

SNOWSHED REHABILITATION

GLACIER NATIONAL PARK, BRITISH COLUMBIA

KM 17.3, KM 18.8 AND KM 19.7

TRANS-CANADA HIGHWAY

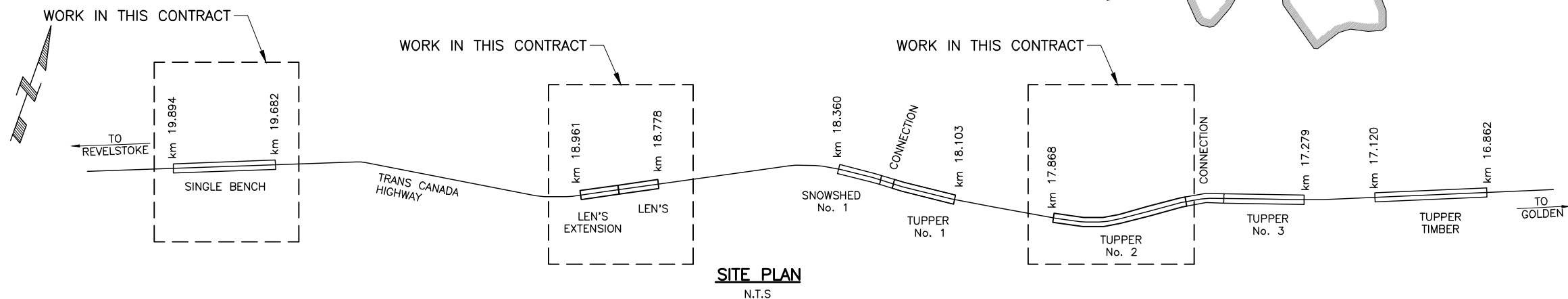
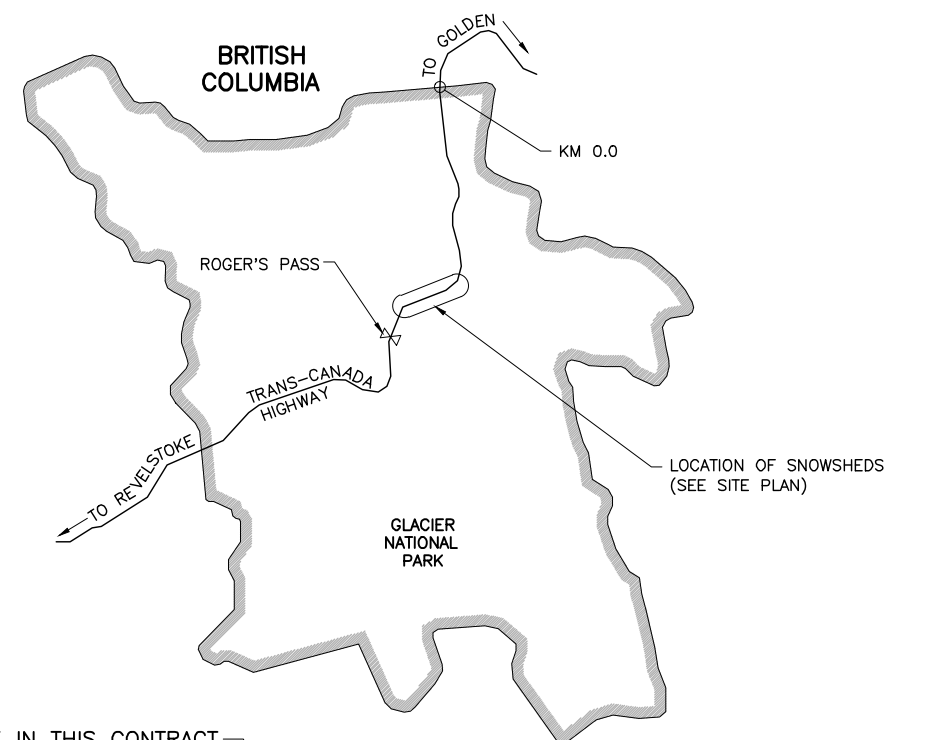
TUPPER No.2, LEN'S AND SINGLE BENCH

DRAWING LIST:

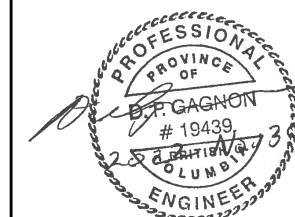
- 2290-02-100 COVER SHEET, DRAWING LIST, LOCATION MAP AND SITE PLAN
- 2290-02-101 TUPPER No.2 SNOWSHED – COLUMN REHAB LOCATION PLAN
- 2290-02-102 LEN'S SNOWSHED – COLUMN REHAB LOCATION PLAN
- 2290-02-103 SINGLE BENCH SNOWSHED – WALL PANEL REHAB LOCATION PLAN
- 2290-02-104 CONSTRUCTION SITE SETUP – LEN'S AND TUPPER No.2
- 2290-02-105 COLUMN REHAB DETAILS – LEN'S (COLUMN LINE B)
- 2290-02-106 COLUMN REHAB DETAILS – TUPPER No.2 (COLUMN LINE C)
- 2290-02-107 WALL PANEL REHAB DETAILS – SINGLE BENCH (LINE A)

REFERENCE DRAWINGS:

SEE SPECIFICATIONS



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PERMIT NUMBER 1003460 2022 NOV 30

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Revision/	Description/Description	Date/Date
B	ISSUED FOR TENDER	2022-11-30
A	ISSUED FOR TENDER	2022-10-28

Client/client	Parks Canada Agence	L'Agence Parcs Canada
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COWI

Project title/Titre du projet
SNOWSHED REHABILITATION
GLACIER NATIONAL PARK, BRITISH COLUMBIA

KM17.3, KM18.8 AND KM 19.7
TRANS-CANADA HIGHWAY
TUPPER No.2, LEN'S AND SINGLE BENCH

Approved by/Approuvé par
DPG

Designed by/Conçu par
DPG

Drawn by/Dessiné par
JAET/KECH

PWGSC Project Manager/Administrateur de Projets TPSGC

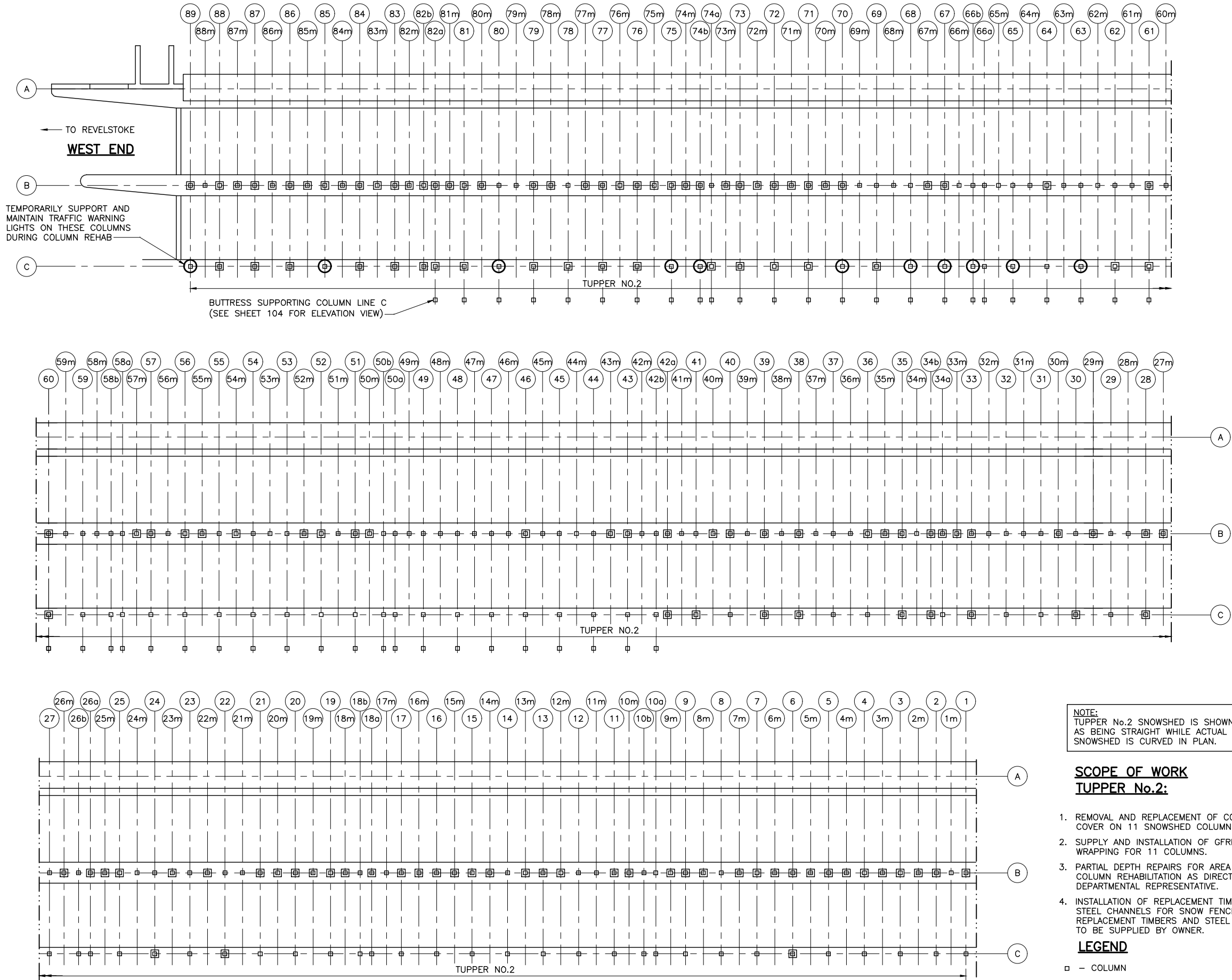
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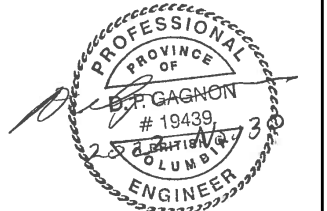
Drawing title/Titre du dessin

COVER SHEET
DRAWING LIST, LOCATION MAP
AND SITE PLAN

Project No./No. du projet	Sheet/Feuille	Revision no./ Révision
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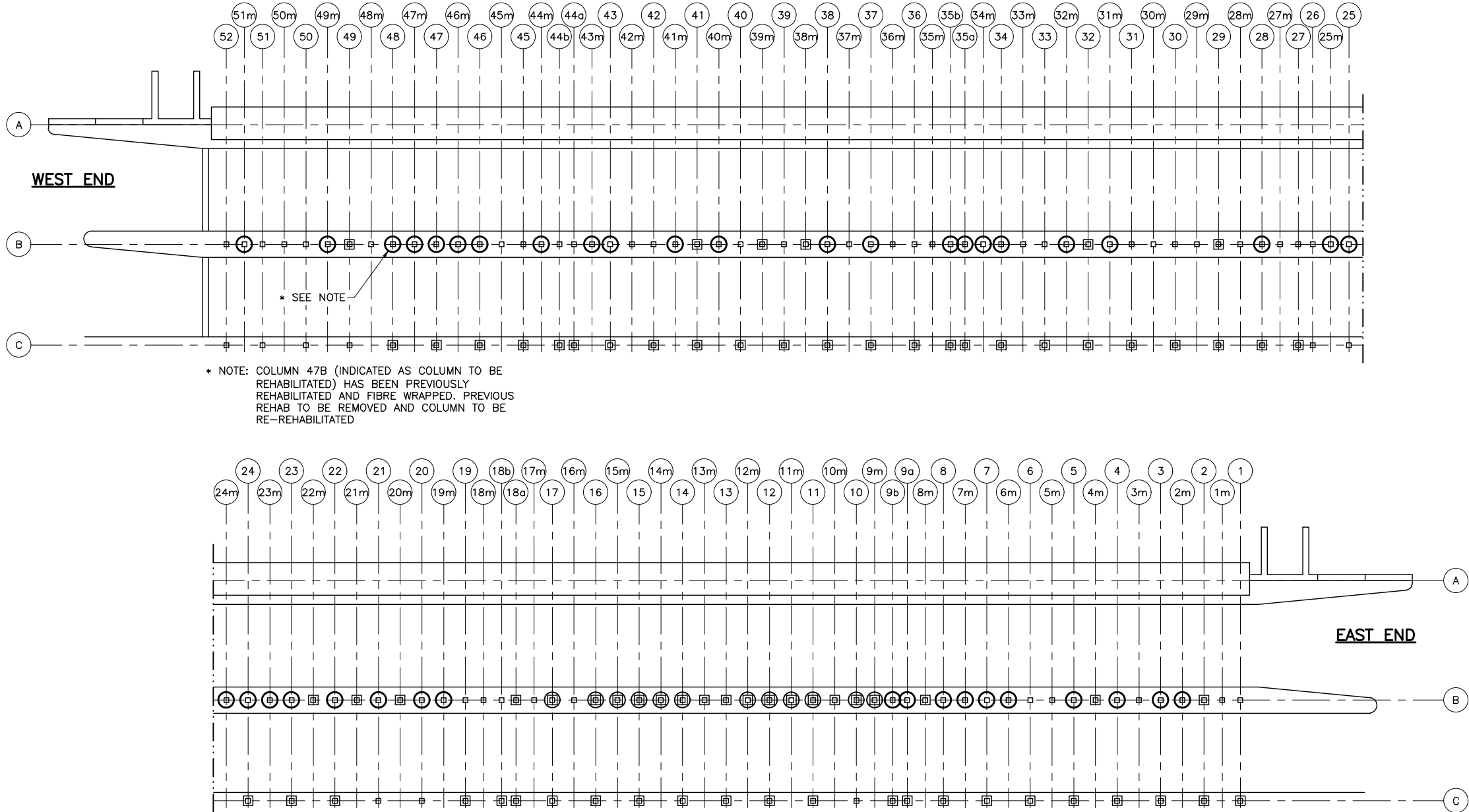
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TUPPER No.2 SNOWSHED
COLUMN REHAB
LOCATION PLAN

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
2290-02	101 OF	B

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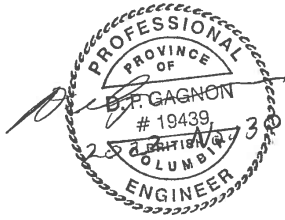
**SCOPE OF WORK:
LEN'S SNOWSHED:**

1. REMOVAL AND REPLACEMENT OF CONCRETE COVER ON 41 SNOWSHED COLUMNS.
2. INSTALLATION OF GFRP FIBRE WRAPPING FOR 53 COLUMNS. INCLUDES 12 COLUMNS WITH PREVIOUS CONCRETE REHABILITATION.
3. PARTIAL DEPTH REPAIRS FOR AREA ABOVE COLUMN REHABILITATION AS DIRECTED BY THE DEPARTMENTAL REPRESENTATIVE.
4. INSTALLATION OF REPLACEMENT TIMBERS OR STEEL CHANNELS FOR SNOW FENCE. REPLACEMENT TIMBERS AND STEEL CHANNELS TO BE SUPPLIED BY OWNER.

LEGEND

- - COLUMN
- ◻ - PREVIOUSLY REHABILITATED COLUMN
- ⊕ - COLUMN TO BE REHABILITATED (INCL. FIBRE WRAP)
- ⊞ - COLUMN TO BE FIBRE WRAPPED ONLY (PREVIOUSLY REHABILITATED)

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**KM17.3, KM 18.8 AND KM19.7
TRANS-CANADA HIGHWAY
TUPPER No.2, LEN'S AND SINGLE BENCH**

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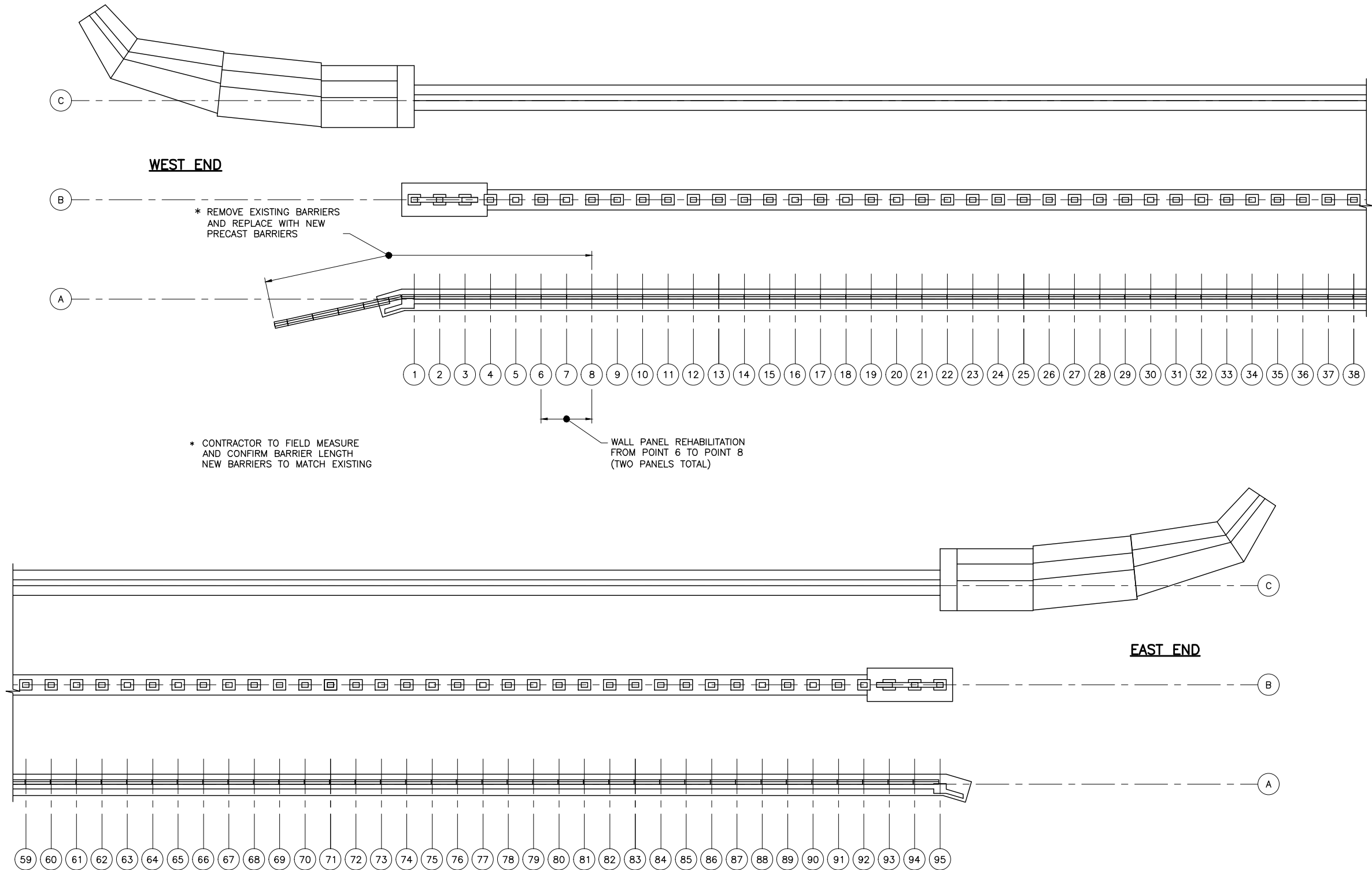
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**LEN'S SNOWSHED
COLUMN REHAB
LOCATION PLAN**

Project No./No. du projet	Sheet/Feuille no.	Revision no./ Révision no.
2290-02	102 OF	B

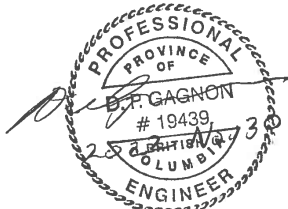
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SCOPE OF WORK:
SINGLE BENCH SNOWSHED:

- PARTIAL DEPTH WALL PANEL REHABILITATION ON 2 PRECAST WALL PANELS.
- REMOVE EXISTING BARRIERS AND REPLACE WITH NEW PRECAST BARRIERS.

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**KM17.3, KM18.8 AND KM19.7
TRANS-CANADA HIGHWAY
TUPPER No.2, LEN'S AND SINGLE BENCH**

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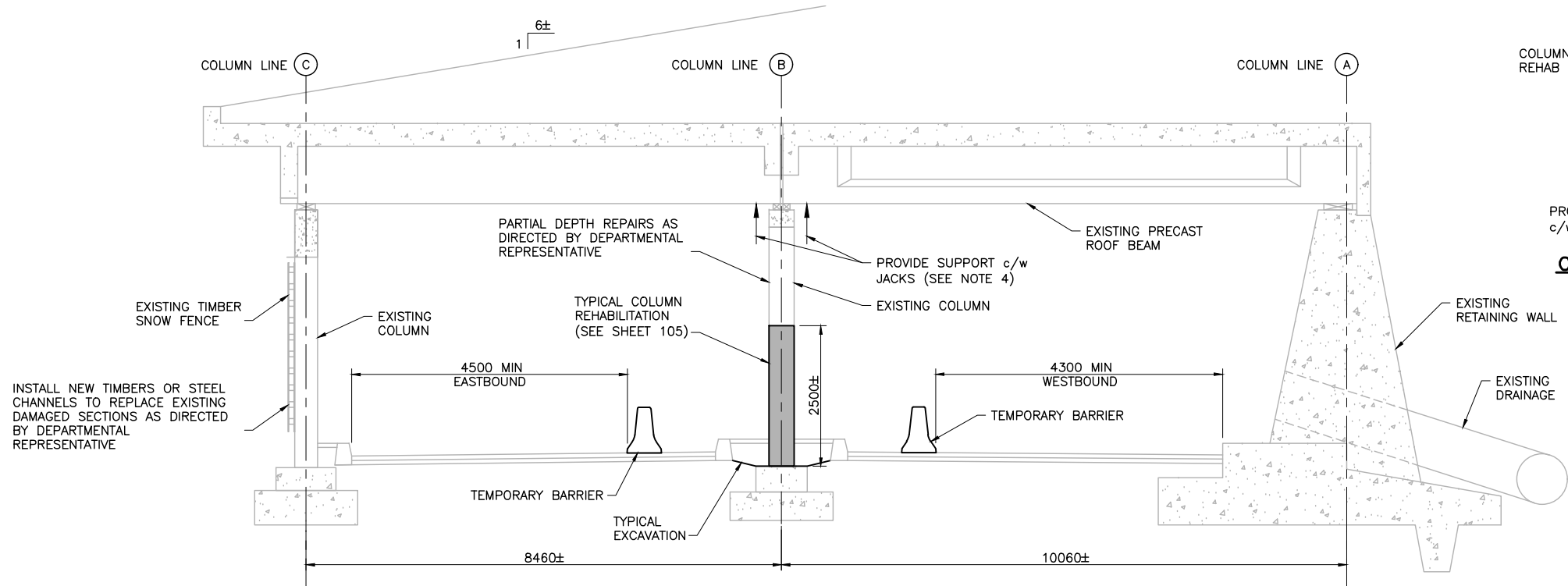
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Drawing title/Titre du dessin

**SINGLE BENCH SNOWSHED
WALL PANEL REHAB
LOCATION PLAN**

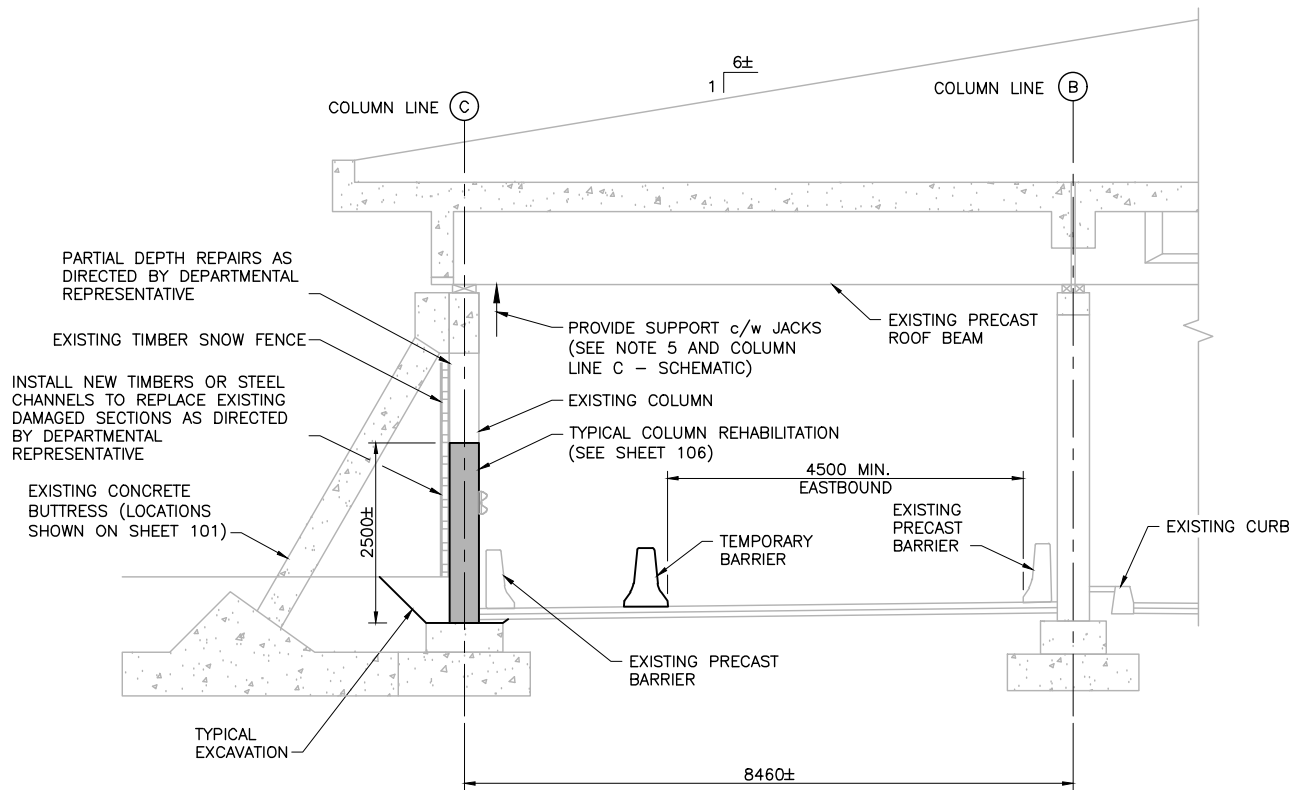
Project No./No. du projet	Sheet/Feuille no.	Revision no./ Révision no.
2290-02	103 OF	B

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SUGGESTED LANE ARRANGEMENT FOR WORKS ON COLUMN LINE B – LEN'S

1:50



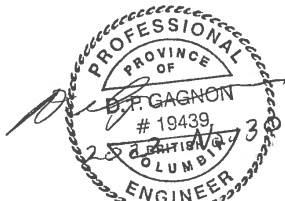
SUGGESTED LANE ARRANGEMENT FOR WORKS ON COLUMN LINE C – TUPPER No.2

1:50

NOTES:

- TEMPORARILY REMOVE AND REINSTALL CURB, BARRIERS, AND TIMBER SNOW FENCE, AS REQUIRED.
- LIGHTING FIXTURES AND CONDUIT NOT SHOWN. PROTECT EXISTING LIGHTING FIXTURES AND CONDUIT FROM DAMAGE, AS REQUIRED.
- LOCALLY REMOVE ASPHALT PAVEMENT AND EXCAVATE TO EXPOSE TOP SURFACE OF COLUMN FOUNDATIONS.
- TEMPORARY SUPPORTS FOR COLUMN LINE B REHABILITATION:
 - ARRANGEMENT AND DESIGN OF TEMPORARY SUPPORTS (COMPLETE WITH JACKS) TO MEET SPECIFIED REQUIREMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
 - PROVIDE TEMPORARY SUPPORTS TO TEMPORARILY SUPPORT THE ROOF BEAM AT EACH COLUMN UNDER REHAB. TEMPORARY SUPPORTS TO PROVIDE EQUAL SUPPORT TO THE ROOF BEAM ON EITHER SIDE OF THE COLUMN UNDER REHAB.
 - TEMPORARY SUPPORTS TO PROVIDE A MINIMUM FACTORED VERTICAL CAPACITY OF 1400kN.
 - JACK TEMPORARY SUPPORTS TO REDUCE LOAD IN COLUMN BEING REHABILITATED BY 800 kN PRIOR TO STARTING CONCRETE REMOVALS.
 - CONCRETE REPAIRS SHALL BE COMPLETE AND HAVE OBTAINED MINIMUM 25MPa CONCRETE STRENGTH PRIOR TO REDUCING LOADS ON JACKS AND REMOVING TEMPORARY SUPPORTS.
- TEMPORARY SUPPORTS FOR COLUMN LINE C REHABILITATION:
 - ARRANGEMENT OF AND DESIGN OF TEMPORARY SUPPORTS (COMPLETE WITH JACKS) TO MEET SPECIFIED REQUIREMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
 - PROVIDE TEMPORARY SUPPORTS TO TEMPORARILY SUPPORT THE ROOF BEAM AT EACH COLUMN UNDER REHAB AND THE TWO ADJACENT ROOF BEAMS (ONE ON EITHER SIDE OF THE COLUMN BEING REHABILITATED). TEMPORARY SUPPORTS TO PROVIDE EQUAL SUPPORT TO THE ROOF BEAMS ON EITHER SIDE OF THE COLUMN UNDER REHAB.
 - COLUMNS 89 AND 74b: PROVIDE TEMPORARY SUPPORTS AT ROOF BEAM AT COLUMN UNDER REHAB AND AT ONE ADJACENT ROOFBEAM ONLY (AT ROOFBEAM 88m AND 74m, FOR WORK AT COLUMNS 89 AND 74b, RESPECTIVELY).
 - TEMPORARY SUPPORTS TO PROVIDE A MINIMUM FACTORED VERTICAL CAPACITY OF 700 kN AT THE ROOF BEAM AT THE COLUMN UNDER REHAB, AND 350 kN AT EACH OF THE TWO ADJACENT ROOF BEAMS (ONE ON EITHER SIDE OF THE COLUMN BEING REHABILITATED).
 - JACK TEMPORARY SUPPORTS TO REDUCE LOAD IN COLUMN BEING REHABILITATED BY 400 kN PRIOR TO STARTING CONCRETE REMOVALS.
 - CONCRETE REPAIRS SHALL BE COMPLETE AND HAVE OBTAINED MINIMUM 25MPa CONCRETE STRENGTH PRIOR TO REDUCING LOADS ON JACKS AND REMOVING TEMPORARY SUPPORTS.
- DO NOT REHABILITATE ADJACENT COLUMNS ON A LINE CONCURRENTLY. CONCRETE REPAIRS SHALL BE COMPLETE AND HAVE OBTAINED MINIMUM 25MPa CONCRETE STRENGTH PRIOR TO STARTING JACKING FOR CONCRETE REMOVALS ON ADJACENT COLUMNS.
- INSTALL ADDITIONAL REINFORCEMENT TO SUPPLEMENT DETERIORATED REINFORCEMENT AS DIRECTED BY THE DEPARTMENTAL REPRESENTATIVE.
- COMPLETE PARTIAL DEPTH REPAIRS AS PER DEPARTMENTAL REPRESENTATIVE AND SPECIFICATIONS. SEE DETAIL ON SHEET 106.
- PLACE NEW GRANULAR MATERIAL AND REINSTATE ASPHALT SURFACE AS PER ORIGINAL STATE.
- NO REMOVAL OF EXISTING CURBS OR BARRIERS OR PROVISION OF TEMPORARY SUPPORTS ARE REQUIRED FOR THE FIBRE WRAPPING OF THE PREVIOUSLY REHABILITATED COLUMNS IN LEN'S.
- EXISTING CONCRETE BARRIERS CANNOT BE RELOCATED TO BE USED AS THE TEMPORARY BARRIER.

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GLACIER NATIONAL PARK, BRITISH COLUMBIA

KM17.3, KM18.8 AND KM19.7
TRANS-CANADA HIGHWAY
TUPPER No.2, LEN'S AND SINGLE BENCH

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PWOSC Project Manager/Administrateur de Projet TPSGC

PWOSC, Architectural and Engineering Resources Manager/
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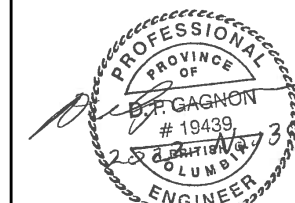
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Drawing title/Titre du dessin

CONSTRUCTION SITE SETUP
LEN'S AND TUPPER No. 2

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
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**KM17.3, KM18.8 AND KM19.3
TRANS-CANADA HIGHWAY
TUPPER No.2, LEN'S AND SINGLE B**

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DRG

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JAET/KECH

PWGSC Project Manager/Administrateur de Projets TP:

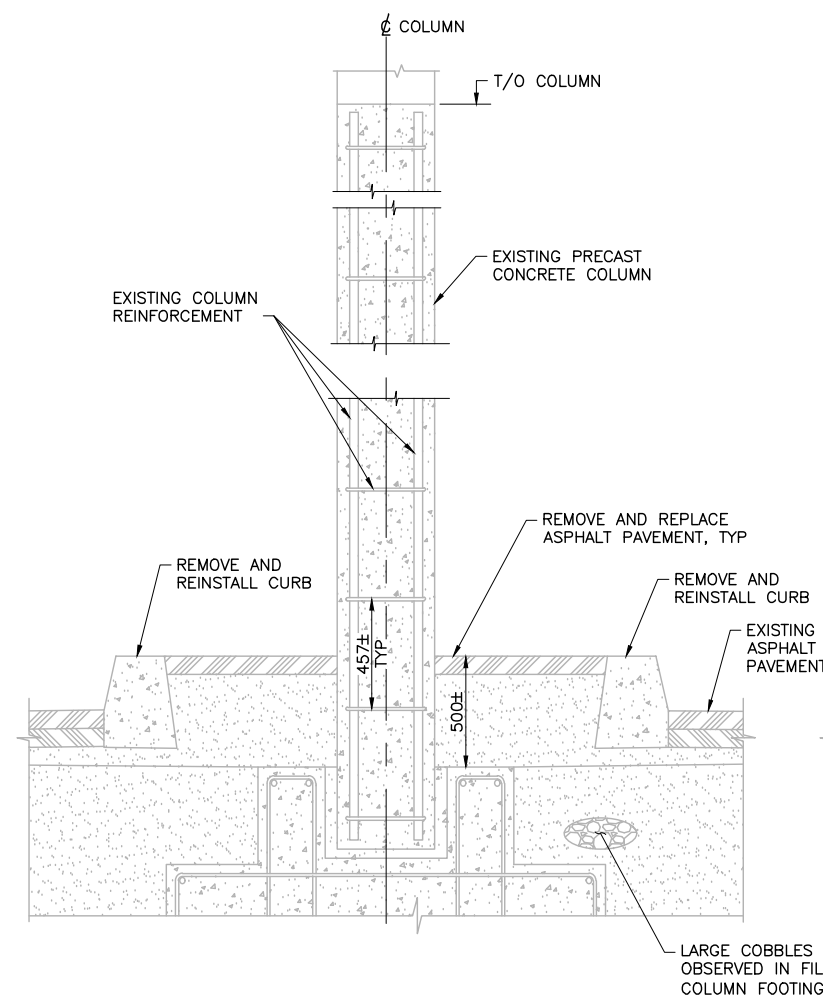
PWGSC, Architectural and Engineering Resources Manager
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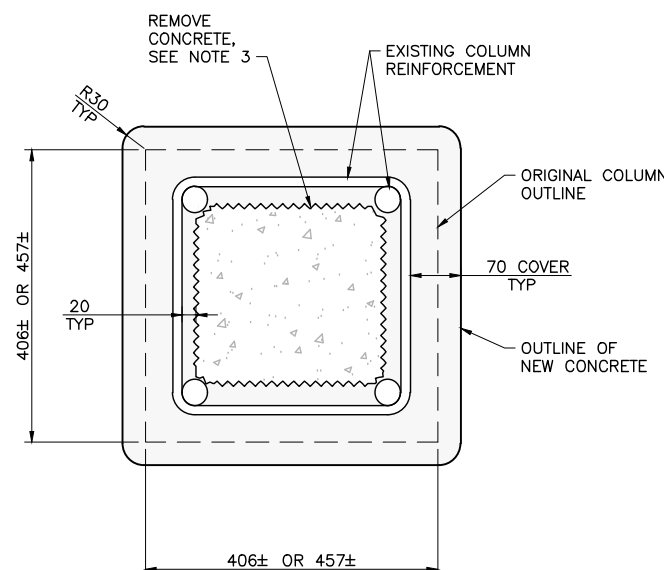
COLUMN REHAB DETAILS
LEN'S (COLUMN LINE B)

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TYPICAL SECTION (EXISTING CONDITION)

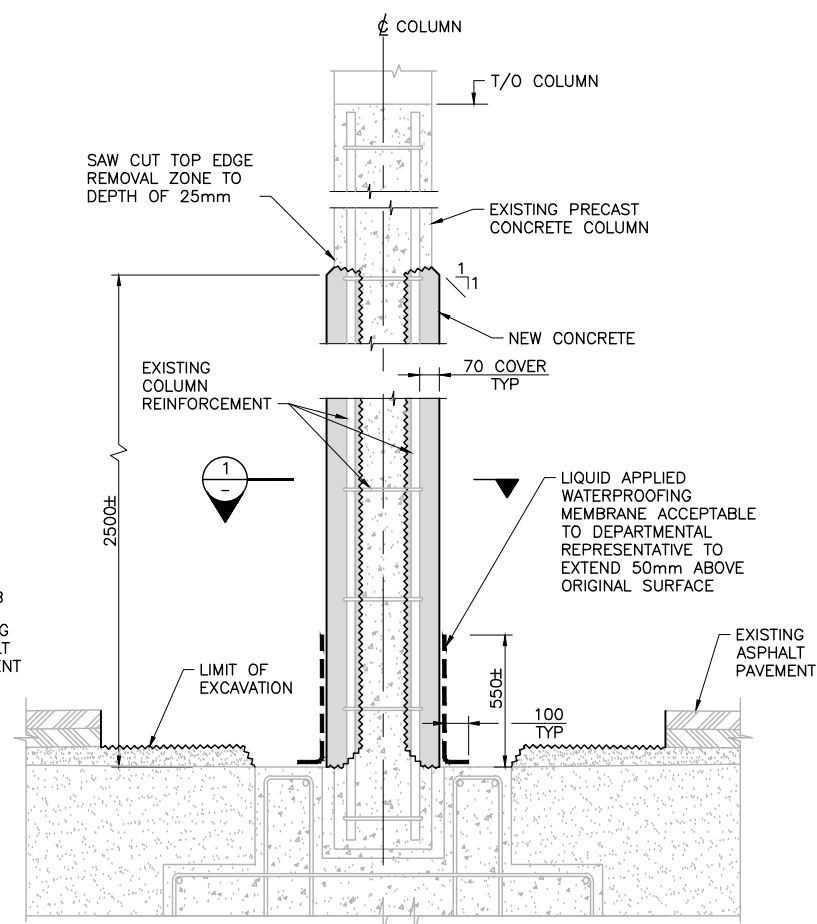
1:15
COLUMN LINE B



SECTION 1 1
1:5 - 106

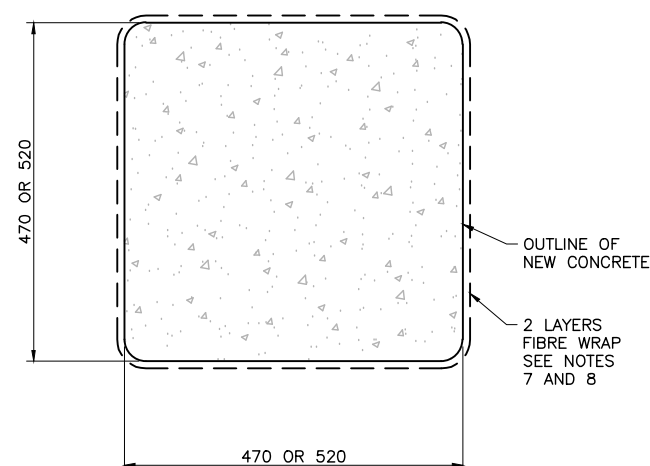
COLUMN REHAB DETAIL

- TUPPER No.2, LINE C TYP: 406±x406±
- LEN'S, LINE B TYP: 457±x457±



TYPICAL SECTION PHASE 1 (COLUMN REHAB)

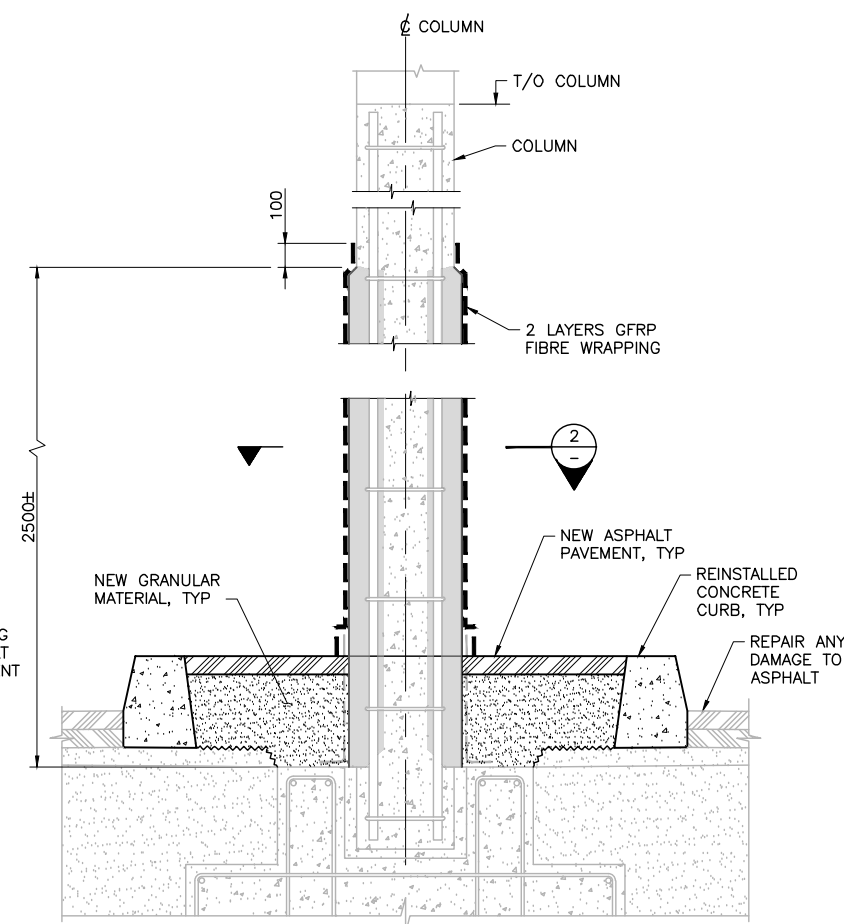
1:15
COLUMN LINE B



SECTION 2 2
1:5 - 106 SIM

FIBRE WRAPPING COLUMN DETAIL

- TUPPER No.2, LINE C TYP: 470x470
- LEN'S, LINE B TYP: 520x520



TYPICAL SECTION PHASE 2 (FIBRE WRAPPING)

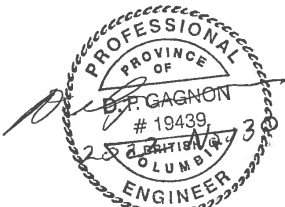
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COLUMN LINE E

(TYPICAL REHAB COLUMN SHOWN, PREVIOUSLY REHABILITATED COLUMNS SIMILAR, SEE NOTE 8)

NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. DIMENSIONS PROVIDED FOR REFERENCE ONLY. CONTRACTOR TO VERIFY ACCURACY OF SUCH INFORMATION BY FIELD MEASUREMENTS.
3. REMOVE CONCRETE TO 20mm BEHIND COLUMN TIES. CLEAN EXPOSED CONCRETE AND STEEL SURFACES AND PREPARE SURFACE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
4. CONCRETE:
 - MINIMUM COMPRESSIVE STRENGTH OF CONCRETE: 35 MPa AT 28 DAYS.
5. MINIMUM CONCRETE COVER: 70 mm.
 - CONSULT DEPARTMENTAL REPRESENTATIVE IF 70 COVER CANNOT BE ACHIEVED WITHIN THE SPECIFIED NEW OUTLINE DIMENSION OF COLUMN.
6. APPLY LIQUID WATERPROOFING IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS AT BASE OF COLUMN AS INDICATED PRIOR TO APPLYING FIBRE WRAPPING.
7. APPLY FIBRE WRAPPING IN ACCORDANCE WITH SPECIFICATIONS. FIBRE WRAPPING TO BE APPLIED NO EARLIER THAN 7 DAYS AFTER CONCRETE CASTING. CONCRETE SURFACES SHALL BE CLEANED AND BRUSHED PRIOR TO APPLYING FIBRE WRAPPING. USE EPOXY RESIN AND APPLY COATING WITH COMPATIBLE AND SUFFICIENT UV-STABILITY ADDITIVES. REINFORCEMENT SHALL BE GLASS FIBRE FABRIC. NO FIBRE ENDS SHALL PROTRUDE OUT OF THE POLYMER MATRIX.
8. PRIOR TO INSTALLATION OF FIBRE WRAPPING ON THE 12 PREVIOUSLY REHABILITATED COLUMNS IN LEN'S SNOWSHED, CONCRETE SURFACES TO BE CLEANED AND IRREGULARITIES TO BE FILLED WITH EPOXY PASTE AND DIAMOND GROUND FLUSH AFTER EPOXY SET.

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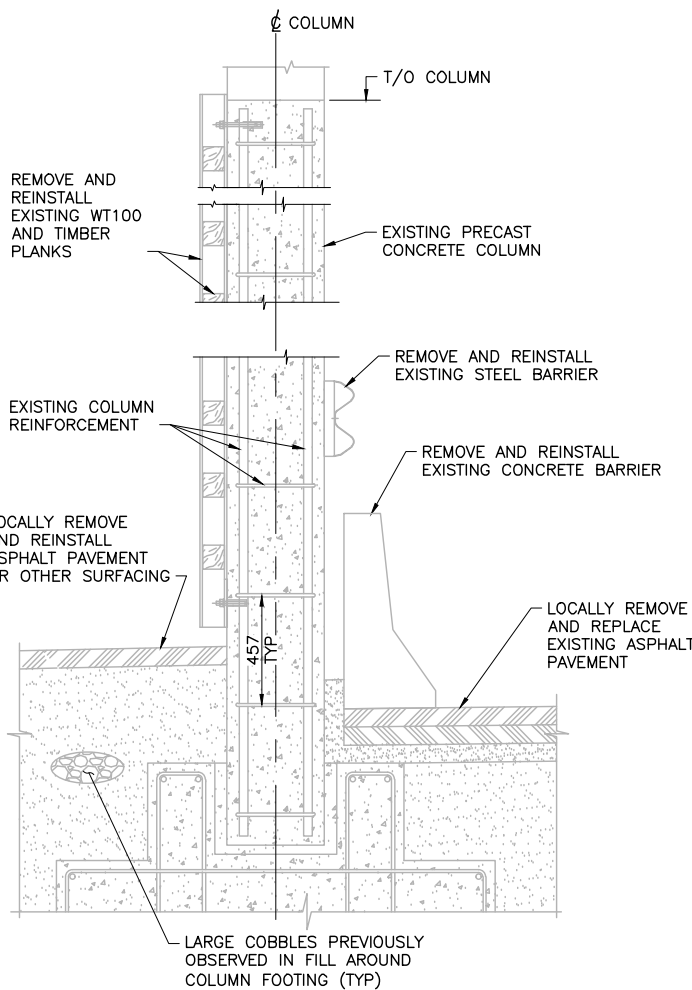
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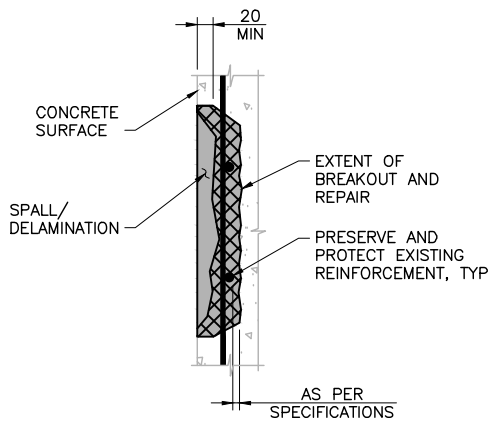
COLUMN REHAB DETAILS
TUPPER No.2 (COLUMN LINE C)

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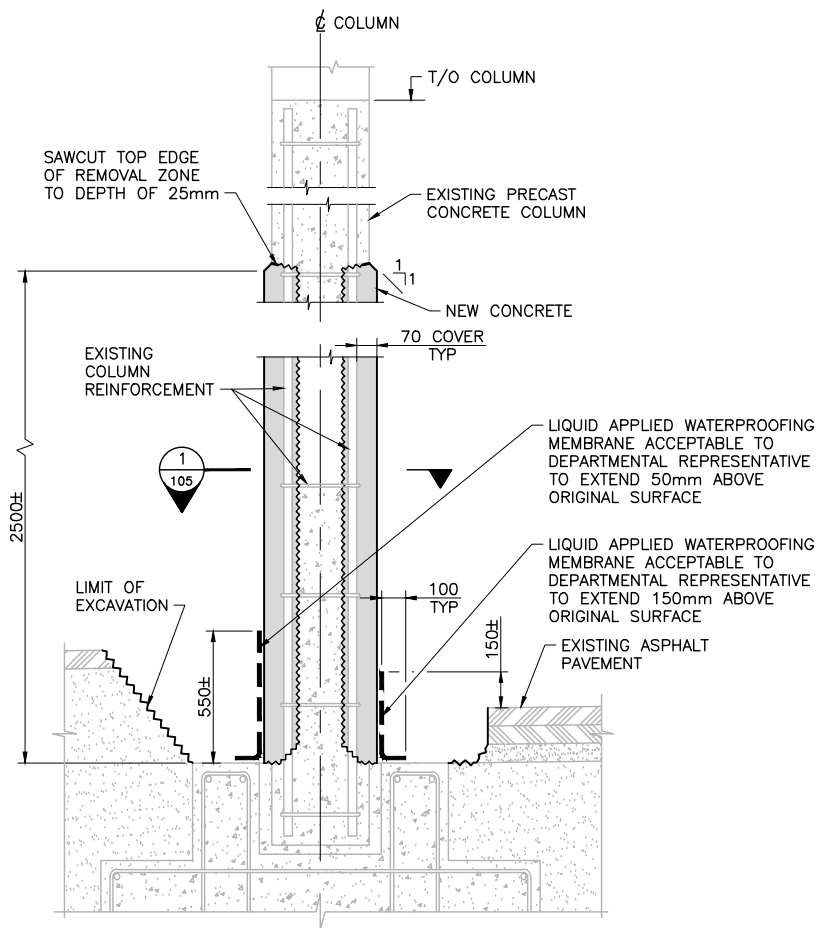
TYPICAL SECTION (EXISTING CONDITION)

1:15
COLUMN LINE C



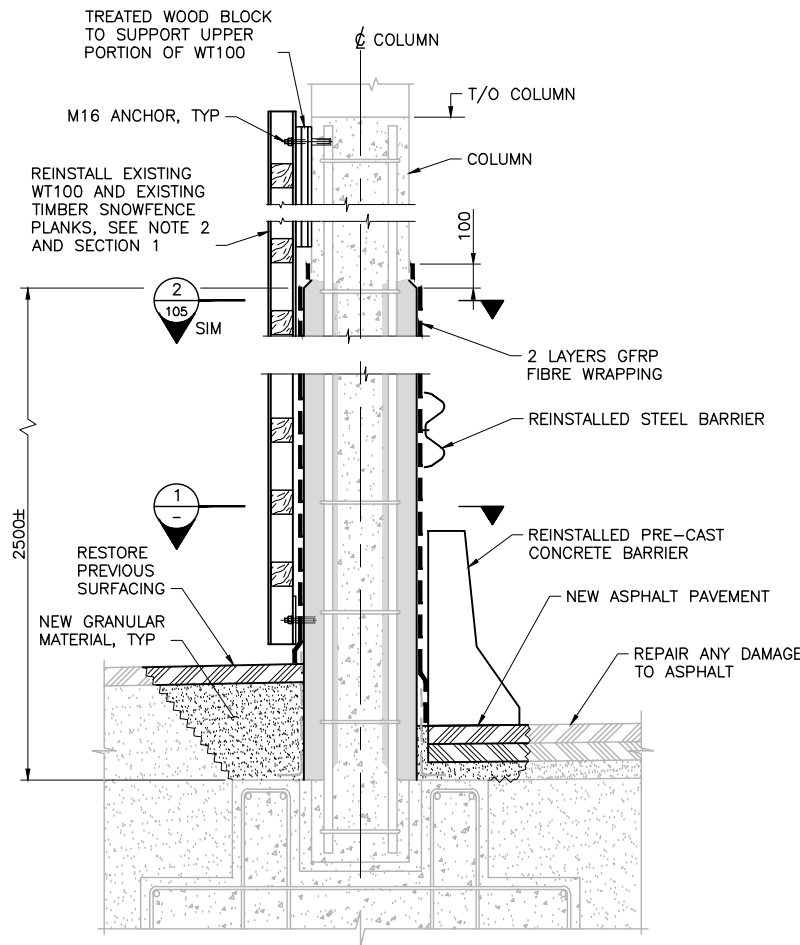
PARTIAL DEPTH CONCRETE
PATCH REPAIR DETAIL

NTS



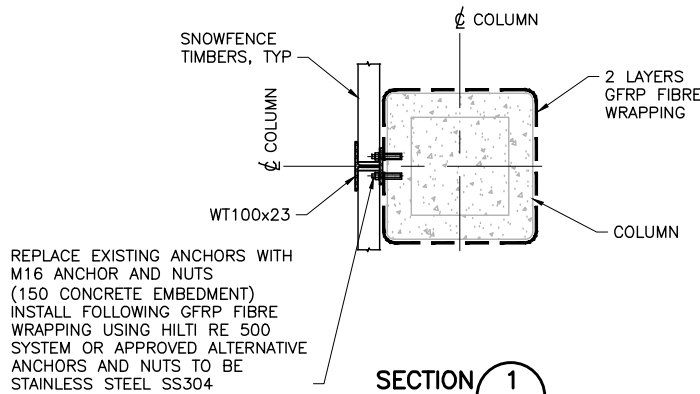
TYPICAL SECTION PHASE 1 (COLUMN REHAB)

1:15
COLUMN LINE C



TYPICAL SECTION PHASE 2 (FIBRE WRAPPING)

1:15
COLUMN LINE C

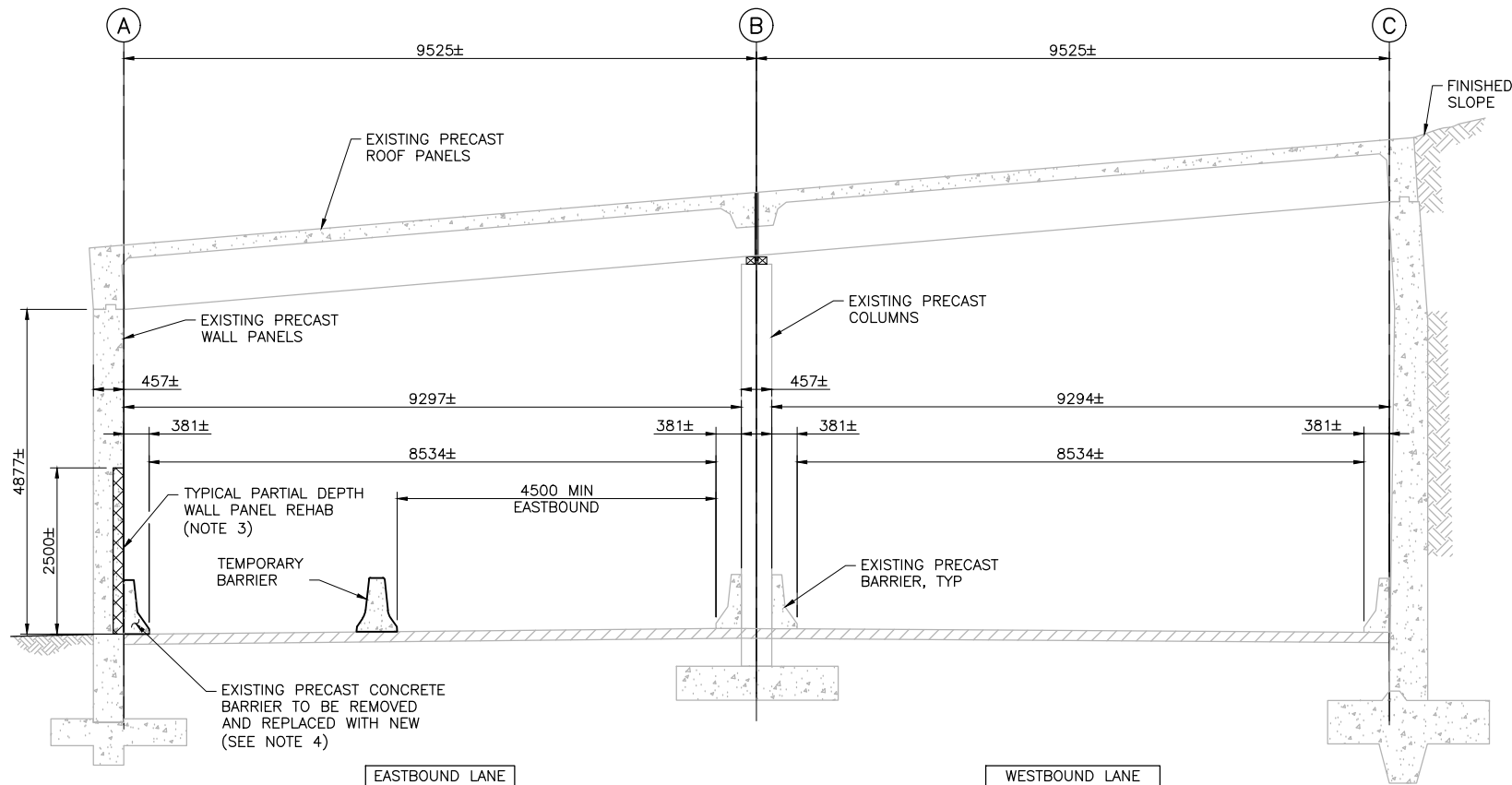


SECTION 1
1:15

NOTES:

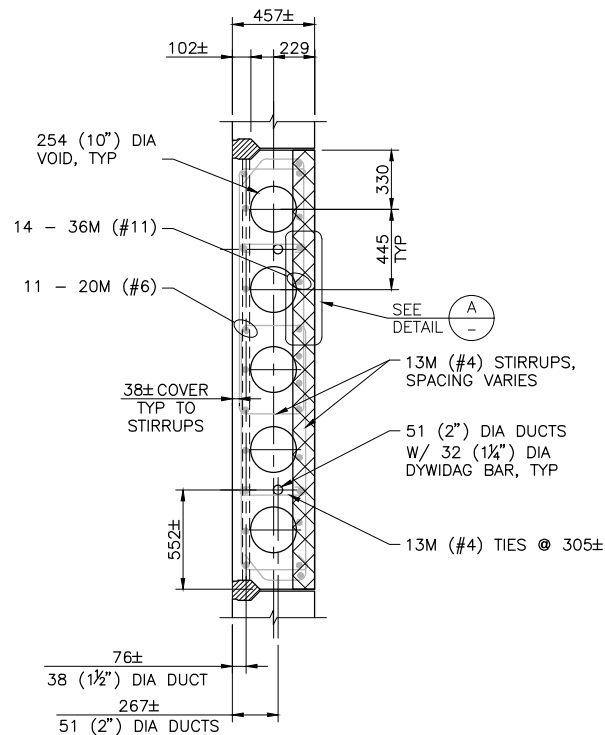
- SEE SHEET 105 FOR ADDITIONAL NOTES.
- REPLACE EXISTING TIMBER SNOWFENCE PLANKS AS DIRECTED BY DEPARTMENTAL REPRESENTATIVE.

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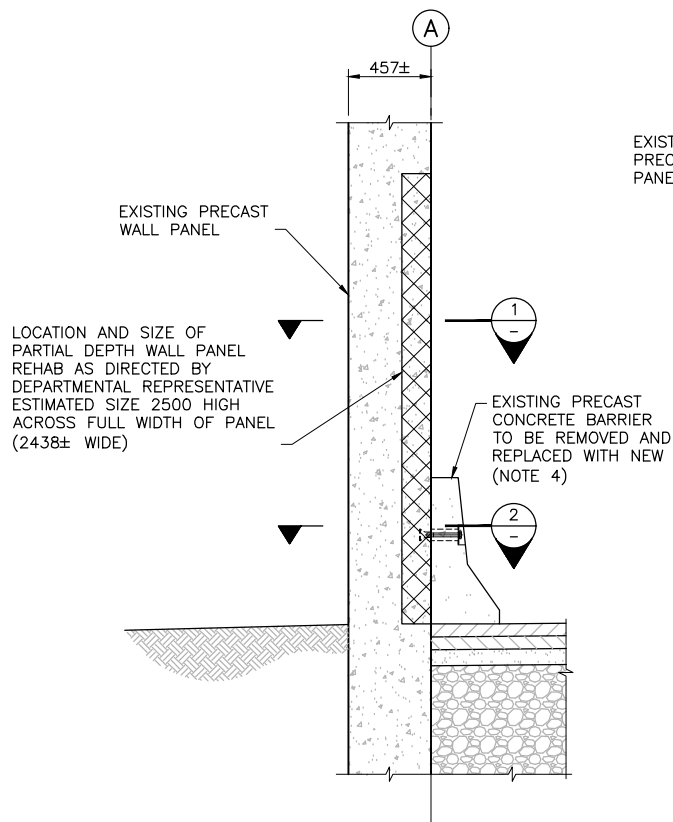
TYPICAL CROSS SECTION AND SUGGESTED LANE ARRANGEMENT FOR WALL PANEL REPAIRS (LINE A)

1:50



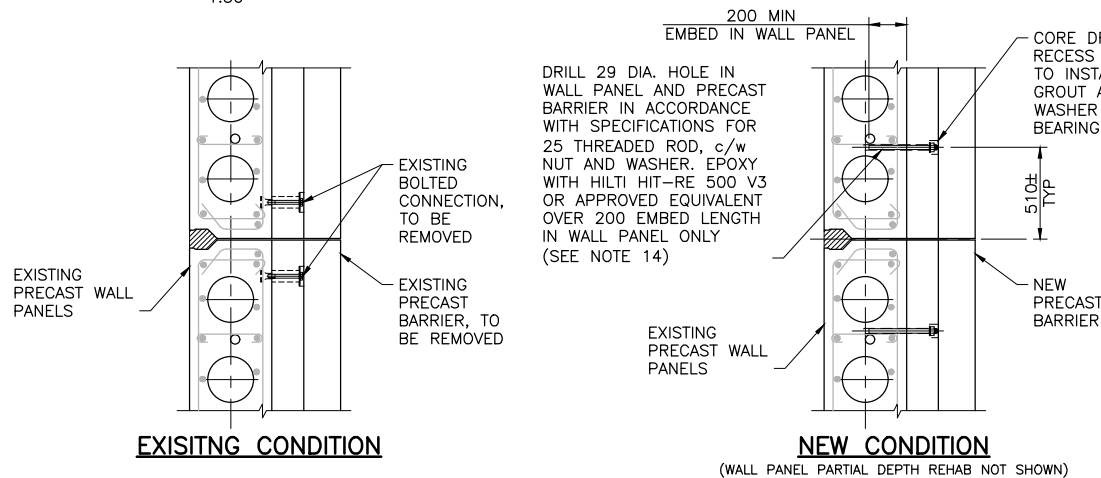
SECTION 1 - TYPICAL PRECAST WALL PANEL

1:20



TYPICAL SECTION - EXISTING CONDITION

1:20



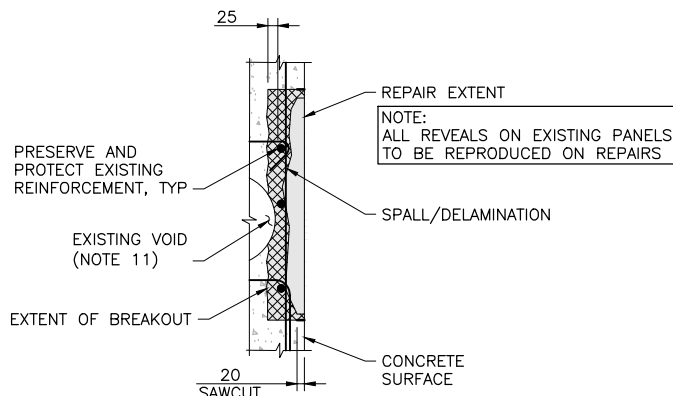
EXISTING CONDITION

NEW CONDITION

(WALL PANEL PARTIAL DEPTH REHAB NOT SHOWN)

SECTION 2 - TYPICAL BARRIER CONNECTION TO PRECAST WALL PANEL

1:20



DETAIL A - DETAIL PARTIAL DEPTH REHAB

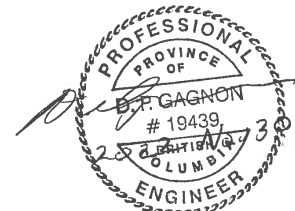
1:10

(DETAIL IS SCHEMATIC AND DOES NOT REPRESENT THE TRUE EXTENT OF THE PARTIAL DEPTH REHAB AREA, INTENT IS TO REHAB FULL WIDTH OF WALL PANEL)

NOTES:

- DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE.
- DIMENSIONS PROVIDED FOR REFERENCE ONLY. CONTRACTOR TO VERIFY ACCURACY OF SUCH INFORMATION BY FIELD MEASUREMENTS.
- ESTIMATED PANEL REHAB SHOWN. ACTUAL EXTENT OF PARTIAL DEPTH WALL PANEL REHAB AS DIRECTED BY DEPARTMENTAL REPRESENTATIVE.
- REMOVE AND REPLACE CONCRETE BARRIER AS INDICATED WITH NEW BCMOTI 810 HIGH CPB-E BARRIER WITH VARIED LENGTH. NOTE NEW BARRIERS ARE NON-STANDARD LENGTH. ALIGN BARRIER JOINTS WITH EXISTING WALL PANEL JOINTS.
- SAWCUT 20 DEPTH ALONG EDGES OF CONCRETE REMOVAL.
- MAINTAIN EXISTING REINFORCEMENT.
- TIGHTLY TIE ALL REBARS 36M (#11) TO EXISTING STIRRUPS AS SOON AS BARS ARE EXPOSED.
- MINIMUM COMPRESSIVE STRENGTH OF CONCRETE: 35 MPa AT 28 DAYS. CONCRETE TO BE SHRINKAGE-COMPENSATING.
- REPAIR CONCRETE AND METHOD OF APPLICATION SUBJECT TO APPROVAL OF DEPARTMENTAL REPRESENTATIVE.
- MINIMUM CONCRETE COVER: 38 mm (1 1/2")
- IF CONCRETE REMOVAL BREAKS INTO EXISTING VOID, FILL VOID WITH CONCRETE TO TOP OF PARTIAL DEPTH REPAIR BEFORE PLACING PARTIAL DEPTH REPAIR CONCRETE. MAXIMUM FILL HEIGHT 1m AT A TIME.
- CONSTRUCTION JOINTS TO BE CLEAN, FREE OF LAITANCE AND ROUGHENED TO AN AMPLITUDE OF 5 mm.
- THREADED ANCHOR RODS: ASTM F1554 GRADE 55, GALVANIZED.
- NO STEEL IN WALL PANEL TO BE CUT OR DAMAGED TO PLACE ANCHOR ROD.

**ISSUED FOR TENDER
NOT FOR CONSTRUCTION**



PERMIT NUMBER 1003460 2022 NOV 30

DO NOT SCALE DRAWINGS

Revision/Description	Description/Description	Date/Date
B	ISSUED FOR TENDER	2022-11-30
A	ISSUED FOR TENDER	2022-10-28

Client/client	Parks Canada Agency / L'Agence Parcs Canada
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COWI

Project title/Titre du projet
**SNOWSHED REHABILITATION
GLACIER NATIONAL PARK, BRITISH COLUMBIA**

**KM17.3, KM18.8 AND KM19.7
TRANS-CANADA HIGHWAY
TUPPER No. 2, LEN'S AND SINGLE BENCH**

Approved by/Approuvé par DPG
Designed by/Concept par TWB
Drawn by/Dessiné par MACM
PWGSC Project Manager/Administrateur de Projets TPSCG
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSCG
Client/client PCA
Drawing title/Titre du dessin

**WALL PANEL REHAB DETAILS
SINGLE BENCH (LINE A)**

Project No./No. du projet 2290-02	Sheet/Feuille 107 OF	Revision no./ La Révision no. B
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