ST. JOHN'S

DEPARTMENT OF PLANNING, ENGINEERING AND REGULATORY SERVICES

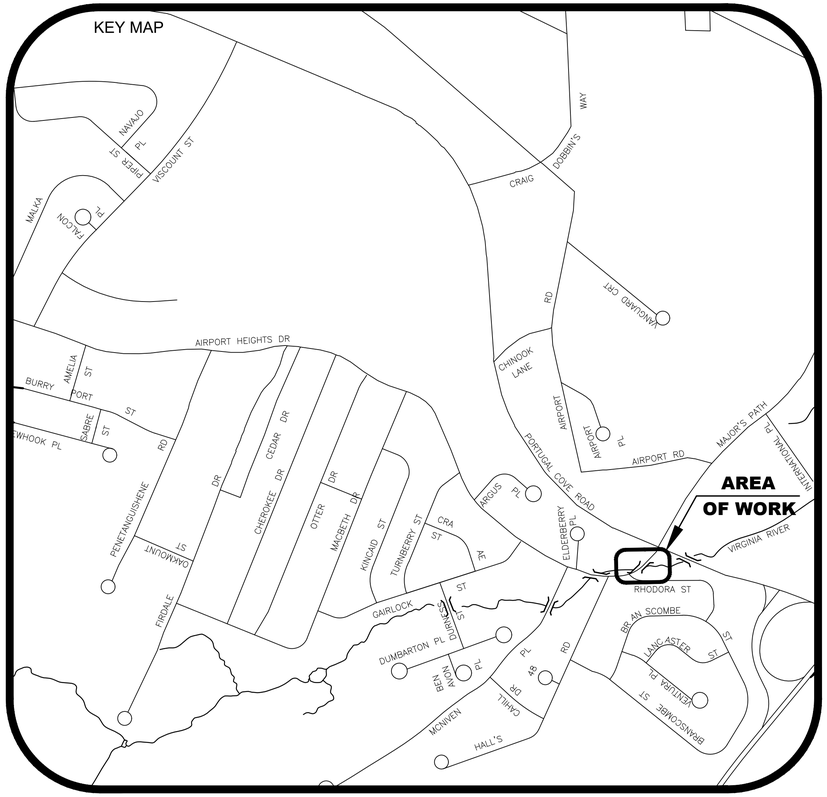
ENGINEERING CONSULTANT:

PINNACLE ENGINEERING

SUITE 202 - 40 ABERDEEN AVE., ST. JOHN'S, NL A1A 5T3
PHONE: (709) 754-2114 ; FAX: (709) 738-0707
WWW.PINNACLEENGINEERING.CA

PROVINCE OF NEWFOUNDLAND
PERMIT HOLDER
CLASS "A"
This Permit Allows
PINNACLE ENGINEERING ULC
MIRC:
To practice Professional Engineering in Newfoundland and Labrador.
Permit No. as issued by PEGNL L0331
which is valid for the year 2025.

KEY MAP



PROJECT TITLE:

AIRPORT HEIGHTS DRIVE CULVERT REPLACEMENT

TENDER # 2025042

MARCH 2025 **P.N. 23046A**

LIST OF DRAWINGS:

C1	GENERAL PLAN
C2	EXISTING CONDITIONS & REMOVAL PLAN
C3	PLAN & PROFILE - VIRGINIA RIVER
C4	TRAFFIC/PEDESTRIAN CONTROL PLAN - PHASE 1
C5	TRAFFIC/PEDESTRIAN CONTROL PLAN - PHASE 2
C6	TRAFFIC/PEDESTRIAN CONTROL PLAN - PHASE 3
D1	CIVIL CONSTRUCTION DETAILS - 01
D2	CIVIL CONSTRUCTION DETAILS - 02
D3	CIVIL CONSTRUCTION DETAILS - 03
D4	CIVIL CONSTRUCTION DETAILS - 04

Newfoundland Labrador

Department of Transportation & Infrastructure
Government of Newfoundland and Labrador



PINNACLE ENGINEERING

GENERAL NOTES:

1. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF ST. JOHN'S SPECIFICATIONS BOOK.
2. TOPOGRAPHIC SURVEY BY PARDY SURVEYS INC. AS OF MAY 2024 AND REFERENCED TO THE CONTROL MONUMENTS SHOWN ON THIS PLAN. CONTRACTOR TO COMPLETE THE CONSTRUCTION LAYOUT FOR THE PROJECT REFERENCED TO THESE SAME CONTROL MONUMENTS.
3. AERIAL IMAGERY SHOWN ON THIS DWG IS FOR ILLUSTRATIVE PURPOSES ONLY AND MAY NOT REFLECT CURRENT EXISTING SITE CONDITIONS.
4. ALL MEASUREMENTS ARE HORIZONTAL GROUND DISTANCES IN METRES AND REFERENCED TO NAD83 DATUM.
5. LEGAL SURVEYOR TO ESTABLISH TBM'S.
6. DO NOT SCALE FROM DRAWINGS.

NO.	REVISIONS	DD/MM/YY
0	ISSUED FOR TENDER	05/03/25

PROFESSIONAL STAMP

REGISTERED PROFESSIONAL ENGINEER — pegnl — PROFESSIONAL ENGINEERS AND GEOSCIENTISTS NEWFOUNDLAND & LABRADOR — TREVOR G. MOORE — SIGNATURE — 05 MARCH 2025 — DATE — PROVINCE OF NEWFOUNDLAND

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DEPARTMENT OF PLANNING, ENGINEERING AND REGULATORY SERVICES

PROJECT TITLE

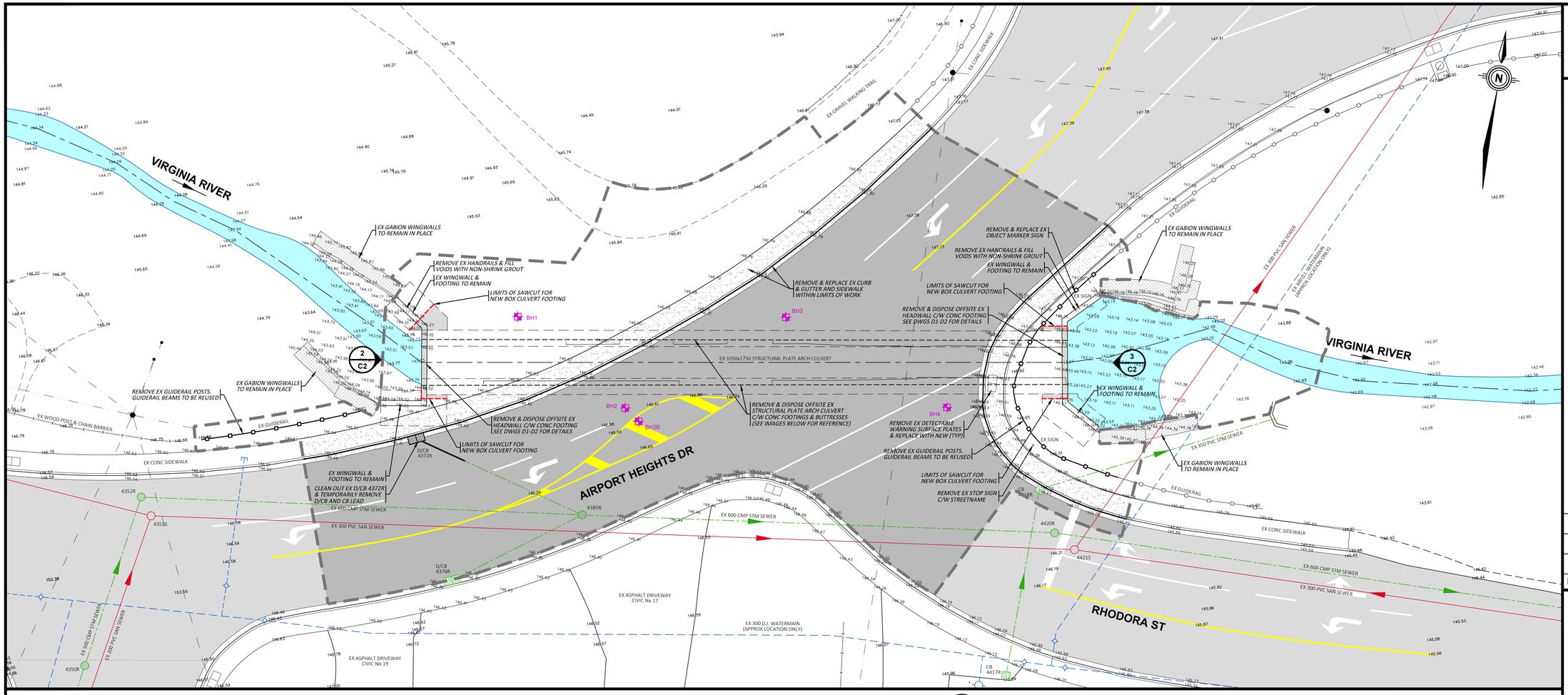
AIRPORT HEIGHTS DRIVE CULVERT REPLACEMENT

SHEET TITLE

GENERAL PLAN

PROJECT NO.
23046A

DRAWN BY	CHECKED BY
MEWC	TGM
DATE: MARCH 2025	DRAWING NO. C1
SCALE: 1 : 1500	



EXISTING CONDITIONS & REMOVAL PLAN

SCALE: 1:150

1 / C2



EX CULVERT (LOOKING DOWNSTREAM) — 2 / C2



EX CULVERT (LOOKING UPSTREAM) — 3 / C2

PINNACLE ENGINEERING

NOTES:

LEGEND:

- LIMITS OF WORK / REINSTATEMENT
- EXISTING WATERMAIN
- EXISTING HYDRANT & MARKER POLE
- EXISTING LINE VALVE
- EXISTING SANITARY SEWER
- 00005 EXISTING SANITARY MANHOLE
- EXISTING STORM SEWER
- 0000R EXISTING STORM MANHOLE
- EXISTING CATCHBASIN
- EXISTING UTILITY POLE & GUY WIRE
- EXISTING FENCE
- EXISTING GUIDERAIL
- EX. STORM SEWER TO BE REMOVED & REPLACED AFTER CONSTRUCTION
- EX. CATCHBASIN TO BE REMOVED & REPLACED AFTER CONSTRUCTION
- EX. COMBINED CURB & SIDEWALK / CURB & GUTTER AND SIDEWALK TO BE REMOVED
- EX. ASPHALT TO BE REMOVED
- BH0 BORE HOLE LOCATION

NO.	REVISIONS	DD/MM/YY
0	ISSUED FOR TENDER	05/03/25

PROFESSIONAL STAMP

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DEPARTMENT OF PLANNING, ENGINEERING AND REGULATORY SERVICES

PROJECT TITLE

AIRPORT HEIGHTS DRIVE CULVERT REPLACEMENT

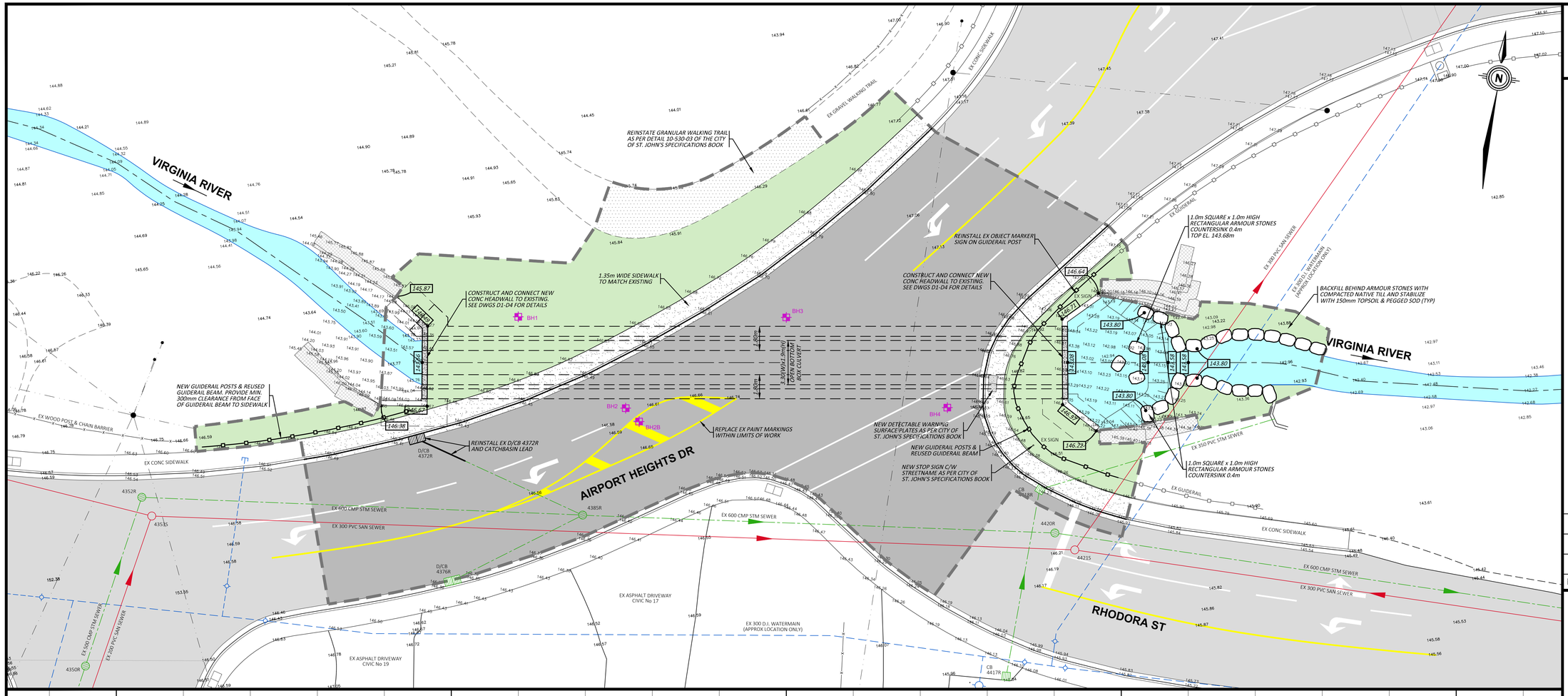
SHEET TITLE

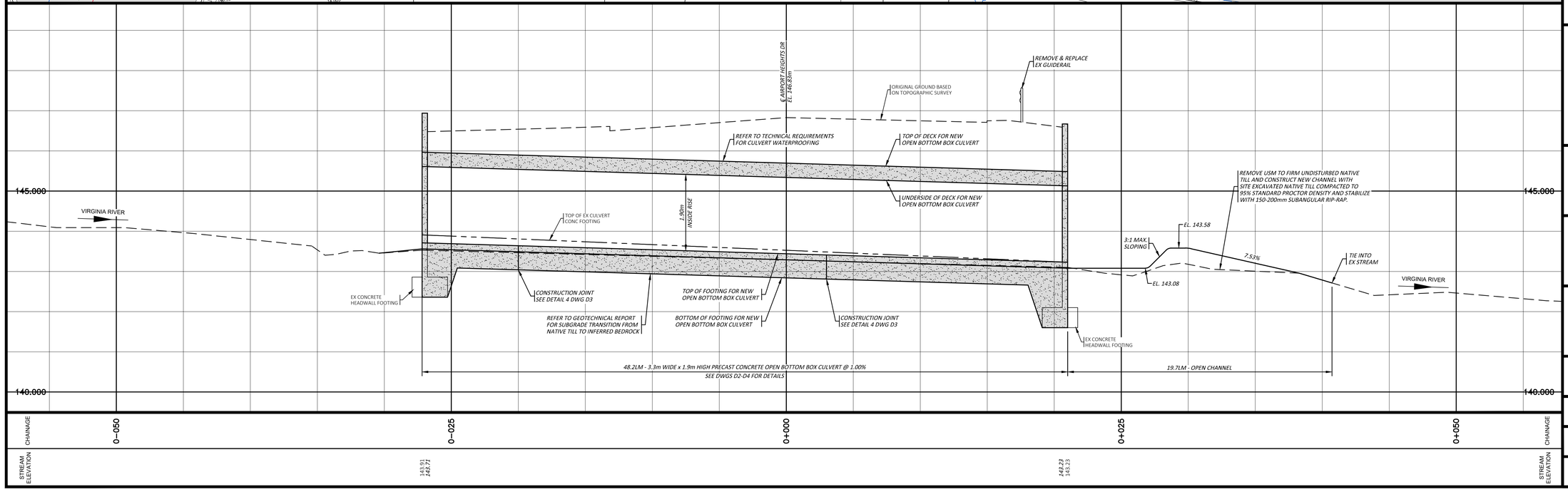
EXISTING CONDITIONS & REMOVAL PLAN

PROJECT NO.

23046A

DRAWN BY	CHECKED BY
MEWC	TGM
DATE	DRAWING NO.
MARCH 2025	C2
SCALE	
1 : 150	





PINNACLE ENGINEERING

NOTES:

1. CONTRACTOR TO CHANNEL CUT / SAW CUT EXISTING ASPHALT / CONCRETE FOR SMOOTH TRANSITION.
2. ASPHALT REINSTATEMENT WITHIN AIRPORT HEIGHTS DRIVE / RHODORA STREET TO CONSIST OF 50mm THK LAYER OF SURFACE COURSE ASPHALT, (2)-50mm THK LAYERS OF BASE COURSE ASPHALT, 200mm THK LAYER OF CLASS 'A' GRANULARS, TENSAR NX650' GEOGRID (OR APPROVED EQUAL) WITH MIN. 900mm OVERLAPS, & 350mm THK LAYER OF CLASS 'B' GRANULARS.
3. EXACT LOCATION OF NEW TRAFFIC SIGNAGE TO BE DETERMINED IN FIELD WITH ENGINEER PRIOR TO PLACEMENT.

LEGEND:

- LIMITS OF WORK / REINSTATEMENT
- EXISTING WATERMAIN (APPROX LOCATION)
- EXISTING HYDRANT & MARKER POLE
- EXISTING LINE VALVE
- EXISTING SANITARY SEWER
- 00005 EXISTING SANITARY MANHOLE
- EXISTING STORM SEWER
- 00008 EXISTING STORM MANHOLE
- EXISTING CATCHBASIN
- EXISTING UTILITY POLE & GUY WIRE
- EXISTING FENCE
- EXISTING GUIDERAIL
- EX. STORM SEWER TO BE REMOVED & REPLACED AFTER CONSTRUCTION
- EX. CATCHBASIN TO BE REMOVED & REPLACED AFTER CONSTRUCTION
- EX. GUIDERAIL TO BE REMOVED & REPLACED
- NEW CONC CURB & GUTTER
- LIMITS OF ASPHALT REINSTATEMENT (SEE NOTE 2 THIS SHEET)
- LIMITS OF CONCRETE REINSTATEMENT (AS PER CITY OF ST. JOHN'S SPECIFICATIONS BOOK)
- LIMITS OF LANDSCAPING REINSTATEMENT STABILIZE WITH 150mm TOPSOIL & SOD
- BH0 BORE HOLE LOCATION

NO.	REVISIONS	DD/MM/YY
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PROJECT TITLE

AIRPORT HEIGHTS DRIVE
CULVERT REPLACEMENT

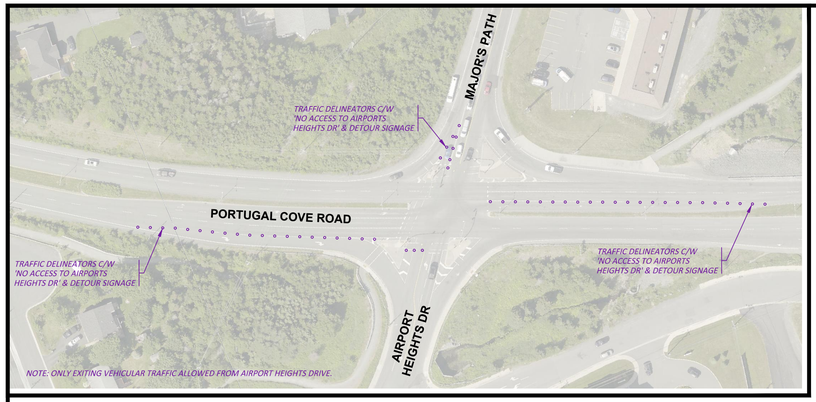
SHEET TITLE

PLAN & PROFILE
VIRGINIA RIVER

PROJECT NO.

23046A

DRAWN BY	CHECKED BY
MEWC	TGM
DATE	DRAWING NO.
MARCH 2025	C3
SCALE	1 : 150 (H) 1 : 50 (V)



PORTUGAL COVE RD

CLOSE EX SIDEWALK C/W SIGNAGE

TRAFFIC DELINEATORS

PEDESTRIAN TRAFFIC TO USE WALKING TRAIL

CLOSE EX SIDEWALK C/W SIGNAGE

CONTRACTOR TO REMOVE EX CONC CURB & GUTTER AND SIDEWALK AND CONSTRUCT TEMPORARY VEHICULAR ACCESS DURING PHASE 1 WORKS. ENSURE MIN. 1.5m WIDE PEDESTRIAN ACCESS IS ALWAYS PROVIDED

VIRGINIA RIVER

APPROX LIMITS OF EXCAVATION

EX CULVERT

TEMPORARY PEDESTRIAN ACCESS

NEW BOX CULVERT

VIRGINIA RIVER

CLOSE EX SIDEWALK C/W SIGNAGE

AIRPORT HEIGHTS DR

CONC JERSEY BARRIER C/W SIDEWALK CLOSED SIGNAGE

SIDEWALK CLOSED SIGNAGE

RHODORA ST

STREET RIGHT OF WAY

EX DRIVEWAY TO REMAIN OPEN

EX DRIVEWAY TO REMAIN OPEN

EX DRIVEWAY TO REMAIN OPEN

JERSEY BARRIER C/W "ROAD CLOSED LOCAL TRAFFIC ONLY" SIGNAGE

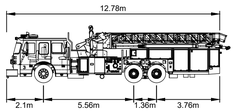
CIVIC No 19

CIVIC No 17

CIVIC No 15

EX DRIVEWAY TO REMAIN OPEN

CIVIC No 25



SUTPHEN SL-100 AERIAL PLATFORM

Overall Length	12.78m
Overall Width	2.52m
Design Centreline Turning Radius	12.00m

OVERALL VEHICLE SWEPT PATH
FORWARD MOTION TIRE PATH
REVERSE MOTION TIRE PATH

PINNACLE ENGINEERING

NOTES:

1. TEMPORARY TRAFFIC/PEDESTRIAN CONTROL PLAN SHOWN ARE A GUIDE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM LIMITS OF EXCAVATION/TEMPORARY SLOPING AND REQUIREMENTS FOR SHEETING, SHORING OR OTHER METHODS TO SAFELY COMPLETE THE WORK. THE ACTUAL PLACEMENT OF JERSEY BARRIERS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL SUBMIT SCHEDULES AND TRAFFIC CONTROL PLANS COMPLETE WITH ALL REQUIRED SIGNAGE FOR APPROVAL PRIOR TO IMPLEMENTATION IN THE FIELD. ANY DEVIANCE SHALL BE APPROVED FIRST BY THE ENGINEER/CITY. REFER TO CITY SPECIFICATION ITEM 130 "TRAFFIC/PEDESTRIAN CONTROL" FOR CONTRACTOR REQUIREMENTS.
2. 1.5m WIDE PEDESTRIAN ACCESS TO BE TEMPORARILY SECURED WITH INTERLOCKING STEEL FENCES ON BOTH SIDES.
3. TRACTOR TRAILERS AND DELIVERY VEHICLES TO BE ADVISED TO USE VISCOUNT STREET.

LEGEND:

- EXISTING UTILITY POLE & GUY WIRE
- CONCRETE JERSEY BARRIER C/W DELINEATORS / FENCING AS REQUIRED
- TRAFFIC DELINEATOR POST
- LIMITS OF NEW CULVERT CONSTRUCTION UNDER TRAFFIC CONTROL PLAN - PHASE 1
- LIMITS OF EXISTING CULVERT STILL IN PLACE

NO.	REVISIONS	DD/MM/YY
0	ISSUED FOR TENDER	05/03/25

PROFESSIONAL STAMP

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NEWFOUNDLAND
pegnl — PROFESSIONAL ENGINEERS AND GEOSCIENTISTS NEWFOUNDLAND & LABRADOR
TREVOR G. MOORE
SIGNATURE
05 MARCH 2025
DATE

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DEPARTMENT OF PLANNING, ENGINEERING AND REGULATORY SERVICES

PROJECT TITLE

AIRPORT HEIGHTS DRIVE CULVERT REPLACEMENT

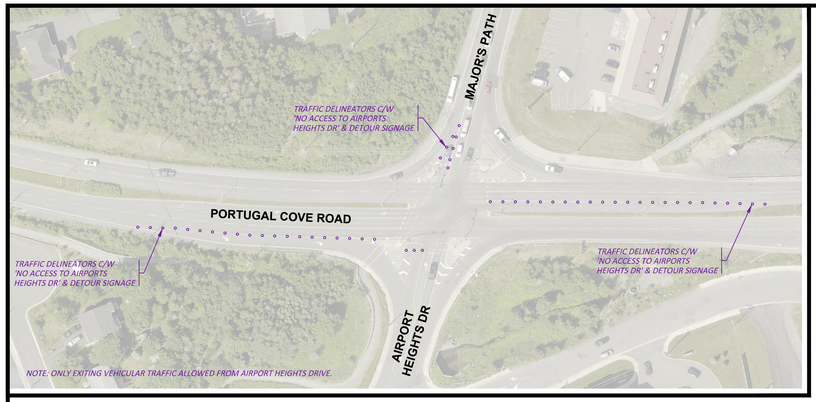
SHEET TITLE

TRAFFIC / PEDESTRIAN CONTROL PLAN - PHASE 1

PROJECT NO.

23046A

DRAWN BY	CHECKED BY
MEWC	TGM
DATE	DRAWING NO.
MARCH 2025	C4
SCALE	
1 : 150	



PORTUGAL COVE RD

CLOSE EX SIDEWALK C/W SIGNAGE

TRAFFIC DELINEATORS

VIRGINIA RIVER

EX CULVERT

APPROX LIMITS OF EXCAVATION

NEW BOX CULVERT

TEMPORARY PEDESTRIAN ACCESS

VIRGINIA RIVER

APPROX LIMITS OF EXCAVATION

'RIGHT TURN ONLY' SIGNAGE

SIDEWALK CLOSED SIGNAGE

TRAFFIC DELINEATORS C/W "ROAD CLOSED - LOCAL TRAFFIC ONLY" SIGNAGE

AIRPORT HEIGHTS DR

CLOSE EX SIDEWALK C/W SIGNAGE

TRAFFIC DELINEATORS

PROVIDE DETOUR SIGNAGE AS REQUIRED FOR ROAD CLOSURE

LEFT TURN LANE CLOSED

RHODORA ST

TRAFFIC DELINEATORS C/W 'LEFT TURN LANE CLOSED' SIGNAGE

EX DRIVEWAY TO REMAIN OPEN

EX DRIVEWAY TO REMAIN OPEN

EX DRIVEWAY TO REMAIN OPEN

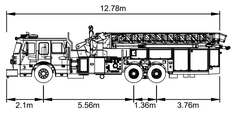
EX DRIVEWAY TO REMAIN OPEN

CIVIC No 19

CIVIC No 17

CIVIC No 15

CIVIC No 25



SUTPHEN SL-100 AERIAL PLATFORM

Overall Length	12.78m
Overall Width	2.52m
Design Centreline Turning Radius	12.00m

OVERALL VEHICLE SWEPT PATH
FORWARD MOTION TIRE PATH
REVERSE MOTION TIRE PATH

PINNACLE ENGINEERING

NOTES:

1. TEMPORARY TRAFFIC/PEDESTRIAN CONTROL PLAN SHOWN ARE A GUIDE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM LIMITS OF EXCAVATION/TEMPORARY SLOPING AND REQUIREMENTS FOR SHEETING, SHORING OR OTHER METHODS TO SAFELY COMPLETE THE WORK. THE ACTUAL PLACEMENT OF JERSEY BARRIERS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL SUBMIT SCHEDULES AND TRAFFIC CONTROL PLANS COMPLETE WITH ALL REQUIRED SIGNAGE FOR APPROVAL PRIOR TO IMPLEMENTATION IN THE FIELD. ANY DEVIANCE SHALL BE APPROVED FIRST BY THE ENGINEER/CITY. REFER TO CITY SPECIFICATION ITEM 130 "TRAFFIC/PEDESTRIAN CONTROL" FOR CONTRACTOR REQUIREMENTS.
2. 1.5m WIDE PEDESTRIAN ACCESS TO BE TEMPORARILY SECURED WITH INTERLOCKING STEEL FENCES ON BOTH SIDES.
3. TRACTOR TRAILERS AND DELIVERY VEHICLES TO BE ADVISED TO USE VISCOUNT STREET.

LEGEND:

- EXISTING UTILITY POLE & GUY WIRE
- CONCRETE JERSEY BARRIER C/W DELINEATORS / FENCING AS REQUIRED
- TRAFFIC DELINEATOR POST
- LIMITS OF NEW CULVERT CONSTRUCTION UNDER TRAFFIC CONTROL PLAN - PHASE 2
- LIMITS OF NEW CULVERT CONSTRUCTION FROM PREVIOUS TRAFFIC CONTROL PHASES
- LIMITS OF EXISTING CULVERT STILL IN PLACE

NO.	REVISIONS	DD/MM/YY
0	ISSUED FOR TENDER	05/03/25

PROFESSIONAL STAMP

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DEPARTMENT OF PLANNING, ENGINEERING AND REGULATORY SERVICES

PROJECT TITLE

AIRPORT HEIGHTS DRIVE CULVERT REPLACEMENT

SHEET TITLE

TRAFFIC / PEDESTRIAN CONTROL PLAN - PHASE 2

PROJECT NO.

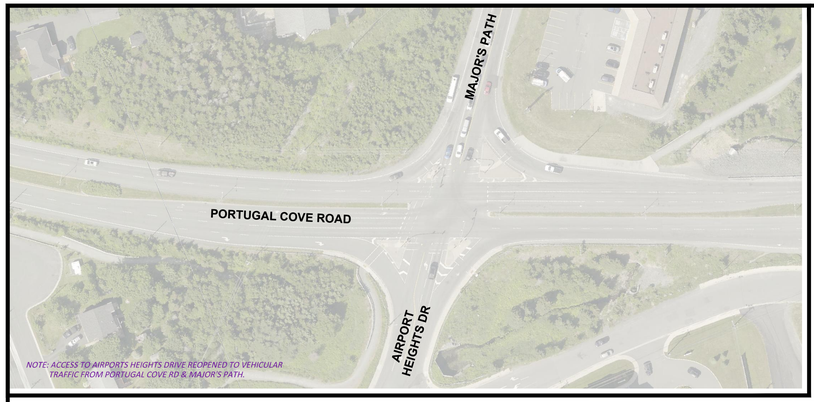
23046A

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MEWC	TGM

DATE: MARCH 2025

SCALE: 1 : 150

DRAWING NO.: C5



PORTUGAL COVE RD

CLOSE EX SIDEWALK C/W SIGNAGE

VIRGINIA RIVER

APPROX LIMITS OF EXCAVATION

TRAFFIC DELINEATORS

TEMPORARY PEDESTRIAN ACCESS

APPROX LIMITS OF EXCAVATION

CLOSE EX SIDEWALK C/W SIGNAGE

3.25m MIN.

3.25m MIN.

AIRPORT HEIGHTS DR

'RIGHT TURN ONLY' SIGNAGE

SIDEWALK CLOSED SIGNAGE

TEMPORARY STOP BAR

TRAFFIC DELINEATORS C/W 'LEFT TURN LANE CLOSED' SIGNAGE

LEFT TURN LANE CLOSED

RHODORA ST

TRAFFIC DELINEATORS

TWO-WAY TRAFFIC

EX DRIVEWAY TO REMAIN OPEN

EX DRIVEWAY TO REMAIN OPEN

EX DRIVEWAY TO REMAIN OPEN

EX DRIVEWAY TO REMAIN OPEN

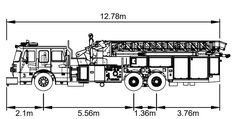
CIVIC No 19

CIVIC No 17

CIVIC No 15

CIVIC No 25

VIRGINIA RIVER



SUTPHEN SL-100 AERIAL PLATFORM

Overall Length	12.78m
Overall Width	2.52m
Design Centreline Turning Radius	12.00m

OVERALL VEHICLE SWEPT PATH
FORWARD MOTION TIRE PATH
REVERSE MOTION TIRE PATH

PINNACLE ENGINEERING

NOTES:

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2. 1.5m WIDE PEDESTRIAN ACCESS TO BE TEMPORARILY SECURED WITH INTERLOCKING STEEL FENCES ON BOTH SIDES.
3. TRACTOR TRAILERS AND DELIVERY VEHICLES TO BE ADVISED TO USE VISCOUNT STREET.

LEGEND:

- EXISTING UTILITY POLE & GUY WIRE
- CONCRETE JERSEY BARRIER C/W DELINEATORS / FENCING AS REQUIRED
- TRAFFIC DELINEATOR POST
- LIMITS OF NEW CULVERT CONSTRUCTION UNDER TRAFFIC CONTROL PLAN - PHASE 3
- LIMITS OF NEW CULVERT CONSTRUCTION FROM PREVIOUS TRAFFIC CONTROL PHASES

NO.	REVISIONS	DD/MM/YY
0	ISSUED FOR TENDER	05/03/25

PROFESSIONAL STAMP

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DEPARTMENT OF PLANNING, ENGINEERING AND REGULATORY SERVICES

PROJECT TITLE

AIRPORT HEIGHTS DRIVE CULVERT REPLACEMENT

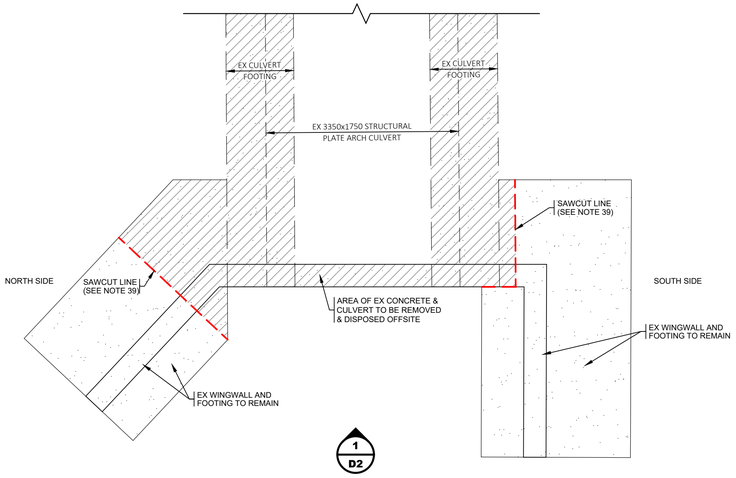
SHEET TITLE

TRAFFIC / PEDESTRIAN CONTROL PLAN - PHASE 3

PROJECT NO.

23046A

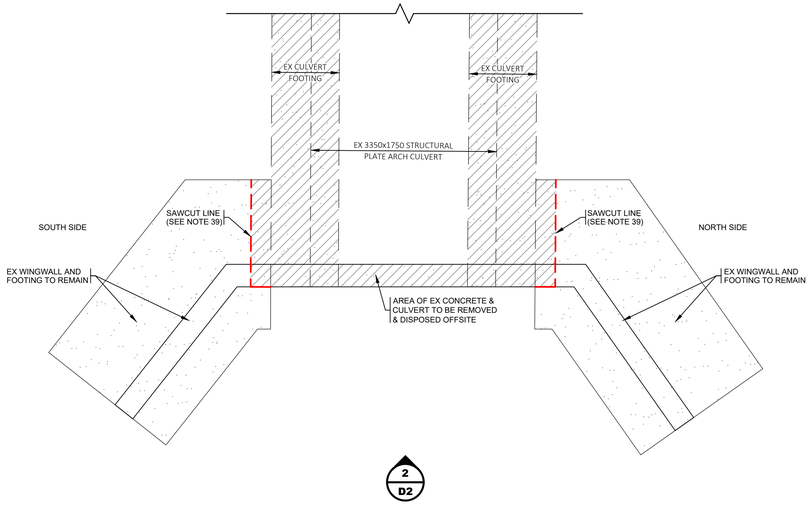
DRAWN BY	CHECKED BY
MEWC	TGM
DATE	DRAWING NO.
MARCH 2025	C6
SCALE	
1 : 150	



PLAN - U/S CONC HEADWALL - EXISTING CONDITIONS

SCALE: 1:50

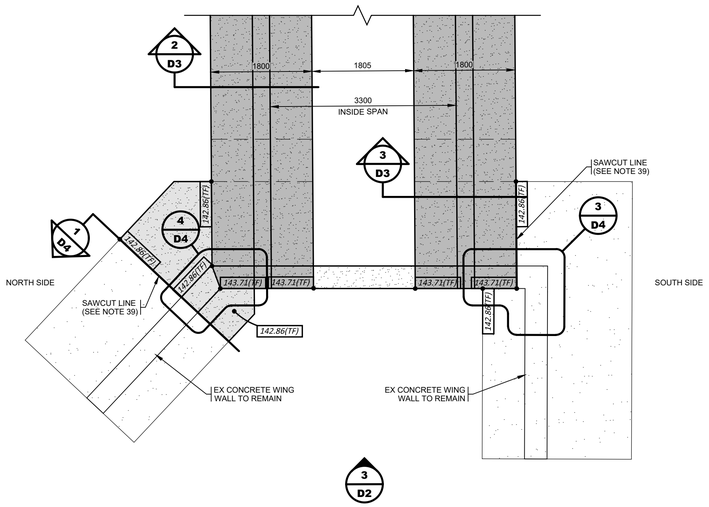
1 D1



PLAN - D/S CONC HEADWALL - EXISTING CONDITIONS

SCALE: 1:50

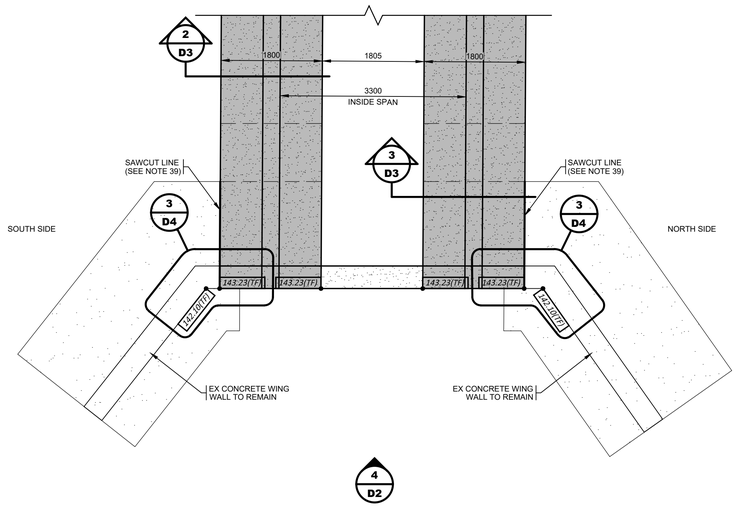
2 D1



PLAN - U/S CONC HEADWALL - PROPOSED MODIFICATIONS

SCALE: 1:50

3 D1



PLAN - D/S CONC HEADWALL - PROPOSED MODIFICATIONS

SCALE: 1:50

4 D1

NOTES:

1. DO NOT IMPOSE LOADS ON THE STRUCTURE IN EXCESS OF THE DESIGN LOADS.
2. DO NOT CUT HOLES IN BEARING WALLS, COLUMNS, BEAMS OR OTHER STRUCTURAL MEMBERS WITHOUT ENGINEER APPROVAL.
3. ALL CSA AND ASTM STANDARDS REFERENCED THROUGHOUT, REFER TO THE LATEST EDITION AND/OR REVISIONS OF NOTED STANDARDS.
4. DO NOT BACKFILL WALL UNTIL CONCRETE HAS REACHED ITS 28 DAY STRENGTH.
5. REFER TO GEOTECHNICAL INVESTIGATION REPORT COMPLETED BY GEOMATERIALSNL AND DATED 23 DECEMBER 2024 (FILE No GM0165).
6. NO FOOTING SHALL BE POURED WITHOUT PRIOR APPROVAL OF THE ENGINEER.
7. REMOVE ALL LOOSE AND UNSUITABLE MATERIAL UNDER FOUNDATIONS DOWN TO COMPETENT MATERIAL. BACKFILL WITH APPROVED MATERIAL AND COMPACT TO 100% CORRECTED MAXIMUM DRY DENSITY.
8. FOUNDING LEVEL TO BE INSPECTED BY GEOTECHNICAL CONSULTANT PRIOR TO PLACEMENT OF REINFORCEMENT AND CONCRETE.
9. GEOTECHNICAL ENGINEER TO VERIFY THE UNDERSIDE OF THE FOOTING ELEVATIONS PRIOR TO PLACEMENT OF REINFORCING STEEL AND CONCRETE.
10. PROTECT FOUNDATIONS FROM FROST DURING CONSTRUCTION.
11. DO NOT PLACE FOOTINGS ON FROZEN GROUND.
12. ANY OVER EXCAVATION OF FOUNDATION GRADES SHALL BE CORRECTED WITH CONCRETE FOR FOOTINGS ON ROCK OR STRUCTURAL FILL FOR FOOTING ON NATIVE TILL TO ACHIEVE THE ALLOWABLE SAFE DESIGN BEARING CAPACITIES. COST TO CORRECT OVER EXCAVATION SHALL BE AT CONTRACTOR'S EXPENSE.
13. CONTRACTOR RESPONSIBLE FOR SHORING OF EXCAVATIONS DURING CONSTRUCTION.
14. ALL CONCRETE WORK SHALL CONFORM TO CSA STANDARDS A23.1, A23.2 & A23.3 LATEST EDITIONS.
15. CONCRETE REQUIREMENTS:

LOCATION	STRENGTH	CLASS OF EXPOSURE	SLUMP	AIR CONTENT	W/C RATIO
ALL	35 MPa	C1	75mm	6 ±1%	0.39

16. TESTING REQUIREMENTS: CONCRETE TEST CYLINDERS SHALL BE CAST AND TESTED BASED ON NOT LESS THAN ONE STRENGTH TEST, CONSISTING OF 3-150x300 STANDARD CYLINDERS MADE FOR EACH 100 M3 OF CONCRETE PLACED AND IN NO CASE FEWER THAN ONE TEST FOR EACH CLASS OF CONCRETE ON ANY ONE DAY AS PER CAN/CSA A23.2. TEST RESULTS SHALL BE FORWARDED TO THE ENGINEER FOR REVIEW.
17. DETAILING, FABRICATION AND PLACEMENT OF ALL REINFORCEMENT SHALL BE IN CONFORMANCE TO THE LATEST EDITION OF 'REINFORCING STEEL MANUAL OF STANDARD PRACTICE' BY THE REINFORCING STEEL INSTITUTE OF ONTARIO.
18. PROVIDE SLAB BARRIER AND SUPPORT BARS IN ACCORDANCE WITH REINFORCING STEEL INSTITUTE OF ONTARIO MANUAL.
19. ALL REINFORCEMENT SHALL BE DEFORMED BARS CONFORMING TO CSA G30.18. MINIMUM YIELD STRENGTH OF 400 MPa.
20. ALL REINFORCING STEEL SHALL HAVE MINIMUM LAP/SPLICE AS FOLLOWS:
    - DEFORMED REBAR UP TO & INCLUDING 20M: 32 BAR DIAMETERS
    - DEFORMED REBAR 25M AND OVER: 40 BAR DIAMETERS
21. PROVIDE CORNER BARS TO MATCH SIZE AND SPACING OF HORIZONTAL BARS.
22. PROVIDE DOWELS TO MATCH SIZE AND SPACING OF VERTICAL BARS.
23. CLEAR CONCRETE COVER TO REINFORCING TO BE 75mm UNLESS NOTED OTHERWISE.
24. CONSTRUCTION JOINTS SHALL BE LOCATED SO AS TO LEAST IMPAIR THE STRENGTH OF THE STRUCTURE AND TO THE APPROVAL OF THE ENGINEER.
25. INSTALL CONTINUOUS SHEAR KEY IN CONSTRUCTION JOINTS IN WALLS.
26. DESIGN, CONSTRUCT AND REMOVE FORMWORK, FRAMING SUPPORTS AND BRACING TO CONFORM TO REQUIREMENTS SPECIFIED IN CSA A23.1 AND CSA S269.1 TO PROVIDE FINISHED POURED CONCRETE SURFACES WITHIN SPECIFIED TOLERANCES.
27. FORMWORK MUST NOT BE REMOVED UNITL CONCRETE HAS ATTAINED SUFFICIENT STRENGTH TO SUSTAIN ALL LOADING IN ACCORDANCE WITH CSA A23.1. PROVIDE SHORING AND RESHORING DRAWINGS STAMPED BY PROFESSIONAL ENGINEER.
28. UNLESS OTHERWISE NOTED LEAVE ALL FORMWORK IN PLACE FOR THE FOLLOWING MINIMUM PERIODS OF TIME AFTER PLACING CONCRETE:
    - WALLS & FOOTINGS - 3 DAYS
29. REMOVE FORMWORK WHEN THE CONCRETE HAS ATTAINED 70% OF ITS DESIGN STRENGTH OR MINIMUM PERIODS NOTED ABOVE, WHICHEVER COMES LATER AND REPLACE IMMEDIATELY WITH ADEQUATE RESHORING. NO BACKFILLING TO TAKE PLACE UNTIL THE CONCRETE HAS REACHED ITS 28 DAY STRENGTH.
30. RESHORING TO REMAIN IN PLACE UNTIL CONCRETE HAS ACHIEVED FULL 28 DAY DESIGN STRENGTH AS VERIFIED BY COMPRESSIVE TEST IN ACCORDANCE WITH CSA A23.1.
31. SPACE RESHORING IN EACH PRINCIPLE DIRECTION AT NOT MORE THAN 3000mm APART.
32. RE-USE OF FORMWORK AND FALSEWORK SUBJECT TO REQUIREMENTS OF CSA A23.1.
33. WELDED WIRE FABRIC SHALL HAVE A MINIMUM YIELD STRENGTH OF 400 MPa AND SHALL CONFORM TO CSA G30.5.
34. CHAMFER ALL EXPOSED CORNERS OF CONCRETE COLUMNS, BEAMS AND WALLS 50mm UNLESS NOTED OTHERWISE.
35. ALL WALL FOOTING CONTACT SURFACES TO BE INTENTIONALLY ROUGH TO A PROFILE OF 3mm. DO NOT FLOAT THE CONTACT SURFACE SMOOTH.
36. ALL EMBEDDED METALS SHALL BE FREE OF GREASE OR ANY FOREIGN AGENT THAT MAY INHIBIT ITS BOND WITH THE CONCRETE ALL EMBEDDED METALS SHALL BE SECURELY PLACED PRIOR TO POURING CONCRETE.
37. CONTRACTOR TO CONFIRM ALL DIMENSIONS OF CONSTRUCTION WORK IN THE FIELD AND COMPARE WITH THE CONSTRUCTION DRAWINGS BEFORE ORDERING THE MATERIAL FROM MANUFACTURER / SUPPLIER. REPORT ANY DISCREPANCIES TO THE ENGINEER.
38. CONTRACTOR SHALL CONFIRM ALL FIELD MEASUREMENTS PRIOR TO FABRICATION.
39. THE FOLLOWING PROCEDURE SHALL BE USED FOR SAWCUTTING OF THE EXISTING CONCRETE HEADWALLS:
    - REMOVE SOIL FROM BEHIND WINGWALLS AND MARK SAWCUTTING LOCATIONS FOR APPROVAL.
    - CLEAN SAWCUT FACE OF ALL LOOSE DEBRIS, DIRT, GREASE & OILS.
    - CONTRACTOR TO INCLUDE COSTS IN BID SUCH THAT SIKA (OR APPROVED EQUAL) TECHNICAL SERVICE REPRESENTATIVE SHALL PROVIDE TRAINING ON THE PREPARATION AND APPLICATION OF THE PRODUCT.
    - ROUGHEN CONTACT SURFACE TO PROFILE OF 6mm.
    - REMOVE DUST PARTICLES WITH COMPRESSED AIR.
    - APPLY TWO (2) COATS OF 'SIKA TOP ARMATEC-110 EPOCEM' (OR APPROVED EQUAL) AS AN ANTI-CORROSION ON STEEL REBAR AND EXPOSED CUT FACE. ALLOW FIRST COAT TO DRY BEFORE APPLYING SECOND COAT. FOLLOW MANUFACTURER'S SPECIFICATIONS.
    - CLEAN UP AS RECOMMENDED BY THE MANUFACTURER.
40. THE FOLLOWING PROCEDURE SHALL BE USED FOR REPAIR OF THE EXISTING CONCRETE HEADWALLS LEFT IN PLACE:
    - REMOVE LOOSE AND CRACKED CONCRETE AND CHIP LIGHTLY TO EXPOSE COMPETENT AND SOUND CONCRETE SURFACE.
    - WHERE REINFORCING BARS ARE EXPOSED, CHIP AWAY 25mm OF CONCRETE LOCALLY ALL AROUND TO EXPOSE BARS IN ACCORDANCE WITH GOOD CONCRETE REPAIR PRACTICES SUCH AS ICRI GUIDELINE R310.1R.
    - REMOVE LOOSE SCALES AND GRIND TO EXPOSE CLEAN SURFACES OF BARS.
    - REMOVE DUST PARTICLES WITH COMPRESSED AIR.
    - CONTRACTOR TO INCLUDE COSTS IN BID SUCH THAT SIKA (OR APPROVED EQUAL) TECHNICAL SERVICE REPRESENTATIVE SHALL PROVIDE TRAINING ON THE PREPARATION AND APPLICATION OF THE PRODUCT.
    - REPAIR PROCEDURE TO BE DISCUSSED WITH TECHNICAL SERVICE REPRESENTATIVE AND CONFIRMED PRIOR TO STARTING REPAIR WORK.
    - APPLY TWO (2) COATS OF 'SIKA TOP ARMATEC-110 EPOCEM' (OR APPROVED EQUAL) AS AN ANTI-CORROSION ON STEEL REBARS. ALLOW EACH COAT TO DRY BEFORE APPLYING SECOND COAT. FOLLOW MANUFACTURER'S SPECIFICATIONS.
    - 'SIKA TOP ARMATEC-110 EPOCEM' (OR APPROVED EQUAL) CAN ALSO BE USED FOR BONDING NEW CONCRETE AND MORTAR TO EXISTING. APPLY 'SIKA TOP ARMATEC-110 EPOCEM' AND BEFORE IT DRIES, APPLY THE CONCRETE PATCHING REPAIR PRODUCT 'SIKA TOP 123 PLUS' (OR APPROVED EQUAL).
    - 'SIKA TOP 123 PLUS' IS DESIGNED FOR REPAIR OF OVERHEAD AND VERTICAL SURFACES. FOLLOW MANUFACTURER'S SPECIFICATIONS.
    - APPLY MORTAR BEFORE BOND COAT DRIES, THEN SCREED. FORCE PRODUCT AGAINST EDGE OF REPAIR WORKING TOWARD CENTER. ALLOW MORTAR TO REACH INITIAL SET (30-60 MINUTES AFTER PLACING AT 23°C/73°F) THEN TO MATCH THE SURROUNDING CONCRETE, FINISH WITH WOOD OR SPONGE FLOAT FOR A TEXTURED SURFACE OR FOR A SMOOTH FINISH, USE A STEEL TROWEL.
    - PROTECT THE FRESHLY APPLIED MORTAR FROM FREEZING FOR A PERIOD OF 24 HOURS.
    - CURING MUST BE MAINTAINED FOR THE FIRST 24 HOURS ONLY. PROTECT FRESHLY APPLIED MORTAR FROM DIRECT SUNLIGHT, WIND, RAIN AND FROST.
    - MINIMUM APPLICATION THICKNESS FOR SURFACES SUBJECT TO ABRASION: 3mm (1/8"). MAXIMUM APPLICATION THICKNESS FOR SURFACES SUBJECT TO ABRASION: 38mm (1-1/2"). MINIMUM AMBIENT AND SUBSTRATE TEMPERATURE: 7°C (45°F).
    - CLEAN UP AS RECOMMENDED BY THE MANUFACTURER.

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ST. JOHN'S
DEPARTMENT OF PLANNING, ENGINEERING AND REGULATORY SERVICES

PROJECT TITLE

AIRPORT HEIGHTS DRIVE CULVERT REPLACEMENT

SHEET TITLE

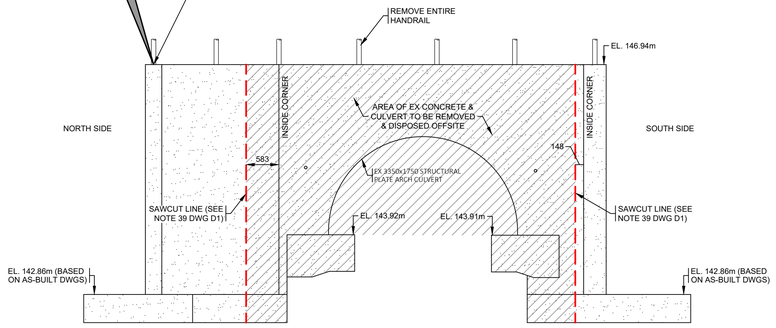
CIVIL CONSTRUCTION DETAILS - 01

PROJECT NO.

23046A

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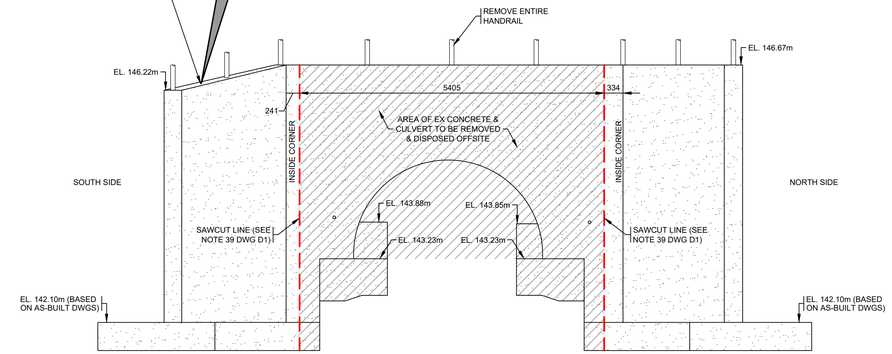




ELEVATION VIEW - U/S CONC HEADWALL - EXISTING CONDITIONS 1 D2

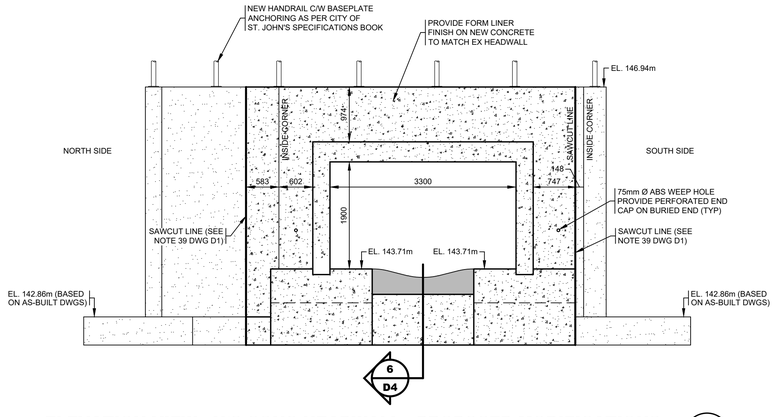
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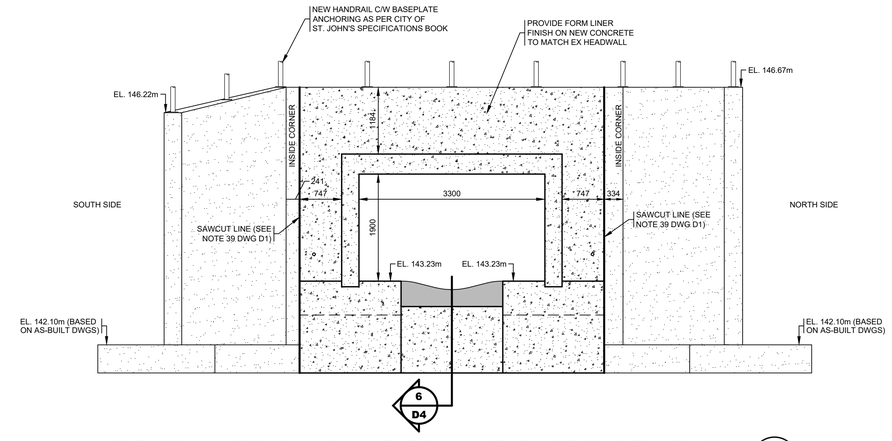
ELEVATION VIEW - D/S CONC HEADWALL - EXISTING CONDITIONS 2 D2

SCALE: 1:50



ELEVATION VIEW - U/S CONC HEADWALL - PROPOSED MODIFICATIONS 3 D2

SCALE: 1:50



ELEVATION VIEW - D/S CONC HEADWALL - PROPOSED MODIFICATIONS 4 D2

SCALE: 1:50

PINNACLE ENGINEERING

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PROJECT TITLE

AIRPORT HEIGHTS DRIVE CULVERT REPLACEMENT

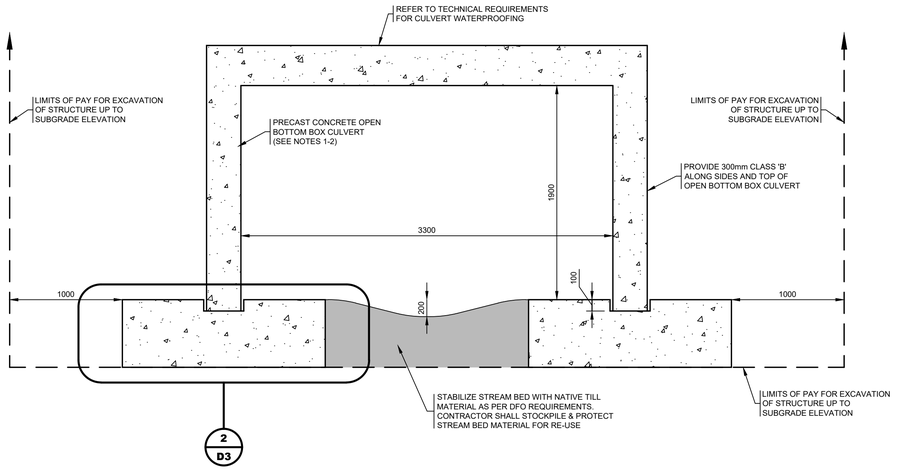
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CIVIL CONSTRUCTION DETAILS - 02

PROJECT NO.

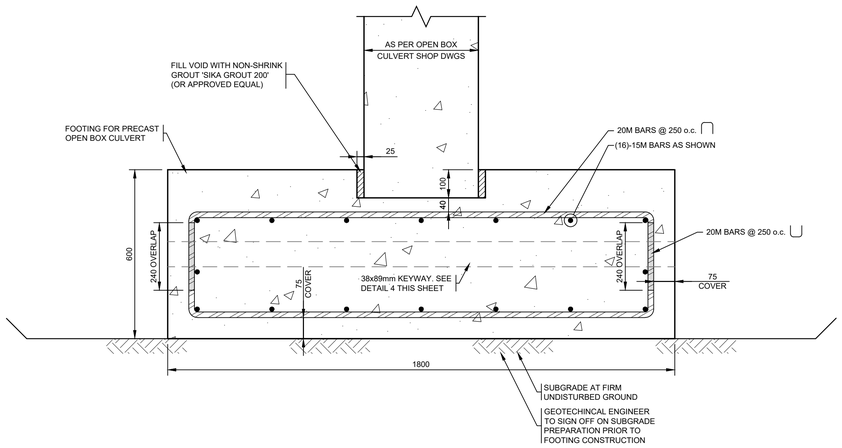
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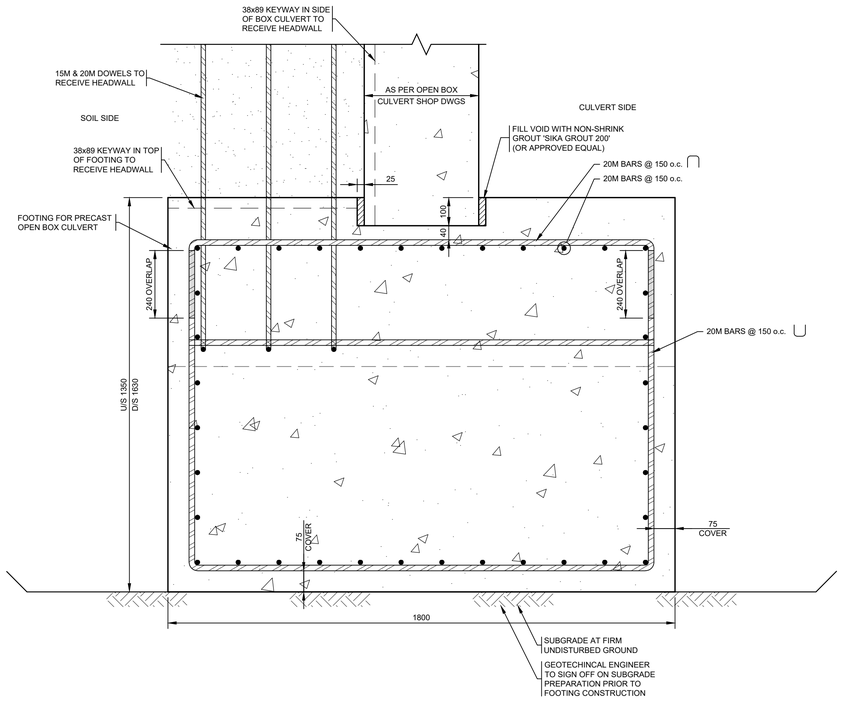
TYPICAL CULVERT CROSS-SECTION — 1 / D3

SCALE: 1:25



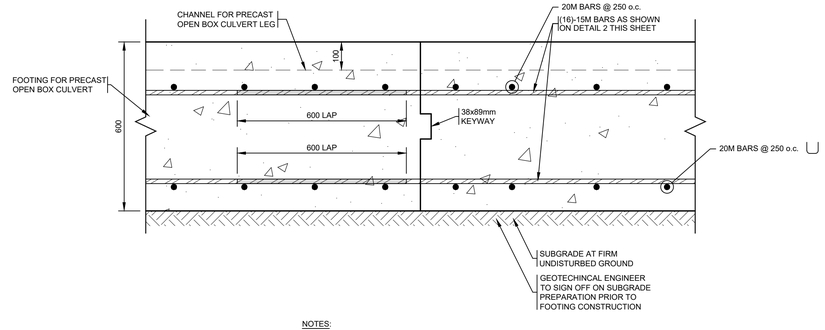
TYPICAL CULVERT FOOTING DETAIL — 2 / D3

SCALE: 1:10



CULVERT FOOTING STEPPED DOWN AT HEADWALL — 3 / D3

SCALE: 1:10



NOTES:

1. SPACING OF CONSTRUCTION JOINTS TO SUIT CONSTRUCTION SEQUENCING. SEE DWGS C3-C4 FOR CONSTRUCTION JOINT LOCATIONS.

CULVERT FOOTING CONSTRUCTION JOINT DETAIL — 4 / D3

SCALE: 1:10

PINNACLE ENGINEERING

NOTES:

1. CONTRACTOR TO PROVIDE SHOP DWGS FOR PRECAST CONCRETE OPEN BOTTOM BOX CULVERT, SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN NEWFOUNDLAND & LABRADOR.
2. PRECAST CONCRETE OPEN BOTTOM BOX CULVERT SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST EDITION OF CAN/CSA-S6-00 SECTION 7 BURIED STRUCTURES AND ASTM C1433-00A PRECAST REINFORCED BOX SECTIONS FOR CULVERTS, STORM DRAINS AND SEWERS.

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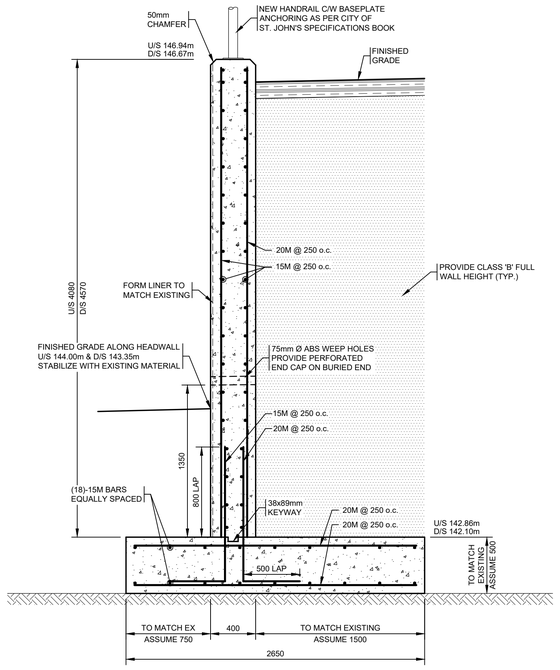
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CIVIL CONSTRUCTION
DETAILS - 03

PROJECT NO.

23046A

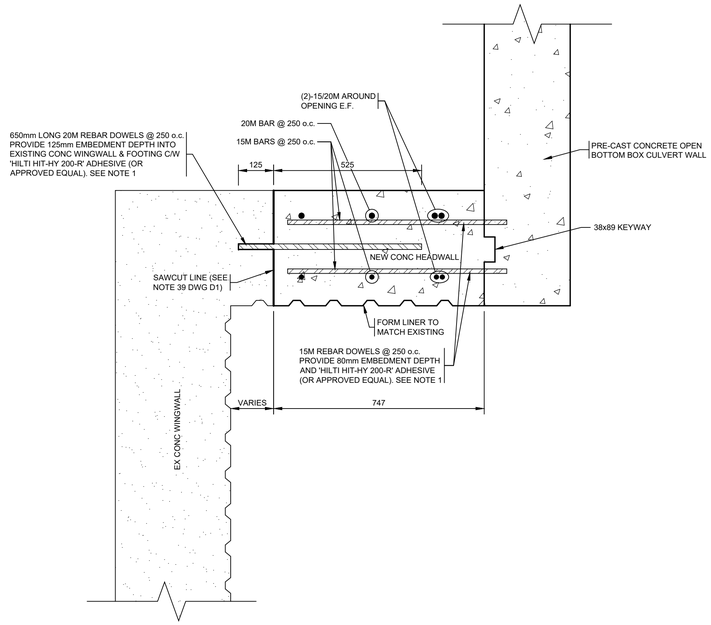
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TYPICAL HEADWALL SECTION

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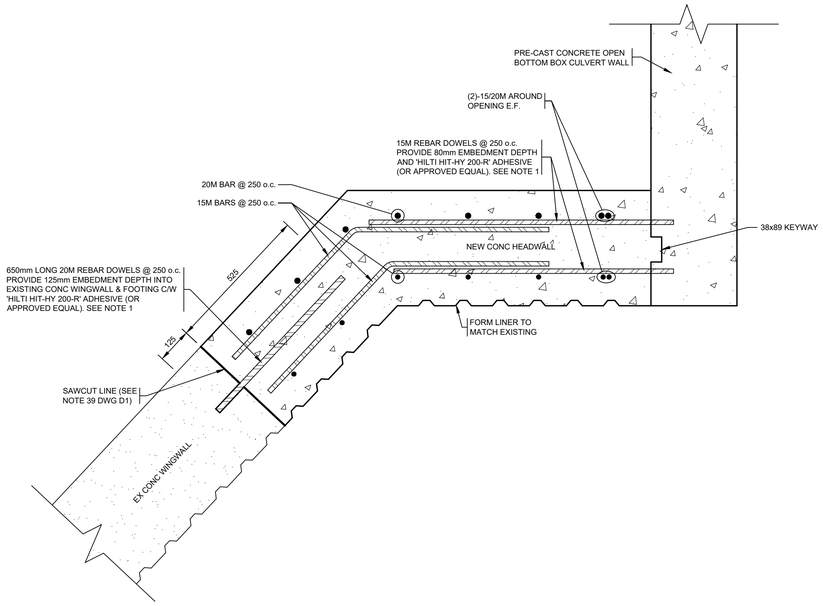
1 / D4



CULVERT WALL & HEADWALL INTERSECTION

SCALE: 1:10

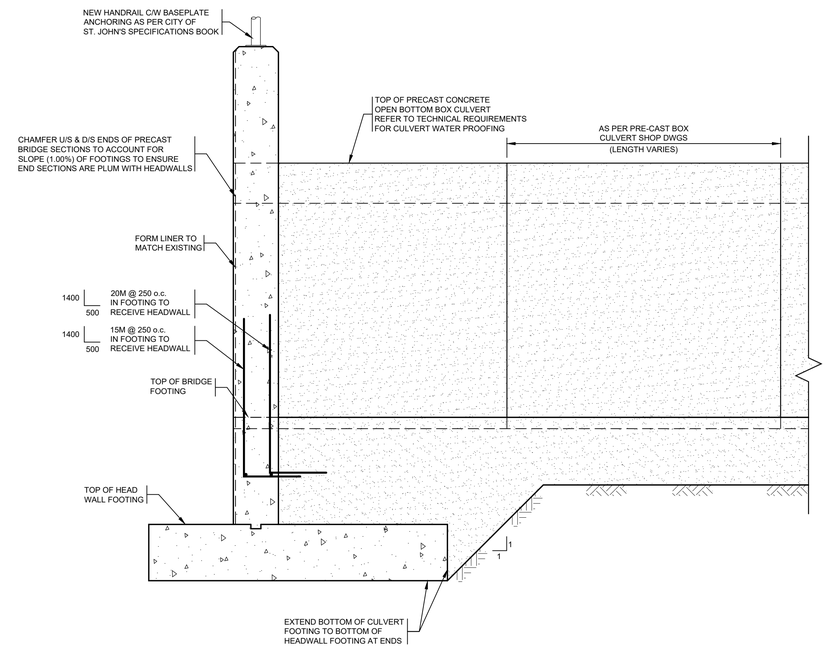
3 / D4



CULVERT WALL & HEADWALL INTERSECTION (UPSTREAM NORTH CORNER ONLY)

SCALE: 1:10

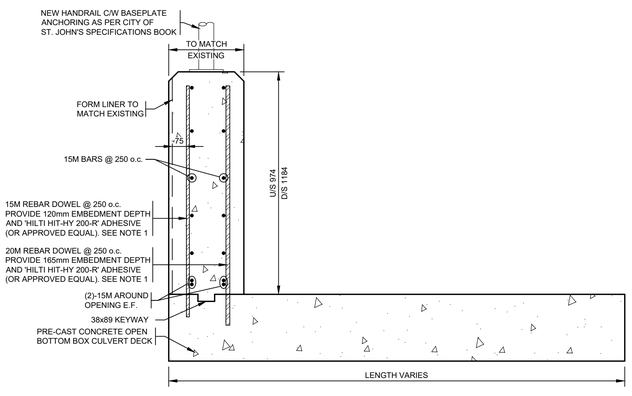
4 / D4



CULVERT / HEADWALL INTERSECTION

SCALE: 1:25

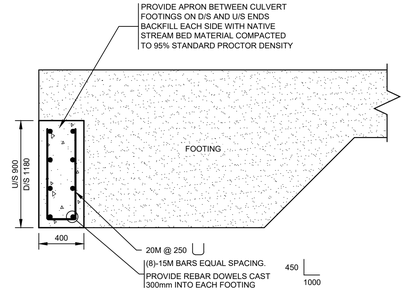
2 / D4



CULVERT DECK & HEADWALL INTERSECTION

SCALE: 1:15

5 / D4



CONCRETE APRON DETAIL

SCALE: 1:25

6 / D4

PINNACLE ENGINEERING

NOTES:

1. REFER TO HILTI SPECIFICATIONS FOR CORRECT HOLE DRILLING AND CLEANING PROCEDURES AT REBAR DOWEL LOCATIONS.

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SHEET TITLE

CIVIL CONSTRUCTION DETAILS - 04

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