MD	EJW	ISSUED FOR ADDENDUM #1

Rev	Date	Des	Dwn	Chk	Description

<b>TOWN OF DRUMHELLER NEWCASTLE DIKE</b>	
<b>LANDSCAPE COVER SHEET &amp; KEY PLAN</b>	
Project No. <b>133142</b>	Drawing No. <b>L-100</b>
Group <b>LANDSCAPE</b>	Rev. <b>1</b>

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- LEGEND**
- EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
  - LANDSCAPE SEEDING AT TOP OF DIKE
  - POTENTIAL FUTURE 2100 TRAIL (OLD RAILWAY LINE/CONNECTION)



SEE L-102  
SEE L-101

RED DEER RIVER

NEWCASTLE TR.

RIVERSIDE DR. W.

SOUTH RAILWAY AVE. S.W.

ADAPTIVE  
FILL AREA

POTENTIAL FUTURE  
CONNECTION TO OLD  
RAILWAY (TRAIL 2100)

**PLAN**  
Scale 1:500



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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**LANDSCAPE MASTER PLAN**

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

Group **LANDSCAPE**

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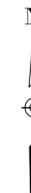
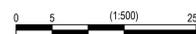
SEE L-102  
SEE L-101

SEE L-103  
SEE L-102

RED DEER RIVER

RIVERSIDE AVE. W.

PLAN  
Scale 1:500



LEGEND

- EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
- LANDSCAPE SEEDING AT TOP OF DIKE
- POTENTIAL FUTURE 2100 TRAIL (OLD RAILWAY LINE/CONNECTION)



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TOWN OF DRUMHELLER  
NEWCASTLE DIKE

LANDSCAPE MASTER PLAN

Project No. 133142  
Group LANDSCAPE

Drawing No.

L-102

Rev. 1

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**LEGEND**

- EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
- LANDSCAPE SEEDING AT TOP OF DIKE
- POTENTIAL FUTURE 2100 TRAIL (OLD RAILWAY LINE/CONNECTION)



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**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**LANDSCAPE MASTER PLAN**

Project No. **133142** Drawing No. **L-103** Rev. **1**

Group **LANDSCAPE**

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**LEGEND**

- EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
- LANDSCAPE SEEDING AT TOP OF DIKE
- POTENTIAL FUTURE 2100 TRAIL (OLD RAILWAY LINE/CONNECTION)



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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

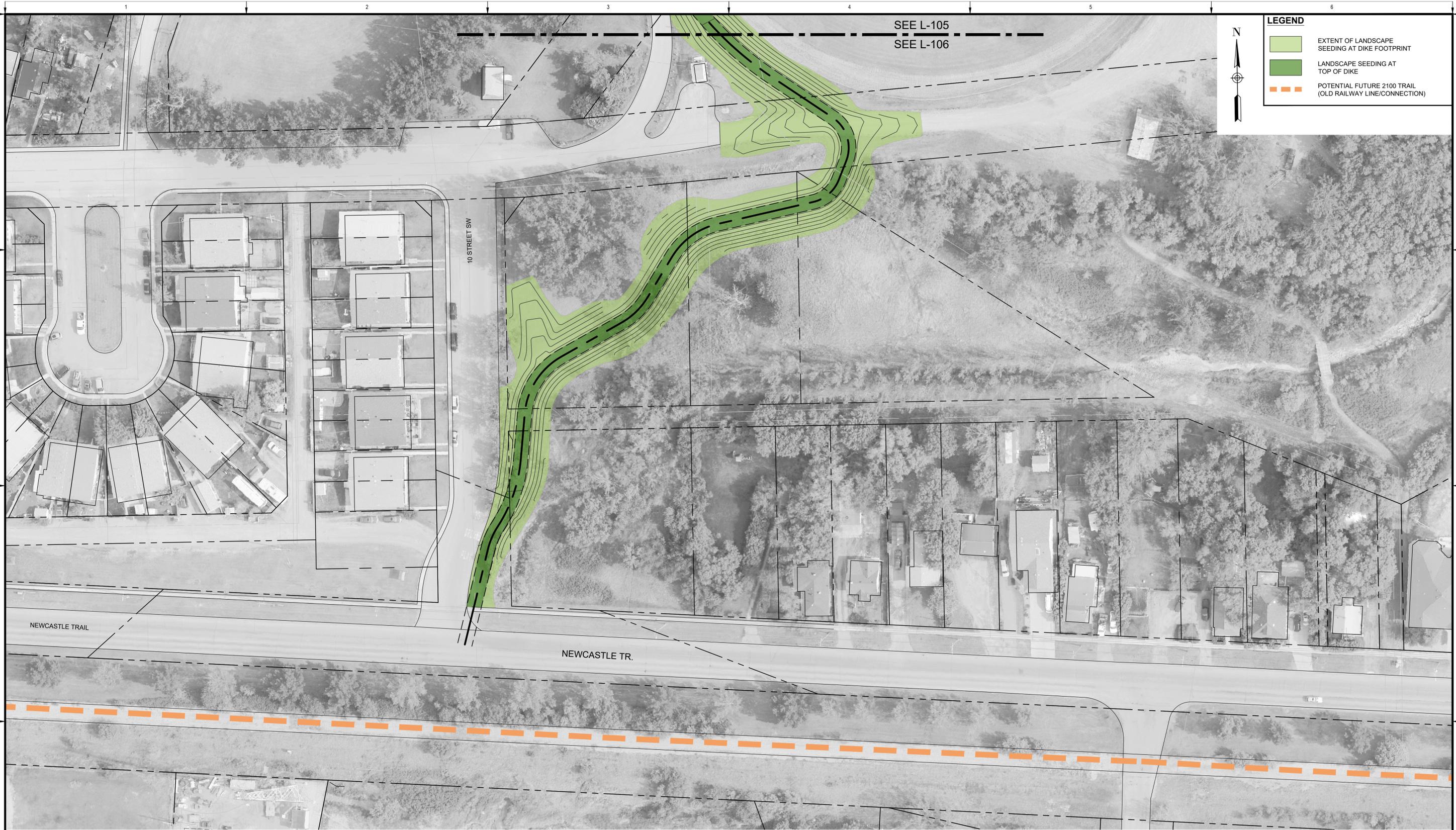
**LANDSCAPE MASTER PLAN**

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



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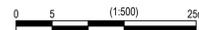
SEE L-105  
SEE L-106



**LEGEND**

	EXTENT OF LANDSCAPE SEEDING AT DIKE FOOTPRINT
	LANDSCAPE SEEDING AT TOP OF DIKE
	POTENTIAL FUTURE 2100 TRAIL (OLD RAILWAY LINE/CONNECTION)

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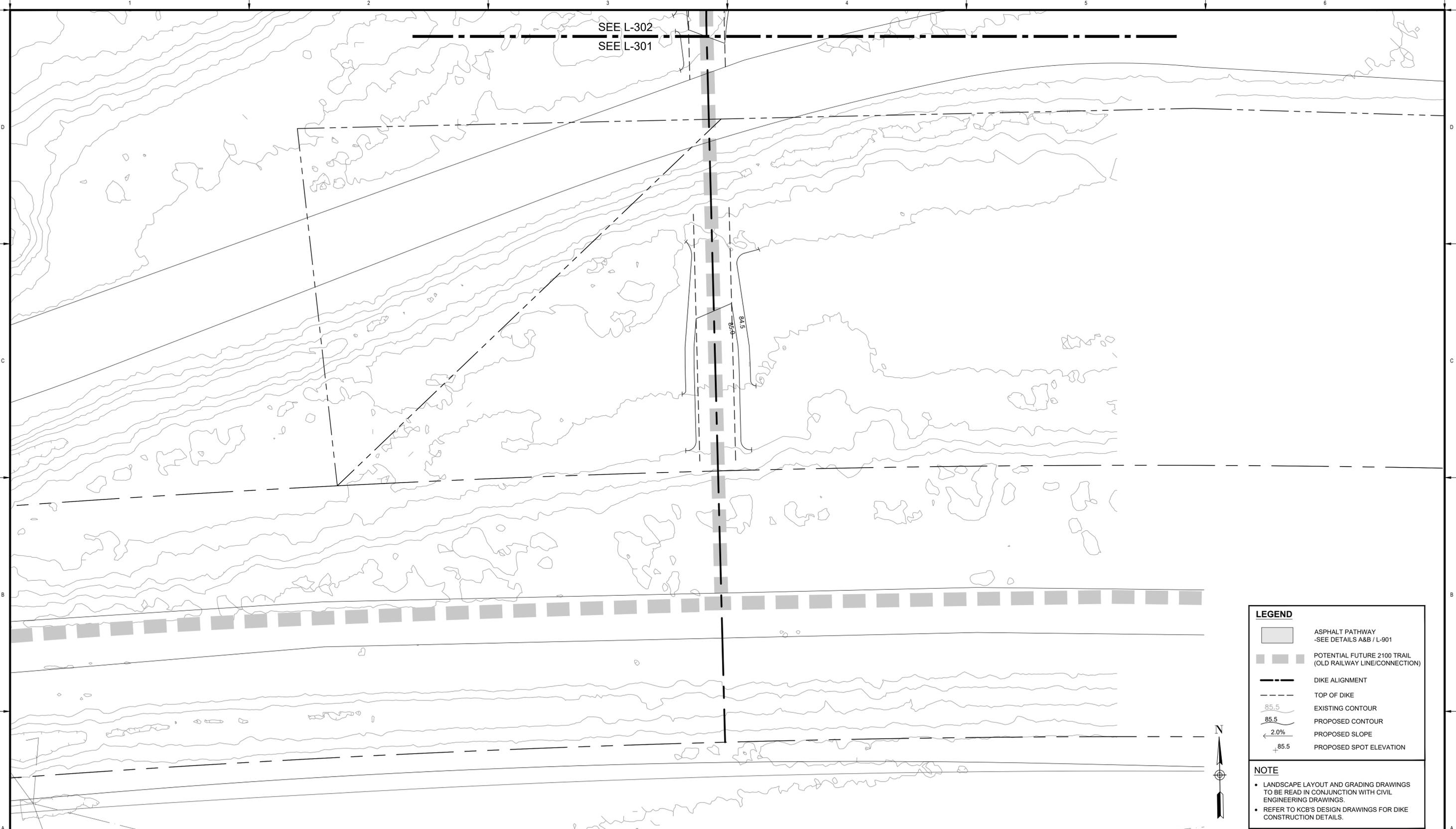
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Rev	Date	Des	Dwn	Chk	Description

<b>TOWN OF DRUMHELLER NEWCASTLE DIKE</b>			
<b>LANDSCAPE MASTER PLAN</b>			
Project No.	133142	Drawing No.	
Group	LANDSCAPE		
			<b>L-106</b>
			<b>1</b>

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**LEGEND**

- ASPHALT PATHWAY  
-SEE DETAILS A&B / L-901
- POTENTIAL FUTURE 2100 TRAIL  
(OLD RAILWAY LINE/CONNECTION)
- DIKE ALIGNMENT
- TOP OF DIKE
- 85.5 EXISTING CONTOUR
- 85.5 PROPOSED CONTOUR
- 2.0% PROPOSED SLOPE
- 85.5 PROPOSED SPOT ELEVATION

**NOTE**

- 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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**TOWN OF DRUMHELLER  
 NEWCASTLE DIKE**

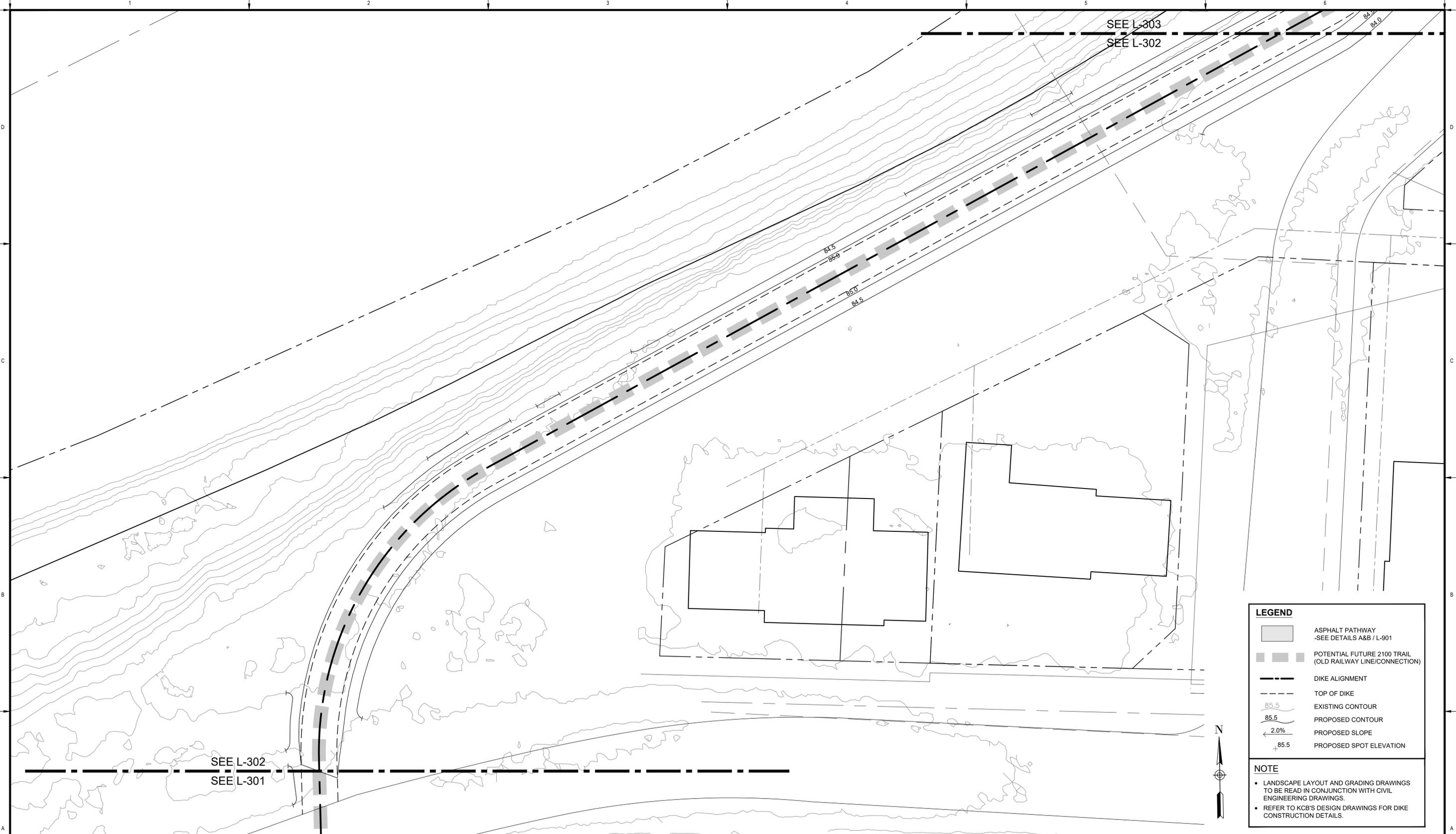
**LAYOUT & GRADING PLAN**

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

Group **LANDSCAPE**

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**LEGEND**

- ASPHALT PATHWAY  
-SEE DETAILS A&B / L-901
- POTENTIAL FUTURE 2100 TRAIL  
(OLD RAILWAY LINE/CONNECTION)
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SLOPE
- PROPOSED SPOT ELEVATION

**NOTE**

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**PLAN**  
Scale 1:200



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**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**LAYOUT & GRADING PLAN**

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

Group **LANDSCAPE**

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**LEGEND**

	ASPHALT PATHWAY -SEE DETAILS A&B / L-901
	POTENTIAL FUTURE 2100 TRAIL (OLD RAILWAY LINE/CONNECTION)
	DIKE ALIGNMENT
	TOP OF DIKE
	EXISTING CONTOUR
	PROPOSED CONTOUR
	PROPOSED SLOPE
	PROPOSED SPOT ELEVATION

**NOTE**

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

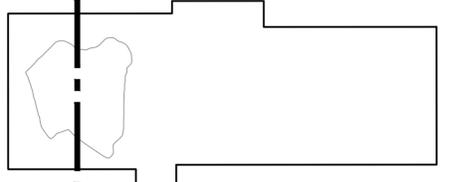
**TOWN OF DRUMHELLER  
 NEWCASTLE DIKE**

**LAYOUT & GRADING PLAN**

Project No. **133142** Drawing No. **L-303** Rev. **1**  
 Group **LANDSCAPE**

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SEE L-305  
 SEE L-304

**LEGEND**

- ASPHALT PATHWAY  
-SEE DETAILS A&B / L-901
- POTENTIAL FUTURE 2100 TRAIL  
(OLD RAILWAY LINE/CONNECTION)
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SLOPE
- PROPOSED SPOT ELEVATION

**NOTE**

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- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.

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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER  
 NEWCASTLE DIKE**

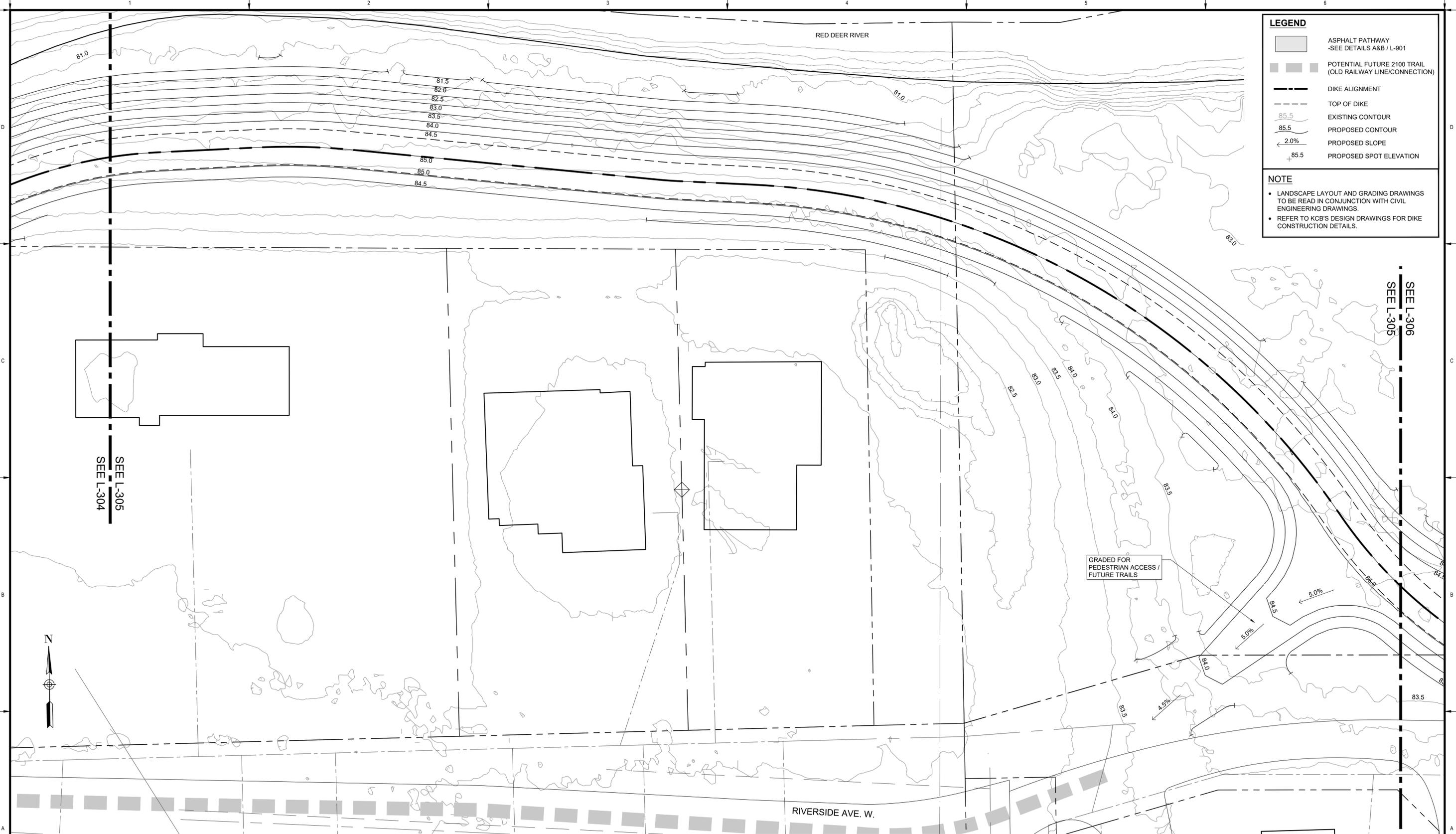
**LAYOUT & GRADING PLAN**

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

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Paper Size = ANSI D  
At Full Size, this border measures 520 mm x 800 mm

100  
50  
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millimeters



**LEGEND**

- ASPHALT PATHWAY  
-SEE DETAILS A&B / L-901
- POTENTIAL FUTURE 2100 TRAIL  
(OLD RAILWAY LINE/CONNECTION)
- DIKE ALIGNMENT
- TOP OF DIKE
- 85.5 EXISTING CONTOUR
- 85.5 PROPOSED CONTOUR
- 2.0% PROPOSED SLOPE
- 85.5 PROPOSED SPOT ELEVATION

**NOTE**

- 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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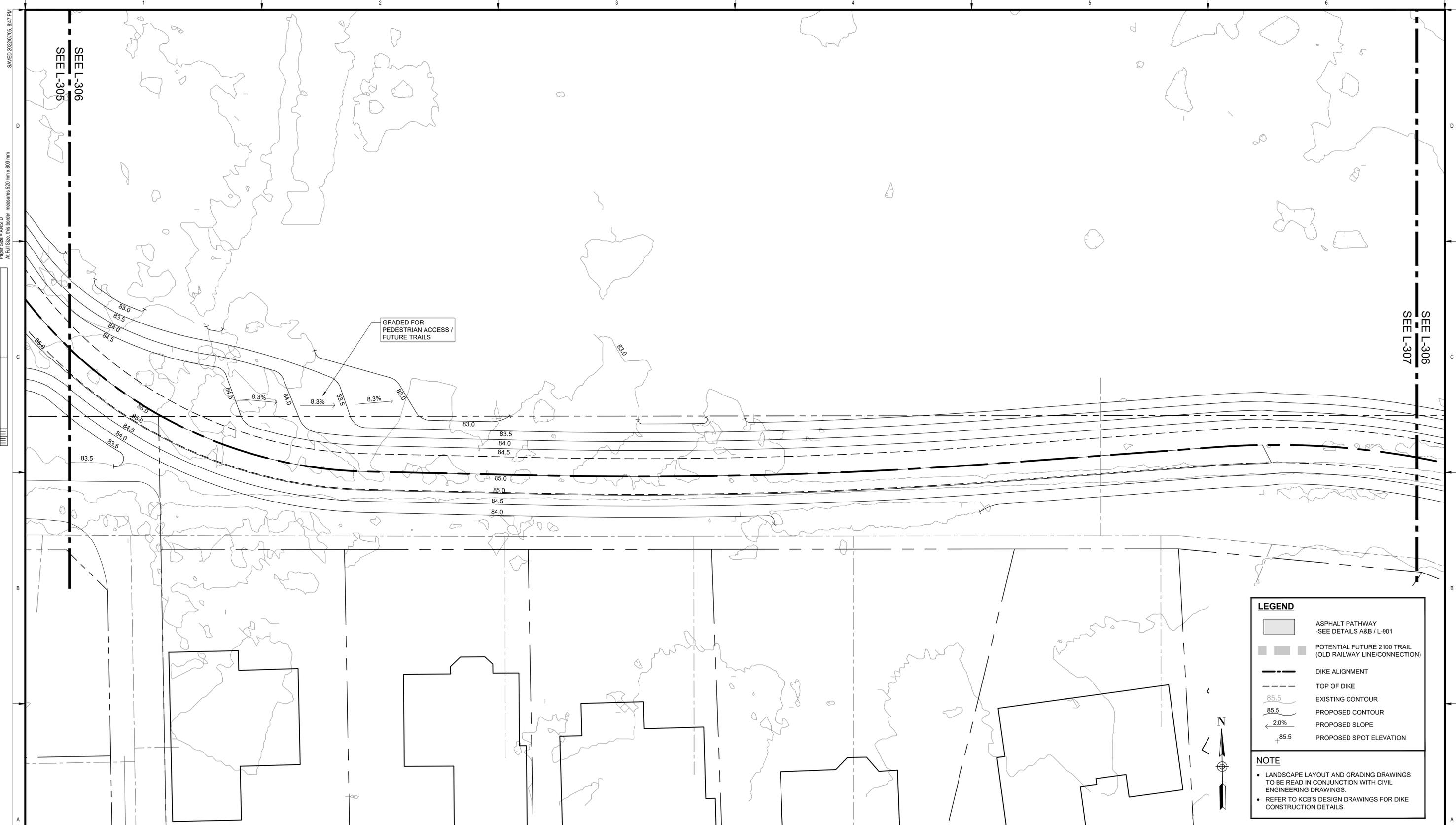
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**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**LAYOUT & GRADING PLAN**

Project No. **133142** Drawing No. **L-305** Rev. **1**

Group **LANDSCAPE**



1:00  
 millimeters  
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LEGEND	
	ASPHALT PATHWAY -SEE DETAILS A&B / L-901
	POTENTIAL FUTURE 2100 TRAIL (OLD RAILWAY LINE/CONNECTION)
	DIKE ALIGNMENT
	TOP OF DIKE
	EXISTING CONTOUR
	PROPOSED CONTOUR
	PROPOSED SLOPE
	PROPOSED SPOT ELEVATION

**NOTE**

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- REFER TO KCB'S DESIGN DRAWINGS FOR DIKE CONSTRUCTION DETAILS.

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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER  
 NEWCASTLE DIKE**

**LAYOUT & GRADING PLAN**

Project No. **133142** Drawing No. **L-306** Rev. **1**  
 Group **LANDSCAPE**

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SEE L-306  
SEE L-307

Paper Size = ANSI D  
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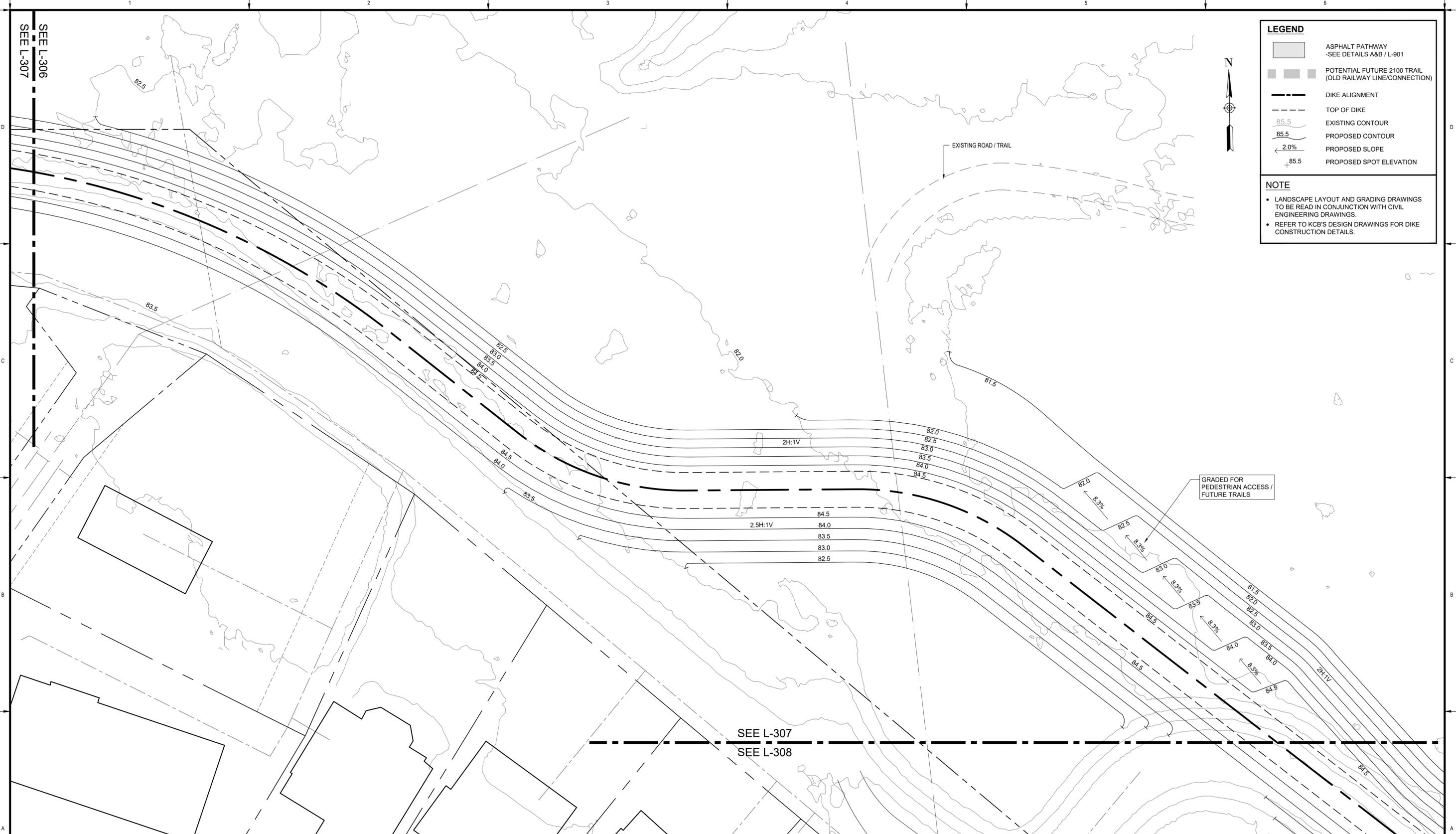


**LEGEND**

	ASPHALT PATHWAY -SEE DETAILS A&B / L-901
	POTENTIAL FUTURE 2100 TRAIL (OLD RAILWAY LINE/CONNECTION)
	DIKE ALIGNMENT
	TOP OF DIKE
	EXISTING CONTOUR
	PROPOSED CONTOUR
	PROPOSED SLOPE
	PROPOSED SPOT ELEVATION

**NOTE**

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



SEE L-307  
SEE L-308

**PLAN**  
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<b>TOWN OF DRUMHELLER NEWCASTLE DIKE</b>	
<b>LAYOUT &amp; GRADING PLAN</b>	
Project No. <b>133142</b>	Drawing No. <b>L-307</b>
Group <b>LANDSCAPE</b>	Rev. <b>1</b>

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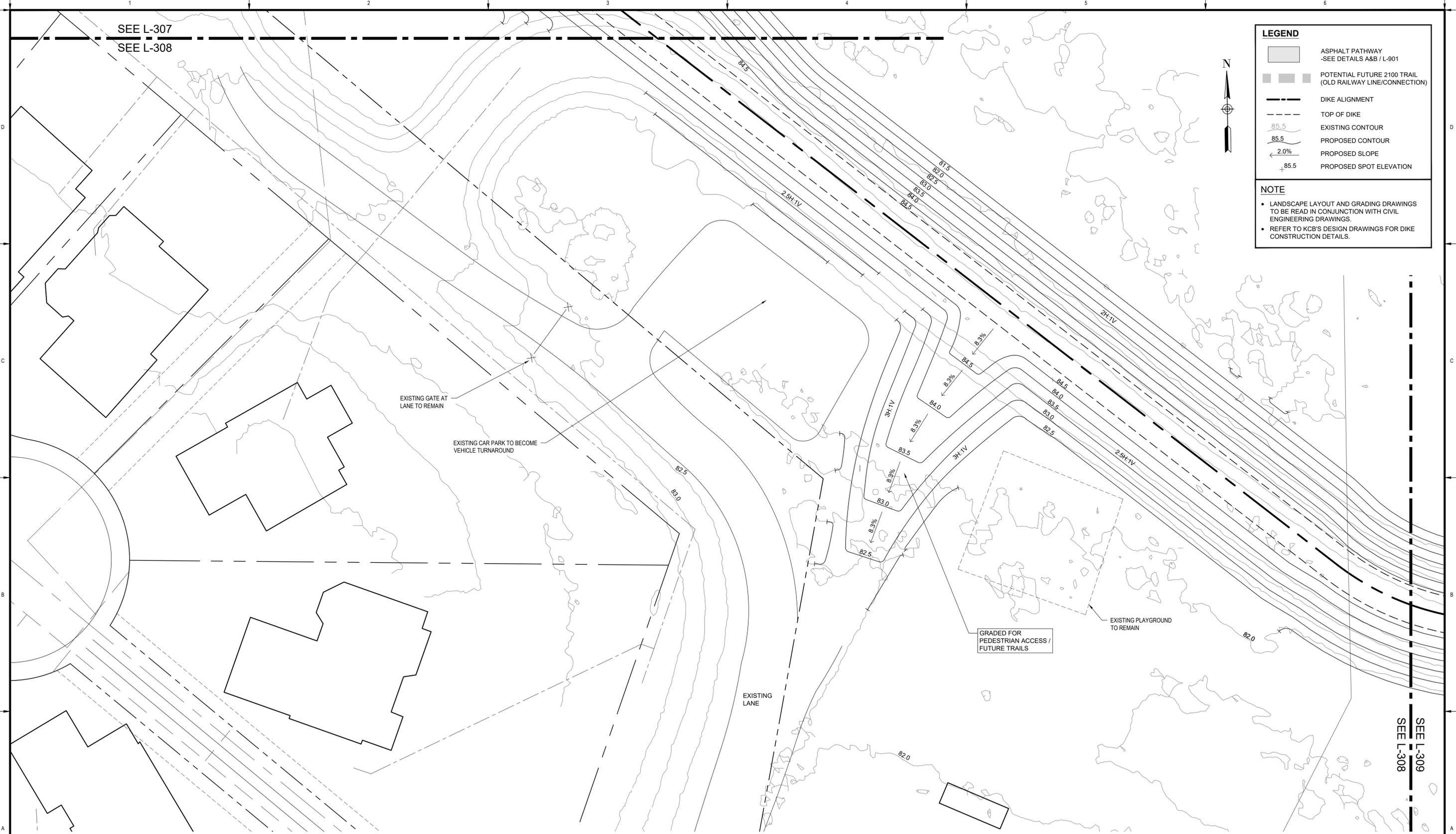
SEE L-307  
SEE L-308

**LEGEND**

- ASPHALT PATHWAY  
-SEE DETAILS A&B / L-901
- POTENTIAL FUTURE 2100 TRAIL  
(OLD RAILWAY LINE/CONNECTION)
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SLOPE
- PROPOSED SPOT ELEVATION

**NOTE**

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



EXISTING GATE AT LANE TO REMAIN

EXISTING CAR PARK TO BECOME VEHICLE TURNAROUND

EXISTING LANE

GRADED FOR PEDESTRIAN ACCESS / FUTURE TRAILS

EXISTING PLAYGROUND TO REMAIN

SEE L-309  
SEE L-308

**PLAN**

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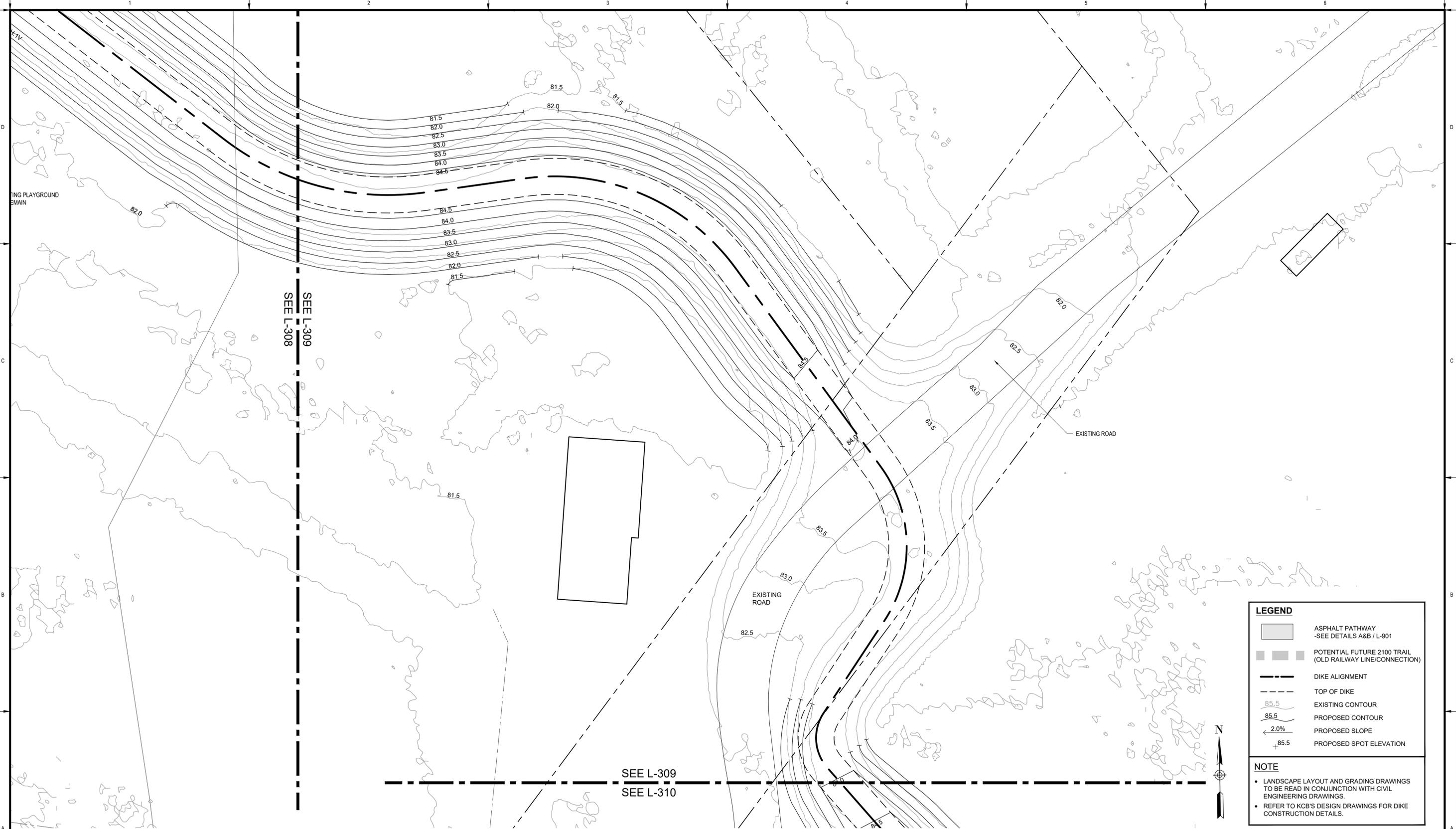
Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**LAYOUT & GRADING PLAN**

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

Group **LANDSCAPE**



**LEGEND**

- ASPHALT PATHWAY  
-SEE DETAILS A&B / L-901
- POTENTIAL FUTURE 2100 TRAIL  
(OLD RAILWAY LINE/CONNECTION)
- DIKE ALIGNMENT
- TOP OF DIKE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- 2.0% PROPOSED SLOPE
- 85.5 PROPOSED SPOT ELEVATION

**NOTE**

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

SEE L-309  
SEE L-310

**PLAN**  
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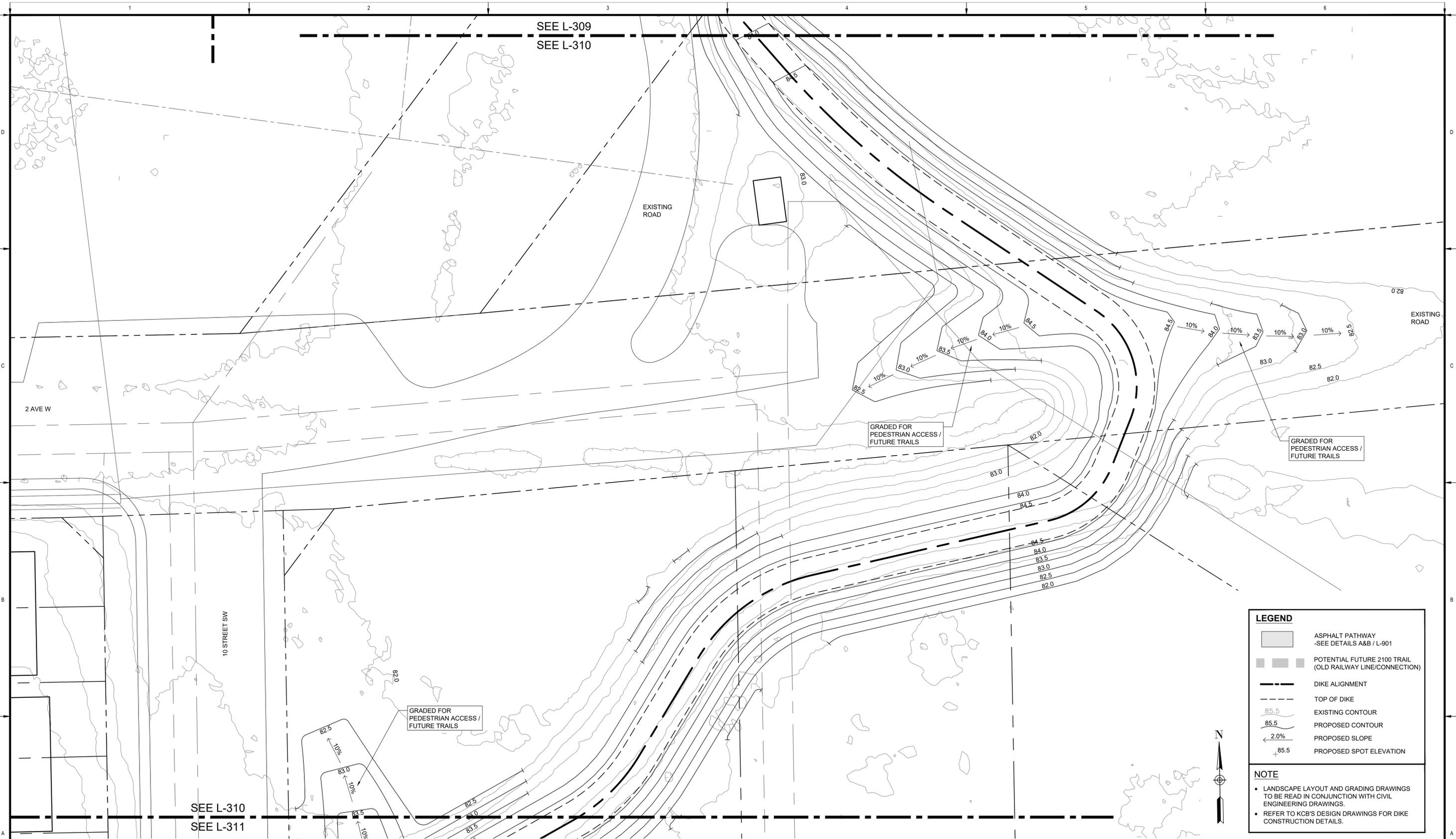
**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**LAYOUT & GRADING PLAN**

Project No. **133142** Drawing No. **L-309** Rev. **1**  
Group **LANDSCAPE**

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**LEGEND**

	ASPHALT PATHWAY -SEE DETAILS A&B / L-901
	POTENTIAL FUTURE 2100 TRAIL (OLD RAILWAY LINE/CONNECTION)
	DIKE ALIGNMENT
	TOP OF DIKE
	EXISTING CONTOUR
	PROPOSED CONTOUR
	PROPOSED SLOPE
	PROPOSED SPOT ELEVATION

**NOTE**

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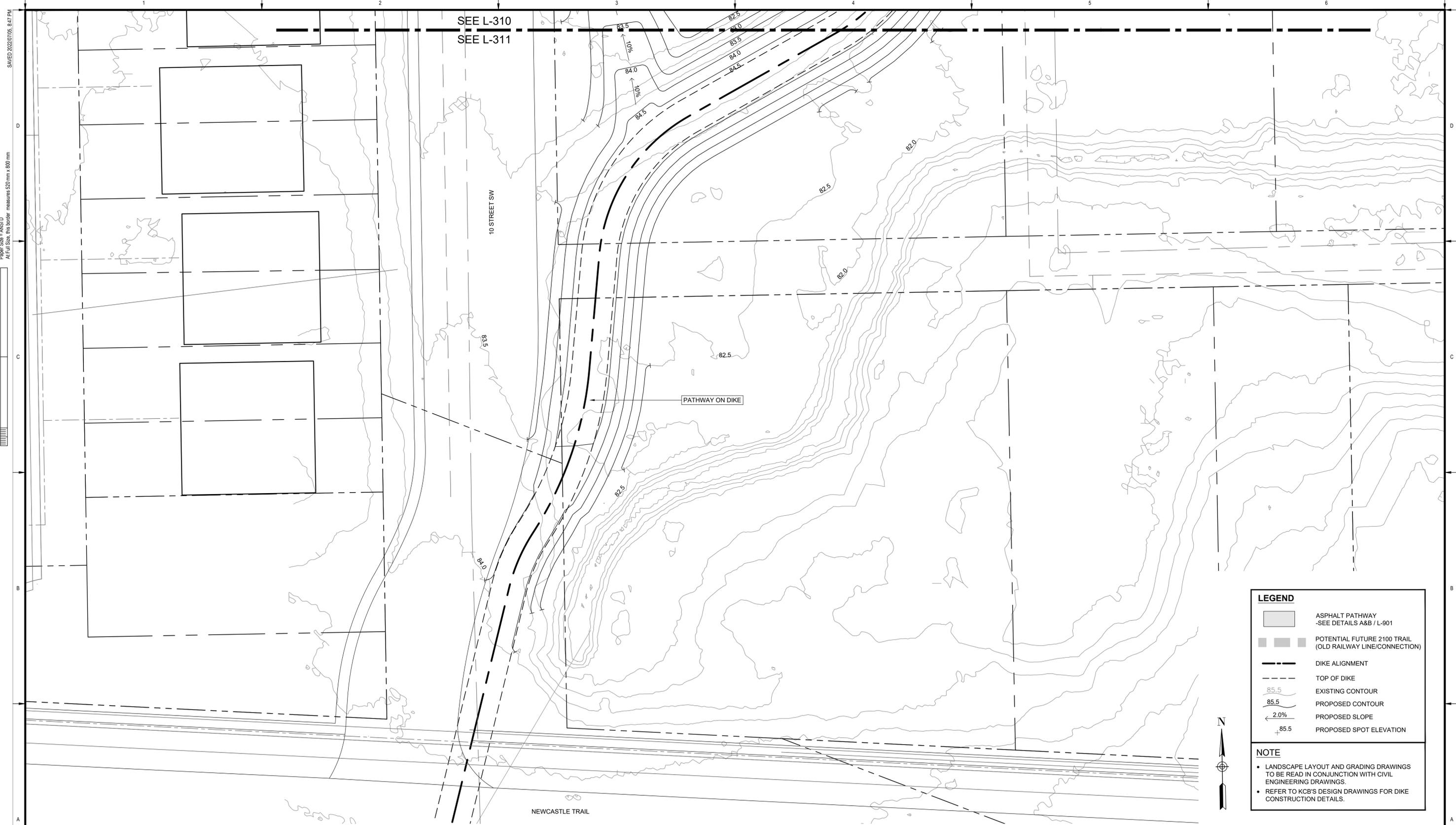
**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**LAYOUT & GRADING PLAN**

Project No. 133142	Drawing No.	Rev.
Group LANDSCAPE		<b>L-310 1</b>

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Paper Size - ANSI D  
At Full Size, this border measures 320 mm x 800 mm



SEE L-310  
SEE L-311

10 STREET SW

PATHWAY ON DIKE

NEWCASTLE TRAIL

**LEGEND**

-  ASPHALT PATHWAY  
-SEE DETAILS A&B / L-901
-  POTENTIAL FUTURE 2100 TRAIL  
(OLD RAILWAY LINE/CONNECTION)
-  DIKE ALIGNMENT
-  TOP OF DIKE
-  85.5 EXISTING CONTOUR
-  85.5 PROPOSED CONTOUR
-  2.0% PROPOSED SLOPE
-  85.5 PROPOSED SPOT ELEVATION

**NOTE**

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**PLAN**



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**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**LAYOUT & GRADING PLAN**

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

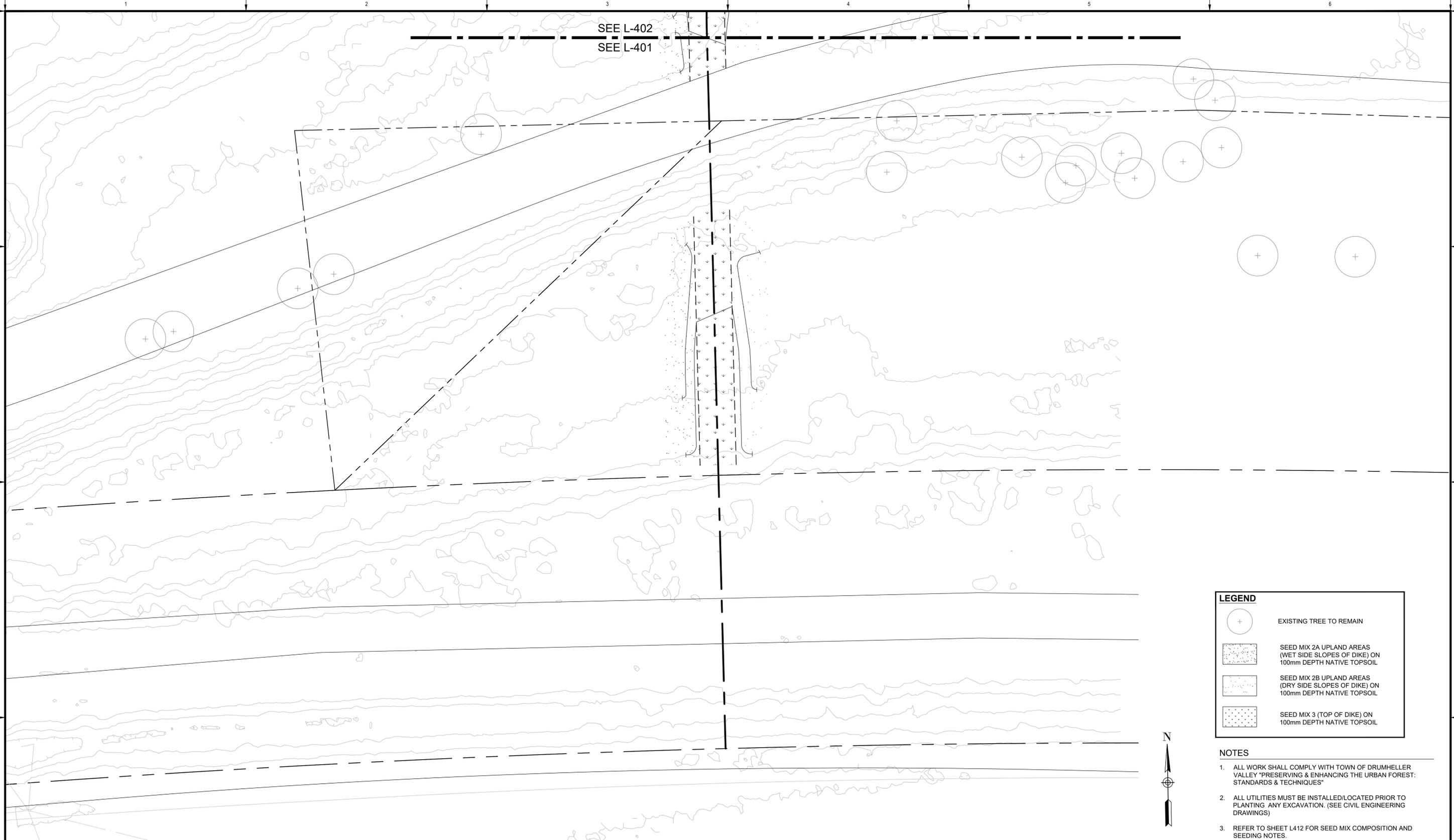
Group **LANDSCAPE**

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Paper Size - ANSI D  
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SEE L-402  
SEE L-401



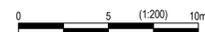
**LEGEND**

	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 L412 FOR SEED MIX COMPOSITION AND SEEDING NOTES.



**PLAN**  
Scale 1:200

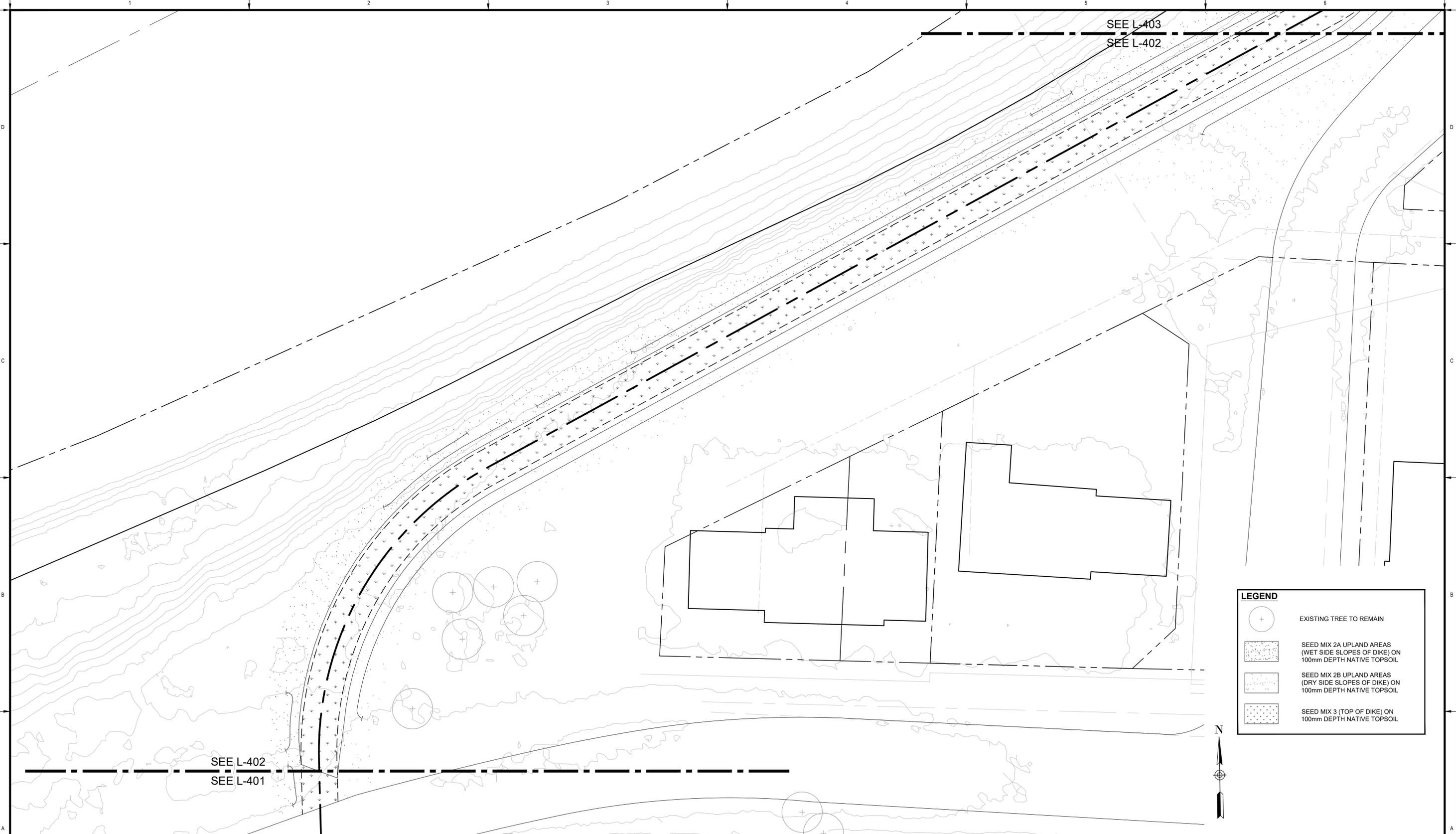


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<b>TOWN OF DRUMHELLER NEWCASTLE DIKE</b>	
<b>SEEDING PLAN</b>	
Project No. <b>133142</b>	Drawing No. <b>L-401</b>
Group <b>LANDSCAPE</b>	Rev. <b>1</b>



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

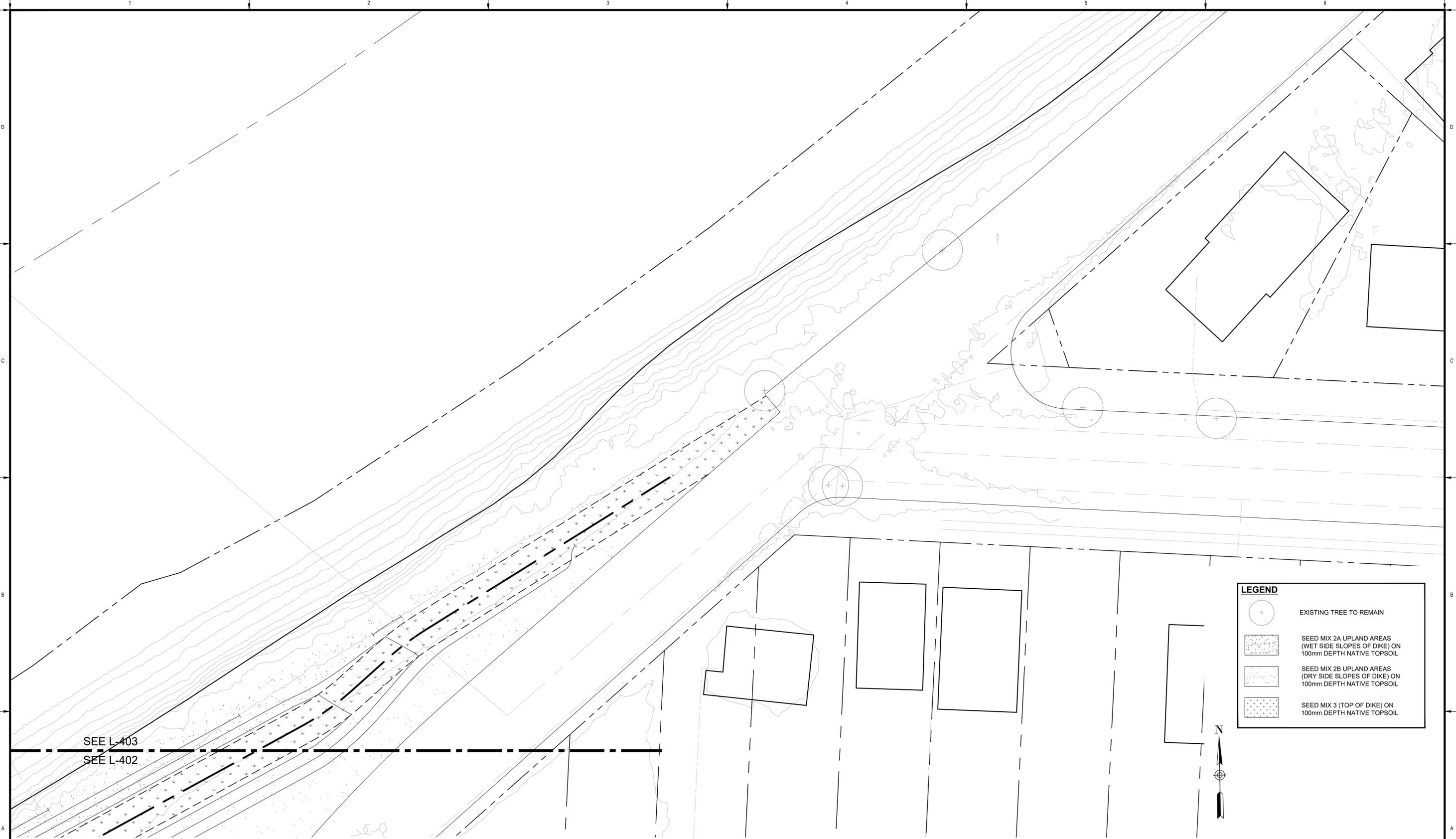


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<b>TOWN OF DRUMHELLER NEWCASTLE DIKE</b>	
<b>SEEDING PLAN</b>	
Project No. <b>133142</b>	Drawing No. <b>L-402</b>
Group <b>LANDSCAPE</b>	Rev. <b>1</b>



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Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER  
 NEWCASTLE DIKE**

**SEEDING PLAN**

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

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SEE L-405  
 SEE L-404

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

Rev	Date	Des	Dwn	Chk	Description

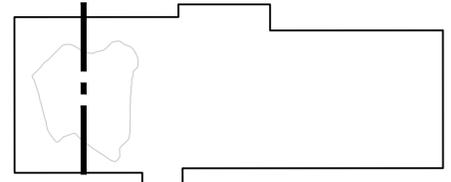
**TOWN OF DRUMHELLER  
 NEWCASTLE DIKE**

**SEEDING PLAN**

Project No. **133142** Drawing No. **L-404** Rev. **1**  
 Group **LANDSCAPE**

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At Full Size, this border measures 320 mm x 800 mm



SEE L-404  
SEE L-405

SEE L-405  
SEE L-406

**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**

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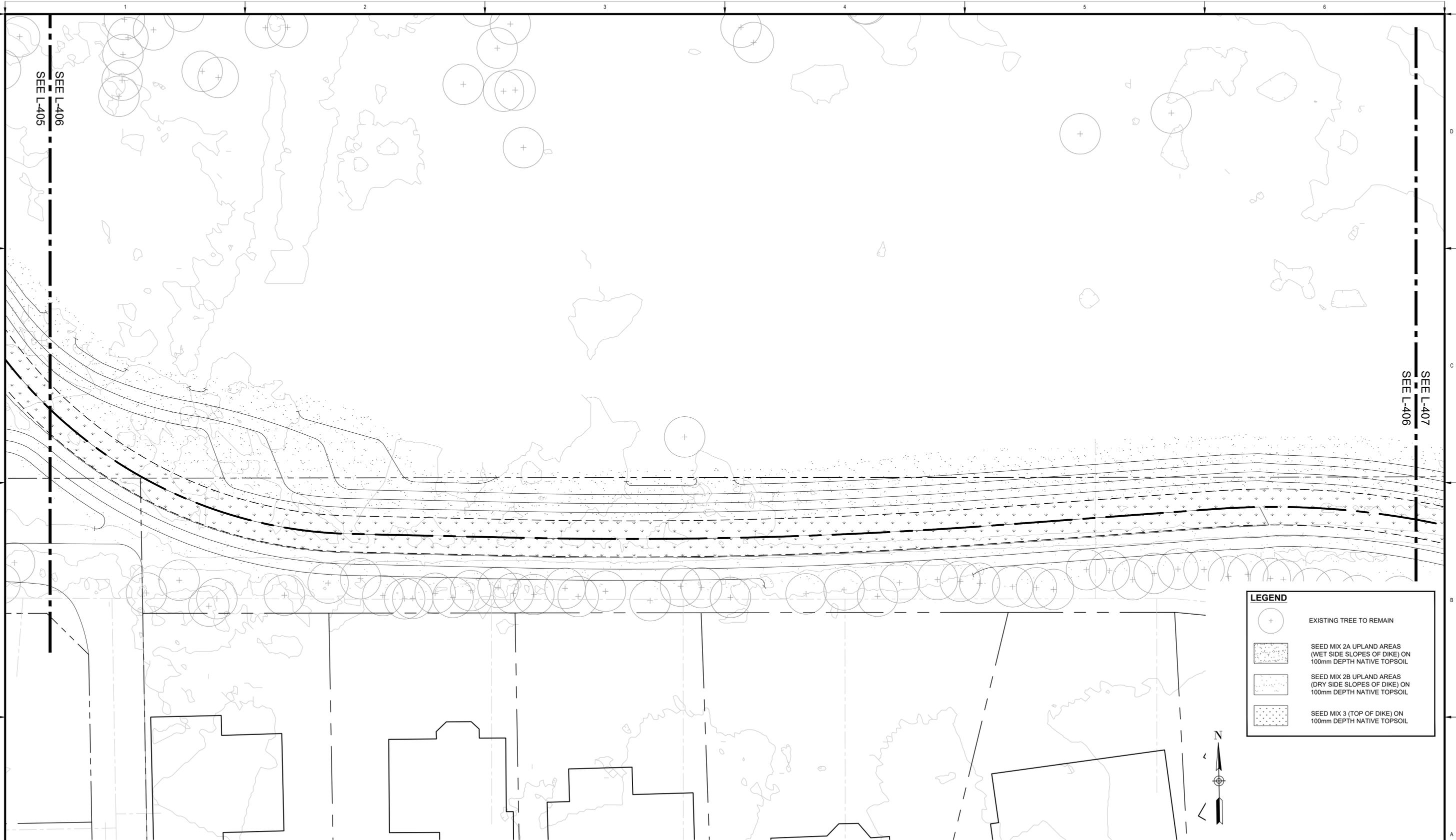
Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**SEEDING PLAN**

Project No. **133142** Drawing No. **L-405** 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**  
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Rev	Date	Des	Dwn	Chk	Description

<b>TOWN OF DRUMHELLER NEWCASTLE DIKE</b>	
<b>SEEDING PLAN</b>	
Project No. <b>133142</b>	Drawing No. <b>L-406</b>
Group <b>LANDSCAPE</b>	Rev. <b>1</b>

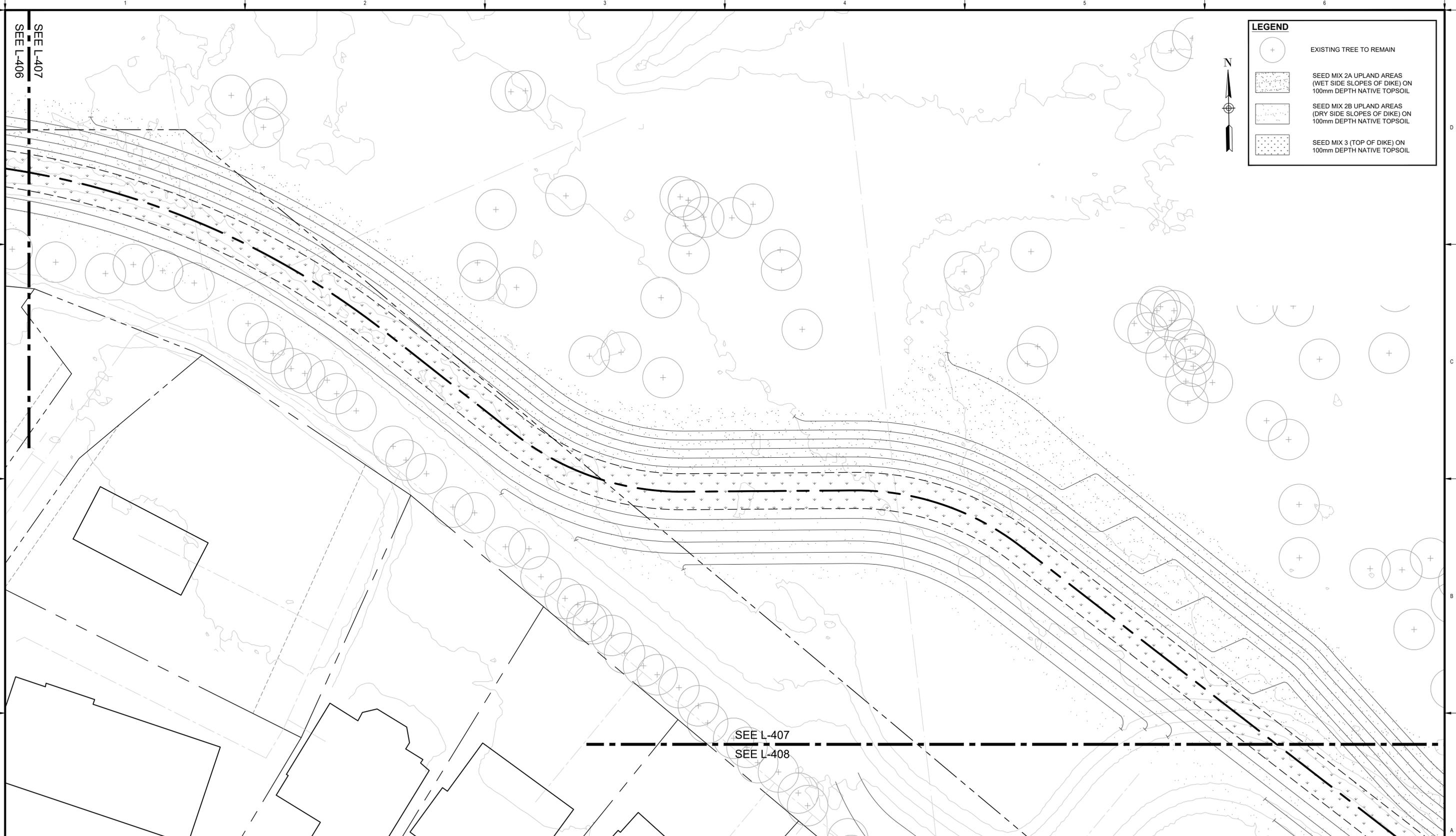
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SEE L-407  
SEE L-406

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Paper Size = ANSI D  
At Full Size, this border measures 520 mm x 850 mm  
millimeters

**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  
NEWCASTLE DIKE**

**SEEDING PLAN**

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

Group **LANDSCAPE**

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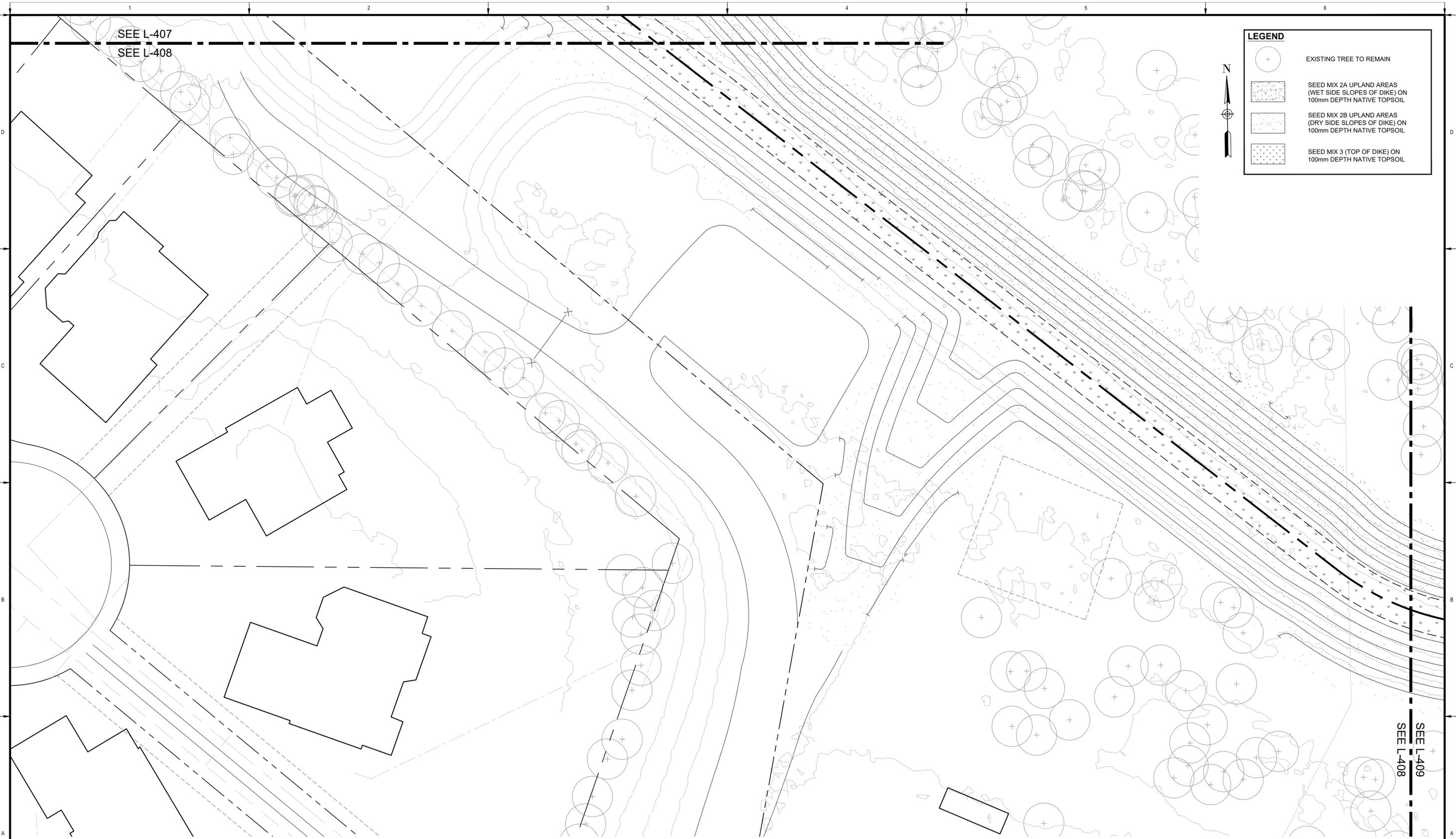
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At Full Size, this border measures 520 mm x 800 mm



SEE L-407  
SEE L-408

**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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**The Alberta Association of Landscape Architects**  
*Ernie J Webster*

Rev	Date	Des	Dwn	Chk	Description
0	2022-06-29	BB	MD	EJW	ISSUED FOR TENDER
1	2022-07-07	BB	MD	EJW	ISSUED FOR ADDENDUM #1

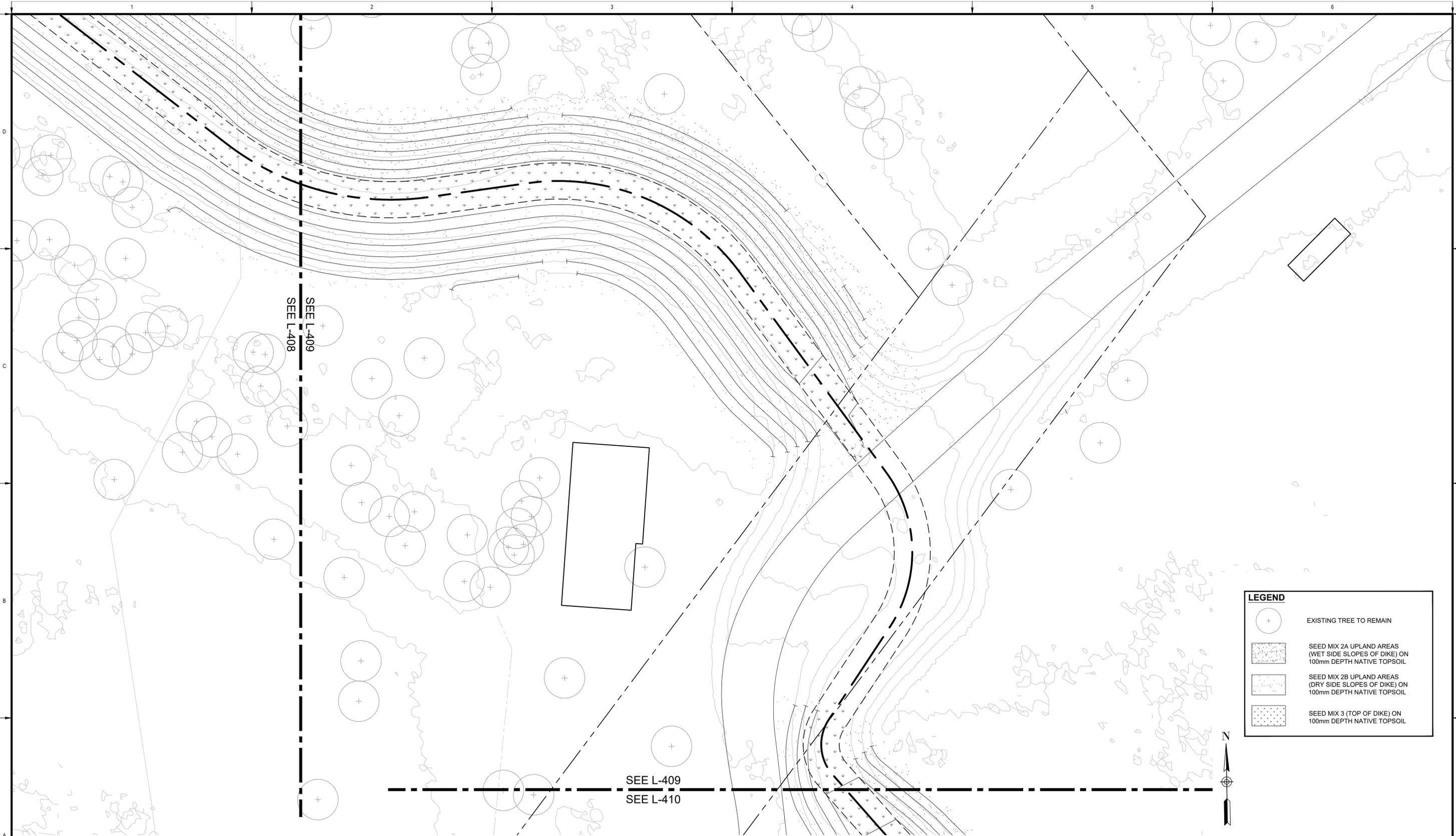
Rev	Date	Des	Dwn	Chk	Description

**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**SEEDING PLAN**

Project No. **133142** Drawing No. **L-408** 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
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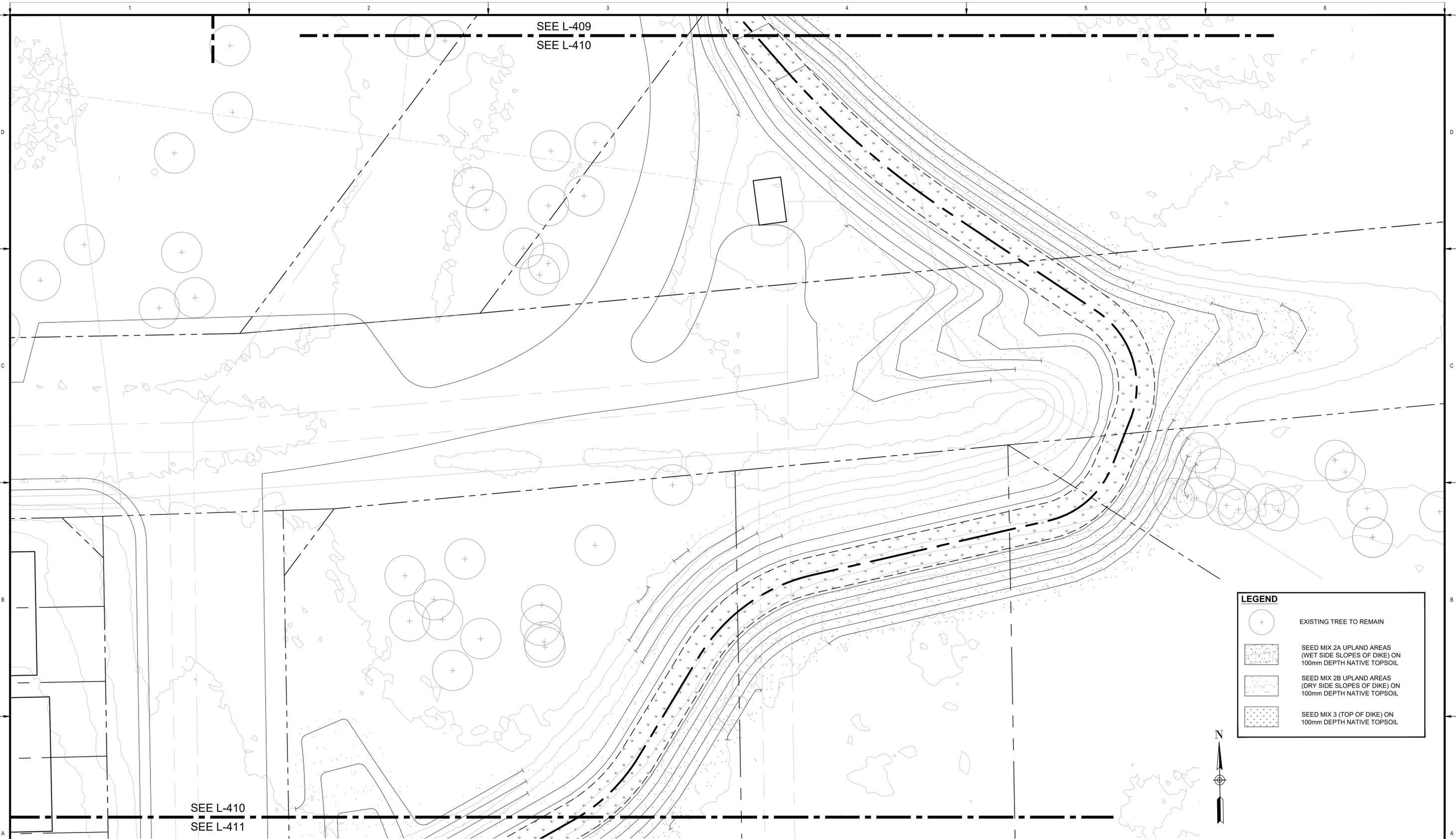
**TOWN OF DRUMHELLER  
 NEWCASTLE DIKE**

**SEEDING PLAN**

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

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At Full Size, this border measures 520 mm x 830 mm



**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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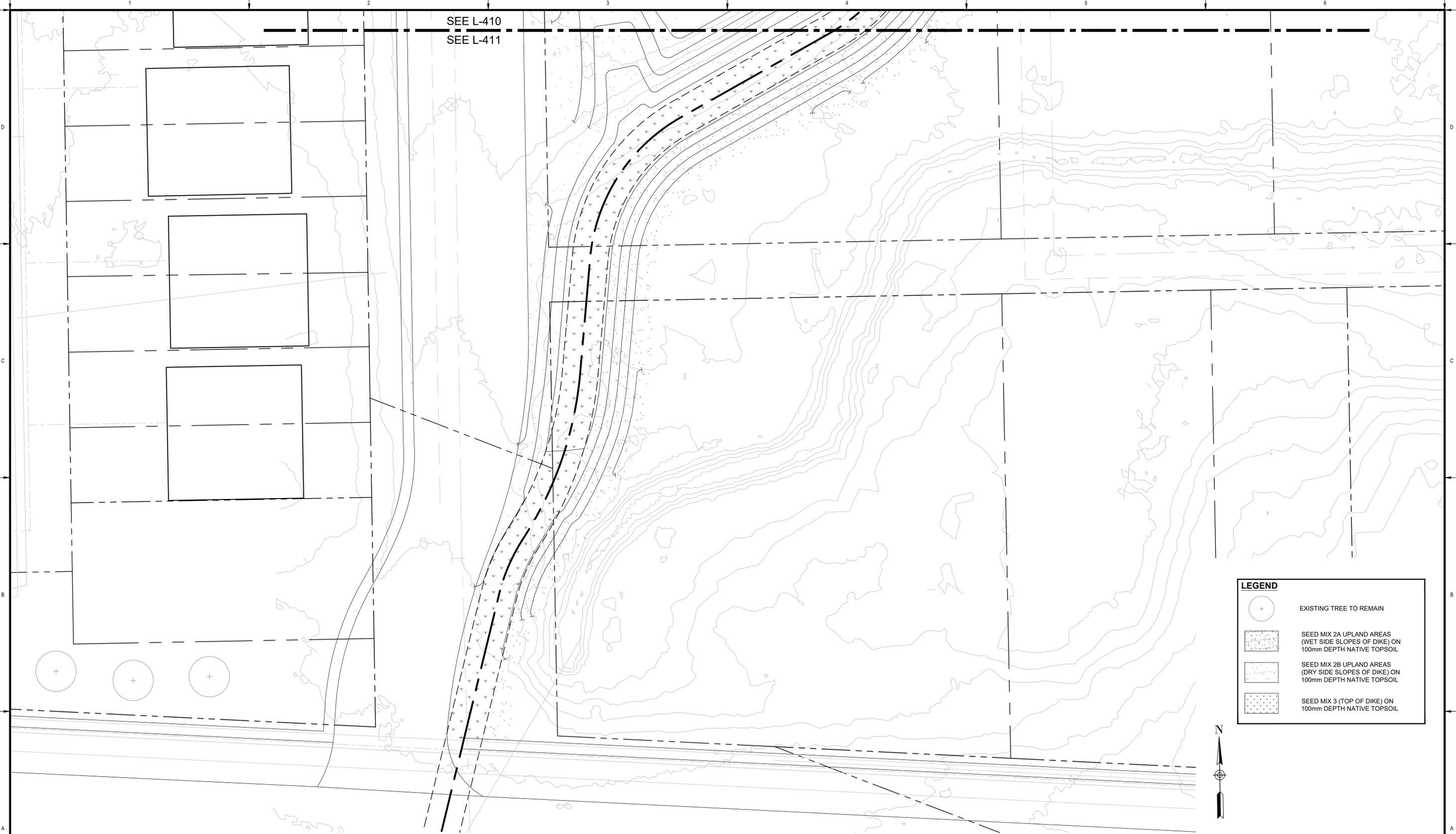
<b>TOWN OF DRUMHELLER NEWCASTLE DIKE</b>	
<b>SEEDING PLAN</b>	
Project No. <b>133142</b>	Drawing No. <b>L-410</b>
Group <b>LANDSCAPE</b>	Rev. <b>1</b>

SAVED: 2022/07/05, 8:38 PM

Paper Size = ANSI D  
 At Full Size, this border measures 520 mm x 800 mm



SEE L-410  
 SEE L-411



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  
 NEWCASTLE DIKE**

**SEEDING PLAN**

Project No. <b>133142</b>	Drawing No.
Group <b>LANDSCAPE</b>	<b>L-411 1</b>

**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)
Deschampsia cespitosa	Tufted Hairgrass	25%	3%	1.97
Pascopyrum smithii / Agropyron smithii	Western Wheatgrass	20%	32%	18.60
Bromus carinatus	Mountain Brome	5%	10%	5.68
Elymus trachycaulus / Agropyron trachycaulum var.	Slender Wheatgrass	10%	11%	6.39
Elymus canadensis	Canada Wildrye	15%	23%	13.34
Spartina pectinata	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)
Elymus lanceolatus / Agropyron dasystachyum	Northern Wheatgrass	15%	16%	9.30
Pascopyrum smithii / Agropyron smithii	Western Wheatgrass	20%	30%	17.36
Elymus trachycaulus / Agropyron trachycaulum var.	Slender Wheatgrass	10%	10%	5.97
Bouteloua gracilis	Blue Grama	10%	2%	0.88
Elymus canadensis	Canada Wildrye	10%	14%	8.30
Nassella viridula / Stipa viridula	Green Needlegrass	25%	27%	15.82
Koeleria macrantha	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)
Elymus lanceolatus / Agropyron dasystachyum	Northern Wheatgrass	23%	46%	22.91
Pascopyrum smithii / Agropyron smithii	Western Wheatgrass	10%	23%	11.16
Bouteloua gracilis	Blue Grama	20%	6%	2.83
Hesperostipa comata / Stipa comata	Needle and Thread	2%	4%	2.13
Poa sandbergii	Sandberg Bluegrass	15%	6%	3.07
Nassella viridula / Stipa viridula	Green Needlegrass	5%	9%	4.24
Koeleria macrantha	Junegrass	23%	4%	2.13
Dalea purpurea	Purple Prairie Clover	2%	2%	1.02

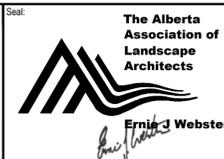
Cover crop for Seed Mix 3 - Top of dike: Annual Ryegrass - application rate of 5 kg / ha.

**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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**TOWN OF DRUMHELLER  
NEWCASTLE DIKE**

**SEEDING NOTES**

Project No. <b>133142</b>	Drawing No. <b>L-412</b>	Rev. <b>1</b>
Group <b>LANDSCAPE</b>		



PROPOSED INSTREAM RIPRAP LOCATION  
 LOOKING UPSTREAM OF THE RED DEER RIVER



EXISTING RIPRAP  
 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**

**NEWCASTLE PROPOSED INSTREAM RIPRAP PROTECTION SITE PHOTOS**

Project No. **A03409A05** Drawing No. **C-105** Rev. **A**

Group **A02**