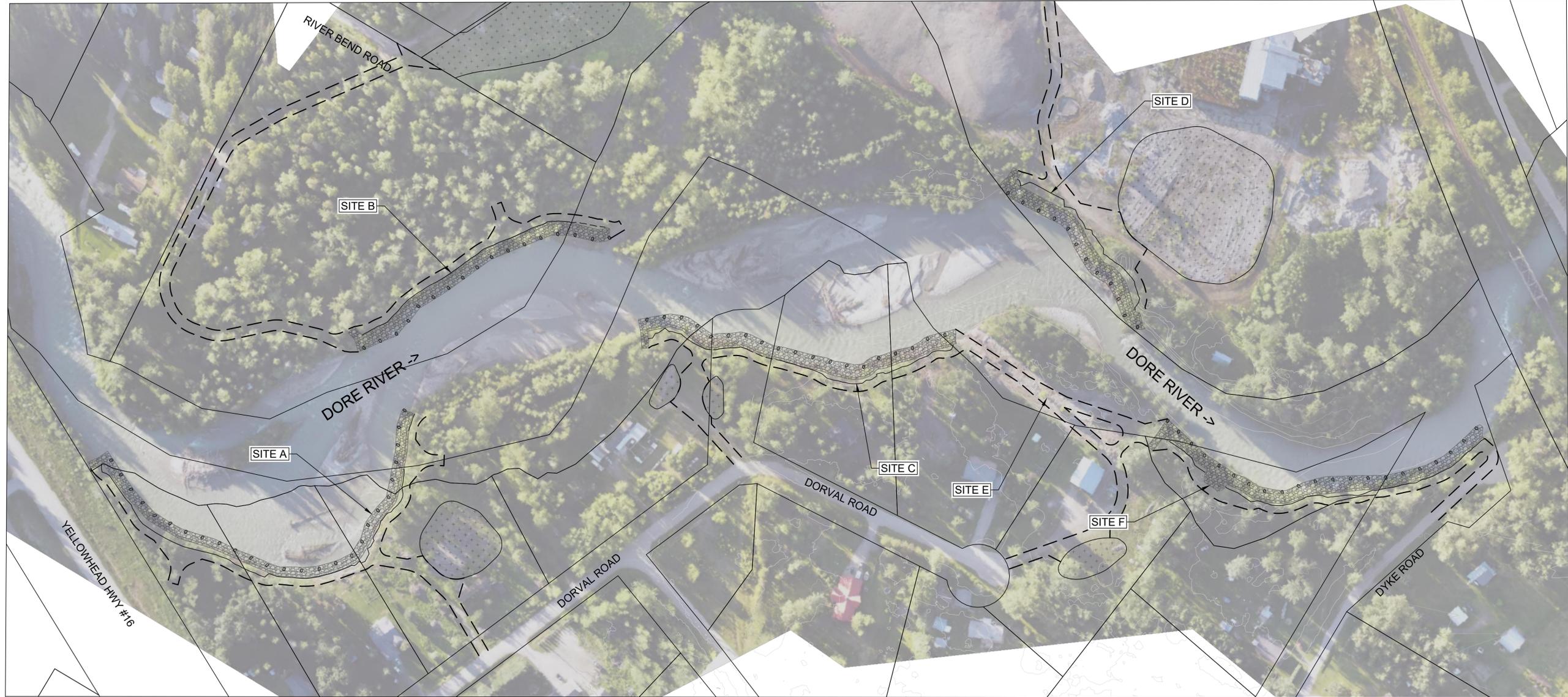


# REGIONAL DISTRICT OF FRASER - FORT GEORGE

## DORE RIVER - BANK EROSION PROTECTION

### CONTRACT # CS-24-02

### MCBRIDE, BC



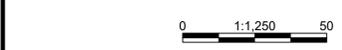
DATE: 2024-03-05 08:14 FILE: X:\2341\Projects\2341-21107-00\RD\DFG - Dore River Phase 2\10.0 Drawings\10.5 Sheets\21107-C-000.dwg

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155 GEORGE STREET, PRINCE GEORGE, BC, V2L 1P8

**DORE RIVER PROPOSED BANK ARMORING  
COVER PAGE**

Drawing No.  
**000**

Project Number  
2341-21107-01

Rev.  
0

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**1. HYDROTECHNICAL DESIGN PARAMETERS**

1.1. Q200 DESIGN FLOW: 186 m<sup>3</sup>/s

**2. GENERAL INSTRUCTIONS TO CONTRACTOR**

- 2.1. THE LOCATION AND SIZE OF EXISTING UTILITIES AND SERVICES, AS SHOWN ON THE DRAWINGS IS APPROXIMATE ONLY. PRIOR TO COMMENCEMENT OF CONSTRUCTION THE CONTRACTOR SHALL EXPOSE AND VERIFY THE EXACT LOCATION AND SIZE OF THESE INSTALLATIONS AND SHALL NOTIFY THE CONTRACT ADMINISTRATOR OF ANY DISCREPANCIES, CONFLICTS OR OMISSIONS.
- 2.2. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING NEAR EXISTING UTILITIES AND SERVICES. ANY DAMAGES SUFFERED BY THESE UTILITIES WHICH MAY BE ATTRIBUTED TO THE CONTRACTORS OPERATIONS, SHALL BE REPAIRED BY THE CONTRACTOR AT THEIR EXPENSE AND TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
- 2.3. WHEN WORKING ON EXISTING PAVEMENT WHICH WILL BE RETAINED FOR FUTURE USE, THE CONTRACTOR SHALL EXERCISE CARE NOT TO CAUSE ANY DAMAGE. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE RETURNED TO EQUIVALENT CONDITION TO THAT EXISTING PREVIOUS AT THEIR EXPENSE AND TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
- 2.4. THE CONTRACTOR SHALL USE ONLY NEW AND APPROVED MATERIALS AND SHALL NOT SUBSTITUTE ANY MATERIALS WITHOUT THE PRIOR WRITTEN APPROVAL OF THE CONTRACT ADMINISTRATOR.
- 2.5. ALL SURVEY MONUMENTS, PROPERTY PINS, AND PROJECT PRIMARY SURVEY CONTROL PINS, SHALL BE PROTECTED DURING ALL STAGES OF CONSTRUCTION. ANY DAMAGE SUFFERED BY THE MONUMENTS OR PINS SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
- 2.6. EXISTING PARKING AREAS, ON-SITE AND OFF-SITE ROADS MUST BE KEPT CLEAN. STREET, ROAD AND PARKING AREA CLEANING SHALL BE DONE BY THE CONTRACTOR AT HIS EXPENSE.
- 2.7. DISTURBANCE TO EXISTING LANDSCAPING OR SURFACE IMPROVEMENT, ATTRIBUTABLE TO THE CONTRACTOR'S OPERATION SHALL BE CORRECTED BY THE CONTRACTOR AT HIS EXPENSE. SUCH REPAIR SHALL BE CARRIED OUT TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
- 2.8. THE CONTRACTOR SHALL NOT ENTER UPON ADJACENT PROPERTIES DURING THE COURSE OF CONSTRUCTION WITHOUT THE PRIOR APPROVAL OF THE PROPERTY OWNER. IF THE CONTRACTOR DOES CAUSE DAMAGE TO ADJOINING PROPERTY THEY SHALL IMMEDIATELY REPAIR IT TO THE SATISFACTION OF THE OWNER. THEY SHALL OBTAIN A LETTER OF CLEARANCE FROM THE OWNER AND SUBMIT IT TO THE CONSULTANT. SUBSTANTIAL COMPLETION SHALL NOT BE GRANTED UNTIL ALL SUCH LETTERS HAVE BEEN RECEIVED BY THE CONSULTANT.

THE OWNER HAS SECURED CONSENT FROM ALL LAND OWNERS ON WHICH WORKS ARE PLANNED FOR CONTRACTOR ACCESS AND MATERIAL LAYDOWN. REFER TO SHEET 102 FOR DETAILS. IF ADDITIONAL AREAS OF PRIVATE LAND ARE REQUIRED TO BE DISTURBED DURING CONSTRUCTION THE CONTRACTOR SHALL COORDINATE WITH THE LAND OWNERS AS REQUIRED AND INFORM THE CONSULTANT OF ALL CHANGES.

- 2.9. CONSTRUCTION AND EXCAVATION WASTES, OVERBURDEN, SOIL, OR OTHER SUBSTANCES DELETERIOUS TO THE AQUATIC LIFE SHALL BE DISPOSED OF OR PLACED IN SUCH A MANNER SO AS TO PREVENT THEIR ENTRY INTO ANY WATERCOURSE, RAVINE OR STORM SEWER SYSTEM.

**3. SURVEY**

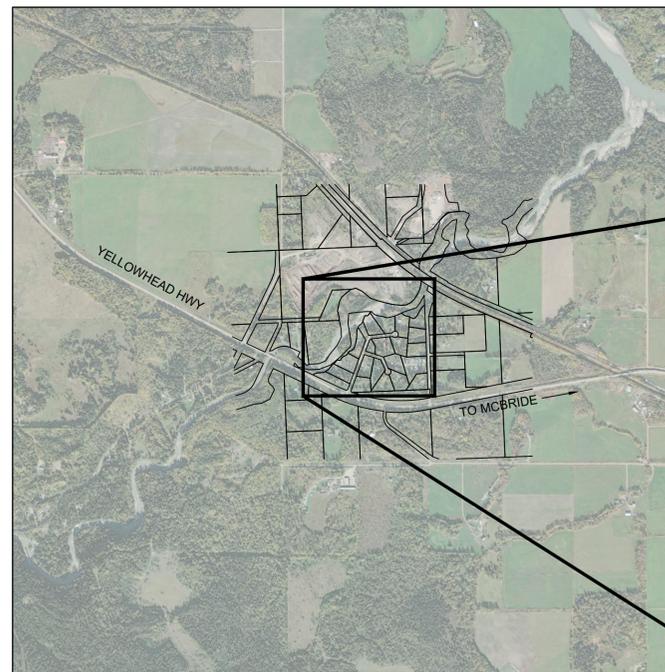
- 3.1. GEODETIC INFORMATION IS IN UTM ZONE 10 CVD2013.
- 3.2. CONSTRUCTION LAYOUT SURVEY IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE CONSIDERED INCIDENTAL TO THE WORK. WORKPOINTS AND DIGITAL LAYOUT FILES WILL BE PROVIDED ON ISSUED FOR CONSTRUCTION DRAWINGS.
- 3.3. SURVEY CONTROL BENCHMARKS WILL BE PROVIDED BY THE CONSULTANT FOR THE CONTRACTOR'S USE.

**DRAWING INDEX**

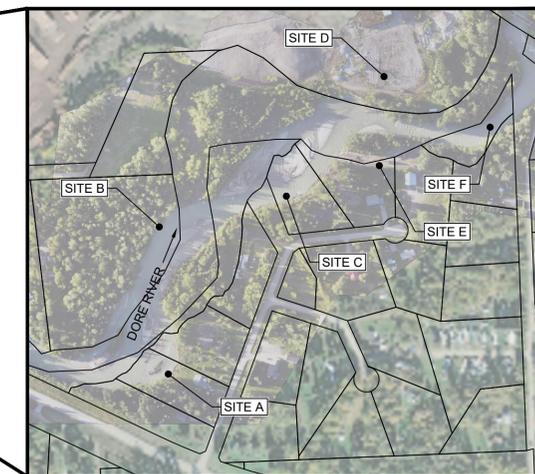
22107-C-001	GENERAL NOTES
22107-C-102	OVERALL SITE PLAN
22107-C-201	SITE A PLAN AND PROFILE
22107-C-202	SITE B PLAN AND PROFILE
22107-C-203	SITE B PLAN AND PROFILE
22107-C-204	SITE C PLAN AND PROFILE
22107-C-205	SITE D PLAN AND PROFILE
22107-C-206	SITE F PLAN AND PROFILE
22107-C-207	SITE F PLAN AND PROFILE
22107-C-301	TYPICAL CROSS SECTION
22107-C-400	PROPOSED RIPARIAN RESTORATION
22107-C-401	RESTORATION DETAILS
22107-C-1001	CROSS SECTIONS SITE A
22107-C-1002	CROSS SECTIONS SITE B
22107-C-1003	CROSS SECTIONS SITE C
22107-C-1004	CROSS SECTIONS SITE D
22107-C-1005	CROSS SECTIONS SITE F

**LEGEND**

EXISTING TOP OF BANK	—————
EXISTING BOTTOM OF BANK	- - - - -
PROPOSED TOP OF RIPRAP BANK	—————
PROPOSED BOTTOM OF RIPRAP BANK	- - - - -
PROPOSED RIPRAP	
PROPOSED ACCESS ROAD	—————
PROPOSED LAYDOWNS	
PROPOSED 1m CONTOURS	————— 720.0
EXISTING 1m CONTOURS	————— 720.0
EXISTING PROPERTY LINE	—————



**A LOCATION PLAN**  
SCALE 1:20,000



**B SITE PLAN**  
SCALE 1:5,000

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AS NOTED:

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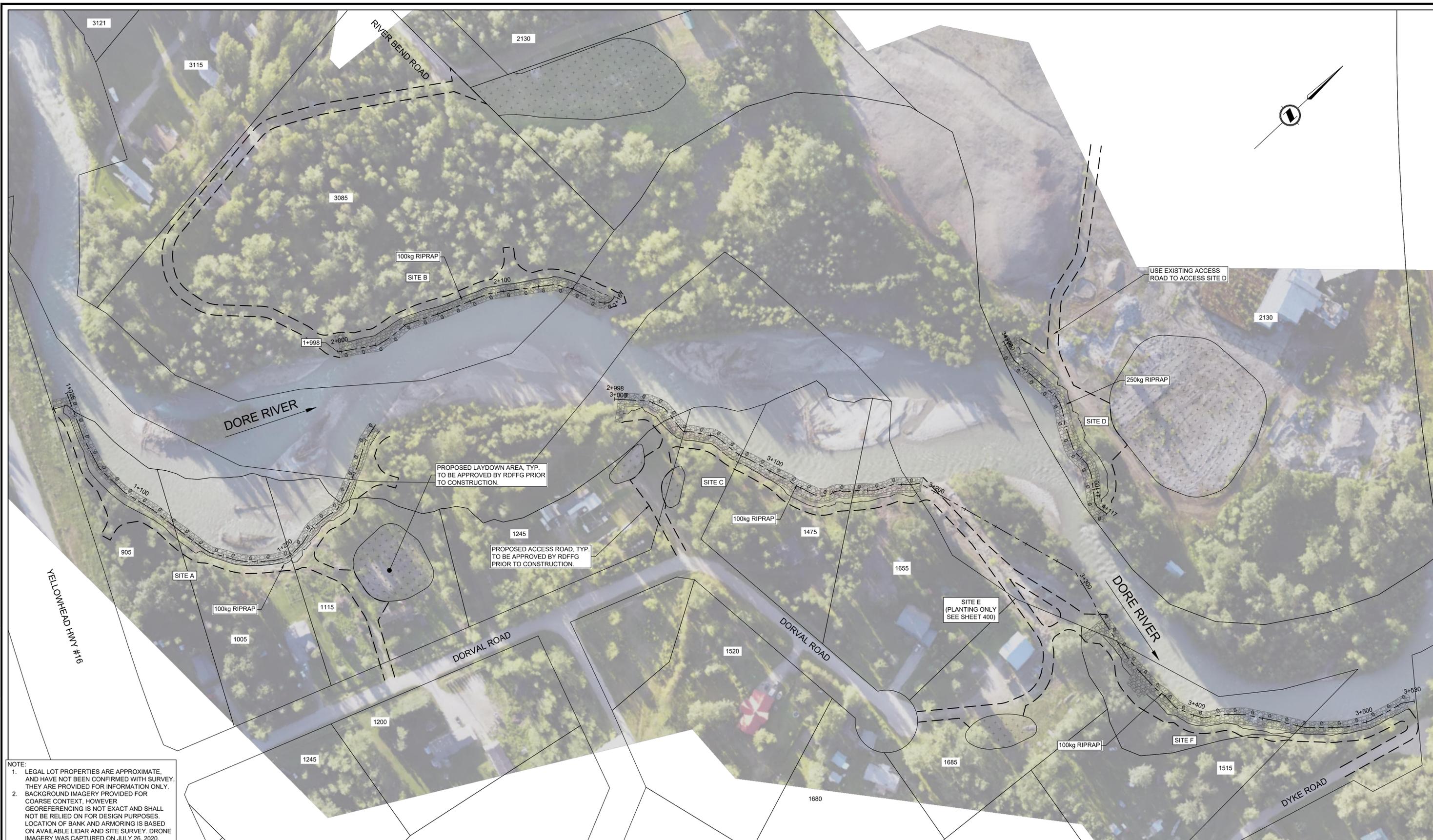
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**DORE RIVER PROPOSED BANK ARMORING NOTES**

Drawing No.	001
Project Number	2341-21107-01
Rev.	0

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**NOTE:**  
 1. LEGAL LOT PROPERTIES ARE APPROXIMATE, AND HAVE NOT BEEN CONFIRMED WITH SURVEY. THEY ARE PROVIDED FOR INFORMATION ONLY.  
 2. BACKGROUND IMAGERY PROVIDED FOR COARSE CONTEXT, HOWEVER GEOREFERENCING IS NOT EXACT AND SHALL NOT BE RELIED ON FOR DESIGN PURPOSES. LOCATION OF BANK AND ARMORING IS BASED ON AVAILABLE LIDAR AND SITE SURVEY. DRONE IMAGERY WAS CAPTURED ON JULY 26, 2020.

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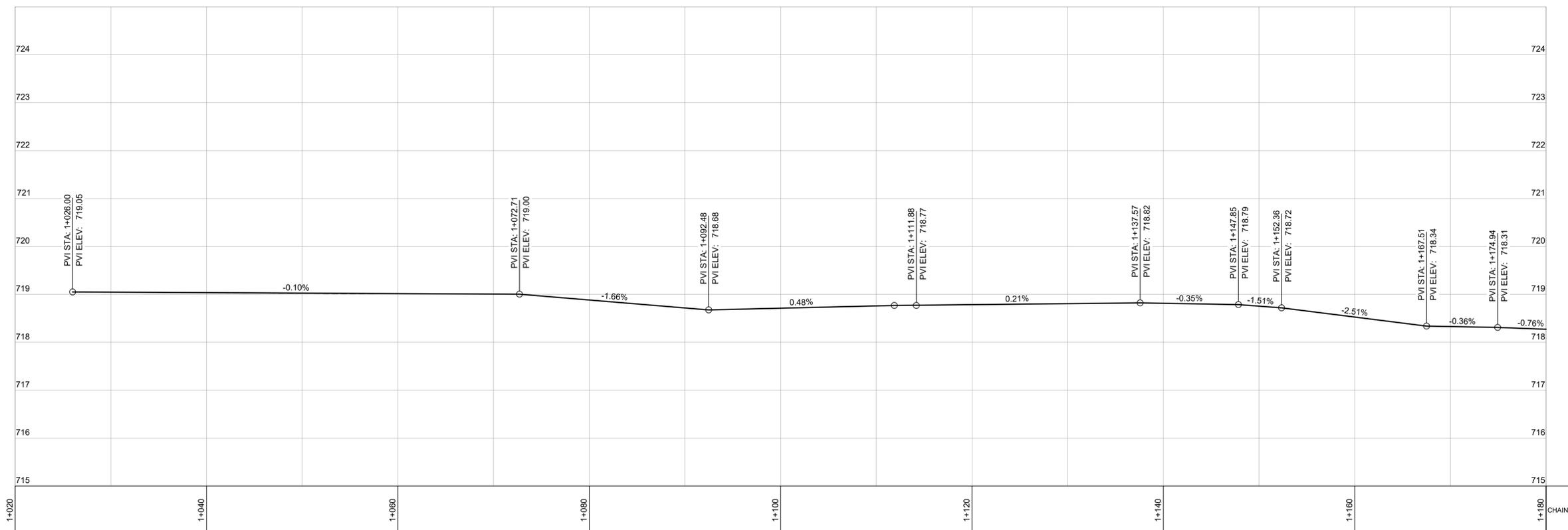
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**DORE RIVER PROPOSED BANK ARMORING  
 OVERALL SITE PLAN**

Project Number	2341-21107-01
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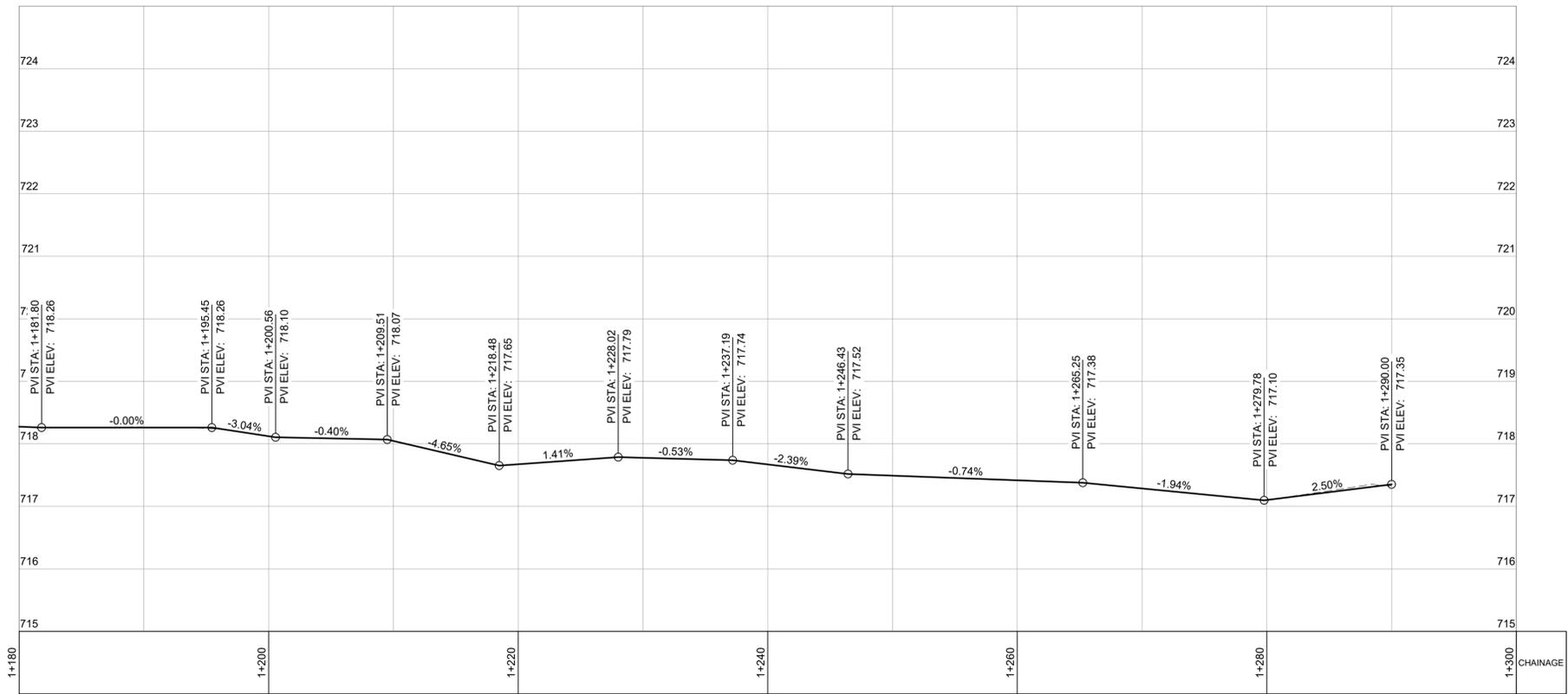
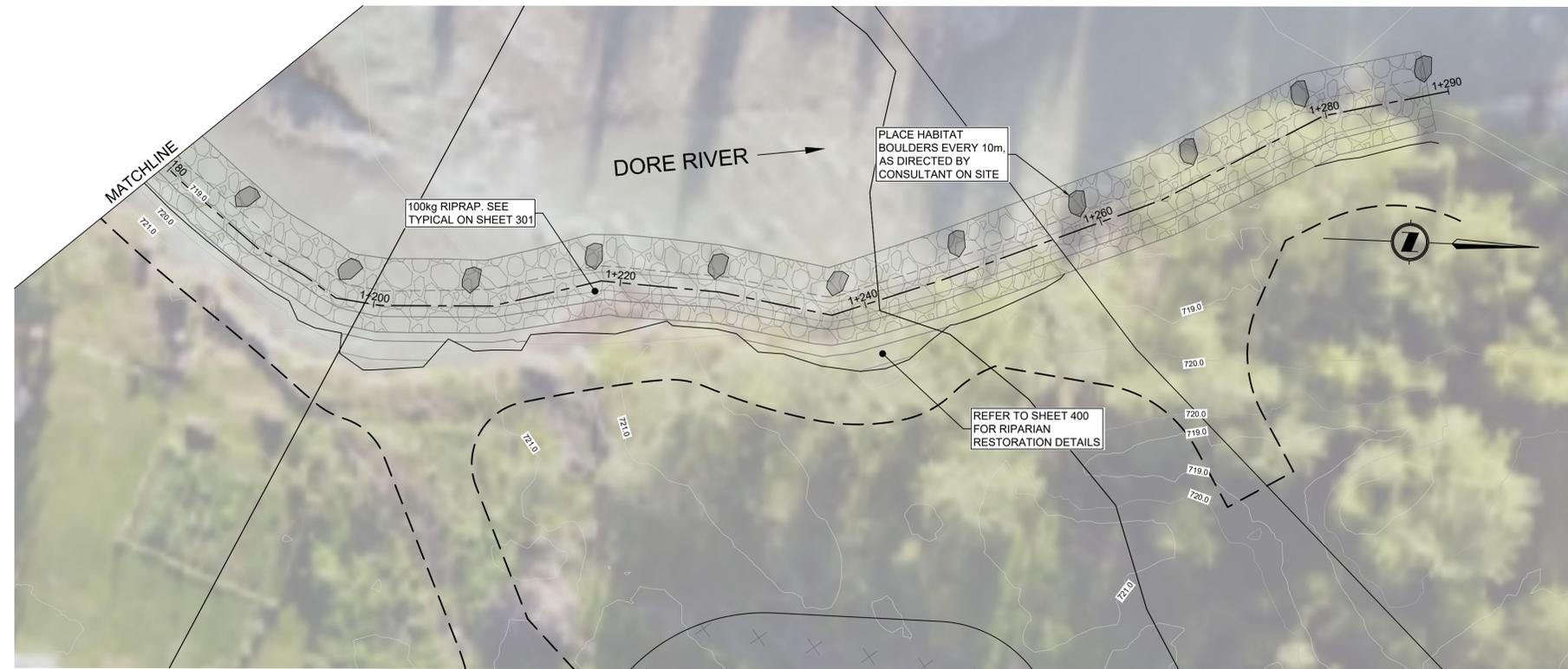
**DORE RIVER PROPOSED BANK ARMORING  
SITE A PLAN AND PROFILE**

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Drawing No. **201**

Project Number 2341-21107-01

Rev. 0

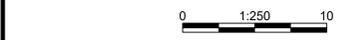


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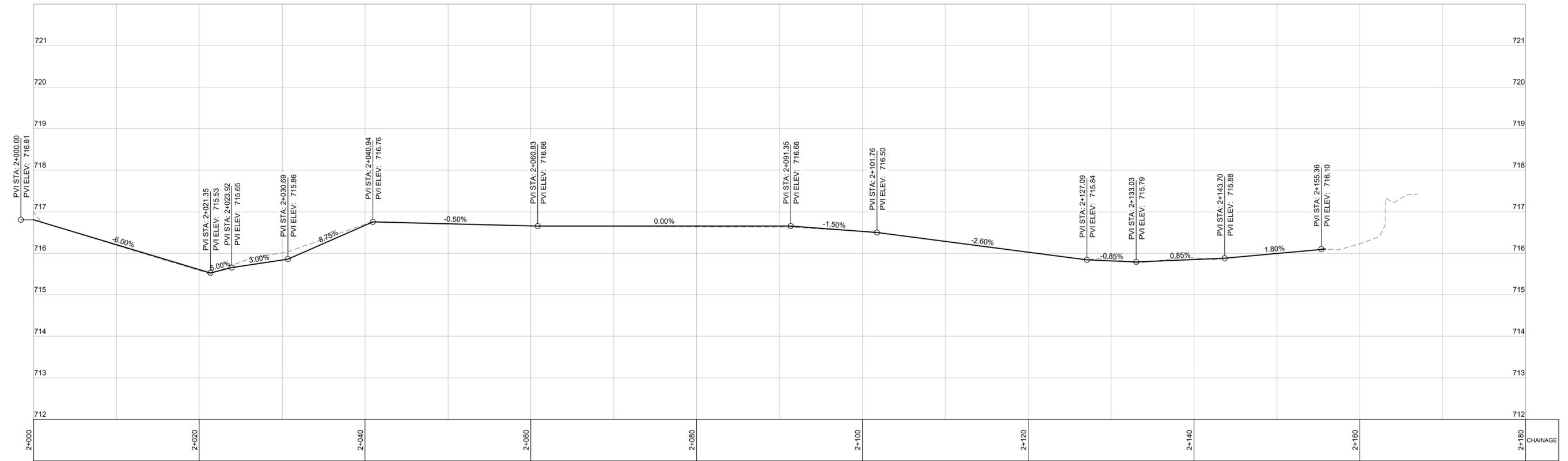
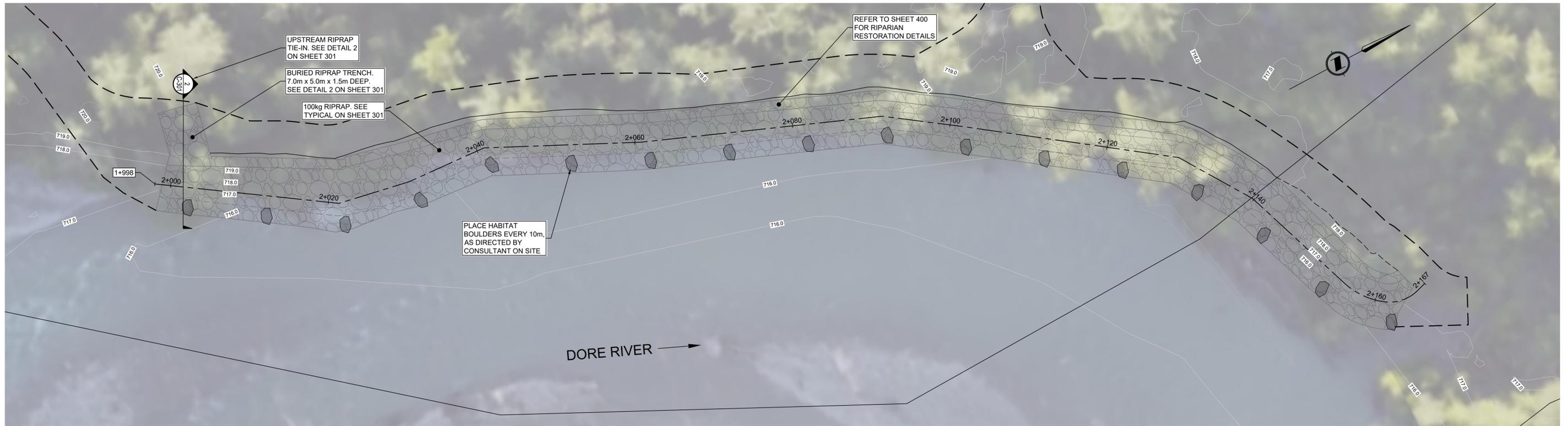
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**DORE RIVER PROPOSED BANK ARMORING  
SITE A PLAN AND PROFILE**

Drawing No.	202
Project Number	2341-21107-01
Rev.	0

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ORIGINAL DWG SIZE: ANSI D (22" x 34")

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**REGIONAL DISTRICT OF FRASER - FORT GEORGE**  
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**DORE RIVER PROPOSED BANK ARMORING  
SITE B PLAN AND PROFILE**

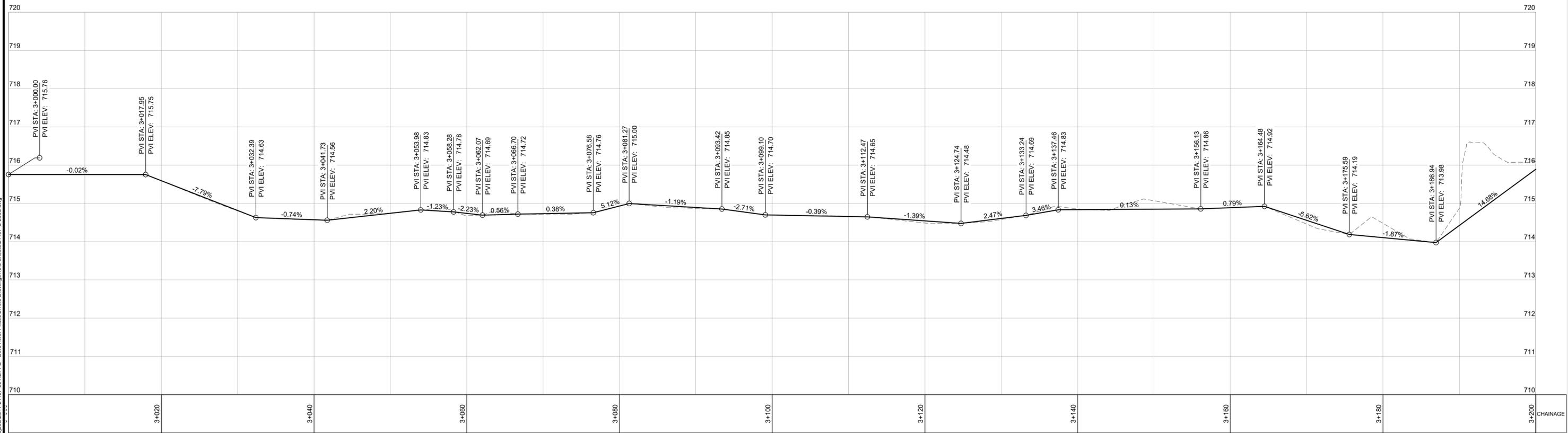
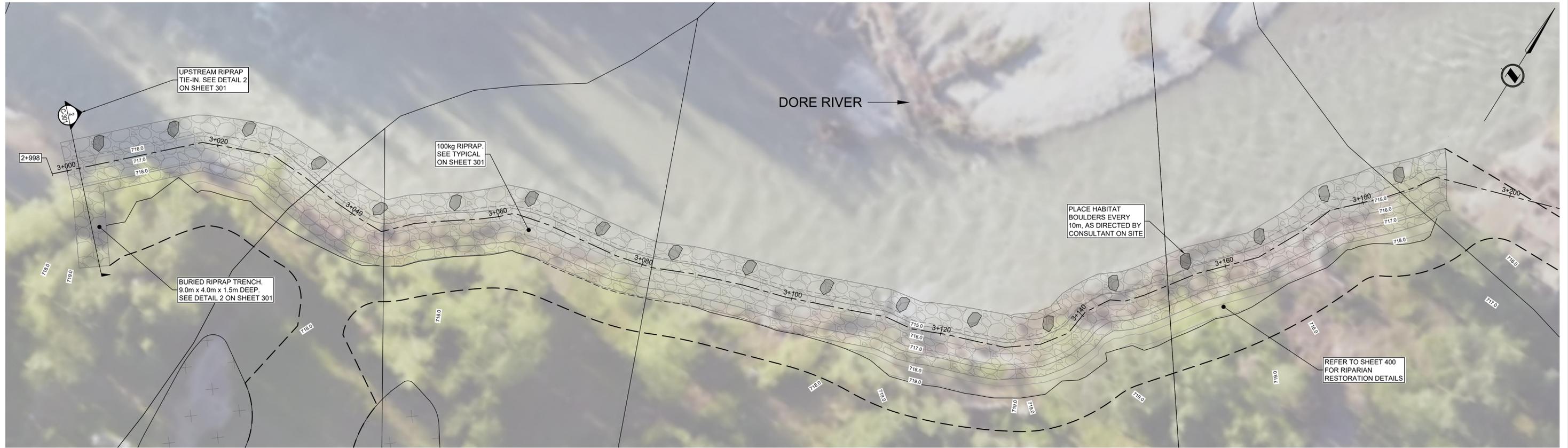
Drawing No. **203**

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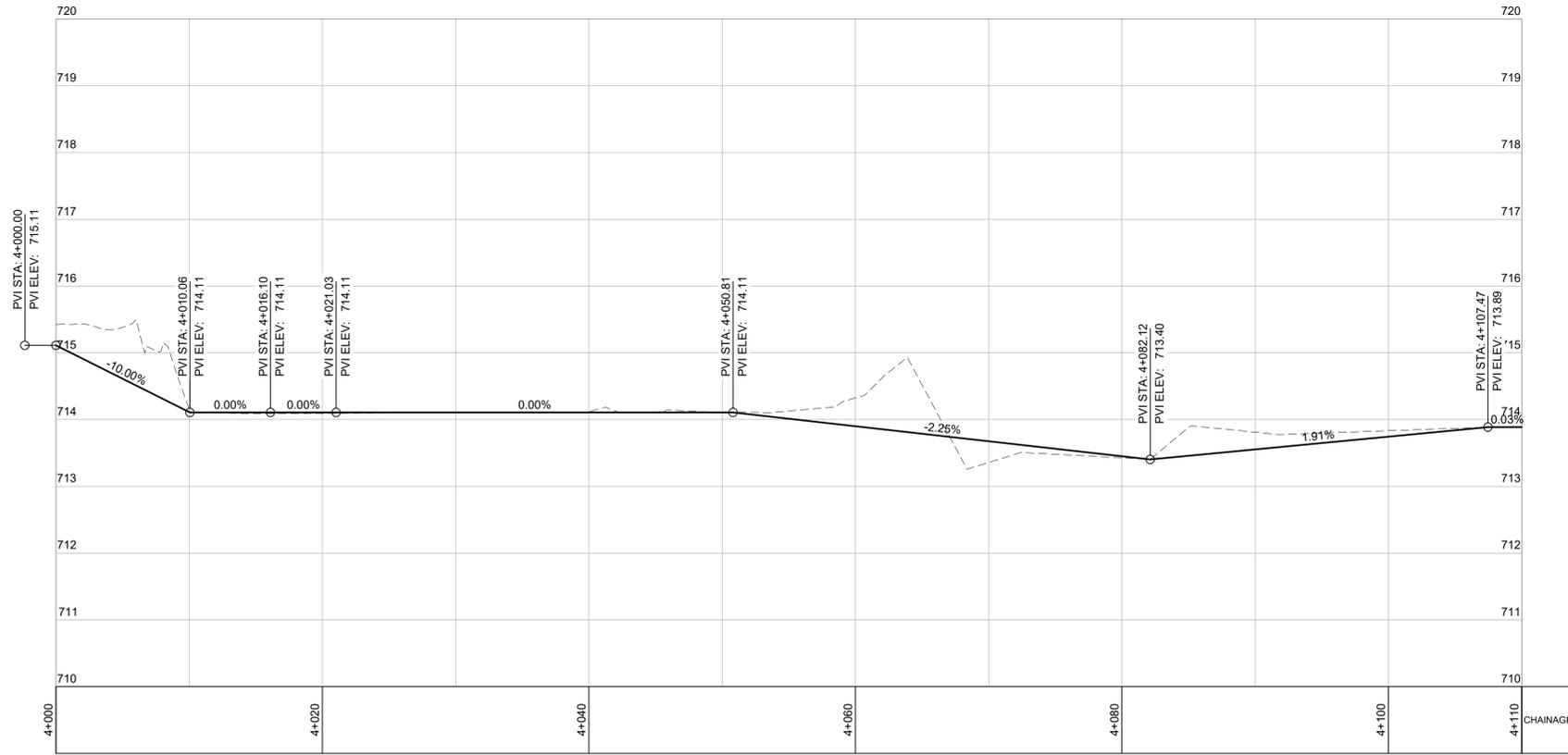
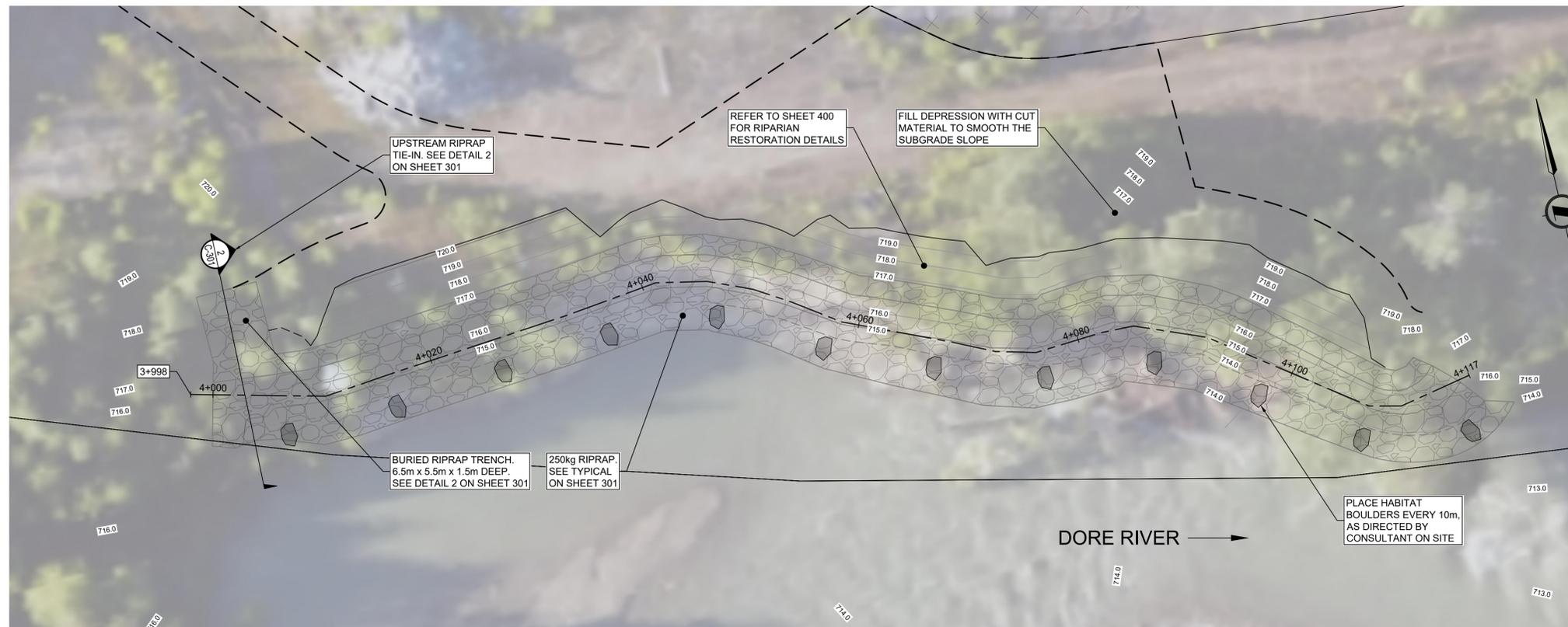
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**DORE RIVER PROPOSED BANK ARMORING  
SITE C PLAN AND PROFILE**

Drawing No. **204**

Project Number 2341-21107-01 Rev. 0

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ORIGINAL DWG SIZE: ANS I D (22" x 34")

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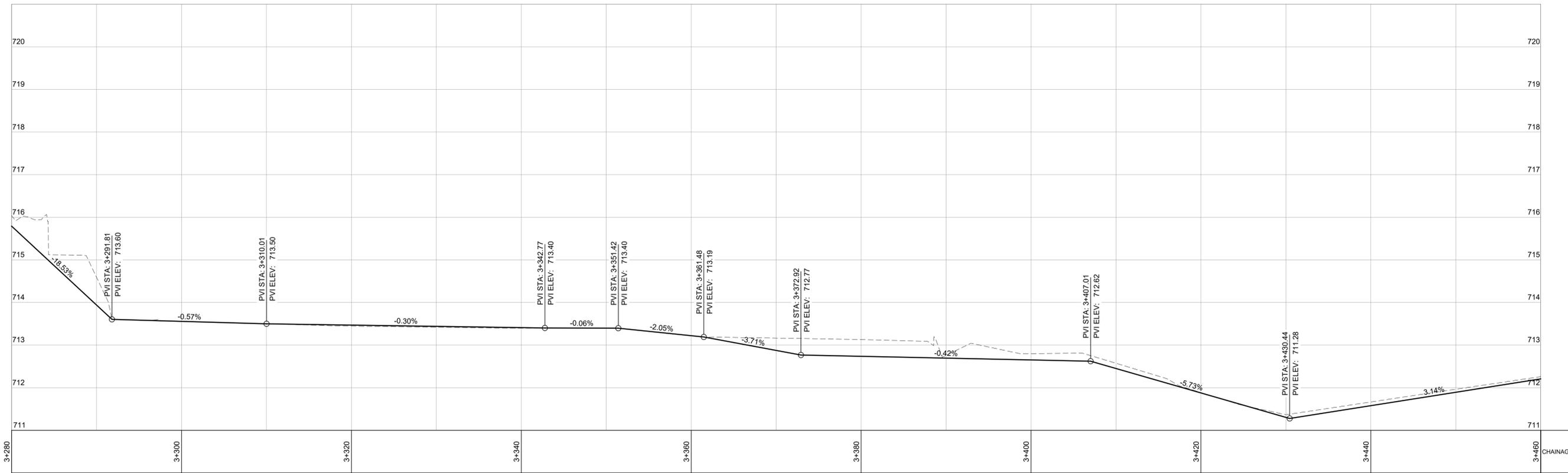
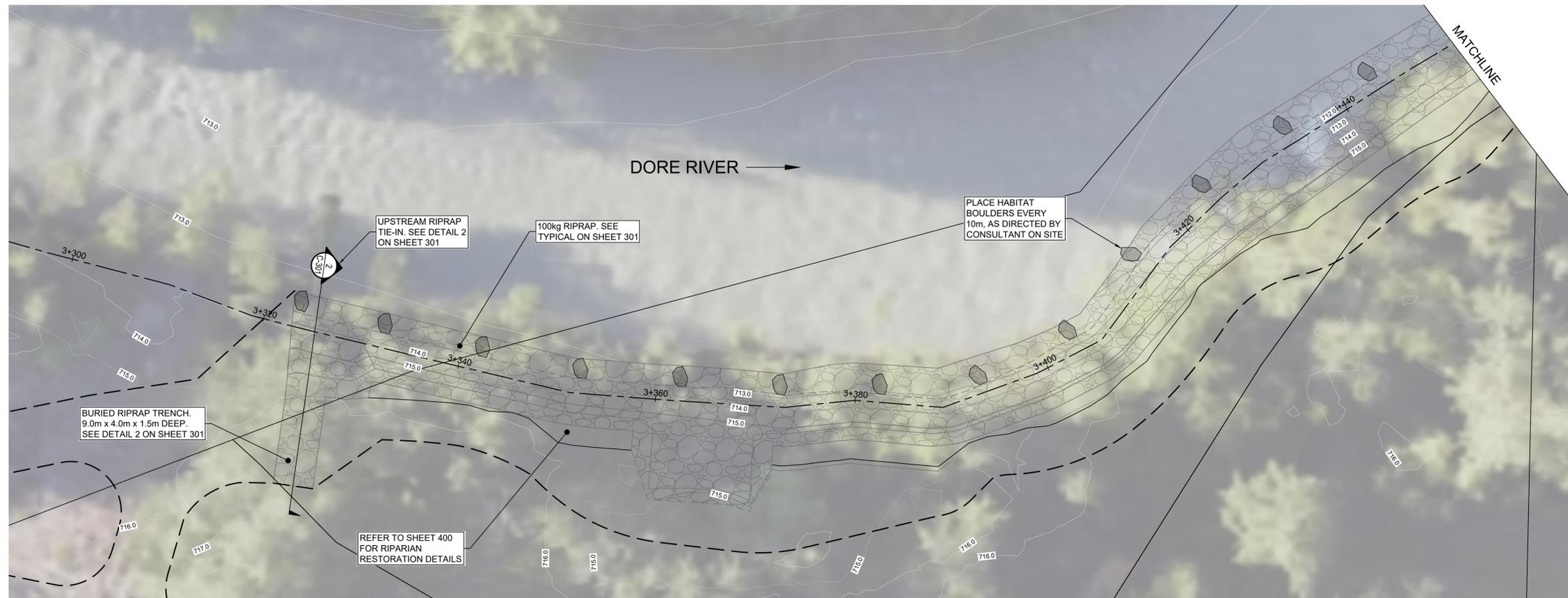
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**DORE RIVER PROPOSED BANK ARMORING**  
**SITE D PLAN AND PROFILE**

Drawing No. **205**

Project Number 2341-21107-01

Rev. 0



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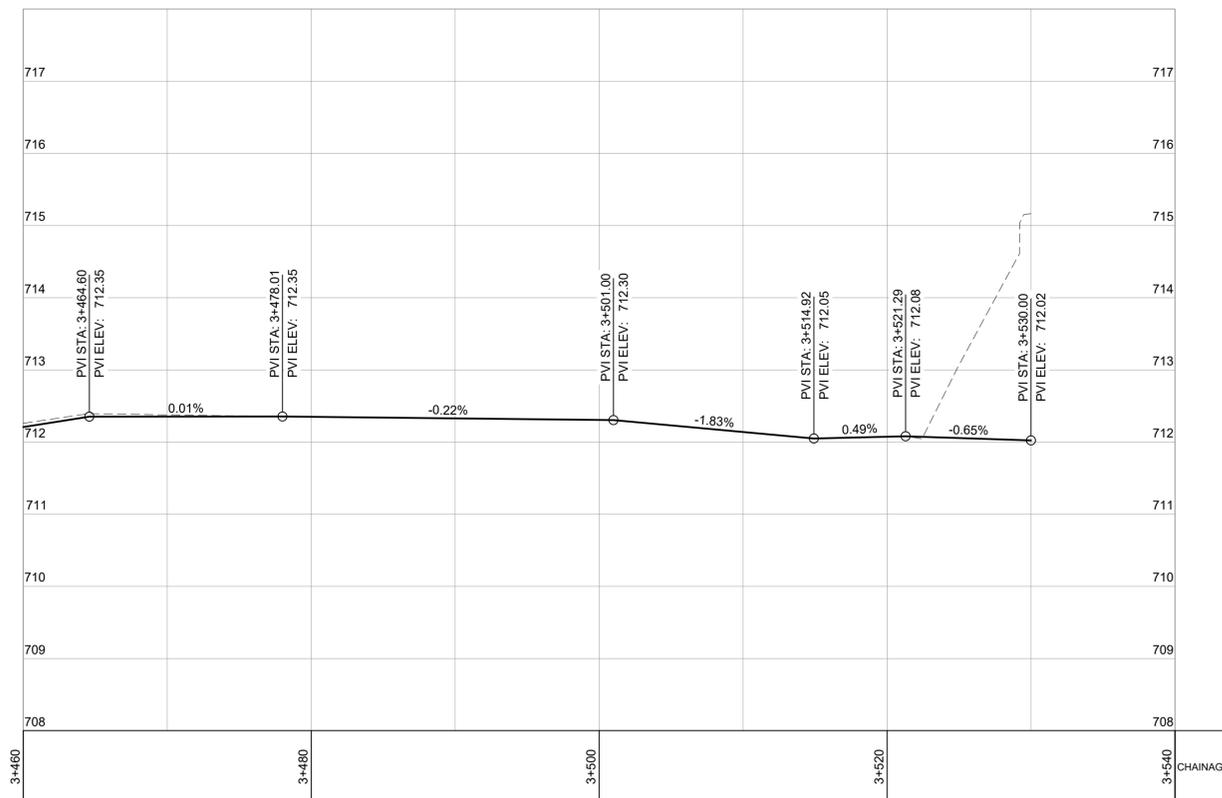
**DORE RIVER PROPOSED BANK ARMORING  
SITE F PLAN AND PROFILE**

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Drawing No. **206**

Project Number 2341-21107-01

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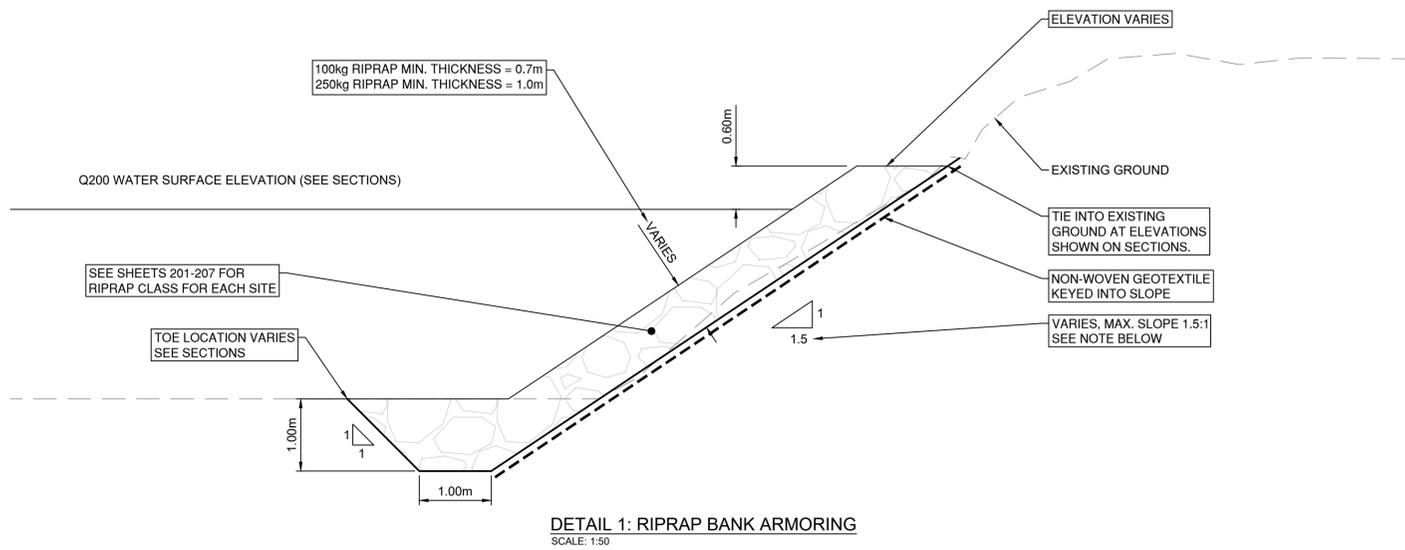
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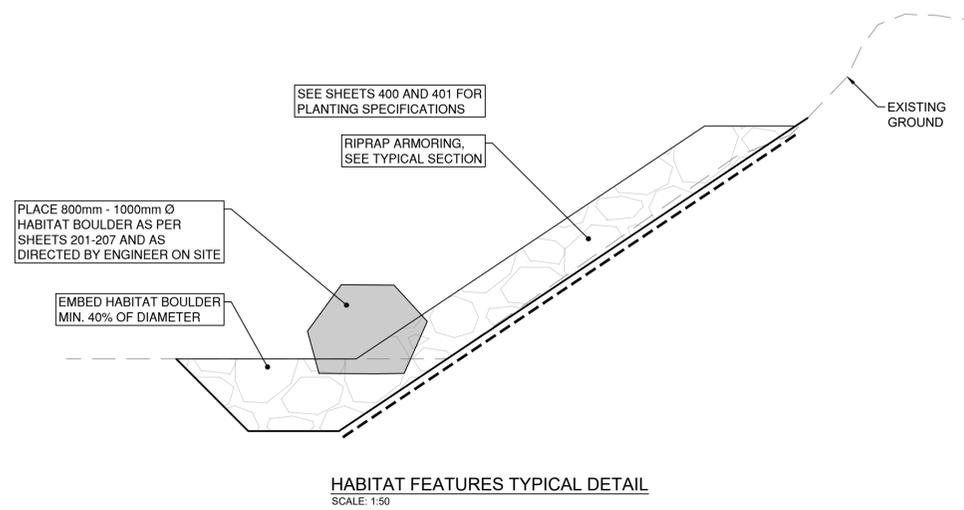
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**DORE RIVER PROPOSED BANK ARMORING  
SITE F PLAN AND PROFILE**

Drawing No.	207
Project Number	2341-21107-01
Rev.	0



**DETAIL 1: RIPRAP BANK ARMORING**  
SCALE: 1:50



**HABITAT FEATURES TYPICAL DETAIL**  
SCALE: 1:50

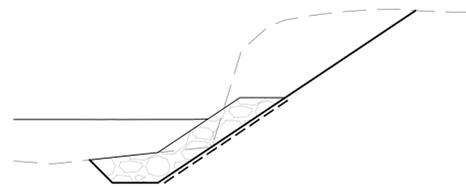
**NOTES ON PREPARATION OF RIVERBANK:**

IN ORDER TO AVOID SLIVER FILLS AND TO MINIMIZE EXCAVATION AND RIPRAP VOLUMES, THE FOLLOWING METHODS MAY BE USED, AS APPROVED BY THE CONTRACT ADMINISTRATOR:

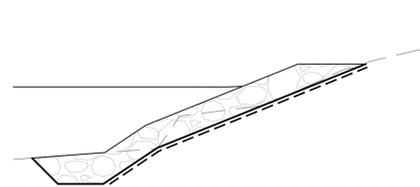
METHOD 1: WHERE BANK IS OVER STEEPENED, EXCAVATE THE BANK TO ACHIEVE 1.5H:1V SUBGRADE SLOPE FOR UNIFORM PLACEMENT OF RIPRAP. SEE METHOD 1 TYPICAL.

METHOD 2: IF EXISTING BANK HAS A SLOPE SHALLOWER THAN 1.5H:1V, SMOOTH EXISTING BANK TO PREPARE SUBGRADE FOR UNIFORM PLACEMENT OF RIPRAP.

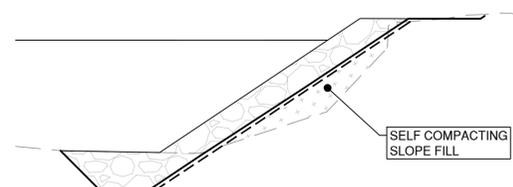
METHOD 3: IF EXISTING BANK UNDULATES AND COULD BENEFIT FROM FILL TO MINIMIZE EXCAVATION AND RIPRAP VOLUMES, CONTRACTOR IS TO PLACE IMPORTED SELF-COMPACTING SLOPE FILL TO PREPARE SUBGRADE FOR UNIFORM PLACEMENT OF RIPRAP.



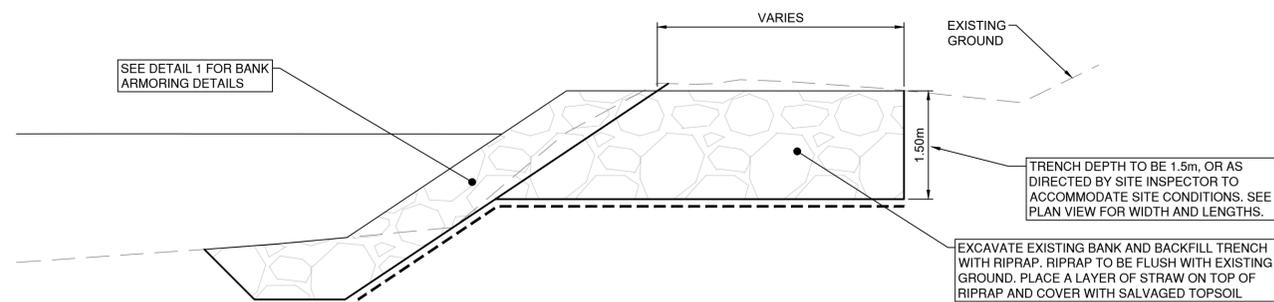
**METHOD 1 TYPICAL SECTION**  
SCALE: 1:100



**METHOD 2 TYPICAL SECTION**  
SCALE: 1:100



**METHOD 3 TYPICAL SECTION**  
SCALE: 1:100



**DETAIL 2 - BURIED TRENCH FOR UPSTREAM RIPRAP TIE IN (ALL SITES)**  
SCALE: 1:50

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AS NOTED:

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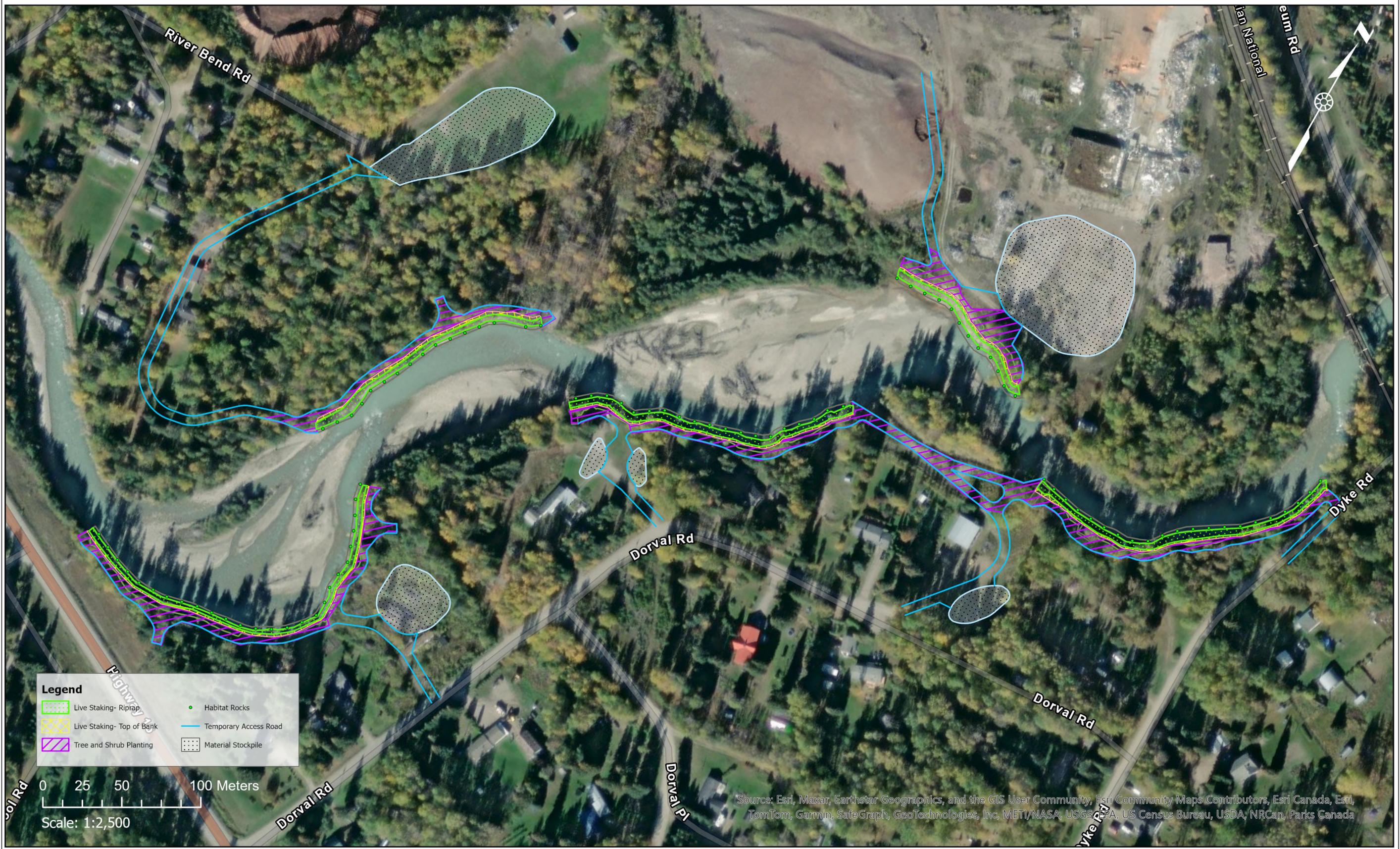
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**DORE RIVER PROPOSED BANK ARMORING  
TYPICAL CROSS SECTION**

Approved Sealed

Drawing No. **301**

Project Number 2341-21107-01  
Rev. 0



**Legend**

- Live Staking- Riprap
- Live Staking- Top of Bank
- Tree and Shrub Planting
- Habitat Rocks
- Temporary Access Road
- Material Stockpile



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Esri Community Maps Contributors, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, NRCAN, Parks Canada

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**DORE RIVER PROPOSED BANK ARMORING  
PROPOSED RIPARIAN RESTORATION**

Drawing No.	<b>400</b>
Project Number	2341-21107-01
Rev.	0

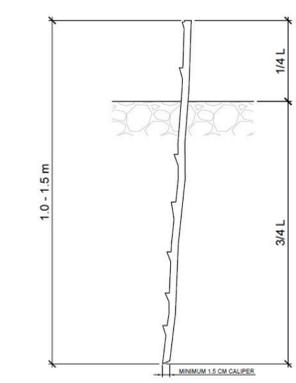
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Bed Type A: Live Stakes (1 Per 1 sq.m.)					
BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	B	
<b>Live Stakes</b>				<b>%</b>	<b>No.</b>
<i>Populus balsamifera</i>	balsam poplar	0.5-0.75 m	Plant at 1 per 1 sq.m. Follow all specifications in Details and Guidelines.	25%	453
<i>Salix bebbiana</i>	Bebb's willow	length.		35%	634
<i>Salix exigua</i>	narrowleaf willow	Min 1.5		25%	453
<i>Cornus stolonifera</i>	red-osier dogwood	cm caliper		15%	272
<b>LIVE STAKES TOTAL</b>				<b>100%</b>	<b>1810</b>

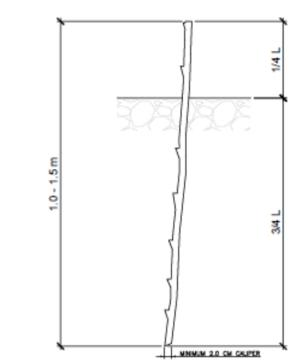
Bed Type B: Tree & Shrub (1 Per 3 sq.m.)					
BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	B	
<b>Trees</b>				<b>%</b>	<b>No.</b>
<i>Picea mariana</i>	black spruce	#1 Pot	Plant at 1 per 3 sq.m. Maintain 1 m spacing from retained trees. Follow all specifications in Details and Guidelines.	20%	520
<i>Picea engelmannii</i>	Engelmann spruce	#1 Pot		5%	130
<i>Populus balsamifera</i>	balsam poplar	#1 Pot		10%	260
<i>Pinus contorta</i>	Lodgepole pine	#1 Pot		15%	390
<i>Acer glabrum</i>	Douglas maple	#1 Pot		5%	130
<b>TREES TOTAL</b>				<b>55%</b>	<b>650</b>

Shrubs & Herbs					
BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	B	
<b>Shrubs &amp; Herbs</b>				<b>%</b>	<b>No.</b>
<i>Rosa acicularis</i>	prickly rose	#1 Pot	Plant at 1 per 1 sq.m. Maintain 1 m distance from existing retained trees/shrubs. Follow all specifications in Details and Guidelines.	10%	780
<i>Rubus parviflorus</i>	thimbleberry	#1 Pot		15%	1170
<i>Viburnum edule</i>	highbush cranberry	#1 Pot		5%	390
<i>Symphoricarpos albus</i>	snowberry	#1 Pot		15%	1170
<b>SHRUBS TOTAL</b>				<b>45%</b>	<b>3510</b>

Bed Type C: Live Stakes in Riprap					
BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	B	
<b>Live Stakes</b>				<b>%</b>	<b>No.</b>
<i>Populus balsamifera</i>	balsam poplar	1.0-1.5 m	Plant at 1 per 2 m linear distance in two rows spaced 1 m vertical distance apart. Plant using 2 stakes per hole. Follow all specifications in Details and Guidelines.	25%	1670
<i>Salix bebbiana</i>	Bebb's willow	length.		35%	2338
<i>Salix exigua</i>	narrowleaf willow	Min 2.0		25%	1670
<i>Cornus stolonifera</i>	red-osier dogwood	cm caliper		15%	1002
<b>LIVE STAKES TOTAL</b>				<b>100%</b>	<b>6680</b>

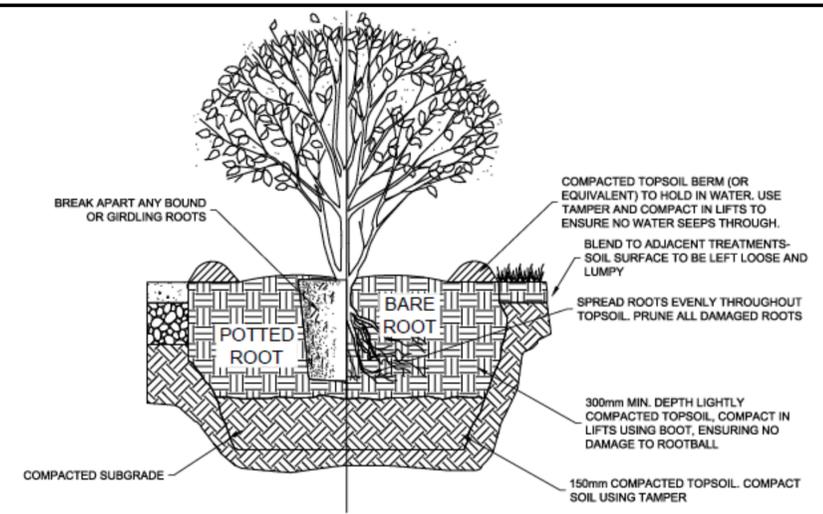


DETAIL B. LIVE STAKE PLANTING: GENERAL  
NTS

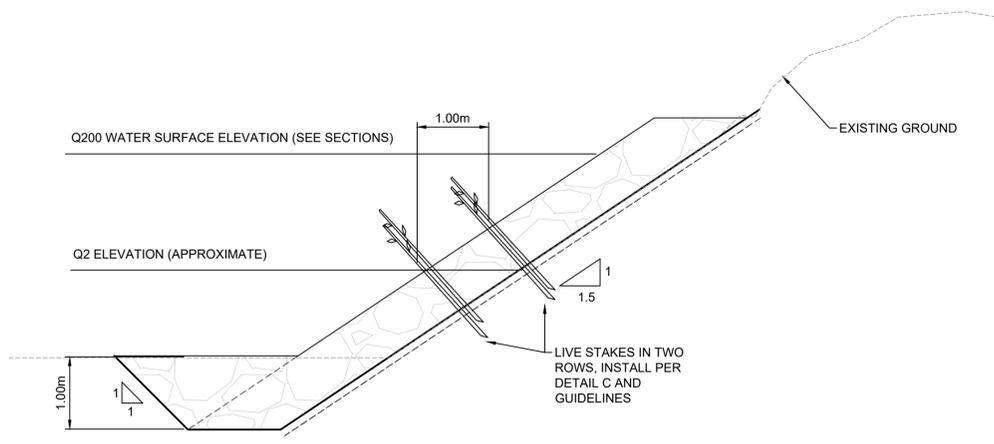


DETAIL C. LIVE STAKE PLANTING: RIPRAP  
NTS

Restoration Guidelines	
<b>GENERAL</b>	1 All work and materials to conform to the latest edition of the Canadian Landscape Standard unless specifically otherwise noted.
	2 Soil disturbance shall be minimized where possible in all riparian areas. Conduct close-cut clearing of shrubs instead of grubbing, where possible. The Contractor shall be responsible for installing additional plants per the prescribed planting mix, if necessary to restore any additional disturbed areas.
	3 If invasive plant species are observed in the work area, machinery must avoid contact with the plant to prevent spread. Species identification to be deferred to the QEP if/as needed.
	4 All instream activities including riprap placement must be conducted under QEP guidance.
<b>TOPSOIL &amp; MULCH</b>	5 Any disturbed soil surfaces in planting areas, including new topsoil installations, are to be finished "rough and loose" prior to planting, ie avoid both compaction and smooth grading.
	6 Apply a 300 mm layer of imported organic topsoil throughout tree and shrub planting areas prior to plant installations.
	7 Provide fertility and particle size analysis test for imported organic topsoil prior to starting work.
	8 After topsoil and shrub installations, planting area shall be finished with hydraulic application of prescribed seed with mulch plus tackifier. Application rate to follow supplier recommendation.
<b>LIVE STAKING</b>	9 Live stakes must be kept moist, using wetted towels or similar, during transport and storage including onsite prior to planting. Store live stakes in a cool, moist, dark environment for no longer than 1 week, if necessary.
	10 Installation: use rebar to pilot a planting hole, then insert the live stake. Stake must be approximately 75% length below topsoil surface, with minimum 2 live buds above the surface. Lightly pack the topsoil around top of live stake to ensure soil contact and stability.
	11 Live stakes to be installed at approximately 1 per square metre.
	12 Ensure all live stakes are installed with bottom/larger end buried and buds pointing upward.
<b>LIVE STAKING IN RIPRAP</b>	13 Live stakes for riparian planting areas shall be between 0.5-0.75 m length. Minimum 1.5 cm caliper at large end.
	14 Live stakes for instream/riprap shall be between 1.0 to 1.5 m length. Minimum 2.0 cm caliper at large end.
	15 Apply topsoil to pockets and open spaces in the riprap live staking areas. Fill pockets with topsoil until flush with riprap slope face, then insert live stake into planting hole piloted with rebar pole (or similar tool).
	16 Live stakes to be installed in 2 rows spaced 1 metre vertically, at approximately 1 live stake per 2 metre linear distance along each row.
<b>MAINTENANCE</b>	17 Irrigation is required as needed during the growing season (May 1st through September 30th) to maintain survival of planted stock. Water as frequently as necessary to maintain healthy plants.
	18 Minimum 80% survival of planted stock is required. A 5-year maintenance and monitoring program must be conducted for the planted area with QEP guidance.



DETAIL A. SHRUB PLANTING ON LEVEL SITES  
NTS



DETAIL D. LIVE STAKE PLACEMENT IN CLASS 100KG RIPRAP  
NTS

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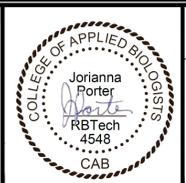
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REGIONAL DISTRICT OF FRASER-FORT GEORGE  
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**DORE RIVER PROPOSED BANK ARMORING  
PROPOSED RIPARIAN RESTORATION**

DETAIL

Drawing No. **401**

Project Number 2341-21107-01  
Rev. 0

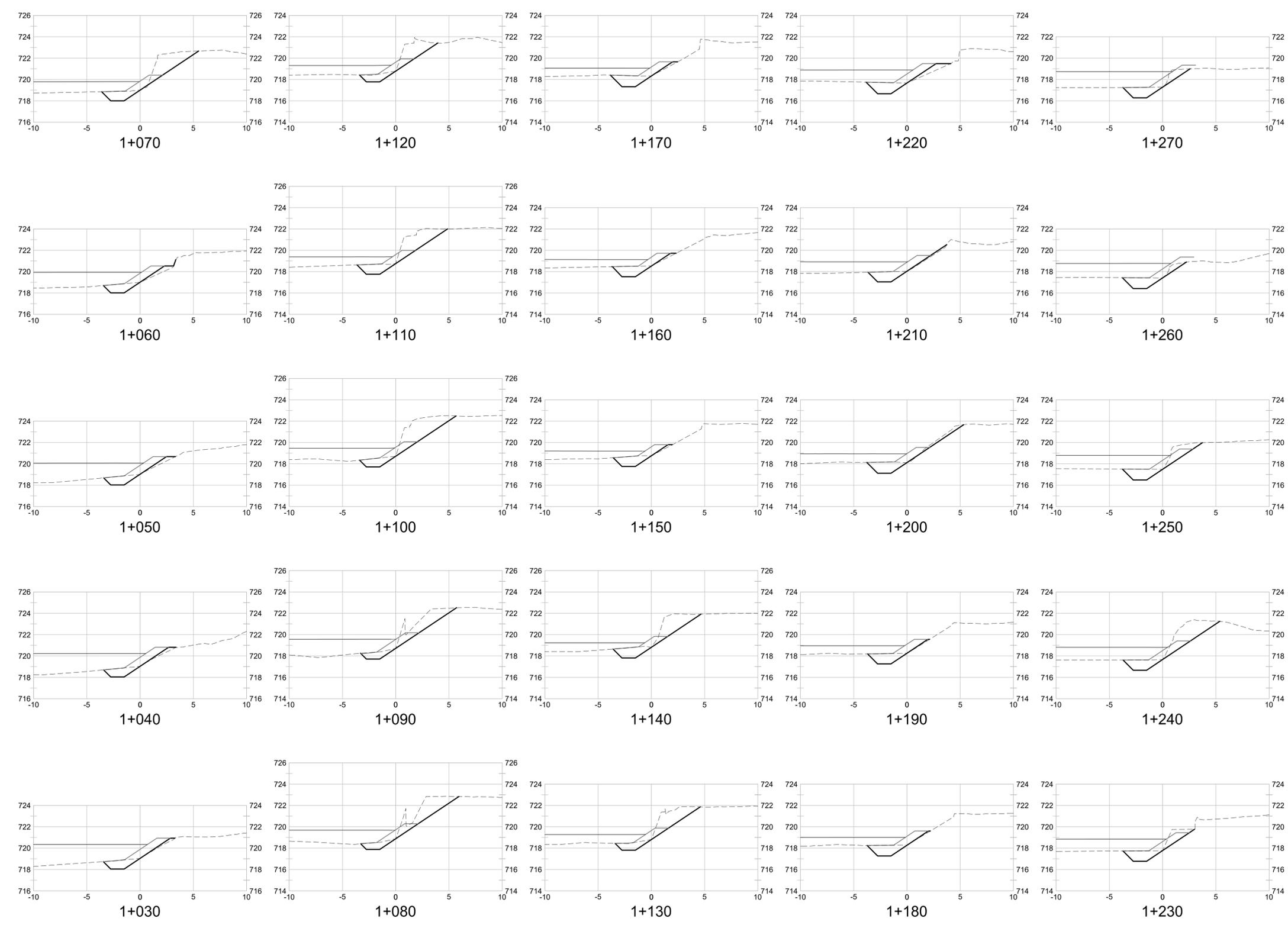
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**LEGEND**

PROPOSED EXCAVATION	
PROPOSED RIPRAP	
Q200 WATER SURFACE ELEVATION	
ORIGINAL GROUND	

NOTE: CROSS SECTIONS ARE FOR REFERENCE ONLY. SEE DWG 301 FOR DETAILS ON BANK PREPARATION AND RIPRAP PLACEMENT



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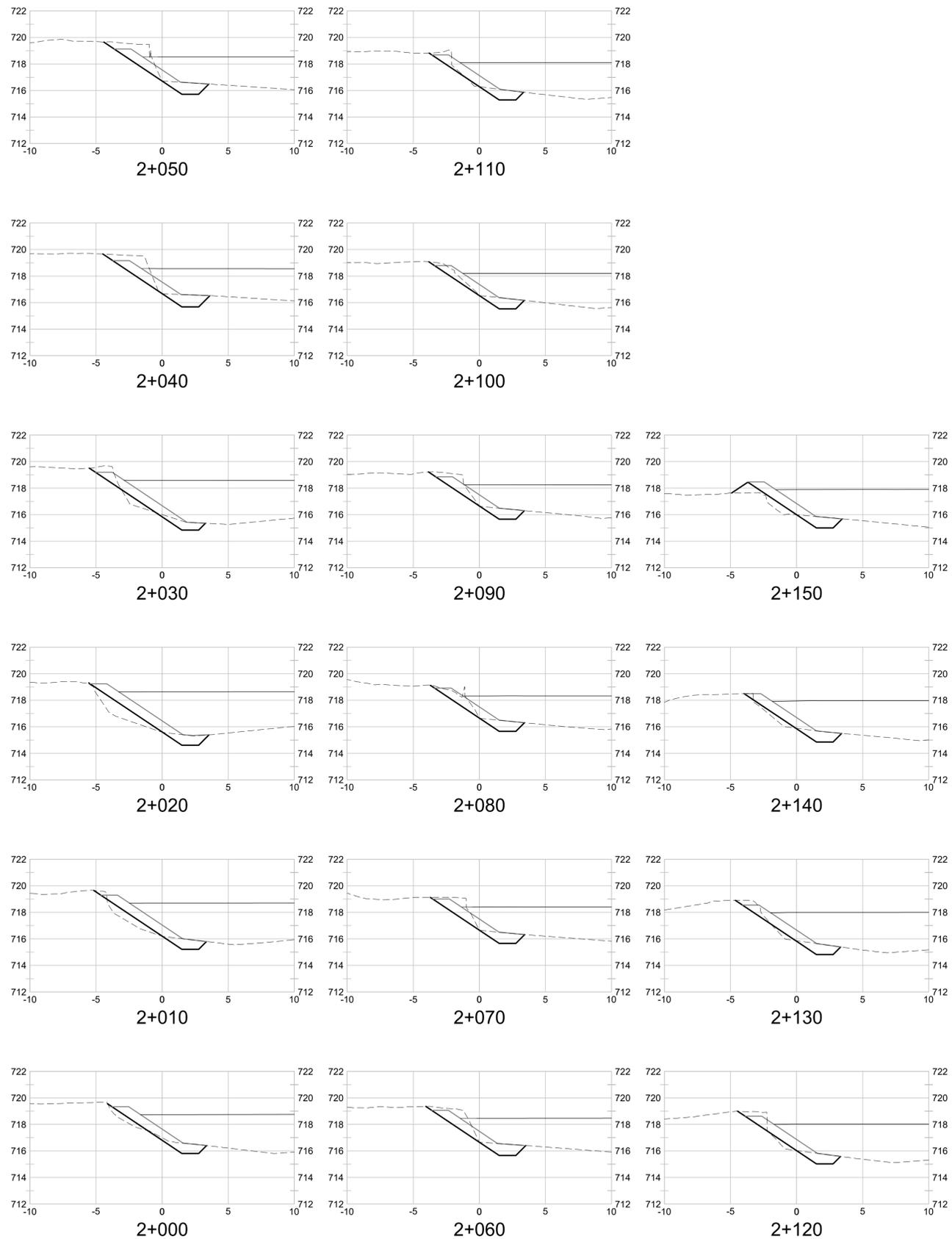
REGIONAL DISTRICT OF FRASER - FORT GEORGE  
155 GEORGE STREET, PRINCE GEORGE, BC, V2L 1P8

**DORE RIVER PROPOSED BANK ARMORING  
CROSS SECTIONS SITE A**

Drawing No. **1001**

Project Number 2341-21107-01 Rev. 0

DATE: 2024-03-05 08:45 FILE: X:\2024\Projects\2341-21107-00\PDF\G- Dore River Phase 2\10.0 Drawings\10.5 Sheets\21107-C-1000.dwg



**LEGEND**

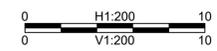
PROPOSED EXCAVATION	
PROPOSED RIPRAP	
Q200 WATER SURFACE ELEVATION	
ORIGINAL GROUND	

NOTE: CROSS SECTIONS ARE FOR REFERENCE ONLY. SEE DWG 301 FOR DETAILS ON BANK PREPARATION AND RIPRAP PLACEMENT

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ORIGINAL DWG SIZE: ANSI D (22" x 34")

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**DORE RIVER PROPOSED BANK ARMORING  
CROSS SECTIONS SITE B**

Drawing No.	1002
Project Number	2341-21107-01
Rev.	0

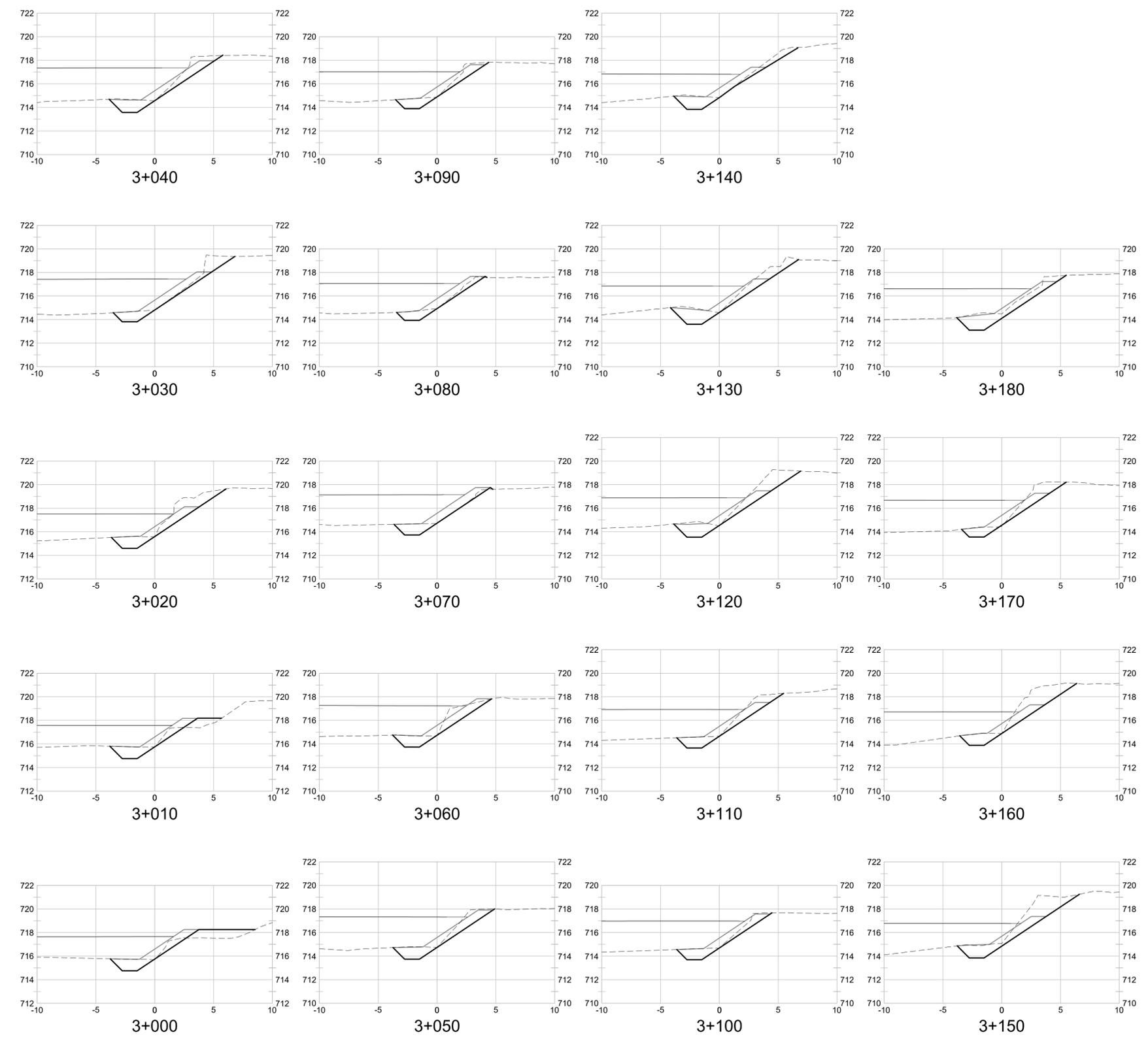
Rev	Date	Description	Drawn	Design	App'd
0	2024-03-04	ISSUED FOR TENDER	EO	KB	DJ

DATE: 2024-03-05 08:45 FILE: X:\2341\Projects\2341-21107-00\PDF\FG - Dore River Phase 2\10.0 Drawings\10.5 Sheets\21107-C-1000.dwg

**LEGEND**

PROPOSED EXCAVATION	
PROPOSED RIPRAP	
Q200 WATER SURFACE ELEVATION	
ORIGINAL GROUND	

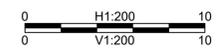
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**DORE RIVER PROPOSED BANK ARMORING CROSS SECTIONS SITE C**

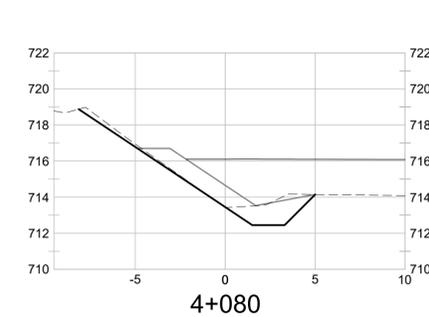
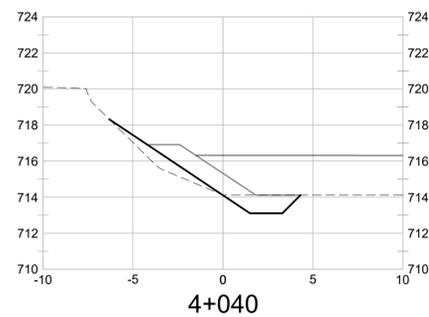
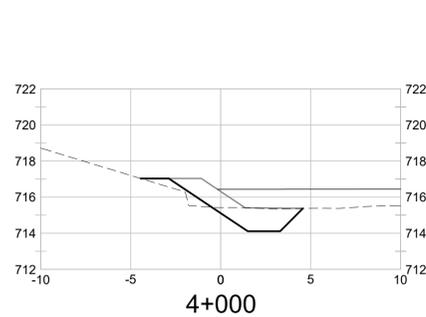
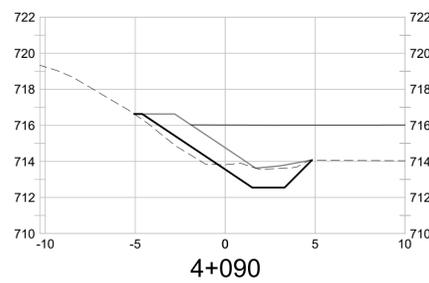
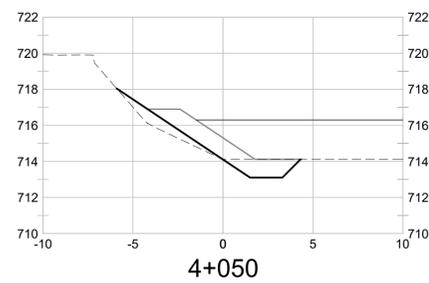
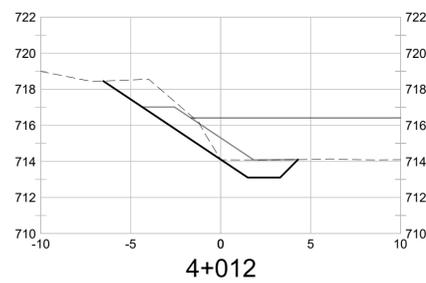
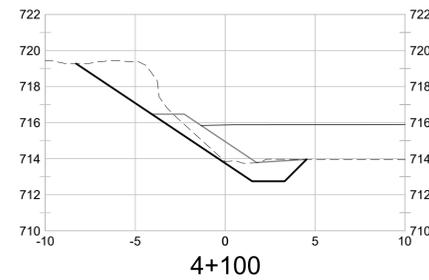
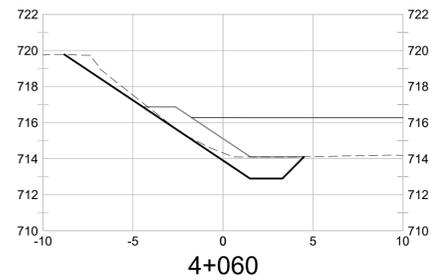
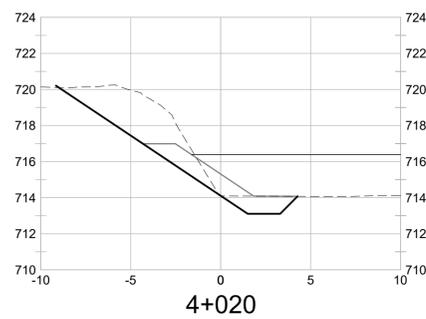
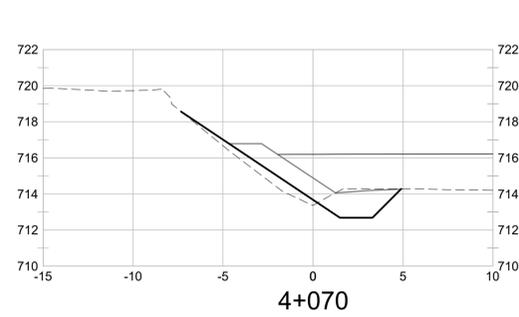
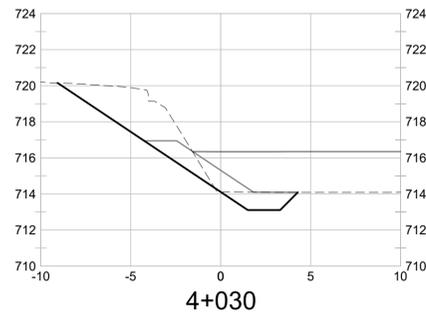
Drawing No.	1003
Project Number	2341-21107-01
Rev.	0

Rev	Date	Description	Drawn	Design	App'd
0	2024-03-04	ISSUED FOR TENDER	EO	KB	DJ

**LEGEND**

PROPOSED EXCAVATION	
PROPOSED RIPRAP	
Q200 WATER SURFACE ELEVATION	
ORIGINAL GROUND	

NOTE: CROSS SECTIONS ARE FOR REFERENCE ONLY. SEE DWG 301 FOR DETAILS ON BANK PREPARATION AND RIPRAP PLACEMENT



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ORIGINAL DWG SIZE: ANSI D (22" x 34")

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**DORE RIVER PROPOSED BANK ARMORING CROSS SECTIONS SITE D**

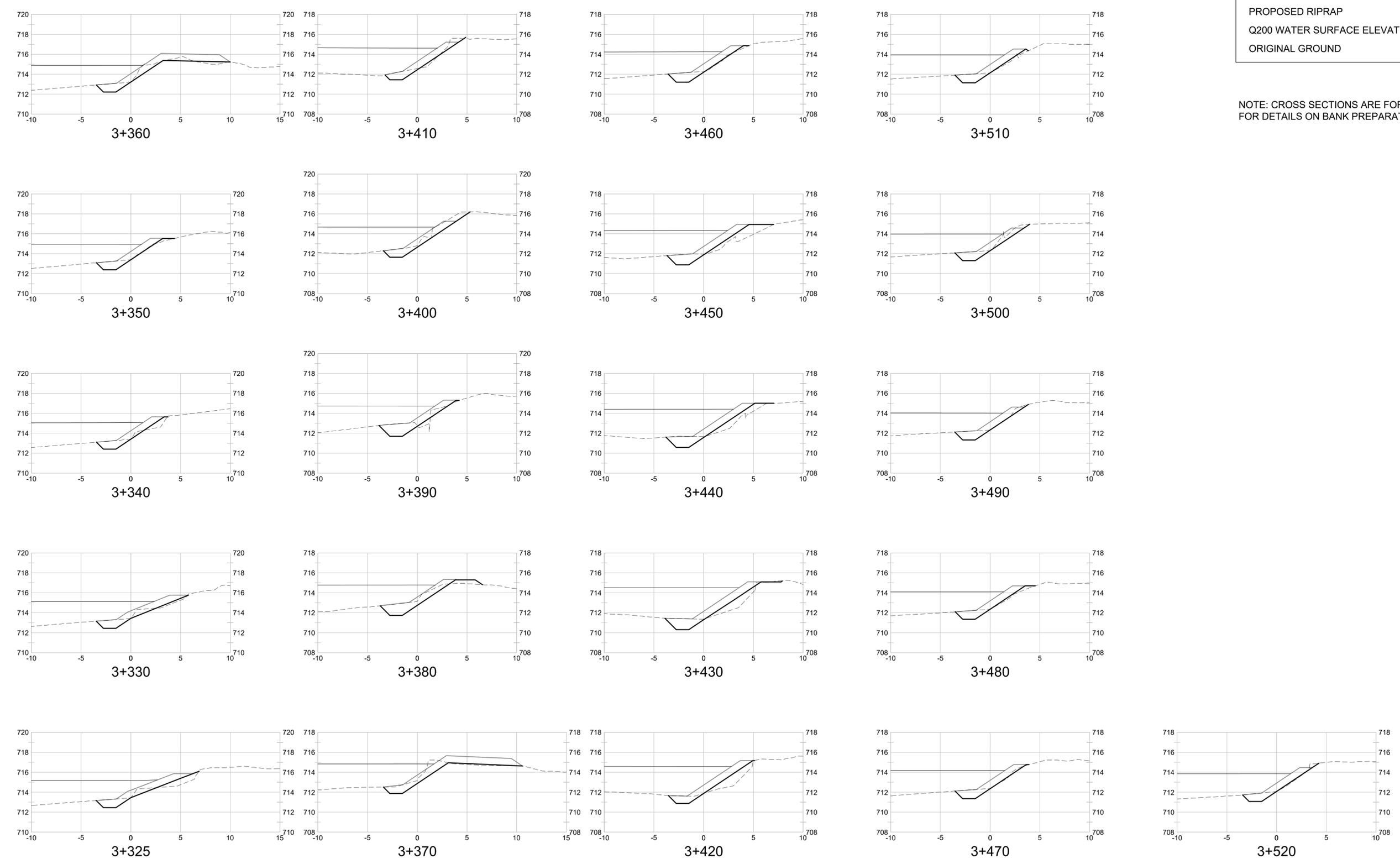
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Project Number	Rev.
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DATE: 2024-03-05 08:45 FILE: X:\2341\Projects\2341-21107-00\RD\DFG - Dore River Phase 2\10.0 Drawings\10.5 Sheets\21107-C-1005.dwg

**LEGEND**

PROPOSED EXCAVATION	
PROPOSED RIPRAP	
Q200 WATER SURFACE ELEVATION	
ORIGINAL GROUND	

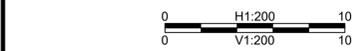
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**DORE RIVER PROPOSED BANK ARMORING  
CROSS SECTIONS SITE F**

Project Number	2341-21107-01
Rev.	0

Rev	Date	Description	Drawn	Design	App'd
0	2024-03-04	ISSUED FOR TENDER	EO	KB	DJ

Drawing No. 1005