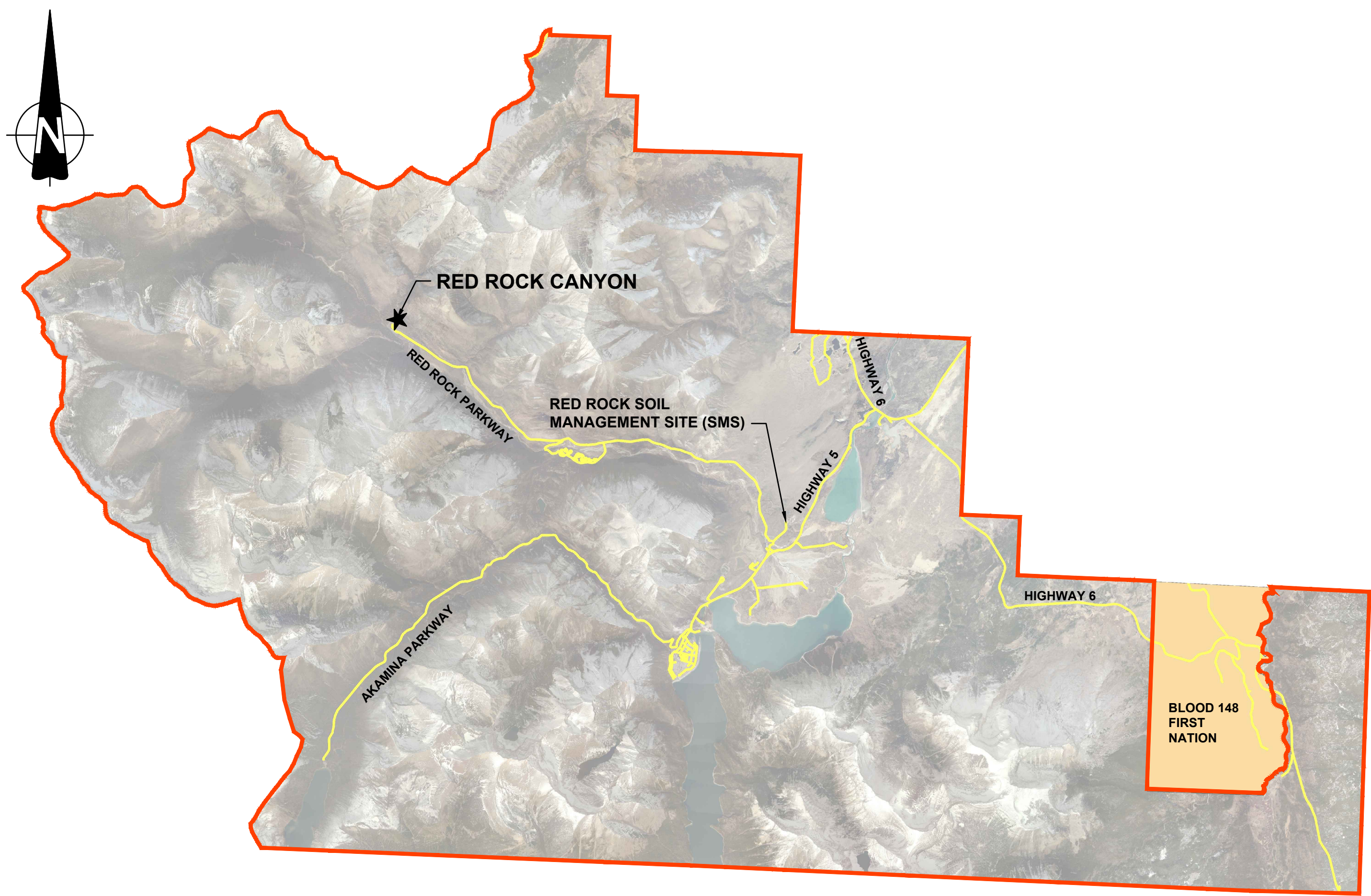


PARKS CANADA AGENCY
WESTERN AND NORTHERN REGION

RED ROCK CANYON TRAIL LOOP AND BRIDGES
WATERTON LAKES NATIONAL PARK

Project No. 2051

DRAWING LIST	
SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	OVERALL PLAN
3	REMOVAL PLAN 1 OF 3
4	REMOVAL PLAN 2 OF 3
5	REMOVAL PLAN 3 OF 3
6	PLAN 1 OF 3
7	PLAN 2 OF 3
8	PLAN 3 OF 3
9	ENLARGEMENT PLAN
DETAILS	
10	DETAIL 1 OF 4
11	DETAIL 2 OF 4
12	DETAIL 3 OF 4
13	DETAIL 4 OF 4
14	TRAIL RAILING NOTES
15	TRAIL RAILING DETAILS
BRIDGES	
16	GENERAL NOTES
UPPER BRIDGE	
17	GENERAL ARRANGEMENT
18	TYPICAL BRIDGE SECTIONS
19	ABUTMENT FOUNDATION DETAILS
20	ABUTMENT BEARING DETAILS
21	BRIDGE PIER DETAILS - STEEL ALTERNATIVE
22	BRIDGE PIER DETAILS - CONCRETE ALTERNATIVE
23	FRAMING SCHEMATICS - 1 OF 2
24	FRAMING SCHEMATICS - 2 OF 2
25	FRAME DETAILS
26	RAILING DETAILS
27	TYPICAL RAMP SECTIONS
28	RAMP PIER DETAILS
29	RAMP DETAILS
EXISTING BRIDGE MODIFICATIONS	
30	MIDDLE BRIDGE
31	LOWER BRIDGE
32	BAUERMAN CREEK BRIDGE
33	DETAILS



SITE LOCATION PLAN
NTS

ISSUED FOR TENDER
APRIL 27, 2020



Client
PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



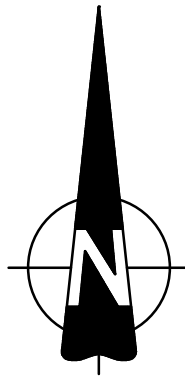
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C	number du detail	B C
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	de dessin no.	
	C detail on drawing no.	
	detail sur dessin no.	

project title
RED ROCK CANYON
TRAIL LOOP AND BRIDGES
titre du projet

drawing title
COVER SHEET
titre du dessin

designed by	I. DANCE / K. WILLIS	conçu par
drawn by	S. NEZAFATI / A. HEWITT	dessiné par
approved by	H. TROFANENKO	approuvé par
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC
scale	AS SHOWN	échelle
project no.	2051	projet no.
date	DECEMBER 2019	date
		sheet
		1
		OF 33



MIDDLE BRIDGE
EAST PLAZA

UPPER BRIDGE

1
6 PLAN 1A

2
6 PLAN 1B

1
7 PLAN 2

MIDDLE BRIDGE

MIDDLE BRIDGE
EAST PLAZA

1
8 PLAN 3A

2
8 PLAN 3B

LOWER BRIDGE

BAUERMAN CREEK BRIDGE

GENERAL NOTES:

1. CONFIRM ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS OR COMMENCING FABRICATION.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
4. ALL MATERIALS USED IN THE WORK SHALL BE NEW.
5. TAKE ALL REASONABLE AND NECESSARY STEPS TO PREVENT MATERIALS FROM ENTERING THE WATERCOURSE.
6. RESTORE ANY DAMAGE TO ACCESS ROUTES OR SURROUNDING AREA AFTER CONSTRUCTION IS COMPLETE.

DEMOLITION AND REMOVAL NOTES:

1. ALL ITEMS NOTED FOR DEMOLITION OR REMOVAL TO BE DISPOSED OF OFF SITE AT THE CONTRACTORS EXPENSE, UNLESS OTHERWISE INDICATED.
2. ALL ITEMS NOTED FOR SALVAGING TO BE STOCKPILED AND PROTECTED ON SITE IN A LOCATION TO BE REVIEWED AND CONFIRMED WITH THE DEPARTMENTAL REPRESENTATIVE.
3. ALL RELOCATIONS SHALL BE COMPLETED TO THE SATISFACTION OF PARKS CANADA AND THE DEPARTMENTAL REPRESENTATIVE. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER. SEE REHABILITATION AND GRUBBING NOTES FOR DIRECTION.
4. ALL TREES ON SITE TO BE PROTECTED DURING CONSTRUCTION.

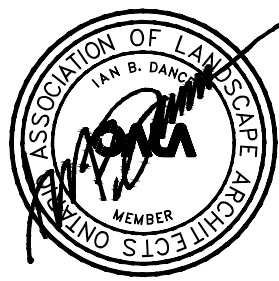
REHABILITATION AND GRUBBING

1. ALL EXISTING STRIPPED NATIVE SOIL AND VEGETATION (SOD, GRASSES) SHALL BE SALVAGED, STOCKPILED AND PROTECTED ON SITE FOR RE-USE IN AREAS REQUIRING RESTORATION.
2. EXISTING SALVAGED VEGETATIVE MATERIAL MUST NOT BE SCREENED OF ANY EXISTING SOIL. KEEP VEGETATIVE MATERIAL AND NATIVE SOILS INTACT AND STOCKPILE AS NOTED ABOVE.
3. UPON COMPLETION OF ALL SITE WORKS, CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITH THE SALVAGED VEGETATION AND SOILS.
4. CONTRACTOR TO ENSURE VEGETATION DOES NOT DRY OUT, AND SUPPLY ADEQUATE WATER TO VEGETATION THROUGHOUT CONSTRUCTION.



Client: **PARKS CANADA AGENCY**
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



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REVISIONS	DESCRIPTION	DATE

A	detail number	A
C	number du detail	B C
	B source drawing no.	
	de dessin no.	
	C detail on drawing no.	
	detail sur dessin no.	

project title **RED ROCK CANYON**
TRAIL LOOP AND BRIDGES

drawing title **OVERALL PLAN**

designed by	I. DANCE	conçu par
drawn by	S. NEZAFATI	dessiné par
approved by	H. TROFANENKO	approuvé par
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC

scale	AS SHOWN	échelle	sheet	2
project no.	2051	projet no.	OF	33
date	DECEMBER 2019	date		

OVERALL PLAN
1:1000



FIGURE 1 - PICNIC AREA



FIGURE 2 - STONE FEATURES



FIGURE 3 - ROCK STAIRWAY



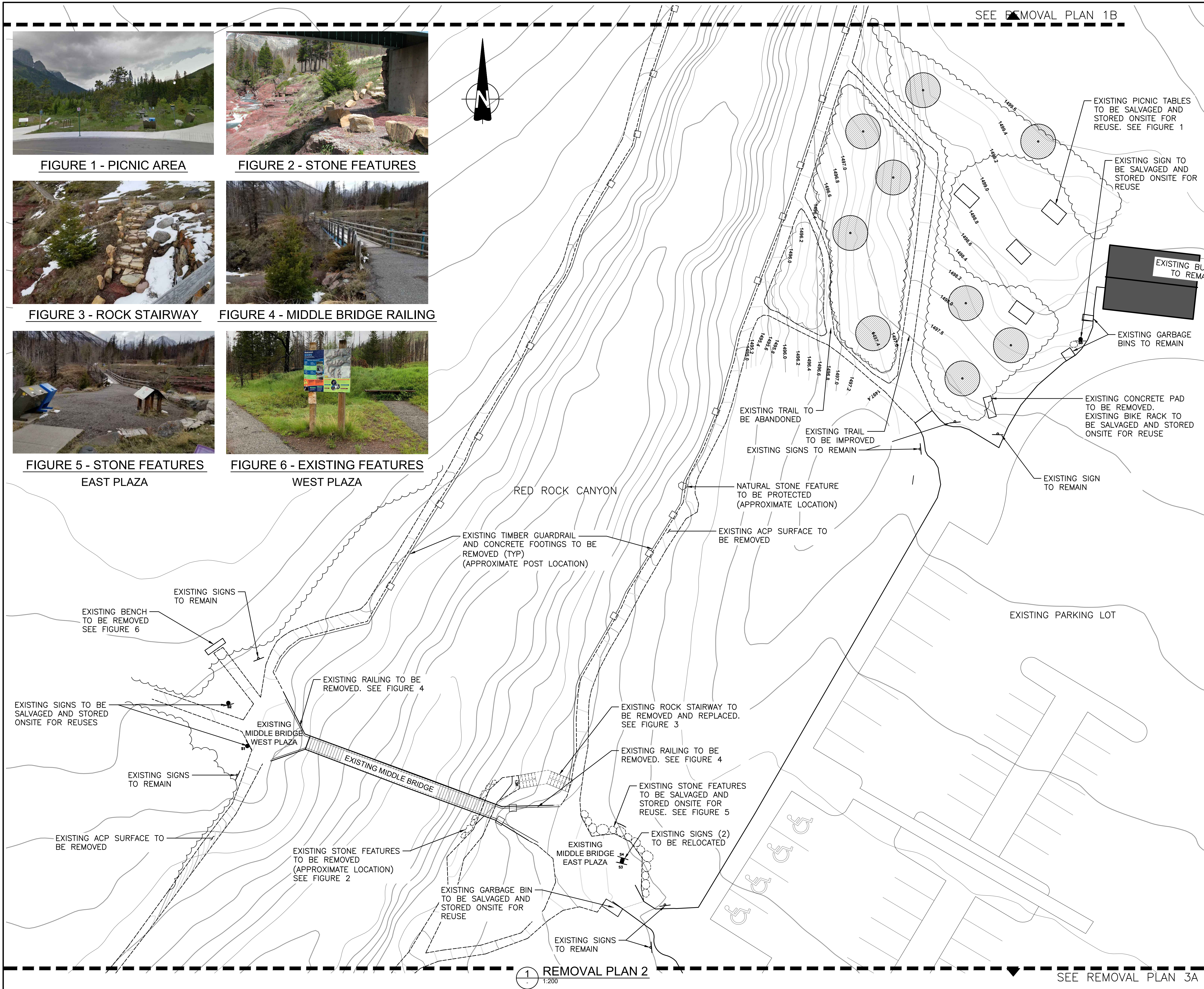
FIGURE 4 - MIDDLE BRIDGE RAILING




FIGURE 5 - STONE FEATURES
EAST PLAZA




FIGURE 6 - EXISTING FEATURES
WEST PLAZA





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PROJECT DELIVERY SERVICES WEST

Client
WATERTON LAKES NATIONAL PARK



DILLON
CONSULTING

LEGEND

- EXISTING RAILING
- - - EXISTING PAVING TO REMOVE
- ACP
- ▨ EXISTING NATURAL STONE SURFACE TO PROTECT
- EXISTING STONE FEATURE TO REMAIN AND PROTECT
- EXISTING STONE FEATURE TO REMOVE AND SALVAGE
- ▨ EXISTING STONE WALL
- EX SIGN TO REMAIN AND PROTECT
- EX SIGN TO BE REMOVED/RELOCATED
- ▨ EXISTING TIMBER EDGE
- EXISTING TREE TO REMAIN AND PROTECT

0 ISSUED FOR TENDER 2020.04.27

REVISIONS	DESCRIPTION	DATE
A	detail number number du detail	
B	source drawing no. de dessin no.	
C	detail on drawing no. detail sur dessin no.	

project title **RED ROCK CANYON TRAIL LOOP AND BRIDGES** titre du projet

drawing title **REMOVAL PLAN 2 OF 3** titre du dessin

designed by **I. DANCE** conçu par

drawn by **S. NEZAFATI** dessiné par

approved by **H. TROFANENKO** approuvé par

PCA Project Manager **M. VILLENEUVE** Administrateur de Projets APC

scale **1:200** échelle sheet **4** feuille

project no. **2051** projet no.

date **DECEMBER 2019** date

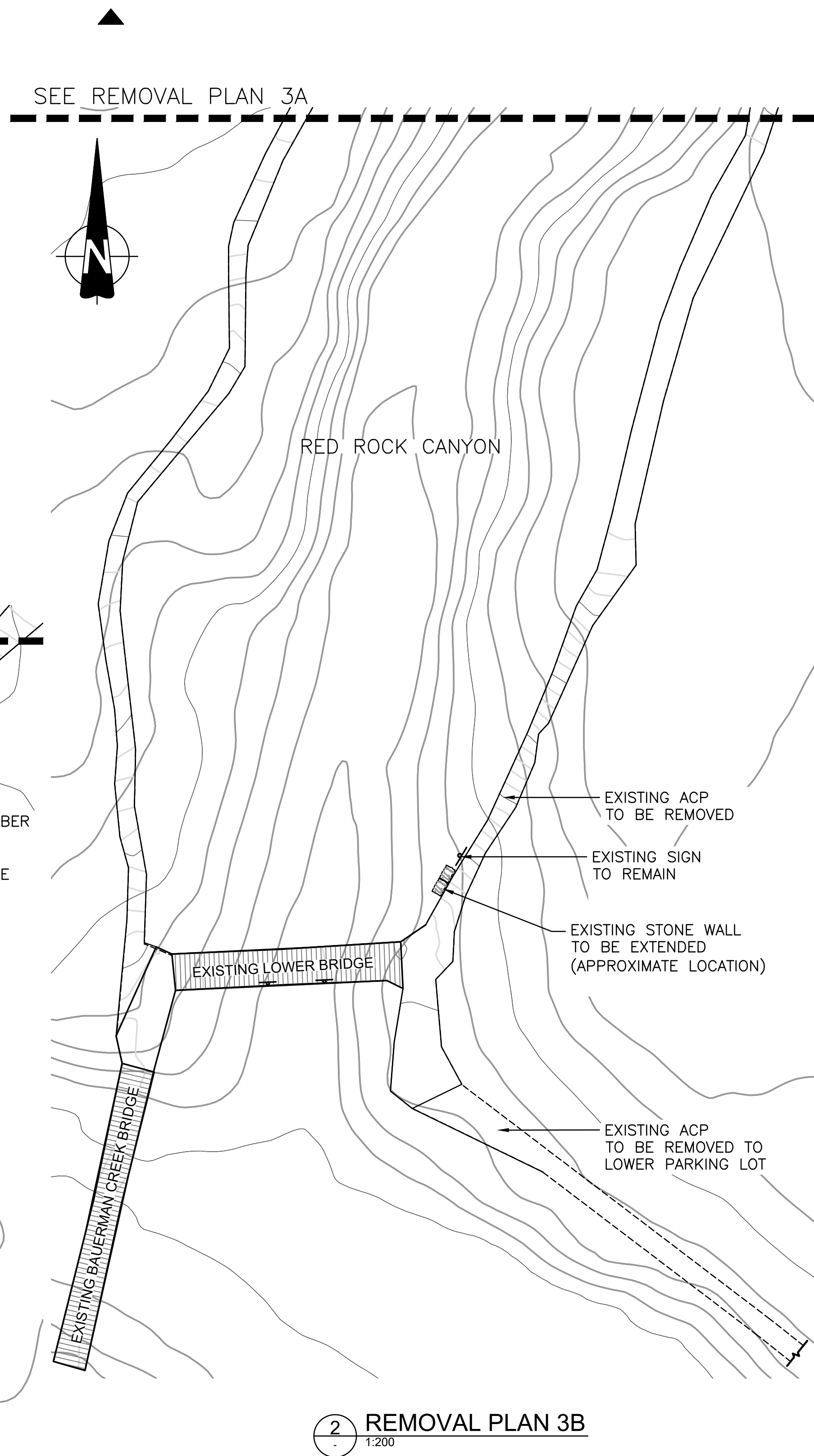
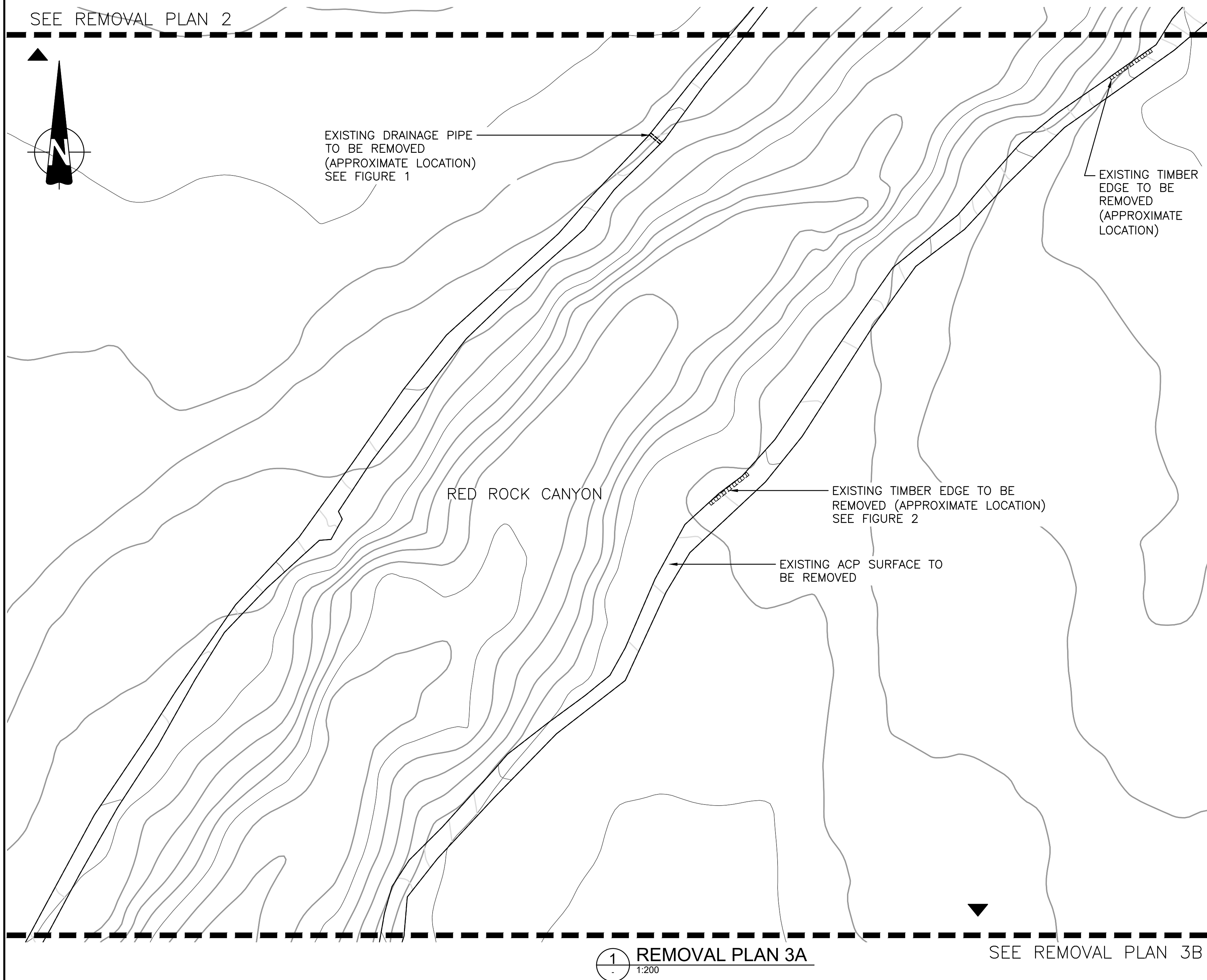
OF 33



FIGURE 1 - DRAINAGE PIPE



FIGURE 2 - TIMBER EDGE



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PROJECT DELIVERY SERVICES WEST

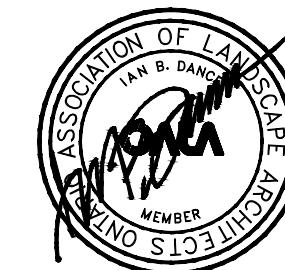
WATERTON LAKES NATIONAL PARK

Client



LEGEND

- EXISTING RAILING
- EXISTING PAVING TO REMOVE
- ACP
- EXISTING NATURAL STONE SURFACE TO PROTECT
- EXISTING STONE FEATURE TO REMAIN AND PROTECT
- EXISTING STONE FEATURE TO REMOVE AND SALVAGE
- EXISTING STONE WALL
- EX SIGN TO REMAIN AND PROTECT
- EX SIGN TO BE REMOVED/RELOCATED
- EXISTING TIMBER EDGE
- EXISTING TREE TO REMAIN AND PROTECT



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	de dessin no.	
	detail on drawing no.	
	detail sur dessin no.	

project title
RED ROCK CANYON
TRAIL LOOP AND BRIDGES
titre du projet

drawing title
REMOVAL PLAN 3 OF 3
titre du dessin

designed by
I. DANCE
conçu par

drawn by
S. NEZAFATI
dessiné par

approved by
H. TROFANENKO
approuvé par

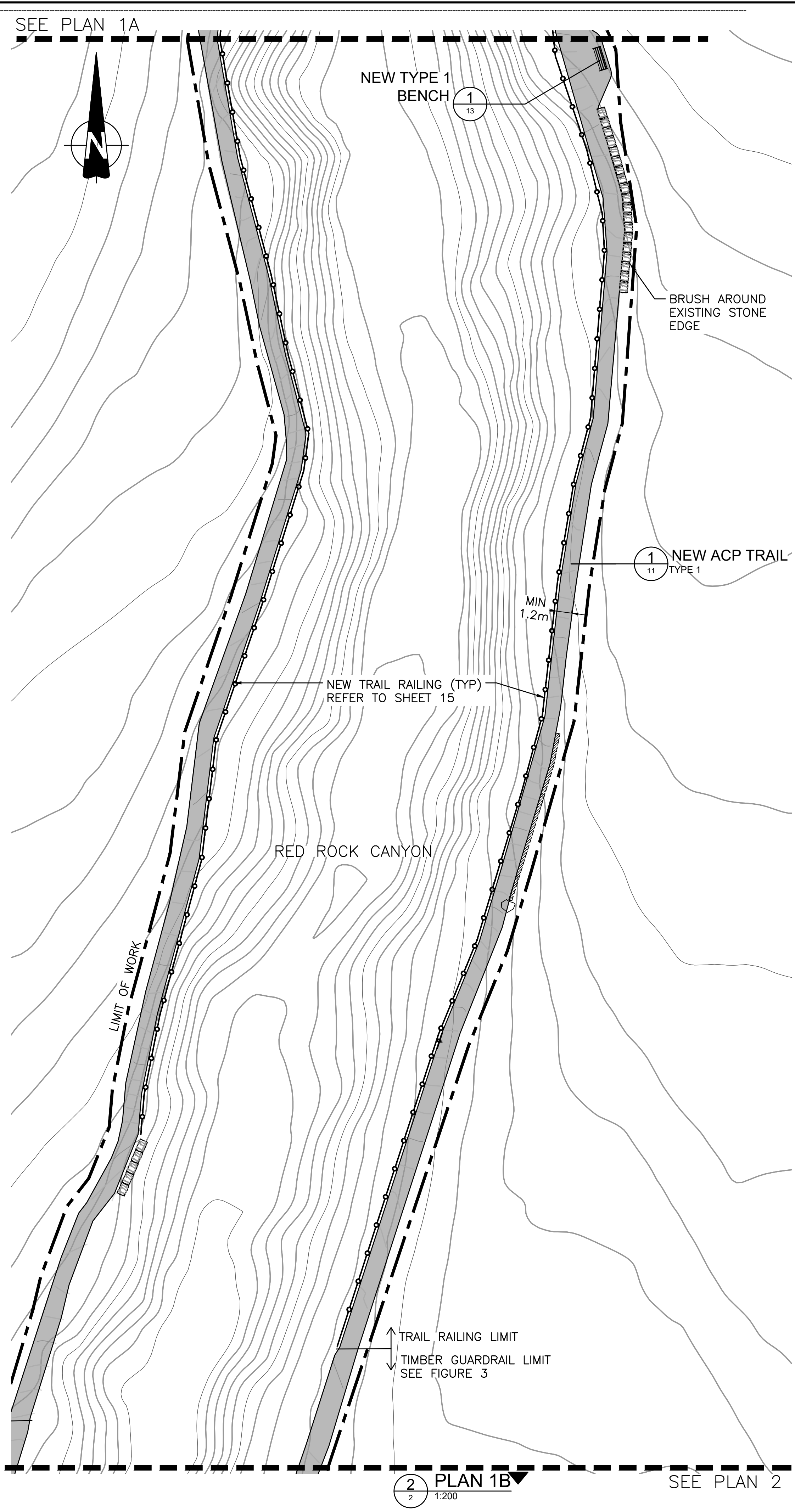
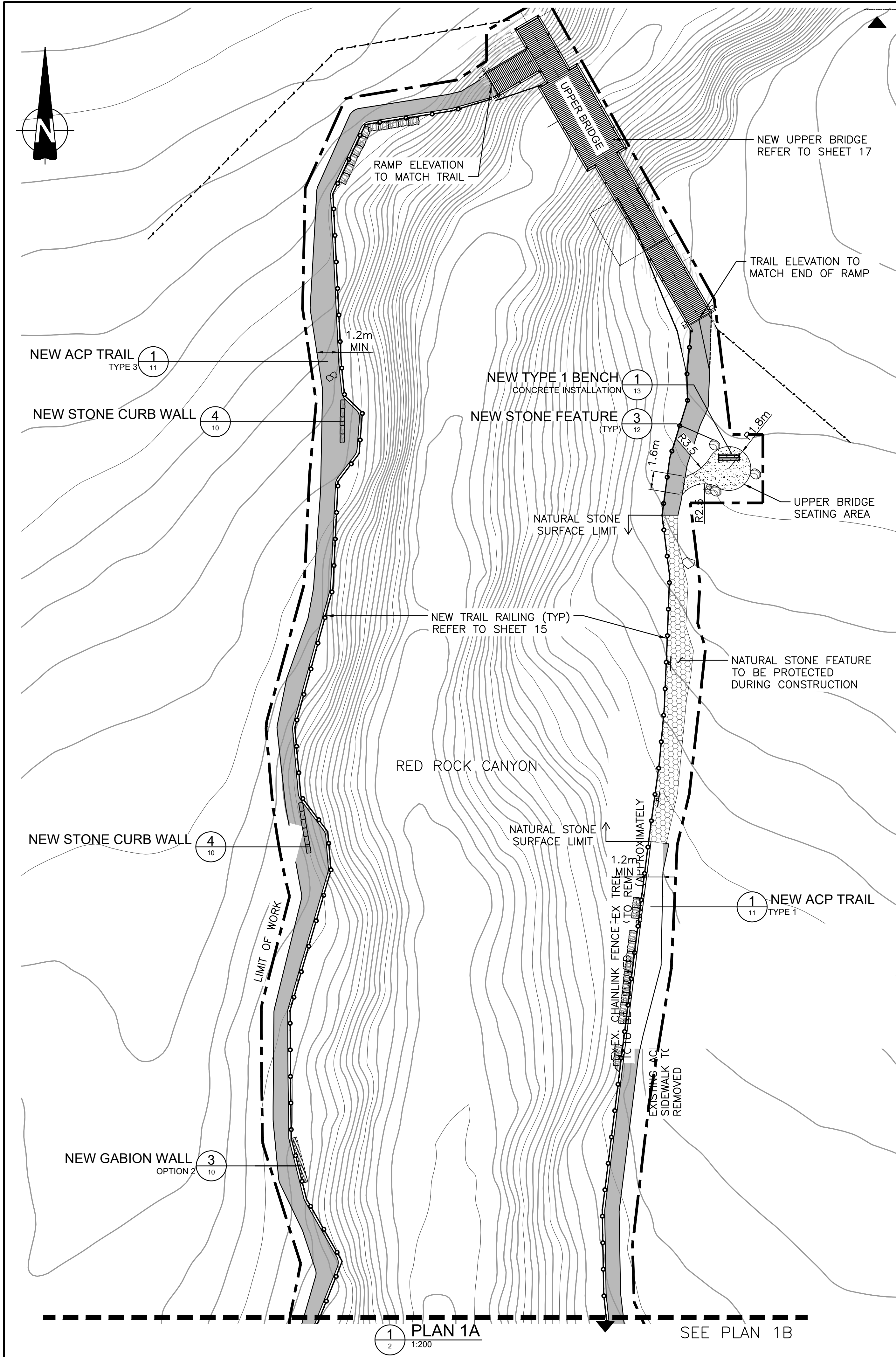
PCA Project Manager
M. VILLENEUVE
Administrateur de Projets APC


scale
1:200
échelle

project no.
2051
proj. no.

date
DECEMBER 2019
date


5
OF 33





Client: **PARKS CANADA AGENCY**
PROJECT DELIVERY SERVICES WEST

Client: **WATERTON LAKES NATIONAL PARK**



DILLON
CONSULTING

LEGEND

- NEW RAILING
- LIMIT OF WORK
- NEW ACP PAVING
- TRAIL AND PICNIC AREA SURFACE IMPROVEMENT
- RECLAIMED AREA
- NEW CONCRETE PAVING
- EXISTING NATURAL STONE SURFACE TO PROTECT
- NEW GABION WALL
- NEW STONE CURB WALL
- EX SIGN TO REMAIN AND PROTECT
- RELOCATED SIGN
- NEW KEEP OUT SIGN
- EXISTING TREE TO REMAIN AND PROTECT

REVISIONS	DESCRIPTION	DATE
0	ISSUED FOR TENDER	2020.04.27

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B source drawing no.
de dessin no.

C detail on drawing no.
détail sur dessin no.

A

B

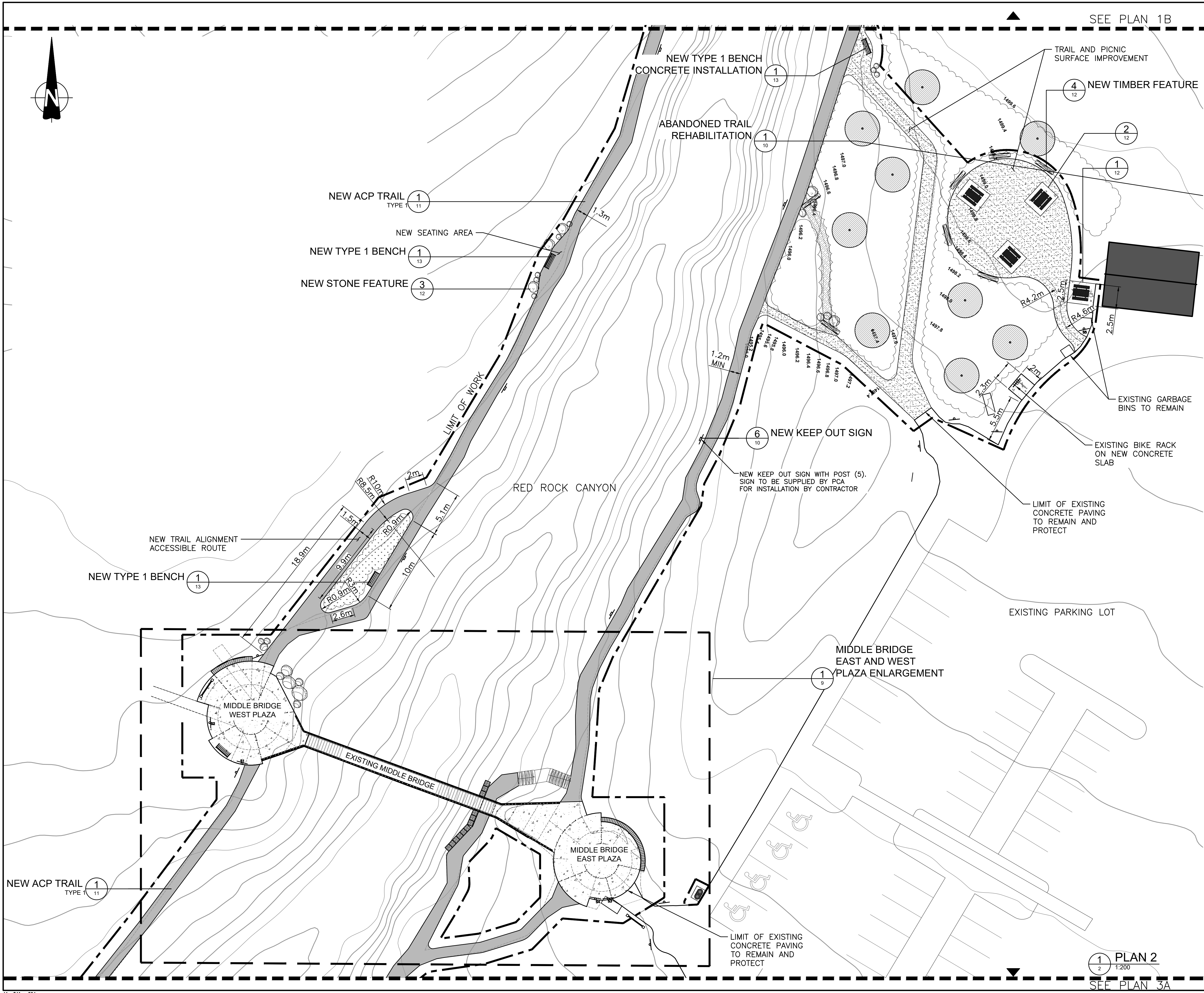
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project title: **RED ROCK CANYON TRAIL LOOP AND BRIDGES** titre du projet

drawing title: **PLAN 1 OF 3** titre du dessin

designed by: I. DANCE	conçu par
drawn by: S. NEZAFATI	dessiné par
approved by: H. TROFANENKO	approuvé par
PCA Project Manager: M. VILLENEUVE	Administrateur de Projets APC

scale: 1:200	échelle	sheet: 6	feuille
project no: 2051	projet no.	date: DECEMBER 2019	OF: 33



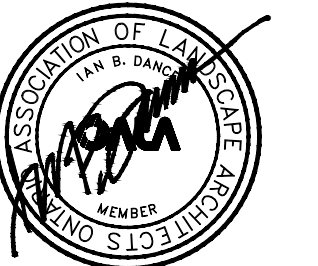
PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



LEGEND

- NEW RAILING
- LIMIT OF WORK
- NEW ACP PAVING
- TRAIL AND PICNIC AREA SURFACE IMPROVEMENT
- RECLAIMED AREA
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- EXISTING NATURAL STONE SURFACE TO PROTECT
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- RELOCATED SIGN
- NEW KEEP OUT SIGN
- EXISTING TREE TO REMAIN AND PROTECT



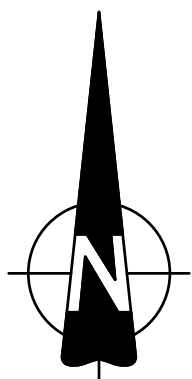
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RED ROCK CANYON TRAIL LOOP AND BRIDGES
titre du projet

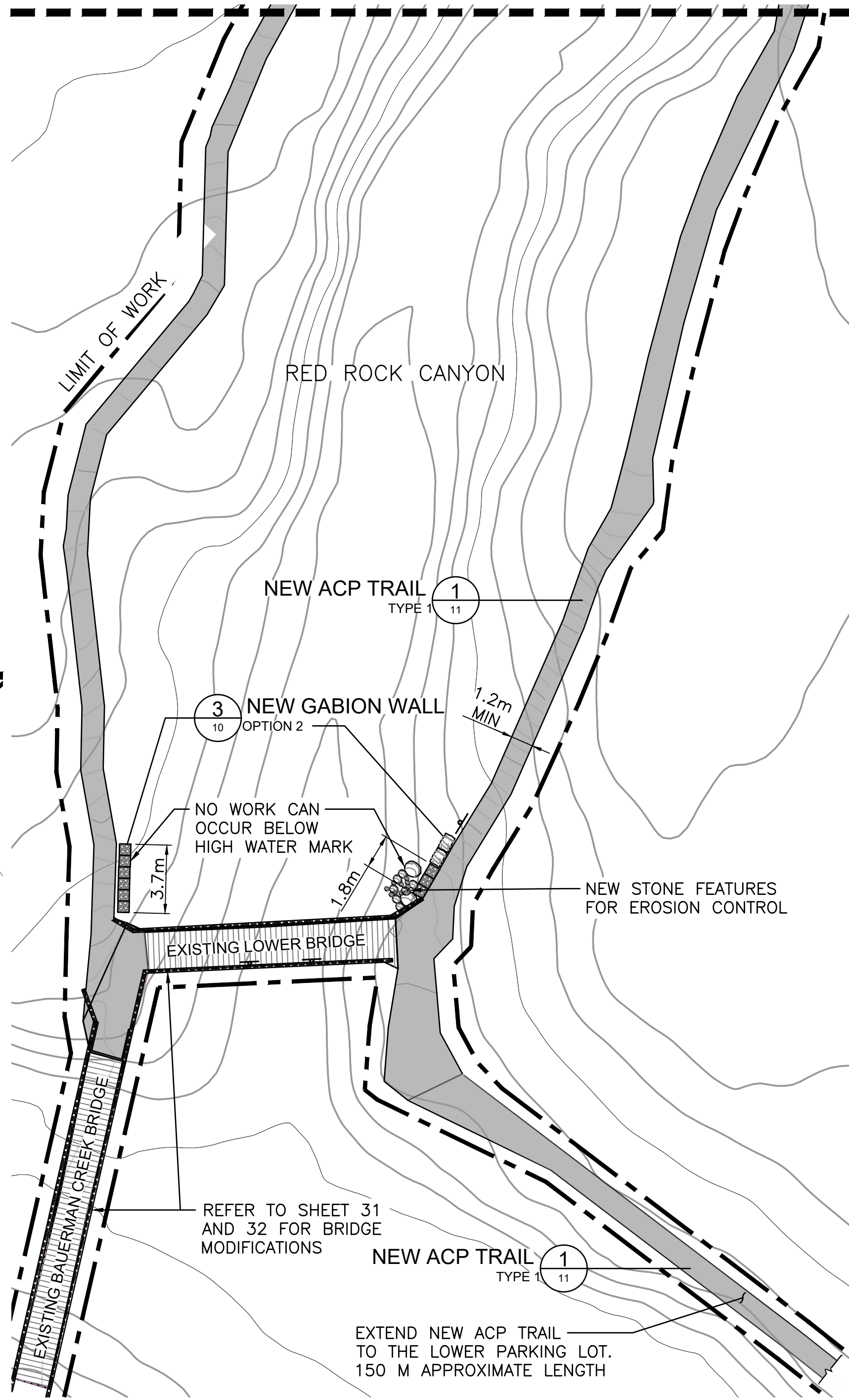
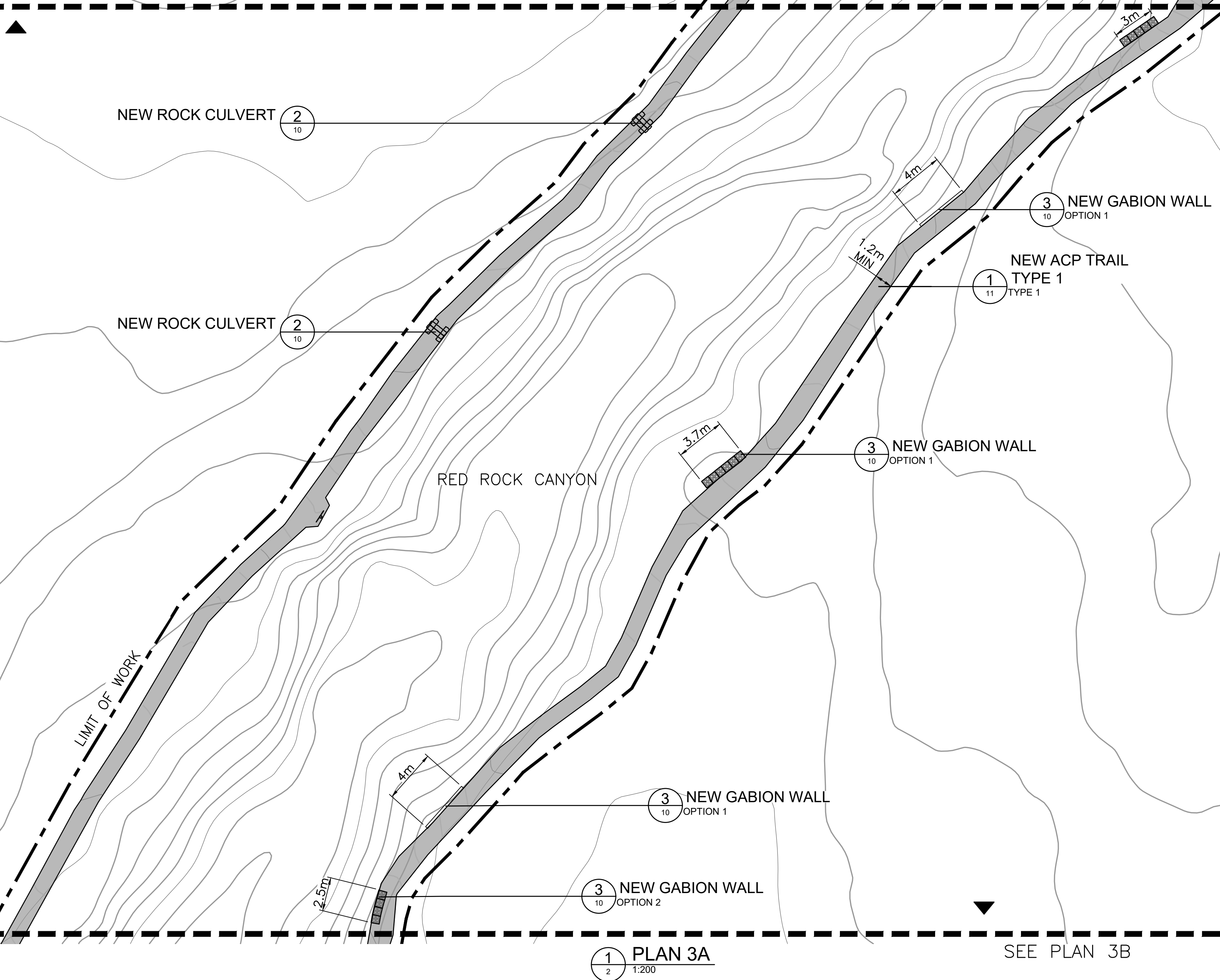
drawing title
PLAN 2 OF 3
titre du dessin

designed by	I. DANCE	conçu par
drawn by	S. NEZAFATI	dessiné par
approved by	H. TROFANENKO	approuvé par
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC
scale	1:200	échelle
project no.	2051	projet no.
date	DECEMBER 2019	date
		sheet 7 OF 33



SEE PLAN 3A

SEE PLAN 2



Client
PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

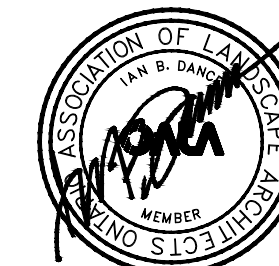
WATERTON LAKES NATIONAL PARK

Client



LEGEND

- NEW RAILING
- LIMIT OF WORK
- NEW ACP PAVING
- TRAIL AND PICNIC AREA SURFACE IMPROVEMENT
- RECLAIMED AREA
- NEW CONCRETE PAVING
- EXISTING NATURAL STONE SURFACE TO PROTECT
- NEW GABION WALL
- NEW STONE CURB WALL
- EX SIGN TO REMAIN AND PROTECT
- RELOCATED SIGN
- NEW KEEP OUT SIGN
- EXISTING TREE TO REMAIN AND PROTECT



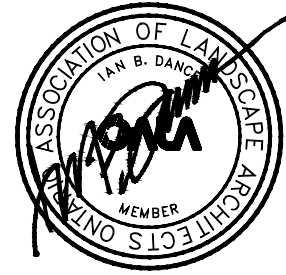
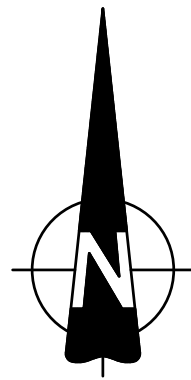
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project title
RED ROCK CANYON
TRAIL LOOP AND BRIDGES
titre du projet

drawing title
PLAN 3 OF 3
titre du dessin

designed by	I. DANCE	conçu par
drawn by	S. NEZAFATI	dessiné par
approved by	H. TROFANENKO	approuvé par
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC
scale	1:200	échelle
project no.	2051	projet no.
date	DECEMBER 2019	date
		sheet
		feuille
		8
		OF 33



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



LEGEND

- NEW RAILING
- LIMIT OF WORK
- NEW ACP PAVING
- TRAIL AND PICNIC AREA SURFACE IMPROVEMENT
- RECLAIMED AREA
- NEW CONCRETE PAVING
- EXISTING NATURAL STONE SURFACE TO PROTECT
- NEW GABION WALL
- NEW STONE CURB WALL
- EX SIGN TO REMAIN AND PROTECT
- RELOCATED SIGN
- NEW KEEP OUT SIGN
- EXISTING TREE TO REMAIN AND PROTECT
- EXPANSION JOINT
- CONTROL JOINT (SAWCUT)
- SPOT ELEVATION
- PROPOSED SLOPE ARROW

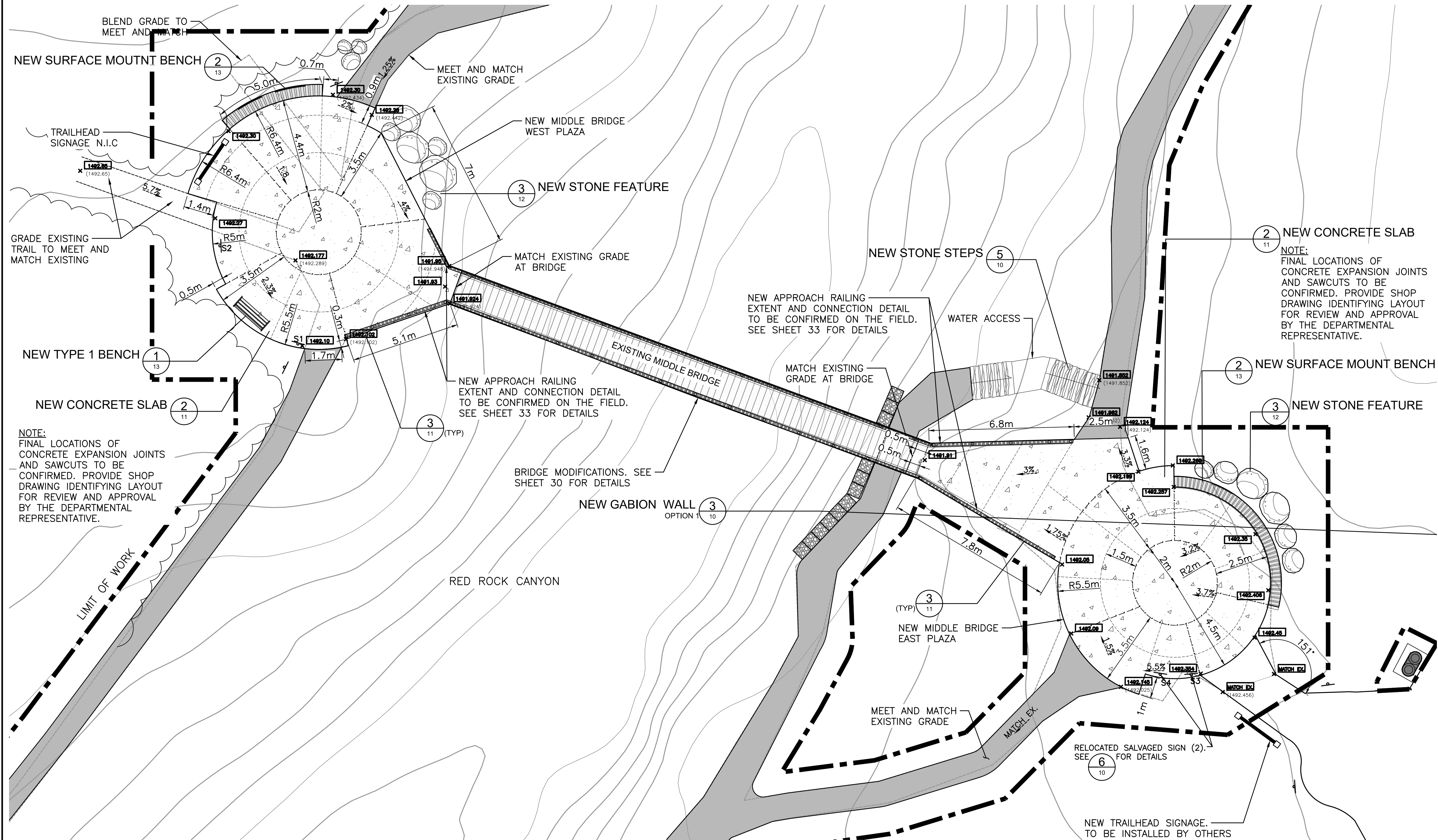
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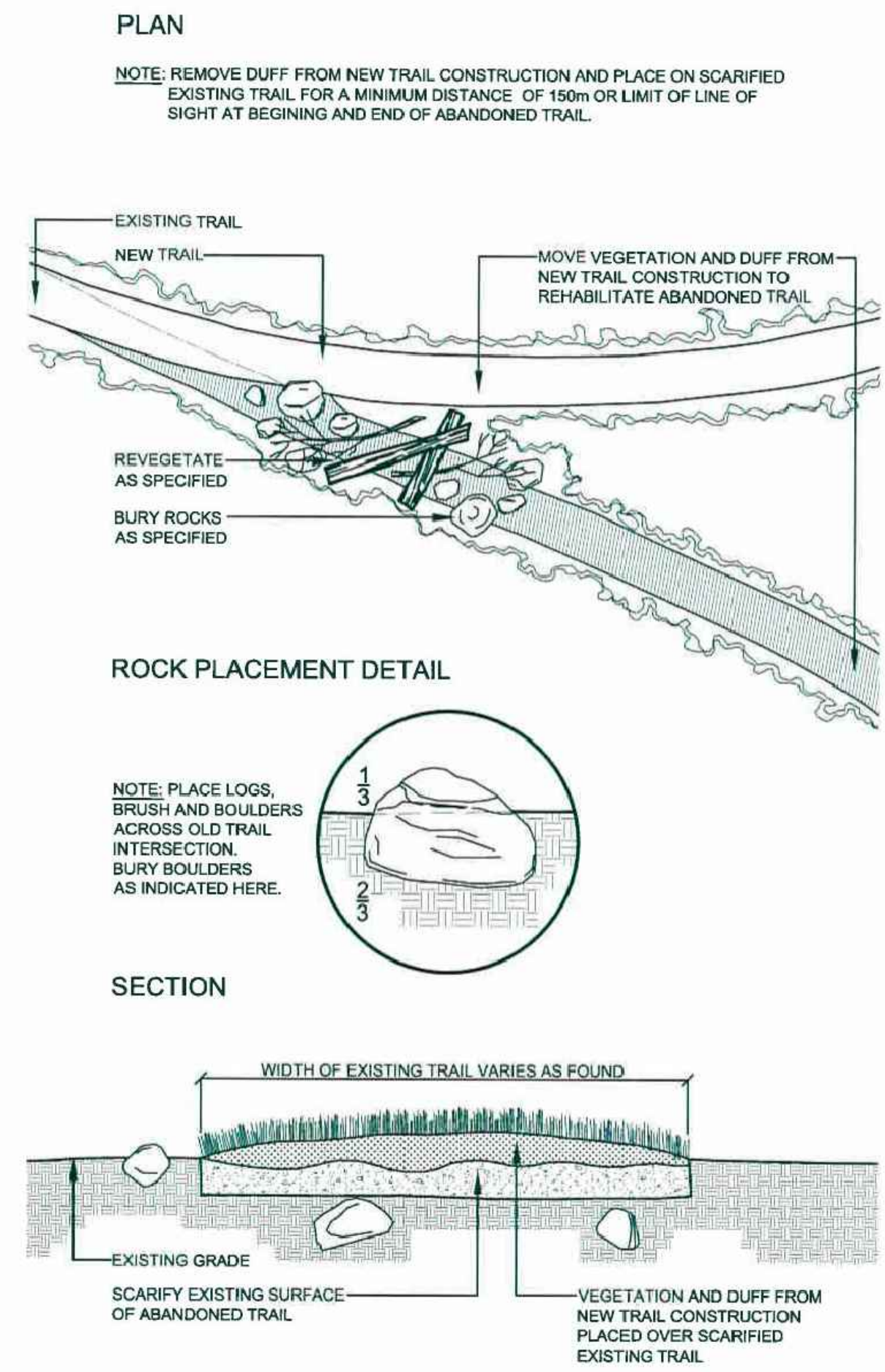
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**RED ROCK CANYON
TRAIL LOOP AND BRIDGES**
titre du projet

drawing title
ENLARGEMENT PLAN
titre du dessin

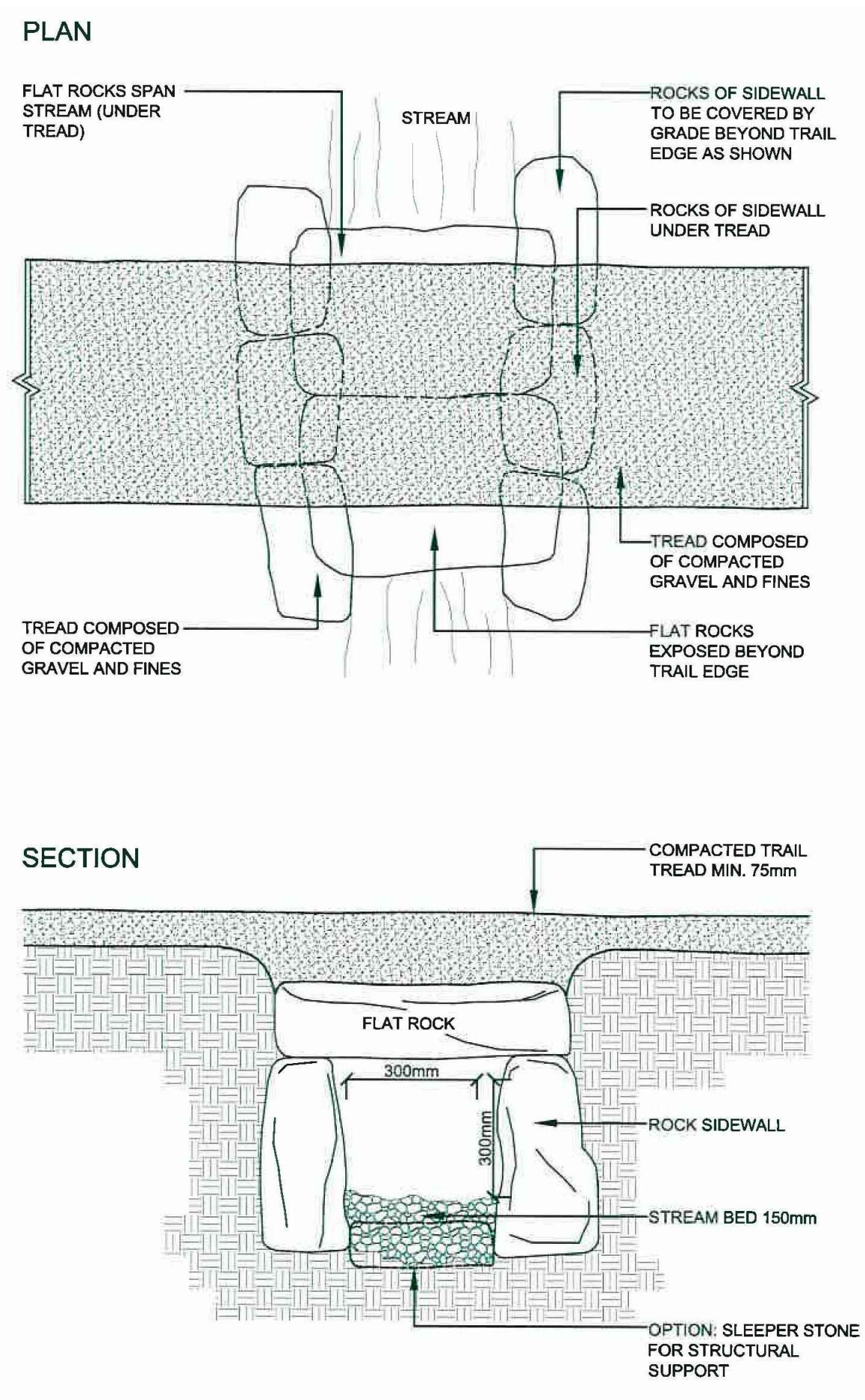
designed by I. DANCE	conçu par
drawn by S. NEZAFATI	dessiné par
approved by H. TROFANENKO	approuvé par
PCA Project Manager M. VILLENEUVE	Administrateur de Projets APC
scale 1:200	échelle
project no. 2051	projet no.
date DECEMBER 2019	date
	sheet 9 OF 33



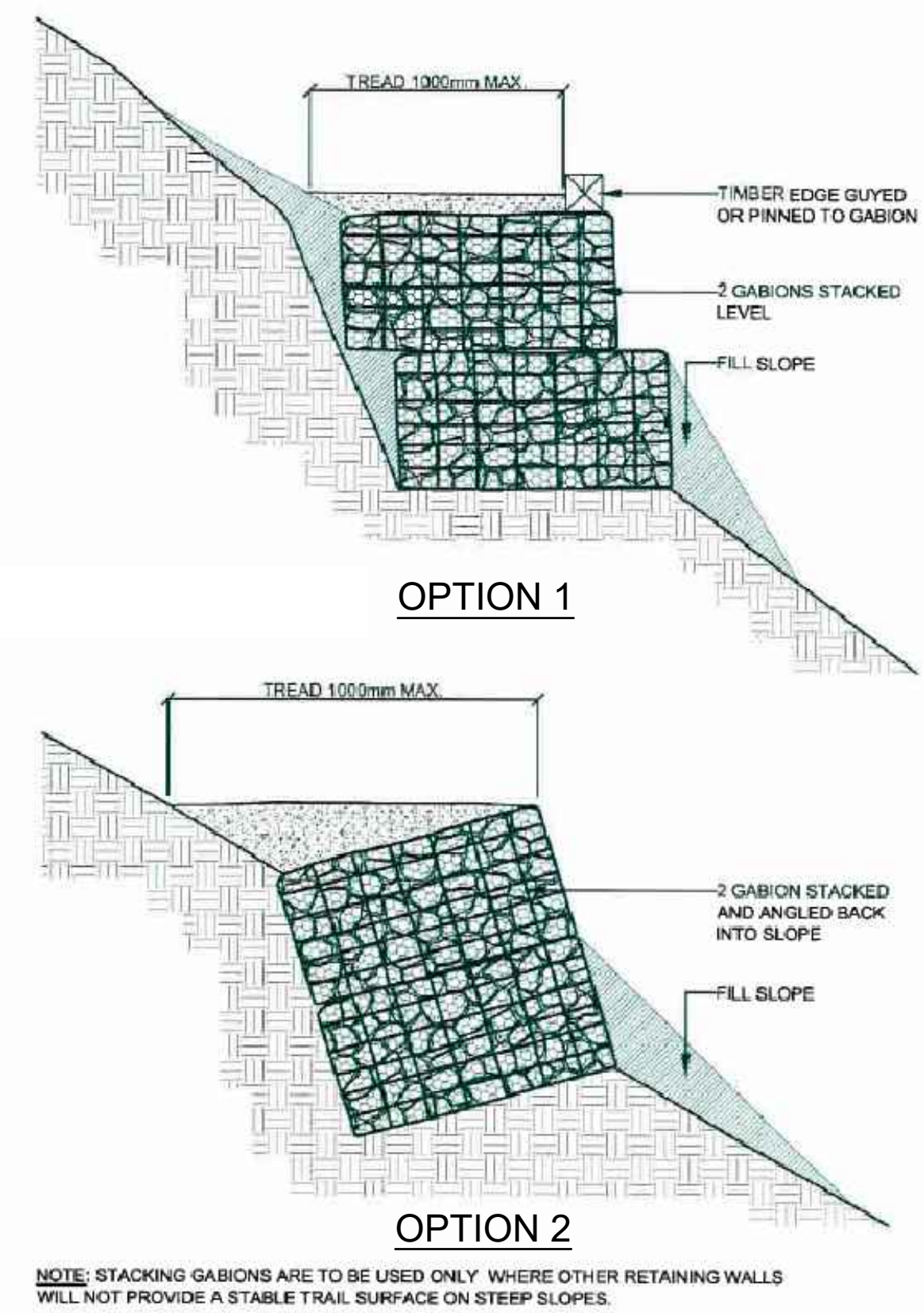
1 MIDDLE BRIDGE EAST AND WEST ENLARGEMENT
1:100



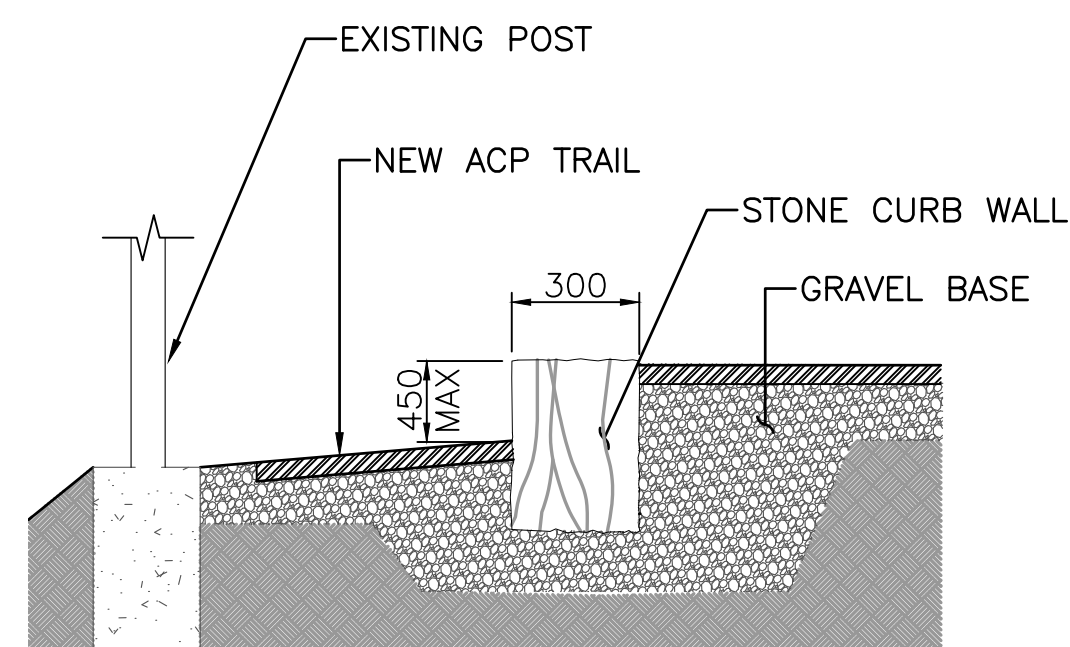
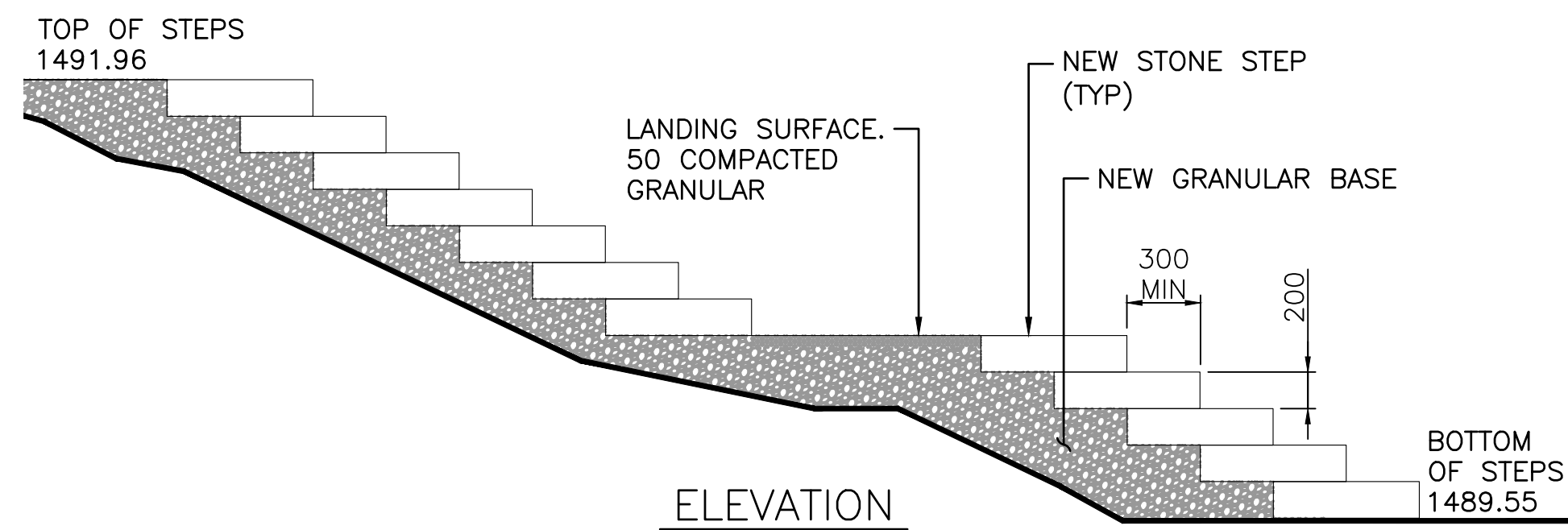
1 ABANDONED TRAIL REHABILITATION
REFERENCE: MOUNTAIN PARKS BACK COUNTRY DESIGN GUIDELINES 2008



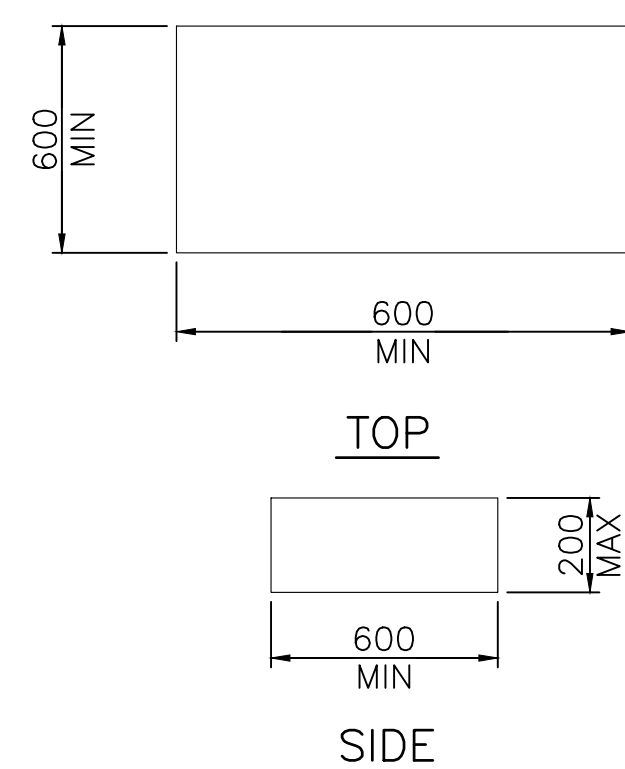
2 ROCK CULVERT
REFERENCE: MOUNTAIN PARKS BACK COUNTRY DESIGN GUIDELINES 2008
LOCATION TO BE DETERMINED ONSITE WITH DEPARTMENTAL REPRESENTATIVE. METHODOLOGY MUST BE APPROVED BY DEPARTMENTAL REPRESENTATIVE PRIOR TO START OF WORK



3 GABION RETAINING WALL
REFERENCE: MOUNTAIN PARKS BACK COUNTRY DESIGN GUIDELINES 2008



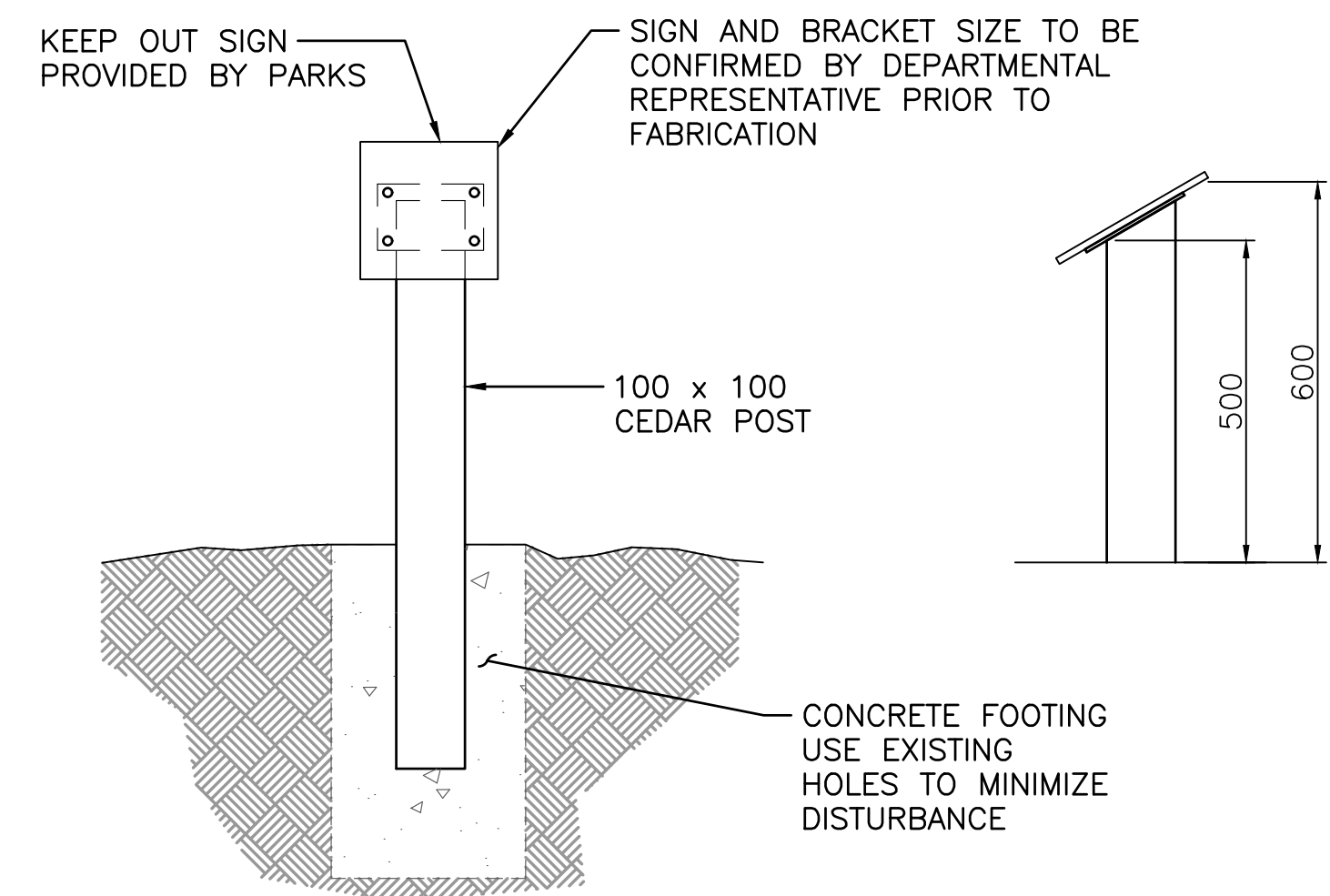
4 STONE CURB WALL SECTION
NTS



5 NEW STONE STEPS
1:20

NOTES:

1. NUMBER OF NEW STEPS TO BE DETERMINED ONSITE BY CONTRACTOR AND DEPARTMENTAL REPRESENTATIVE.
2. STONE STEP COLOR SAMPLE TO BE APPROVED ONSITE BY DEPARTMENTAL REPRESENTATIVE PRIOR TO STONE DELIVERY.
3. LANDING WIDTH TO BE DETERMINED ON SITE.

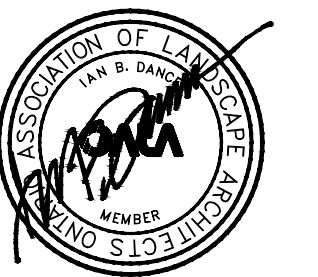


6 NEW KEEP OUT SIGNAGE
1:10



Client **PARKS CANADA AGENCY**
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



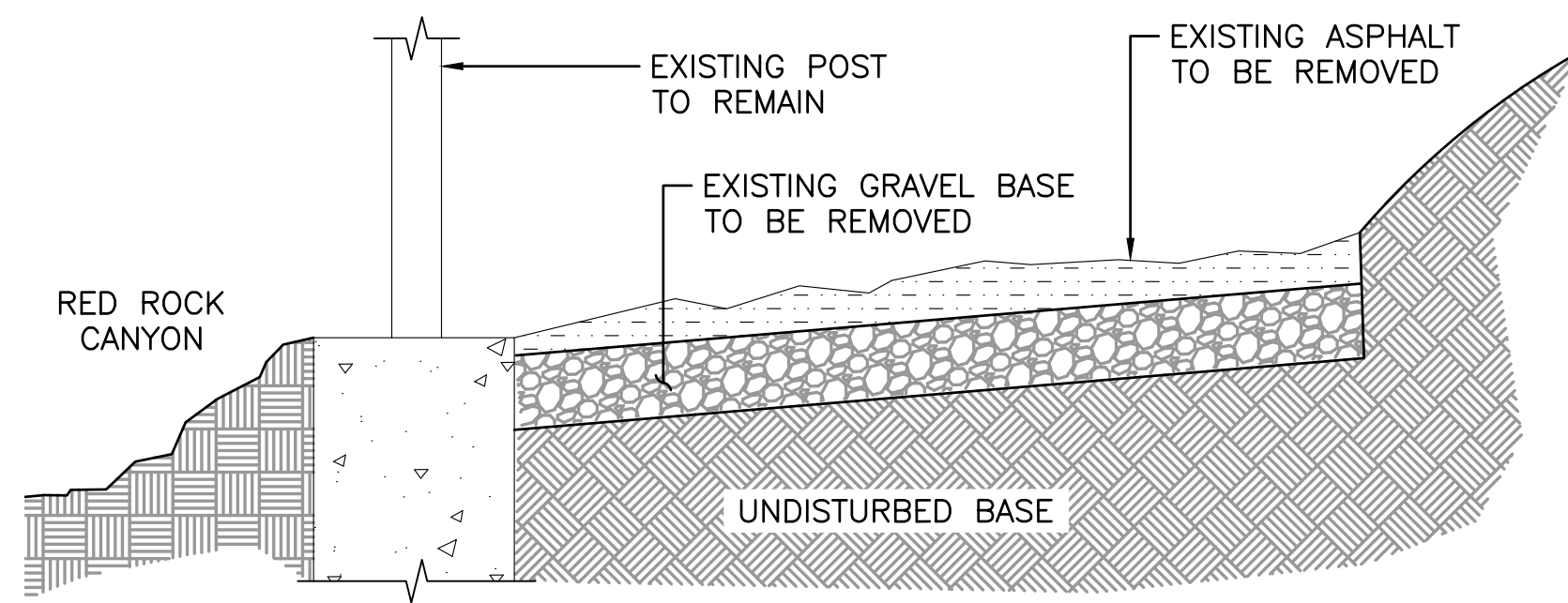
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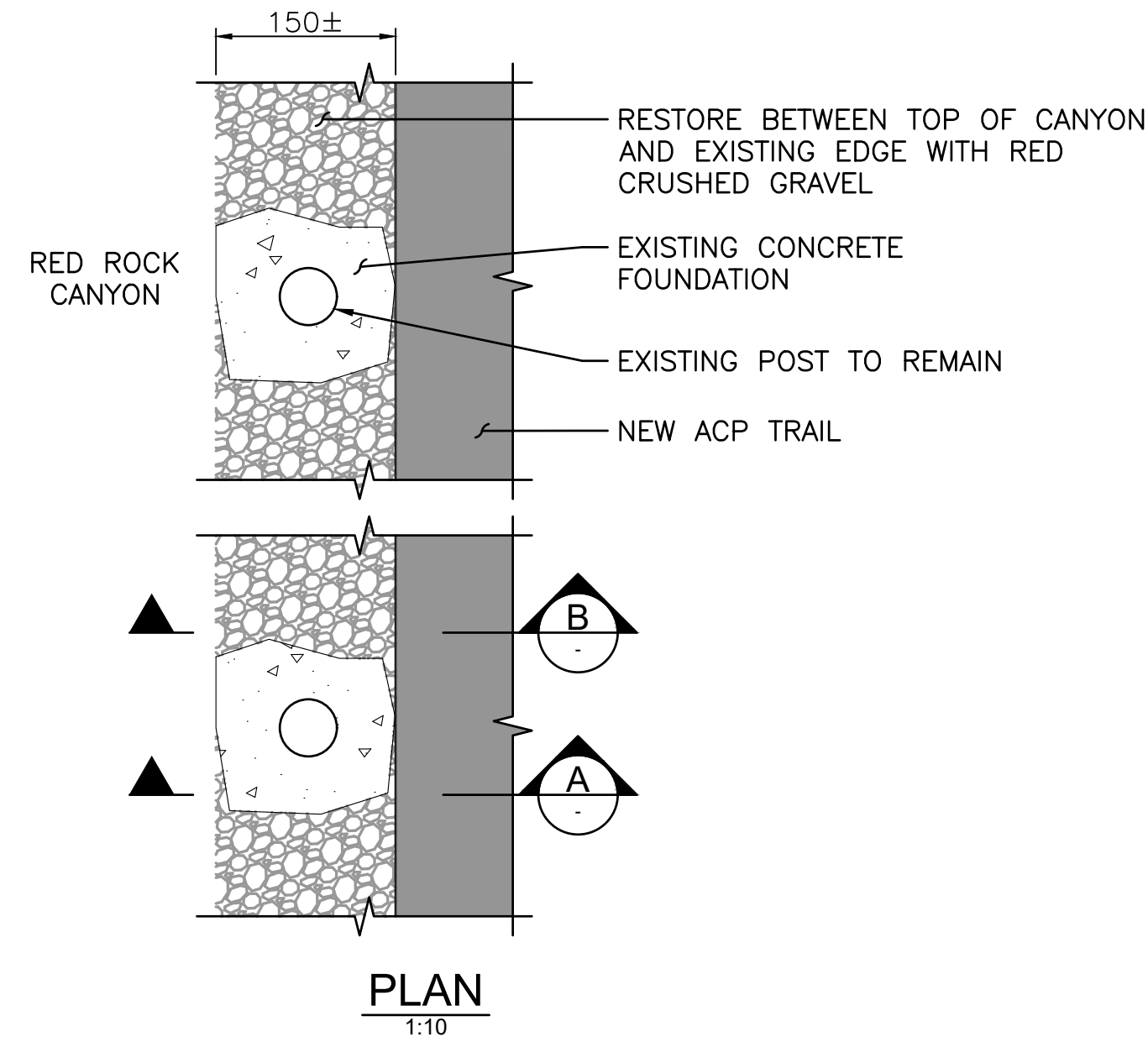
project title **RED ROCK CANYON TRAIL LOOP AND BRIDGES** titre du projet

drawing title **DETAIL 1 of 4** titre du dessin

designed by	I. DANCE	conçu par
drawn by	S. NEZAFATI	dessiné par
approved by	H. TROFANENKO	approuvé par
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC
scale	AS SHOWN	échelle
project no.	2051	projet no.
date	DECEMBER 2019	date
		sheet 10 OF 33

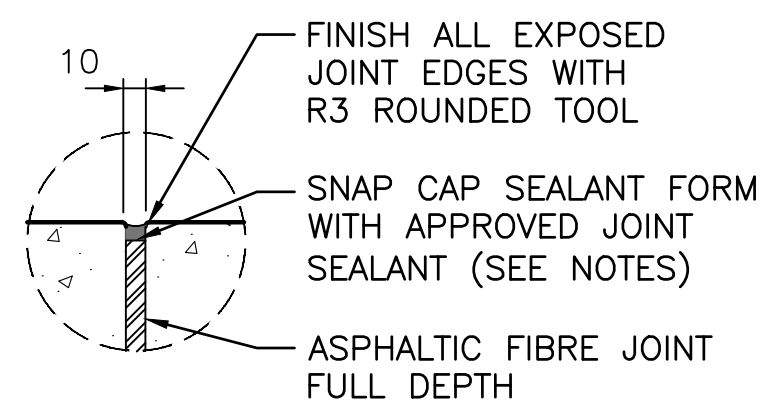


EXISTING CONDITION

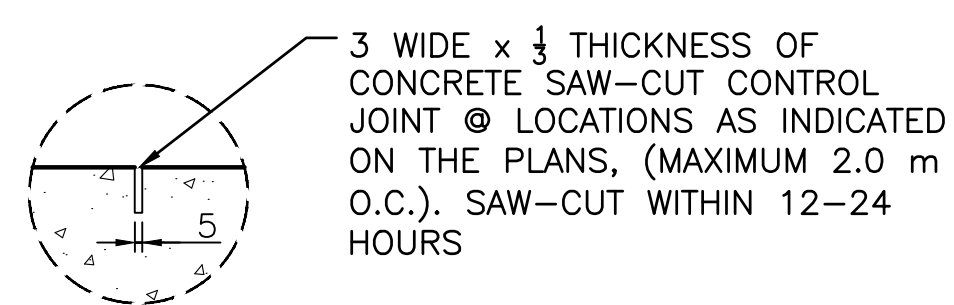


PLAN
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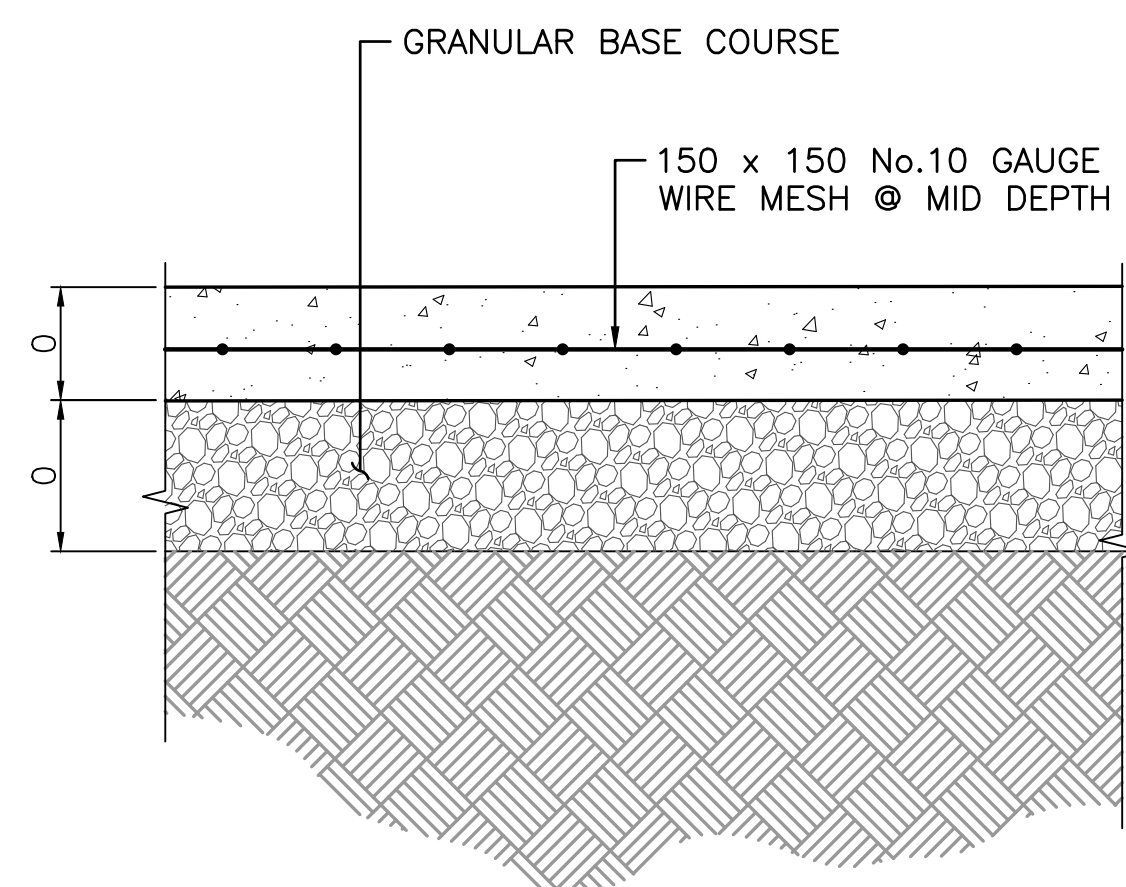
1 ACP TRAIL
6,7,8 1:10



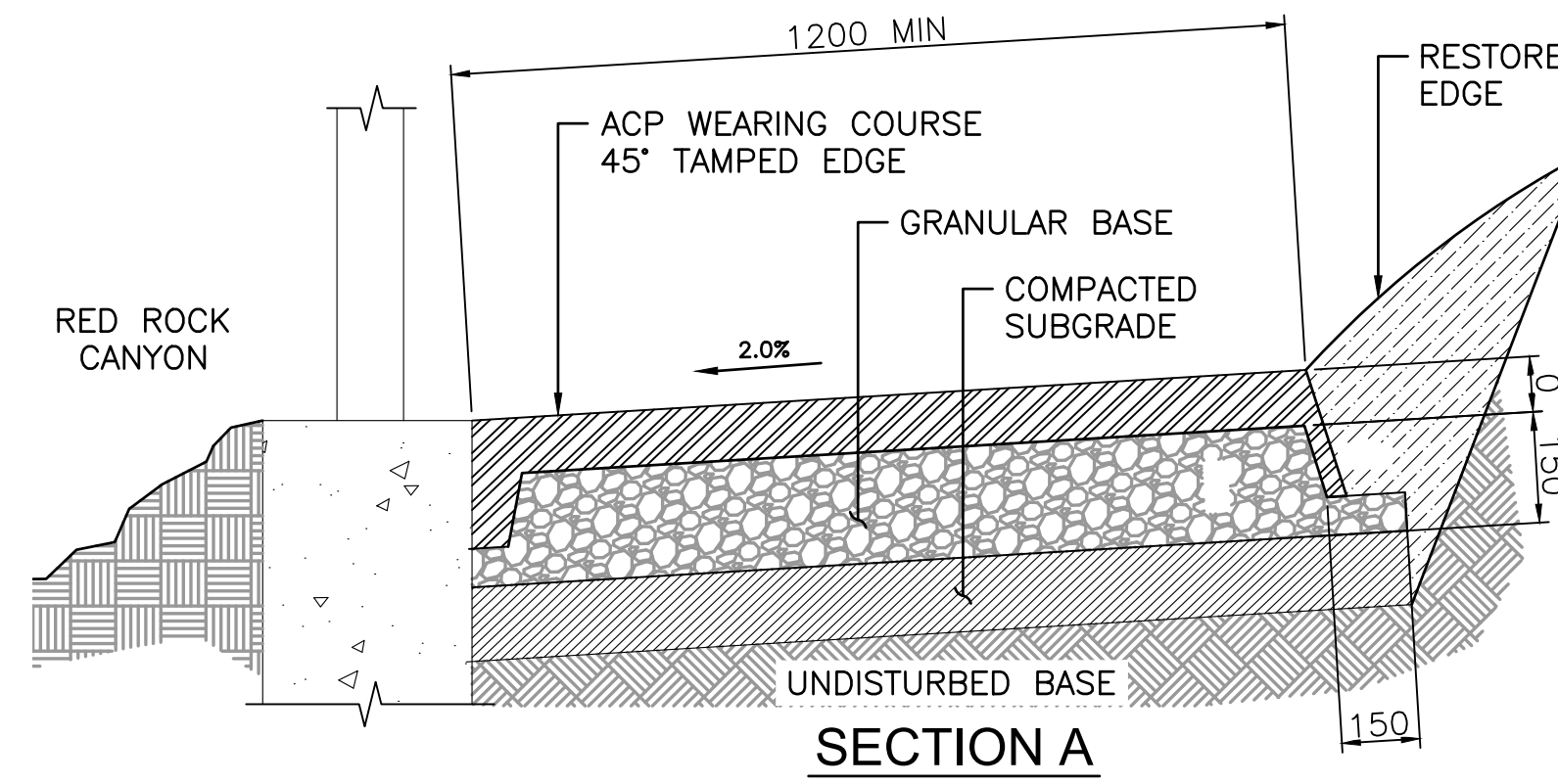
EXPANSION JOINT
1:5



CONTROL JOINT
1:5

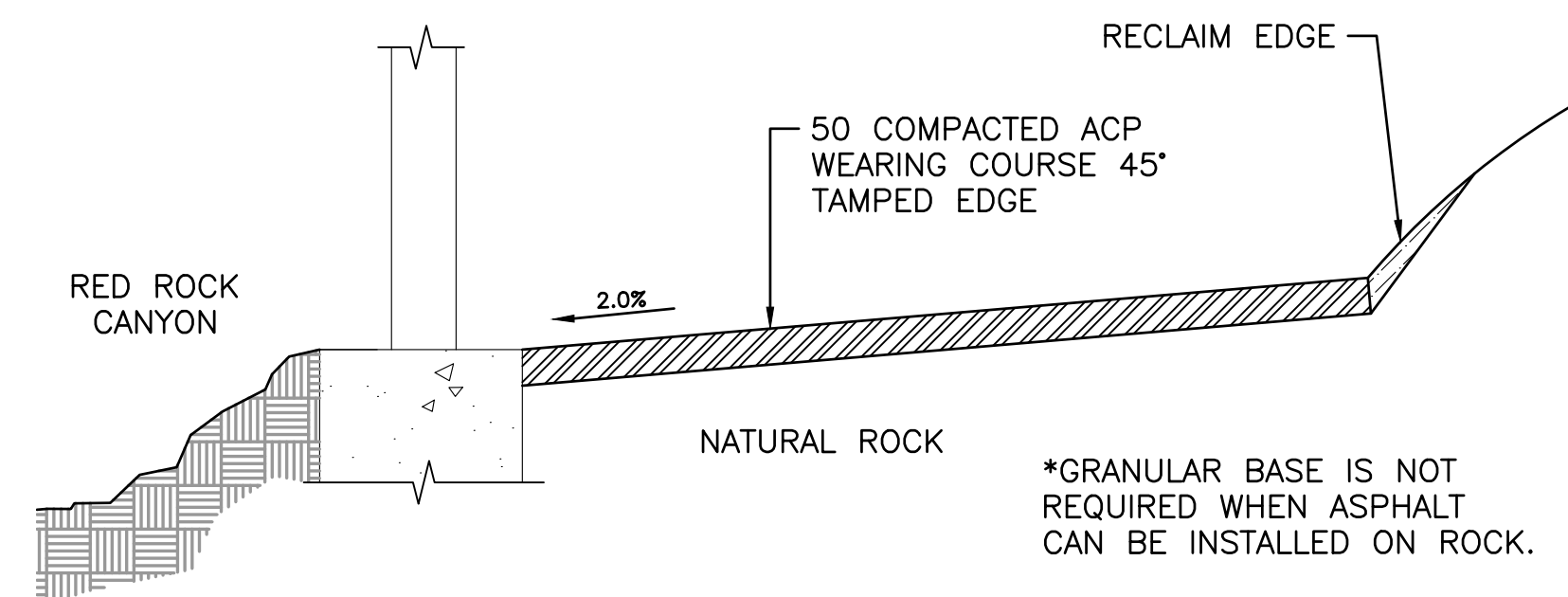


2 CONCRETE SLAB
9 1:10



SECTION A

TYPE 1: ACP ON COMPACTED SOIL



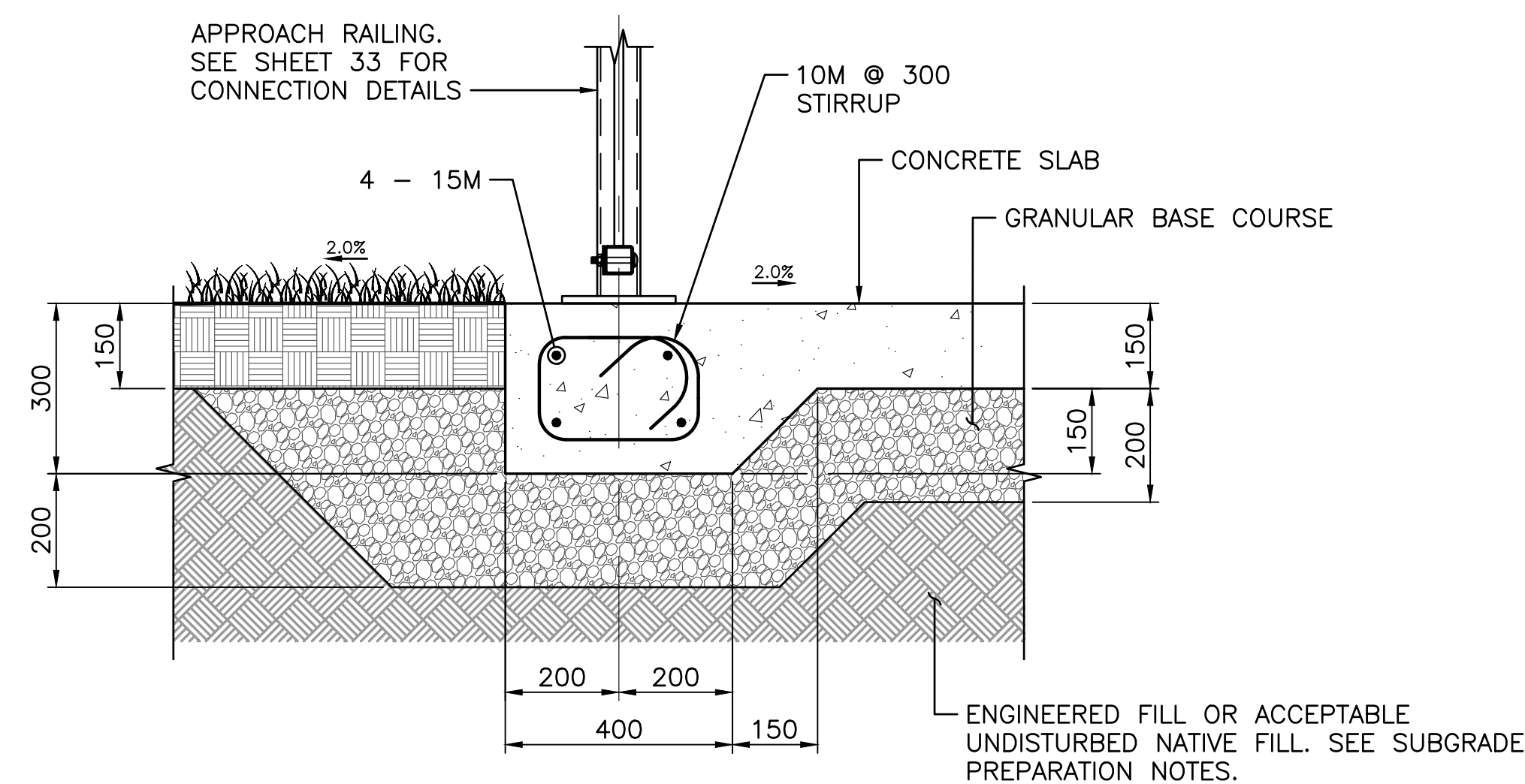
TYPE 2: ACP ON ROCK

NOTES:

1. ENSURE THAT ALL ORGANIC MATTER IS REMOVED FROM THE EXCAVATED TRAIL AREA PRIOR TO PLACING AND COMPACTION OF BASE MATERIALS.
2. DO NOT PLACE BACKFILL AGAINST ASPHALT FOR A MINIMUM OF 48 HOURS.
3. EDGES TO BE SMOOTH CURVES/STRAIGHT AND EVEN ADJACENT SURFACE TREATMENT VARIES, REFER TO LAYOUT PLAN.

NOTES

1. CLEAR COVER TO REINFORCING STEEL:
 - 1.1. CONCRETE CAST AGAINST EARTH = 75
 - 1.2. ALL OTHER LOCATIONS = 60
2. REINFORCING STEEL SHALL BE GRADE 400 UNLESS OTHERWISE SPECIFIED.
3. BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS.
4. LOCATE CONTROL JOINTS AS PER LANDSCAPE LAYOUT ENLARGEMENT ON SHEET 9.
5. BAR LAP SPLICE FOR HORIZONTAL REINFORCEMENT MUST NOT LAP THROUGH CONTROL JOINT.

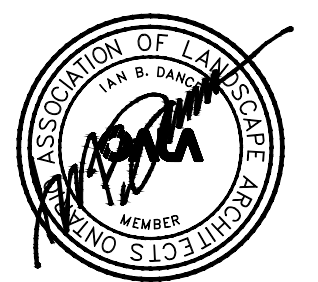


3 CONCRETE EDGE THICKENING FOR APPROACH RAILING
9 1:10



Client: **PARKS CANADA AGENCY**
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WATERTON LAKES NATIONAL PARK



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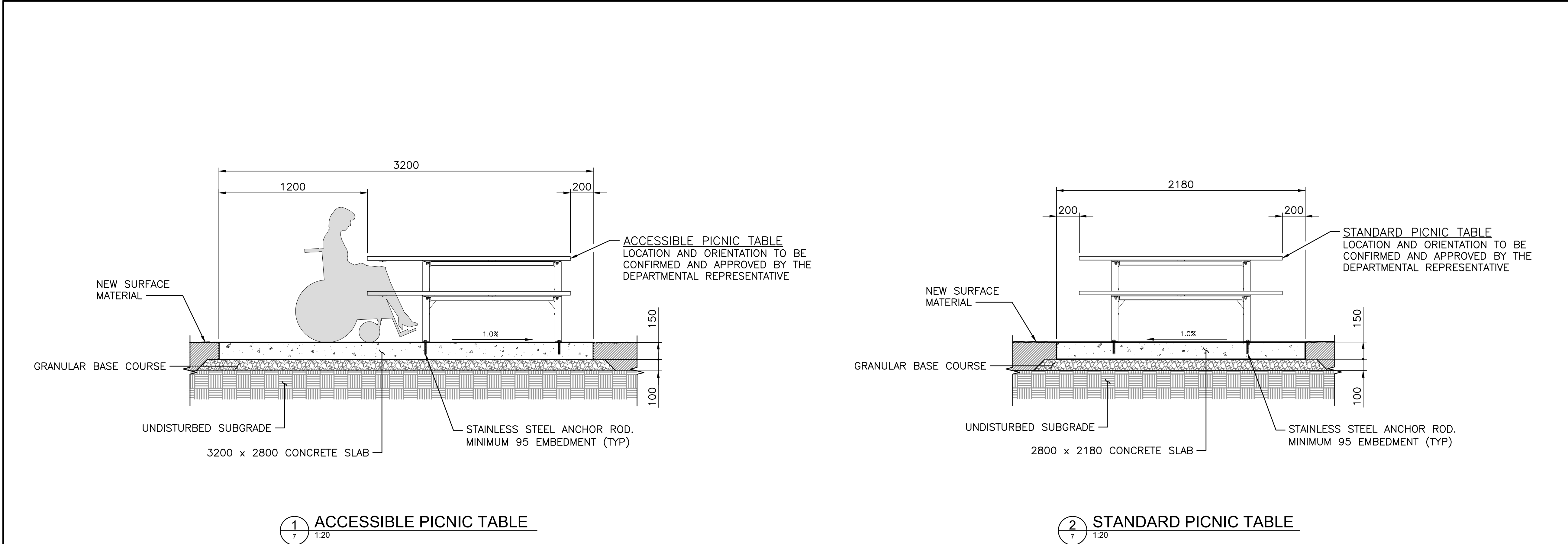
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C	number du detail	B/C
B	source drawing no.	
	de dessin no.	
C	detail on drawing no.	
	detail sur dessin no.	

project title: **RED ROCK CANYON TRAIL LOOP AND BRIDGES** titre du projet:

drawing title: **DETAIL 2 of 4** titre du dessin:

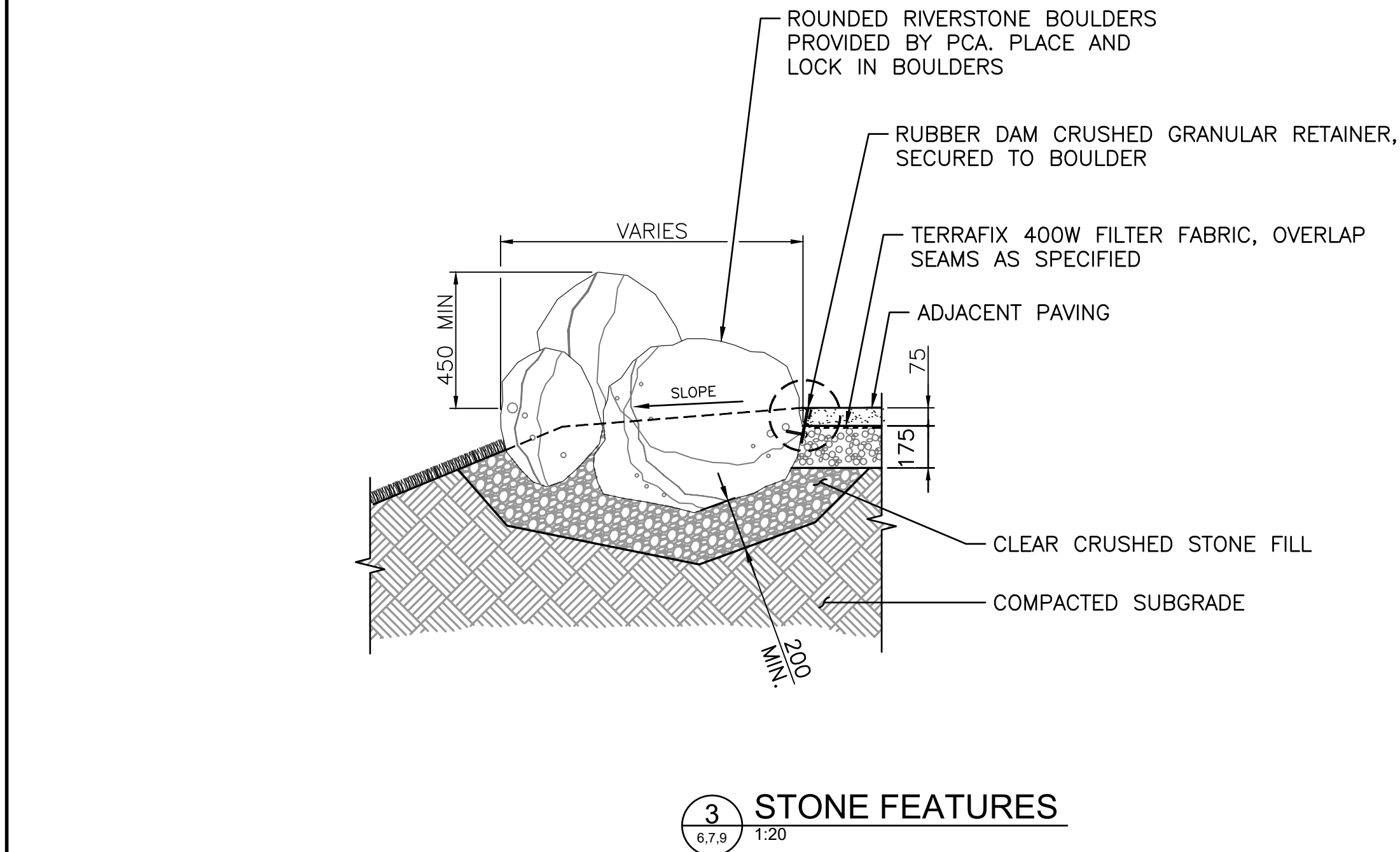
designed by	I. DANCE	conçu par
drawn by	S. NEZAFATI	dessiné par
approved by	H. TROFANENKO	approuvé par
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC

scale	AS SHOWN	échelle	sheet	11
project no.	2051	projet no.	OF	33
date	DECEMBER 2019	date		

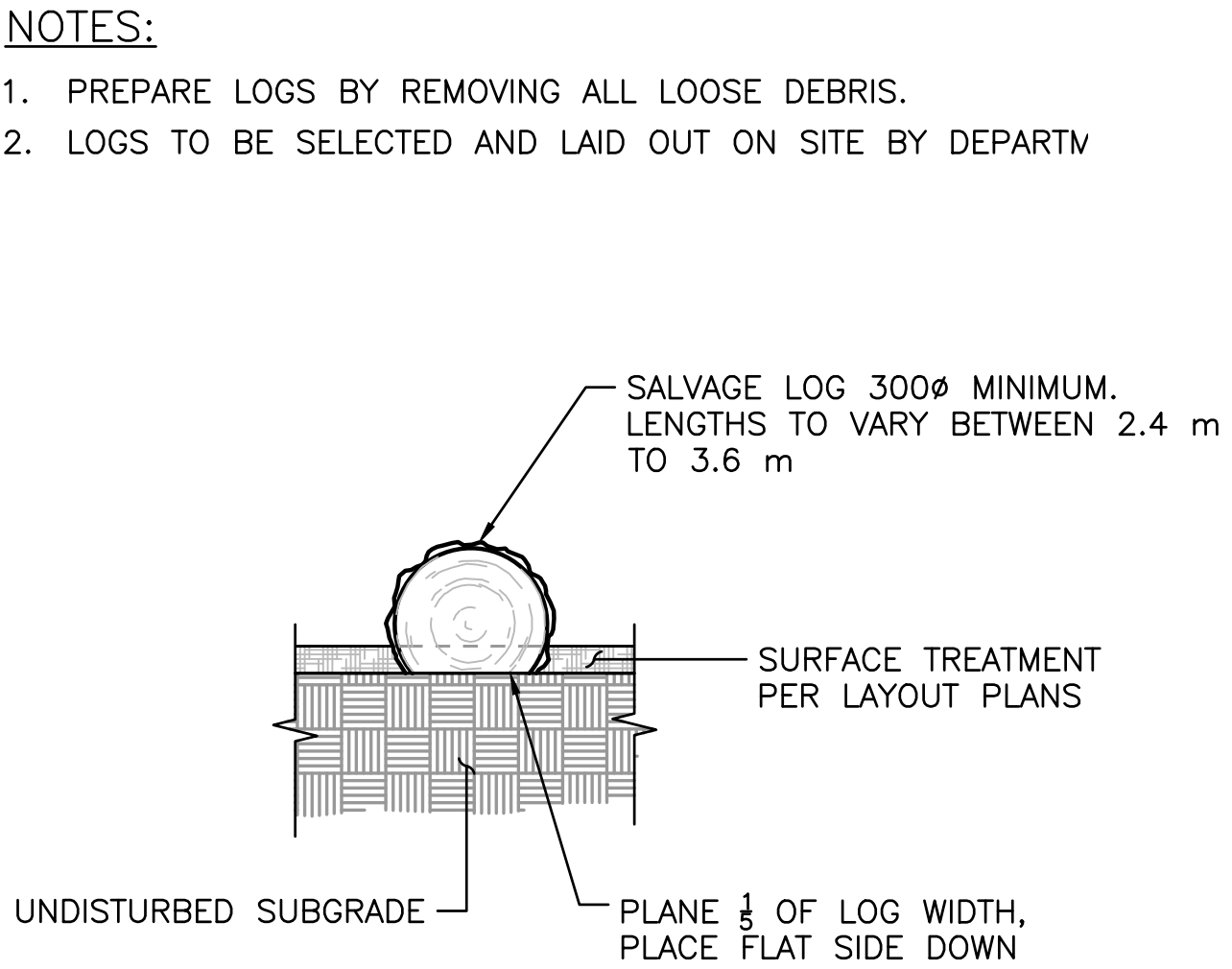


1 ACCESSIBLE PICNIC TABLE
1:20

2 STANDARD PICNIC TABLE
1:20



3 STONE FEATURES
1:20



4 TIMBER FEATURE
1:20



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WATERTON LAKES NATIONAL PARK



REVISIONS	DESCRIPTION	DATE
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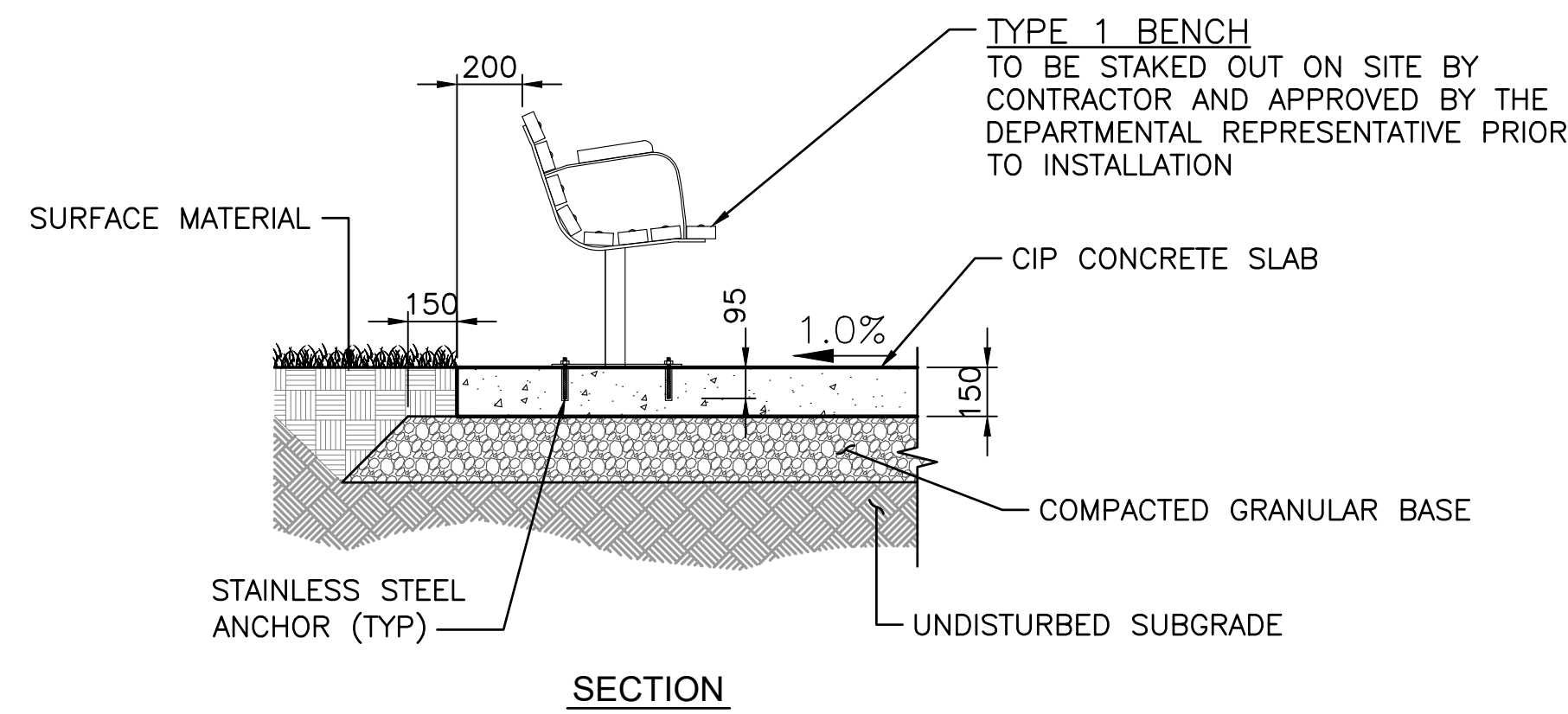
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C	detail on drawing no. detail sur dessin no.	

project title **RED ROCK CANYON
TRAIL LOOP AND BRIDGES** titre du projet

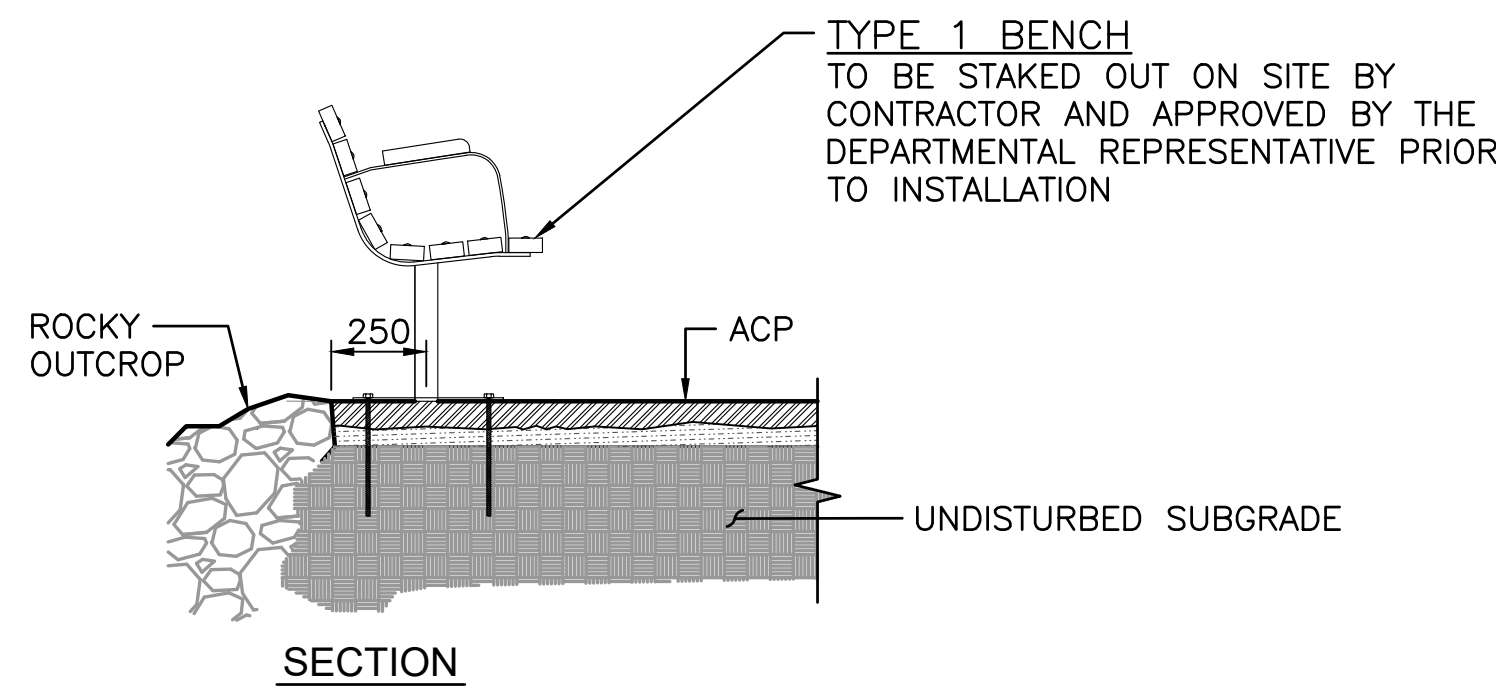
drawing title **DETAIL 3 of 4** titre du dessin

designed by I. DANCE	conçu par
drawn by S. NEZAFATI	dessiné par
approved by H. TROFANENKO	approuvé par
PCA Project Manager M. VILLENEUVE	Administrateur de Projets APC

scale AS SHOWN	échelle	sheet 12	feuille OF 33
project no. 2051	projet no.		
date DECEMBER 2019	date		



BENCH SURFACE MOUNT ON CONCRETE SLAB

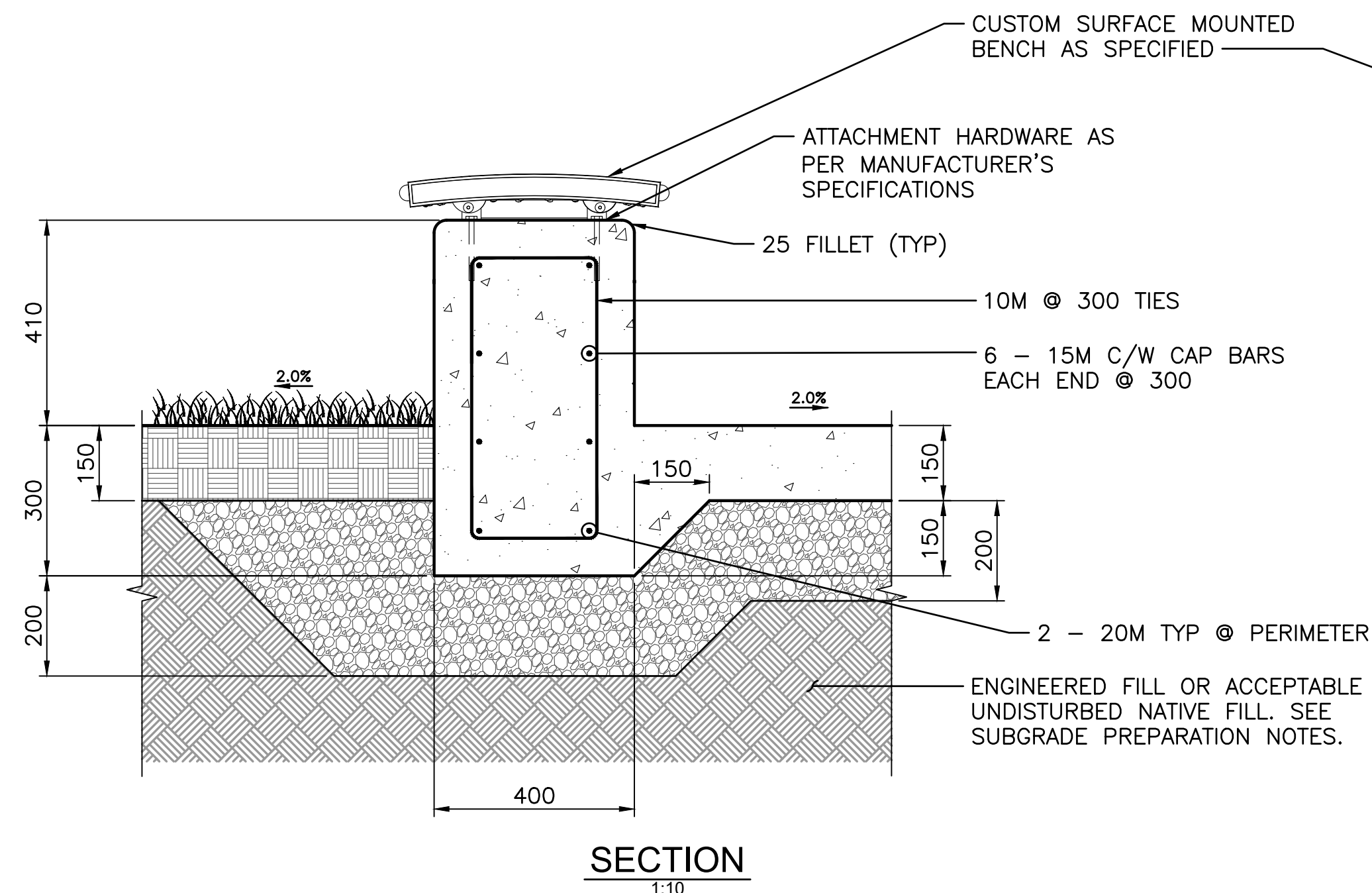
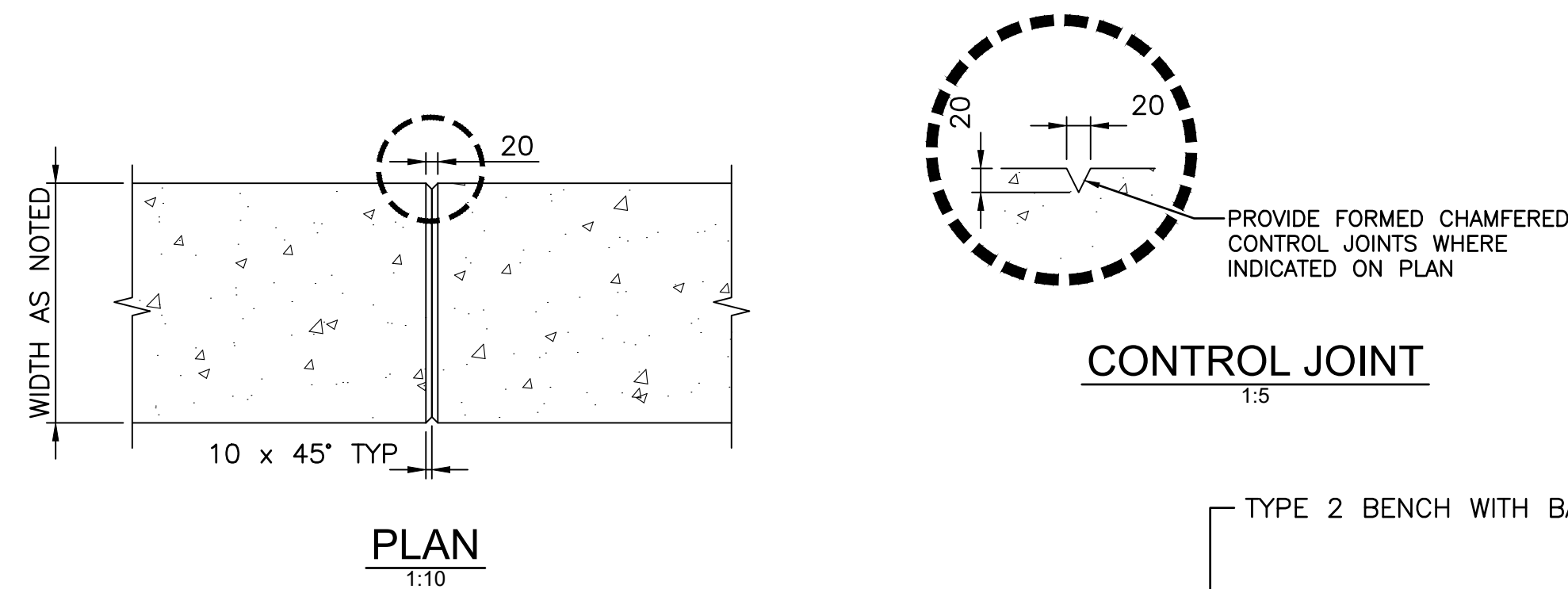


BENCH SURFACE MOUNT ON ASPHALT

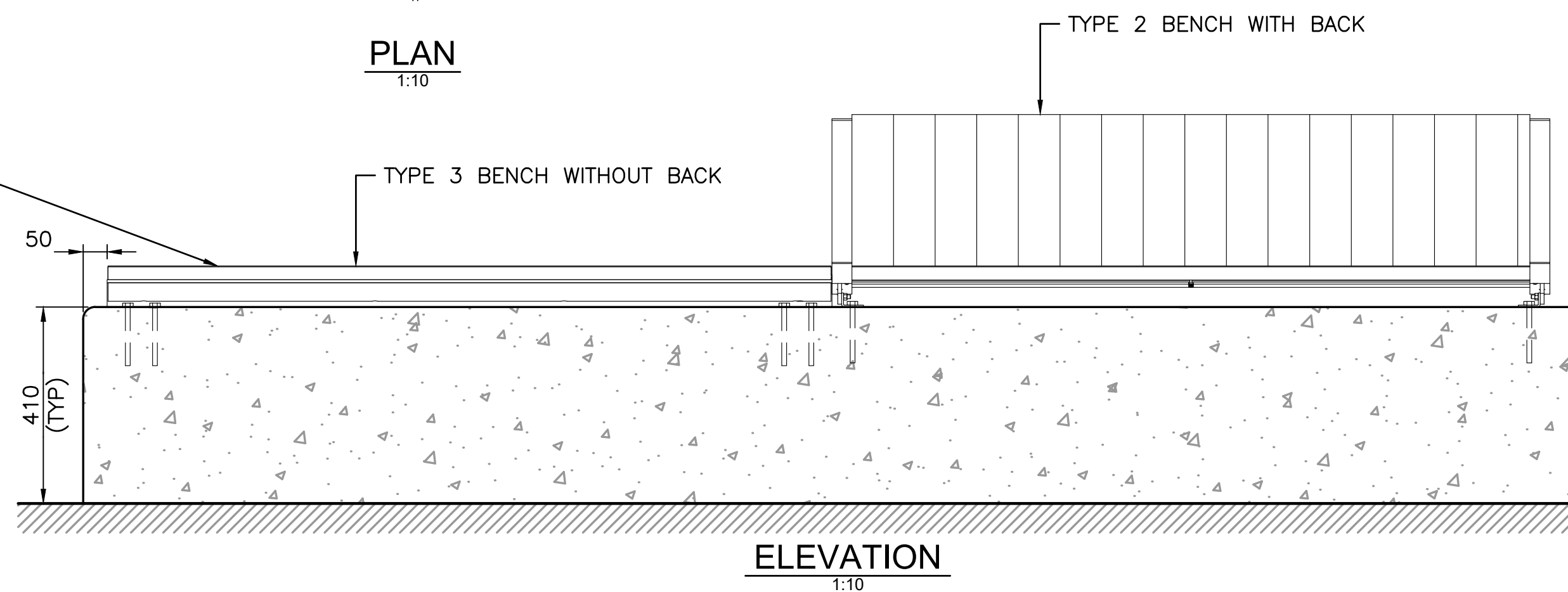
1 TYPE 1 BENCH
6.7.9 1:20

NOTES:

- CLEAR COVER TO REINFORCING STEEL:
 - CONCRETE CAST AGAINST EARTH = 75
 - ALL OTHER LOCATIONS = 60
- REINFORCING STEEL SHALL BE GRADE 400 UNLESS OTHERWISE SPECIFIED.
- BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS.
- LOCATE CONTROL JOINTS AS PER LANDSCAPE LAYOUT ENLARGEMENT ON SHEET 9.
- BAR LAP SPLICE FOR HORIZONTAL REINFORCEMENT MUST NOT LAP THROUGH CONTROL JOINT.



2 TYPE 2 AND TYPE 3 SURFACE MOUNTED BENCH
9 1:10



TYPE 3 BENCH

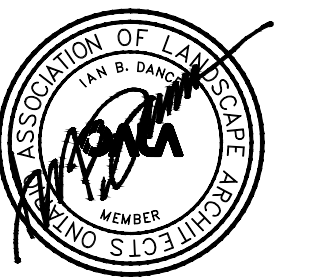


TYPE 2 BENCH



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A	detail number number du detail	A
B	source drawing no. de dessin no.	B
C	detail on drawing no. detail sur dessin no.	C

project title: **RED ROCK CANYON TRAIL LOOP AND BRIDGES** titre du projet:

drawing title: **DETAIL 4 of 4** titre du dessin:

designed by	I. DANCE	conçu par	
drawn by	S. NEZAFATI	dessiné par	
approved by	H. TROFANENKO	approuvé par	
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC	
scale	AS SHOWN	échelle	
project no.	2051	projet no.	13
date	DECEMBER 2019	date	OF 33

TRAIL RAILING NOTES

GENERAL

- CONFIRM ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS OR COMMENCING FABRICATION.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
- ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
- ALL MATERIALS USED IN THE WORK SHALL BE NEW.
- THE SCOPE OF WORK CONSISTS OF THE FOLLOWING GENERAL TASKS:
 - CARRY OUT FIELD SURVEYS TO GATHER DETAILED GEOMETRIC INFORMATION FOR THE EXISTING RAILING.
 - DETAIL INDIVIDUAL POSTS AND PANELS TO CONFORM TO THE GEOMETRIC INFORMATION GATHERED IN THE FIELD.
 - REMOVE AND DISPOSE OF THE EXISTING CHAIN–LINK STYLE FABRIC.
 - REMOVE AND DISPOSE OF THE EXISTING TOP RAIL BY MAKING HORIZONTAL CUTS THROUGH THE EXISTING POSTS, TAKING CARE TO ENSURE THE CUTS ARE MADE AT THE APPROPRIATE ELEVATION.
 - INSTALL NEW STEEL PIPE SLEEVES OVER THE EXISTING POSTS.
 - INSTALL NEW PICKET–TYPE FRAMES BETWEEN THE NEW STEEL PIPE SLEEVES.
 - INSTALL TIMBER TOP RAIL.
- ATTENTION IS SPECIFICALLY DRAWN TO THE COMPLEXITY OF THE RAILING REPLACEMENT TASK. COMPLICATIONS INCLUDE, BUT MAY NOT BE LIMITED TO THE FOLLOWING:
 - EACH SEPARATE ELEMENT OF THE NEW RAILING – INCLUDING PIPE SLEEVES, PICKET FRAMES AND TIMBER TOP RAIL – WILL REQUIRE MEASUREMENT, DETAILING, FABRICATION AND INSTALLATION ON A PANEL BY PANEL BASIS.
 - THERE MAY BE ONLY LIMITED REPETITION IN TERMS OF ELEMENT DIMENSIONS, WHICH WILL REQUIRE A SIGNIFICANT NUMBER OF SHOP DRAWINGS.
 - IT IS ESSENTIAL THAT EVERY POST AND PANEL ALONG THE PATHWAY IS ALLOCATED A UNIQUE IDENTIFIER TO BE CROSS–REFERENCED TO SHOP DRAWINGS AND TO FABRICATED ELEMENTS.
- DETAILS SHOWN ON THE DRAWINGS HAVE BEEN SELECTED TO MEET VARIOUS CONSTRAINTS RELATING TO THE CONSTRUCTION SEQUENCE, THE GEOMETRY OF THE EXISTING RAILING AND THE DESIRED APPEARANCE OF THE FINISHED RAILING.
- WHEN ESTIMATING THE COST OF THE WORK, CONTRACTOR SHALL RECOGNIZE THAT REVISIONS TO THE DETAILS SHOWN THAT MAY RESULT IN A MORE COST–EFFECTIVE SOLUTION WILL BE WELCOMED AND WILL BE CONSIDERED THOROUGHLY, BUT MAY ULTIMATELY NOT BE ACCEPTED, AND A SPECIFIC REASON FOR THE LACK OF ACCEPTANCE MAY NOT BE PROVIDED.

MATERIALS

- STRUCTURAL STEEL SHALL BE ATMOSPHERIC CORROSION RESISTANT (“WEATHERING”, “CORTEN”, “COR–TEN”) STEEL. GRADE 300A OR BETTER IN ACCORDANCE WITH CSA STANDARD G40.21, ASTM A606 TYPE 4, ASTM A588 OR APPROVED EQUIVALENT ONLY.
- AFTER THE NEW RAILINGS HAVE BEEN INSTALLED, MEASURES SHALL BE TAKEN TO ENCOURAGE THE DEVELOPMENT OF A CONSISTENT OXIDIZED SURFACE APPEARANCE. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- WELDING MATERIALS USED WITH STRUCTURAL STEEL SHALL BE SELECTED TO HAVE WEATHERING PROPERTIES THAT ARE SIMILAR TO THE SELECTED STEEL MATERIAL.
- HEX–HEAD BOLTS, CARRIAGE BOLTS AND OTHER FASTENERS SHALL BE STAINLESS STEEL IN ACCORDANCE WITH ASTM STANDARD F593, OR APPROVED EQUIVALENT ONLY.
- TIMBER SHALL BE D.FIR–LARCH, NO. 1 OR BETTER AND SHALL CONFIRM TO CSA STANDARD Q141.
- TIMBER DIMENSIONS ARE SPECIFIED IN MILLIMETERS AND ARE ACTUAL FINISHED DIMENSIONS, NOT NOMINAL DIMENSIONS.
- TIMBER RAILS SHALL BE FREE OF SLIVERS AND SANDED SMOOTH TO THE PROFILE SHOWN.

POTENTIAL WORK SEQUENCE

THIS SECTION DESCRIBES ONE POTENTIAL WORK SEQUENCE THAT MAY SATISFY THE REQUIREMENTS OF THE CONTRACT. IT HAS BEEN PRESENTED AS AN EXAMPLE OF THE LEVEL OF EFFORT THAT MAY BE EXPECTED AS PART OF THE RAILING REPLACEMENT. RESPONSIBILITY FOR SUITABILITY OF SPECIFIC MEANS, METHODS AND SEQUENCES USED TO DETAIL, FABRICATE AND CONSTRUCT THE WORK REMAINS WITH THE CONTRACTOR.

- DEVELOP A NAMING SYSTEM TO BE USED TO IDENTIFY EACH SEPARATE POST AND EACH SEPARATE RAILING PANEL MAKING UP THE EXISTING RAILING.
- SURVEY EACH POST TO IDENTIFY THE COORDINATES (NORTHING, EASTING AND ELEVATION) AT A CONSISTENT POINT ON THE POST AT GRADE LEVEL (POINT A) AND AT UNDERSIDE OF EXISTING TOP RAIL (POINT B). ACCURACY OF THESE MEASUREMENTS SHALL BE WITHIN ±5mm AT MOST (LESS IF REQUIRED FOR EXPECTED FABRICATION TOLERANCES). THE INTENT OF THESE MEASUREMENTS IS TO IDENTIFY THE LENGTH OF EACH PANEL, THE POTENTIAL HEIGHT OF EACH POST AND THE ANGLE OF EACH POST MEASURED FROM THE VERTICAL. ENSURE THAT NEW POST LOCATIONS ADJACENT TO THE UPPER BRIDGE ARE ACCOUNTED FOR. END PANELS MAY HAVE TO VARY IN HEIGHT TO MATCH BRIDGE RAIL.
- PHYSICALLY MARK THE LOCATION OF POINT A ON EACH POST FOR CONSISTENT REFERENCE DURING FOLLOWING STAGES OF THE WORK.
- CONFIRM OUTSIDE DIAMETER OF EACH EXISTING POST.
- IDENTIFY PANELS WHERE THE STANDARD LAYOUT DESCRIBED BELOW WILL NOT BE APPLICABLE. THIS WILL INCLUDE PANELS WHERE THE EXISTING RAIL HAS BEEN CONSTRUCTED AROUND NATURAL OBSTRUCTIONS SUCH AS BOULDERS OR TREE ROOTS. FOR THESE LOCATIONS, PROPOSE ALTERNATIVE PANEL FRAMING ARRANGEMENTS THROUGH THE SHOP DRAWING PROCESS, MAINTAINING CONSISTENCY WITH TYPICAL DETAILS WHEREVER POSSIBLE.
- TABULATE POST ELEVATIONS (ELEV B – ELEV A) TO DETERMINE THE RANGE OF EXISTING POST HEIGHTS. IN COORDINATION WITH THE DEPARTMENTAL REPRESENTATIVE, DECIDE ON DIMENSION C, A CONSTANT VERTICAL DISTANCE FROM GRADE LEVEL (POINT A) TO THE POINT AT WHICH THE EXISTING POSTS WILL BE CUT OFF. ASSUME C = 1000 FOR TENDER PURPOSES.

- NOTE THAT THE INTENT IS FOR THE TOP PLATE OF THE PIPE SLEEVES TO BEAR ON THE CUT END OF THE EXISTING POSTS, SO IT IS IMPORTANT THAT THE POSTS ARE CUT AT THE CORRECT ELEVATION. POSTS THAT ARE CUT TOO HIGH WILL HAVE TO BE RECUT; POSTS THAT ARE CUT TOO LOW WILL REQUIRE THE CONTRACTOR TO PROPOSE CORRECTIVE ACTION IN ORDER TO RESTORE THE NECESSARY SUPPORT FOR THE PIPE SLEEVE. DETAILS OF THIS CORRECTIVE ACTION WILL BE SUBJECT TO THE APPROVAL OF THE DEPARTMENTAL REPRESENTATIVE AND THE CORRECTIONS SHALL BE COMPLETED AT NO ADDITIONAL COST.
- BASED ON THE MEASURED OUTSIDE DIAMETER OF THE EXISTING POSTS, AND IN COORDINATION WITH THE DEPARTMENTAL REPRESENTATIVE, SELECT AN APPROPRIATE SIZE FOR THE PIPE SLEEVES TO BE INSTALLED OVER THE EXISTING POSTS. ASSUME DN80 STD PIPE (88.9 O.D., 5.5 WALL) FOR TENDER PURPOSES.
- TABULATE ANGLE D FOR ALL PANELS BASED ON SURVEY DATA TAKEN AT POINT A. BASED ON ANGLE D, AND IN COORDINATION WITH THE DEPARTMENTAL REPRESENTATIVE, SELECT DIMENSIONS X AND Y TO GIVE A CLEARANCE BETWEEN THEORETICAL GRADE LINE AND UNDERSIDE OF BOTTOM RAIL NO LESS THAN 20 AND NO GREATER THAN 100. ASSUME X = 100 AND Y = 100 FOR TENDER PURPOSES.
- BASED ON THE SELECTED VALUES FOR X AND Y, AND ON THE SURVEY DATA TAKEN AT POINT A, TABULATE ANGLE E FOR ALL PANELS. NOTE THAT ANGLE E IS DIFFERENT FROM ANGLE D AS A RESULT OF THE HORIZONTAL OFFSET DIMENSION, X. ANGLE E DEFINES THE ANGLE BETWEEN THE TOP AND BOTTOM RAILS AND THE PICKETS, WHICH ARE INTENDED TO BE VERTICAL.
- BASED ON THE SURVEY DATA TAKEN AT POINT A, TABULATE THE ANGLE F FOR ALL POSTS. THIS DEFINES THE ANGLE AT WHICH THE CONNECTION BRACKETS ARE ATTACHED TO THE PIPE SLEEVES.
- BASED ON THE SURVEY DATA TAKEN AT POINTS A AND B, AND ON THE VALUES SELECTED FOR DIMENSIONS C AND Y, TABULATE THE POSITION OF POINTS G AND H AT EACH POST LOCATION.
- BASED ON THE TABULATED POSITION OF POINTS G AND H, AND ON THE VALUE SELECTED FOR DIMENSION X, DETERMINE THE COORDINATES FOR POINTS PLG, PLH, PRG AND PRH AT EACH PANEL. BASED ON THESE COORDINATES, DETERMINE THE DIMENSION LT AND LB FOR EACH PANEL. ALSO DETERMINE DIMENSIONS DL AND DR. NOTE THAT BY DEFINITION, DL AND DR ARE POSITIVE AT LOCATIONS WHERE THE TOP RAIL IS LONGER THAN THE BOTTOM RAIL, AND NEGATIVE AT LOCATIONS WHERE THE BOTTOM RAIL IS LONGER THAN THE TOP RAIL. THE SIGN OF THESE DIMENSIONS MAY BE DIFFERENT BETWEEN THE TWO ENDS OF A SINGLE PANEL.
- BASED ON DIMENSIONS DL AND DR, SET PL AND PR TO A VALUE THAT WILL ENSURE A MAXIMUM DISTANCE OF 100 BETWEEN FACE OF PIPE SLEEVE AND CENTERLINE OF FIRST PICKET. SET THESE DIMENSIONS ASSUMING THE DISTANCE BETWEEN FACE OF PIPE SLEEVE AND END OF BOTTOM RAIL IS AT THE CENTER OF THE SUGGESTED TOLERANCE (i.e. 15).

THIS RESULTS IN THE FOLLOWING:

WHERE DL < 0, PL = 85
WHERE DL >= 0, PL = 85 – DL

WHERE DR < 0, PR = 85
WHERE DR >= 0, PR = 85 – DR

- IF THE PREVIOUS STEP RESULTS IN A VALUE FOR PL OR PR THAT IS LESS THAN 50, THE LOCATION SHALL BE REVIEWED IN MORE DETAIL AS IT LIKELY INDICATES A LOCATION WHERE ONE OR BOTH POSTS ARE SIGNIFICANTLY OUT OF PLUMB AND IT MAY BE NECESSARY TO CORRECT THEIR POSITION BEFORE DETAILING THE AFFECTED PANELS.
- USING THE VALUES OF PL AND PR DETERMINED ABOVE, SELECT THE NUMBER OF PICKET SPACES, N, TO BE THE MINIMUM NUMBER AT WHICH THE FOLLOWING REQUIREMENT IS SATISFIED:

(LB + 2K – PR – PL) / N <= 100 + PICKET WIDTH = 116

- BASED ON THE EXPECTED PANEL LENGTH, THIS SHOULD RESULT IN C/C PICKET SPACINGS THAT VARY BETWEEN 105 AND 116.
- FABRICATE TIMBER RAILS TO SUIT EACH PANEL LENGTH.
- AFTER PIPE SLEEVES AND PICKET FRAMES ARE IN PLACE, INSTALL TIMBER RAILS.
- WHERE THE ALIGNMENT OF THE RAILING PERMITS, KEEP THE TIMBER RAIL CONTINUOUS ACROSS POSTS, LOCATE NECESSARY SPLICES AT INTERMEDIATE BRACKET LOCATIONS.
- WHERE THE TIMBER RAIL IS SPLICED AT INTERMEDIATE BRACKET LOCATIONS, ENSURE THE GAP BETWEEN ADJACENT RAIL SECTIONS IS UNIFORM AND NO GREATER THAN 5mm. ENSURE THE TRANSVERSE OFFSET BETWEEN ADJACENT RAIL SECTION IS NO MORE THAN 5mm.
- WHERE THE TIMBER RAIL IS DISCONTINUOUS AT POST LOCATIONS, PROVIDE STEEL SHIMS AT ONE OR MORE ADJACENT BRACKET LOCATIONS AS NECESSARY TO LIMIT THE ELEVATION DIFFERENCE BETWEEN THE TWO RAIL SECTIONS TO NO MORE THAN 5mm.
- AFTER THE NEW RAILING SYSTEM IS IN PLACE, THE DEPARTMENTAL REPRESENTATIVE WILL REVIEW THE COMPLETED INSTALLATION IN ORDER TO IDENTIFY ANY AREAS WHERE THE CLEARANCE BELOW THE BOTTOM RAIL EXCEEDS THE REQUIRED MAXIMUM. IF ANY SUCH AREAS ARE IDENTIFIED, DETAILS WILL BE DEVELOPED FOR THE CONTRACTOR TO ADDRESS THE ISSUE ON A CASE BY CASE BASIS. A CHANGE ORDER WILL BE NEGOTIATED TO ADDRESS ANY SUCH LOCATIONS WHERE THE ISSUE RESULTED FROM CIRCUMSTANCES OUTSIDE THE CONTRACTOR’S CONTROL.



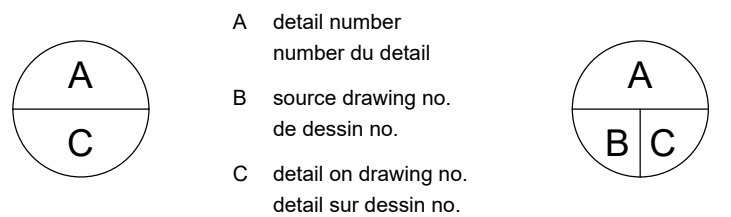
PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
PERMIT TO PRACTICE NUMBER: P2528

DATE 2020.04.27



RED ROCK CANYON
TRAIL LOOP AND BRIDGES

TRAIL RAILING NOTES

designed by

K. WILLIS

conçu par

drawn by

A. HEWITT

dessiné par

approved by

H. TROFANENKO

approuvé par

PCA Project Manager

Administrateur de Projets APC

M. VILLENEUVE

scale

AS SHOWN

echelle

sheet

feuille

project no.

2051

14

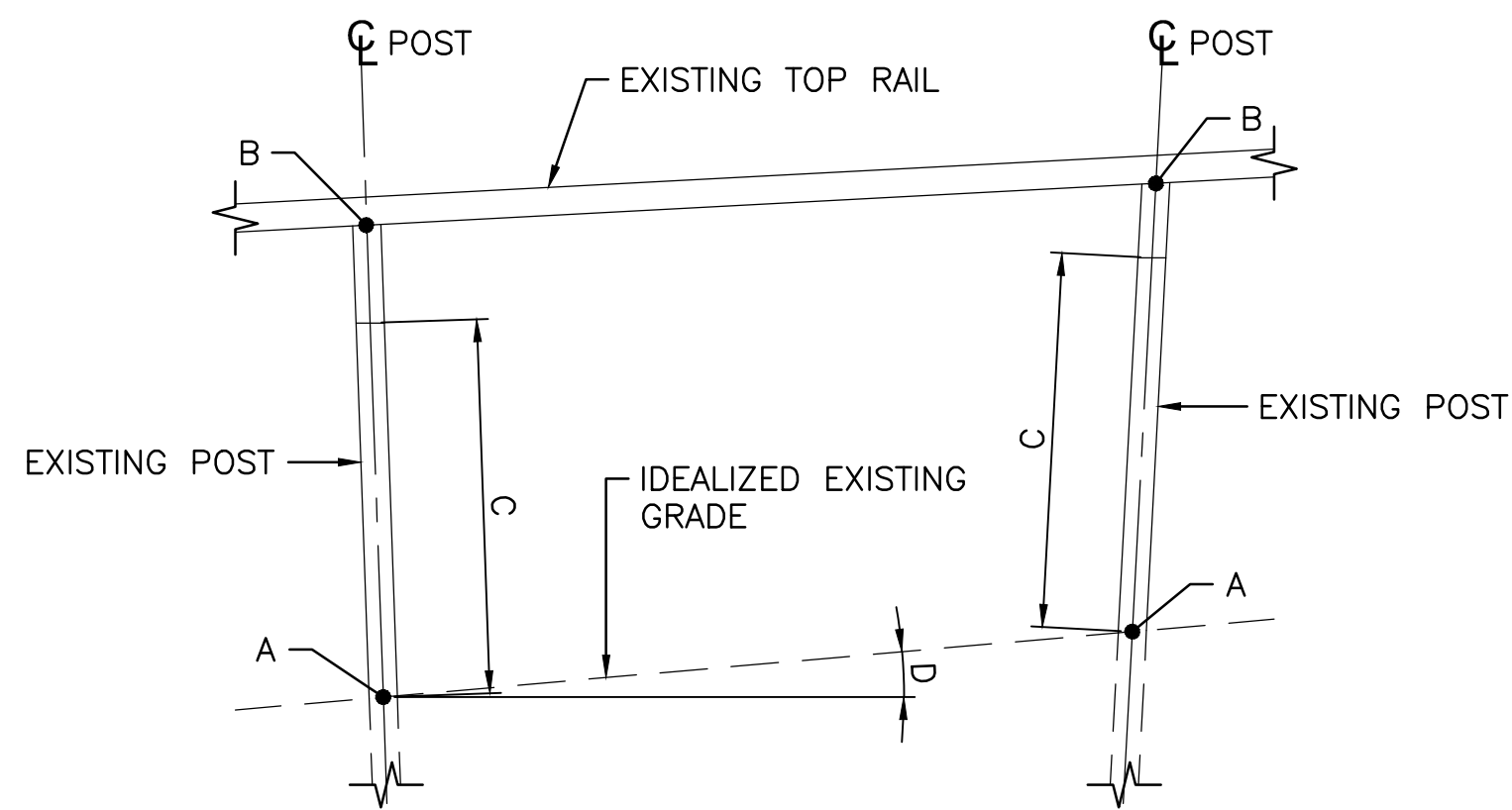
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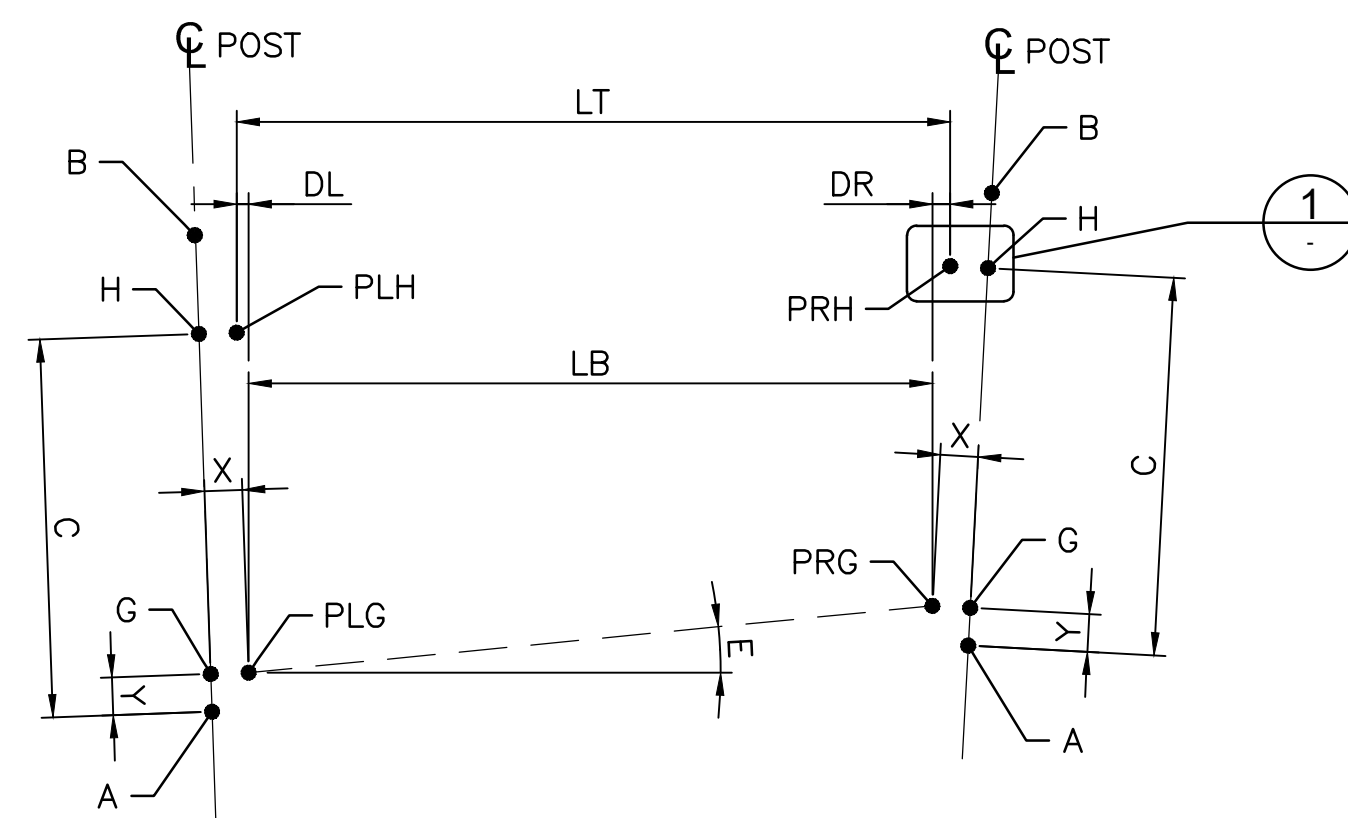
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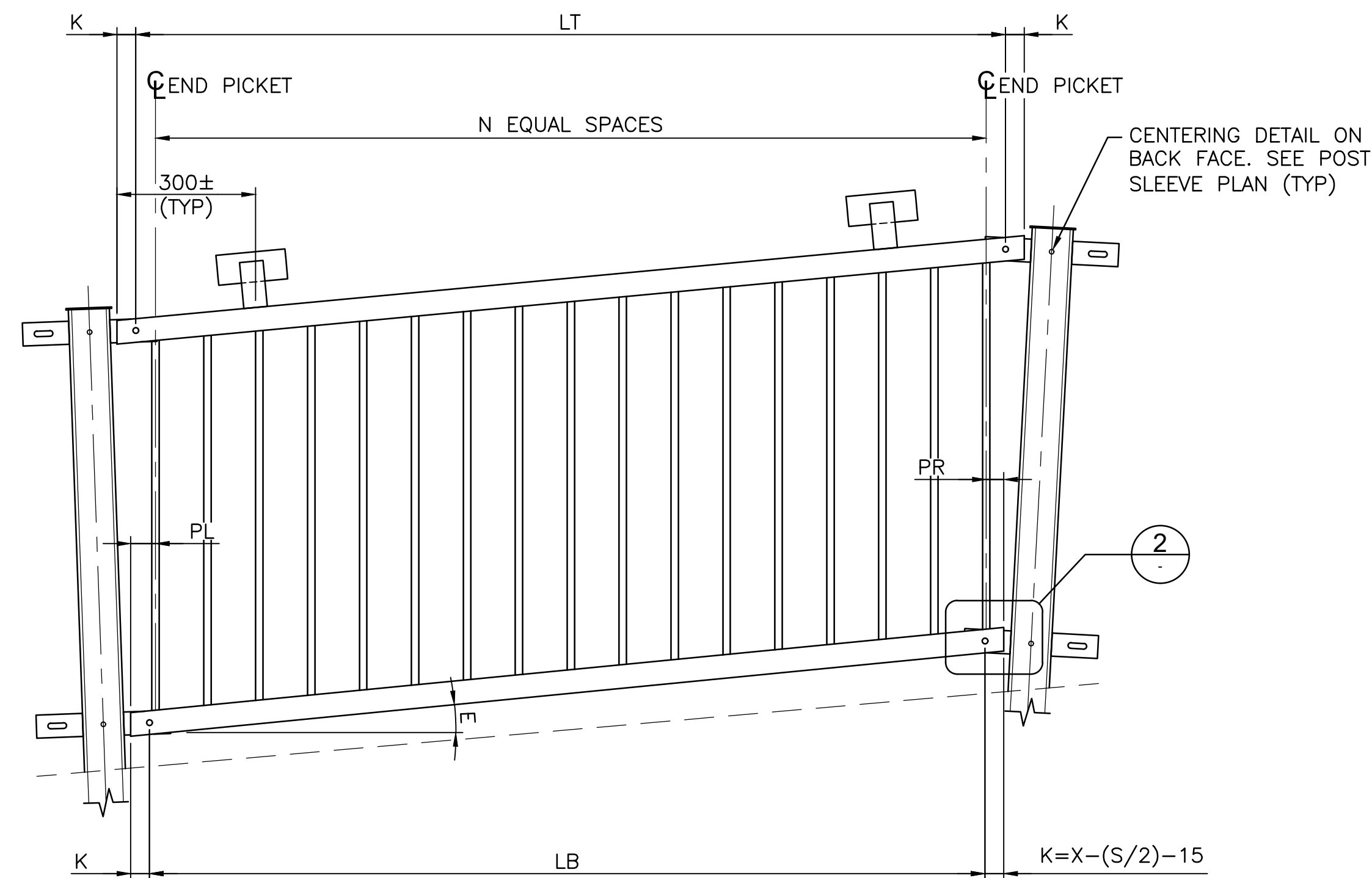
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BASIC PANEL GEOMETRY
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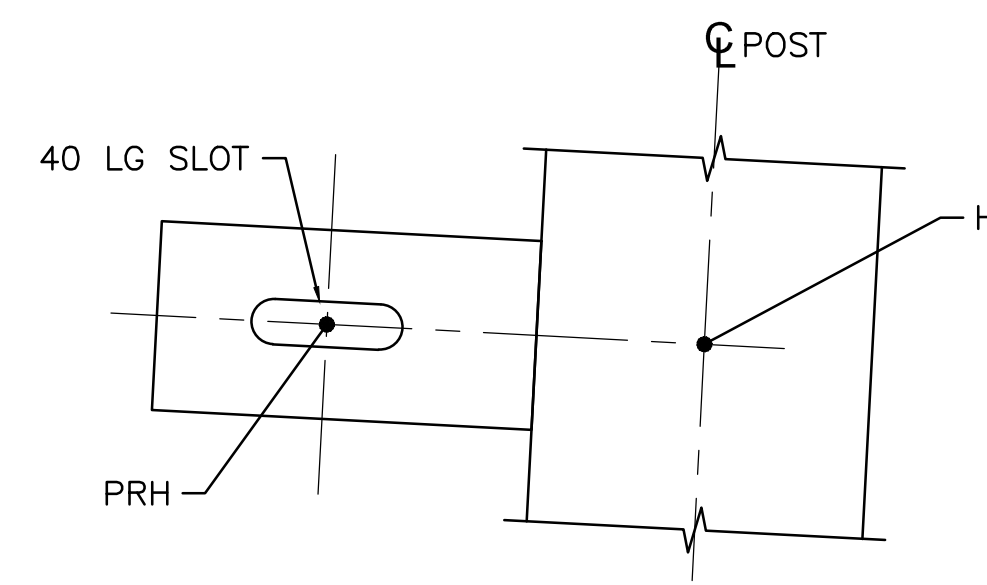


PICKET FRAME GEOMETRY
1:20

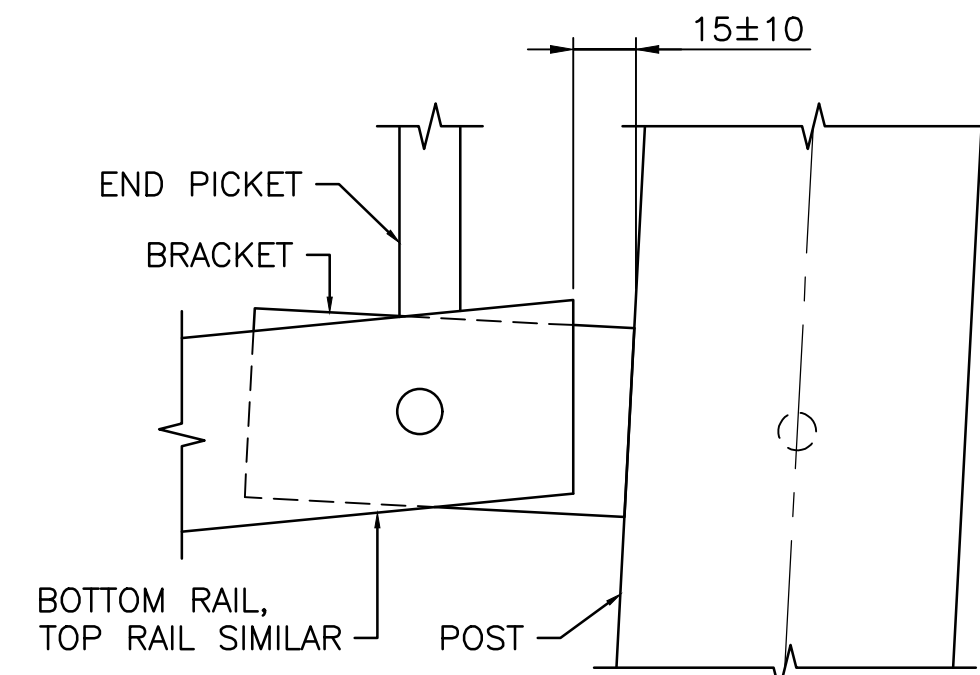


TYPICAL PICKET FRAME
1:10

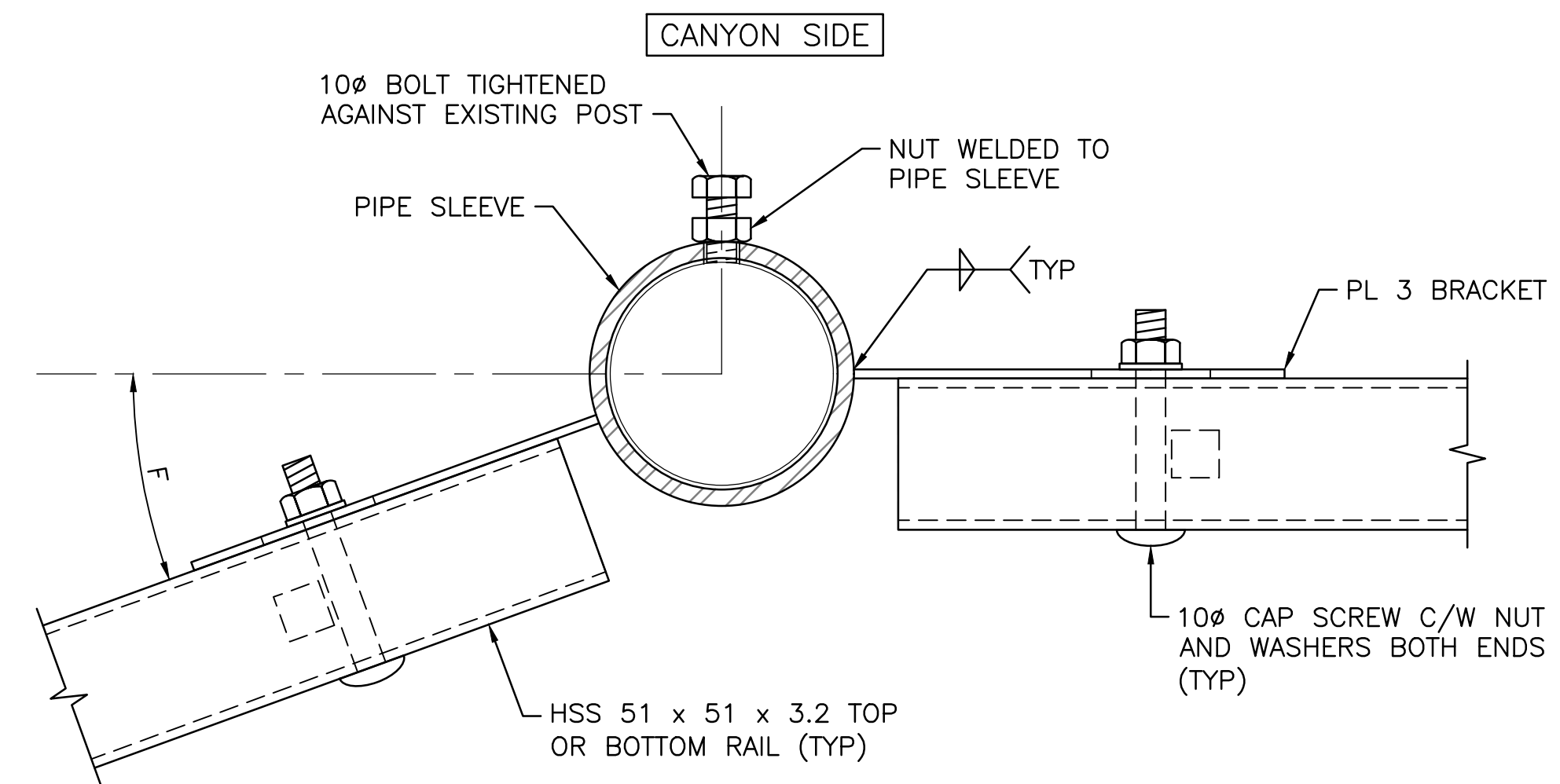
- NOTE:
1. TIMBER RAIL NOT SHOWN FOR CLARITY
2. POSTS SHOWN OUT OF PLUMB TO REFLECT POSSIBLE FIELD CONDITIONS AND EXAGGERATED FOR CLARITY.



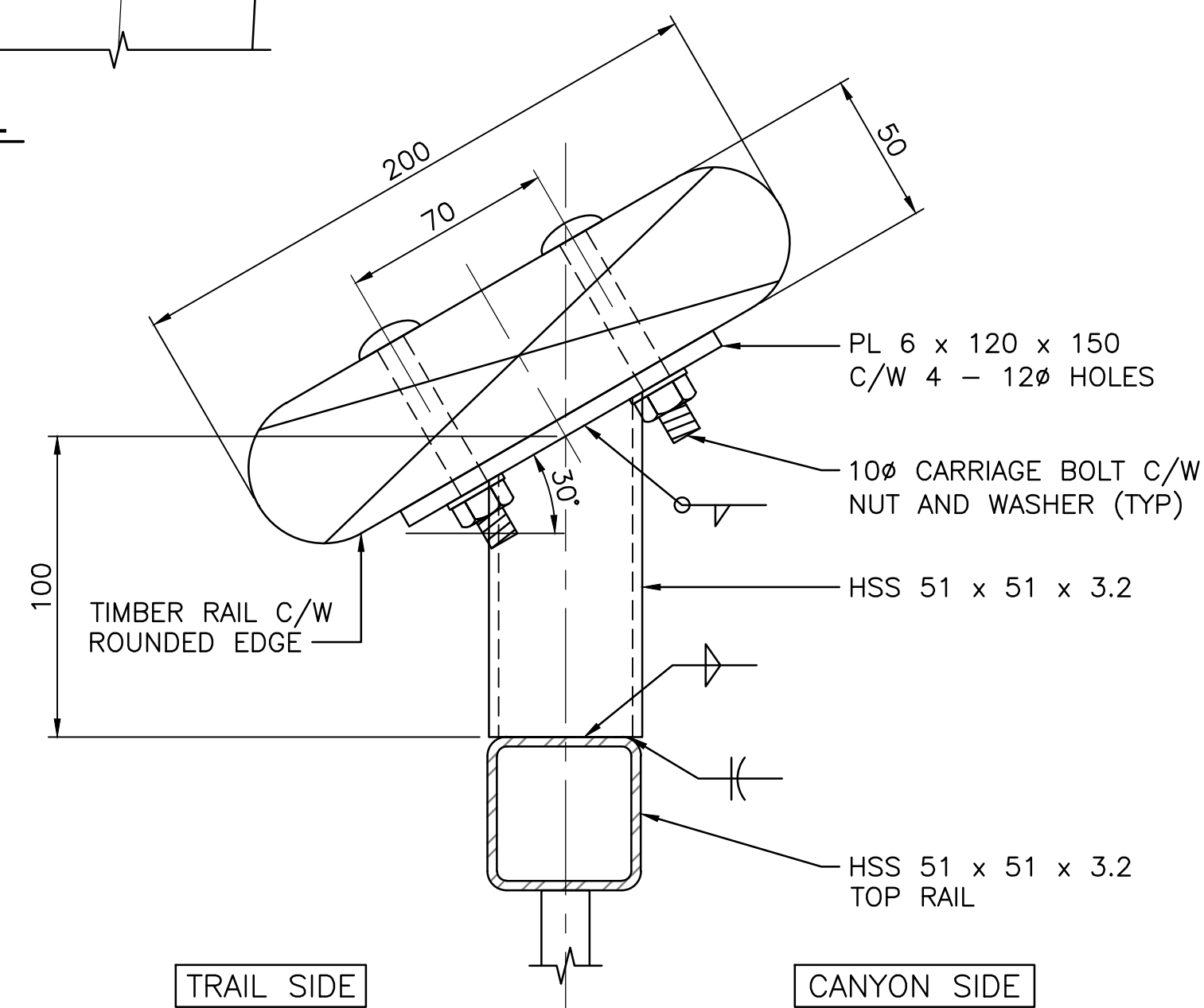
DETAIL 1
1:2
PLG, PRG, PLH SIMILAR



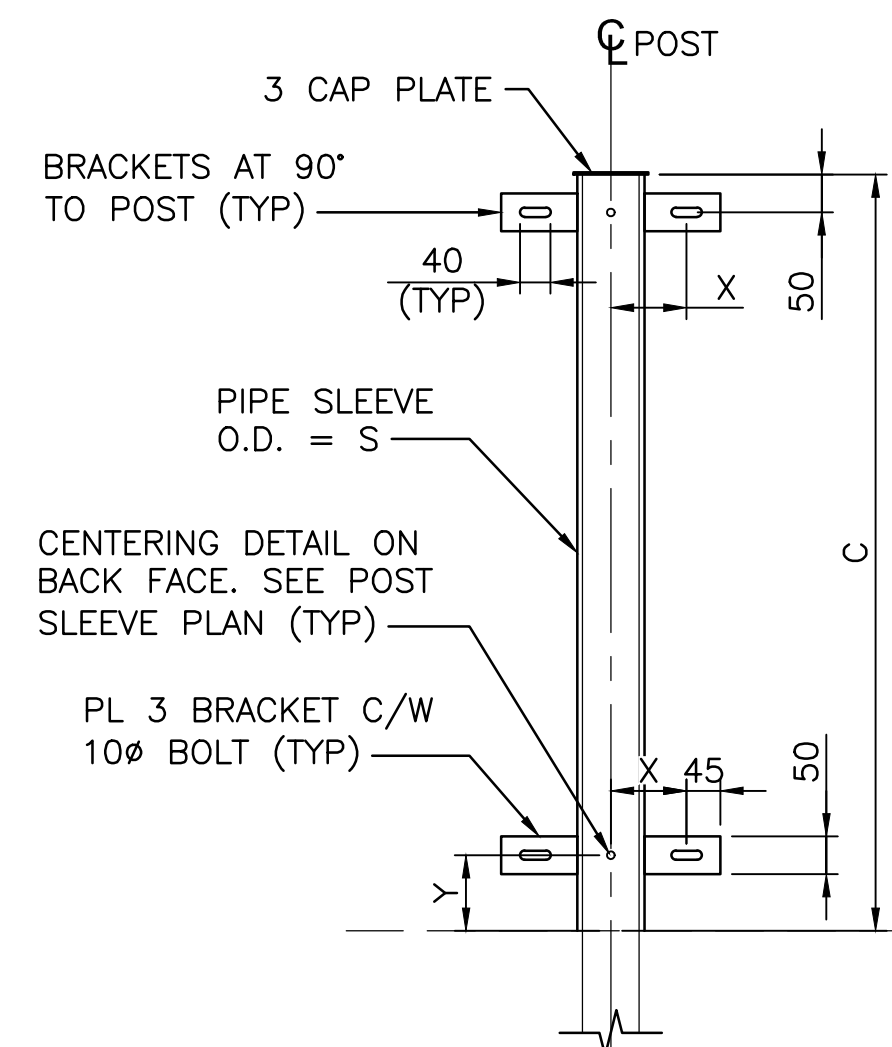
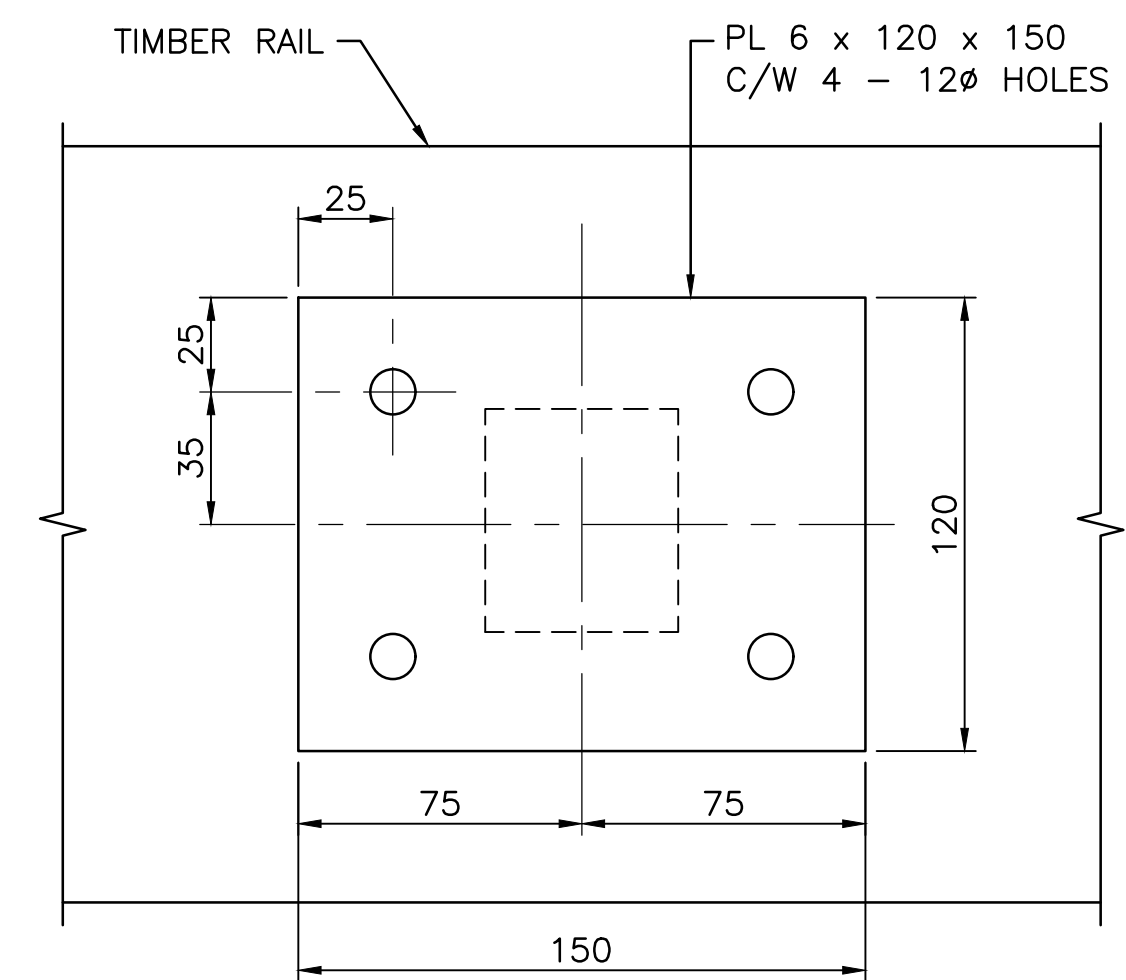
DETAIL 2
1:2



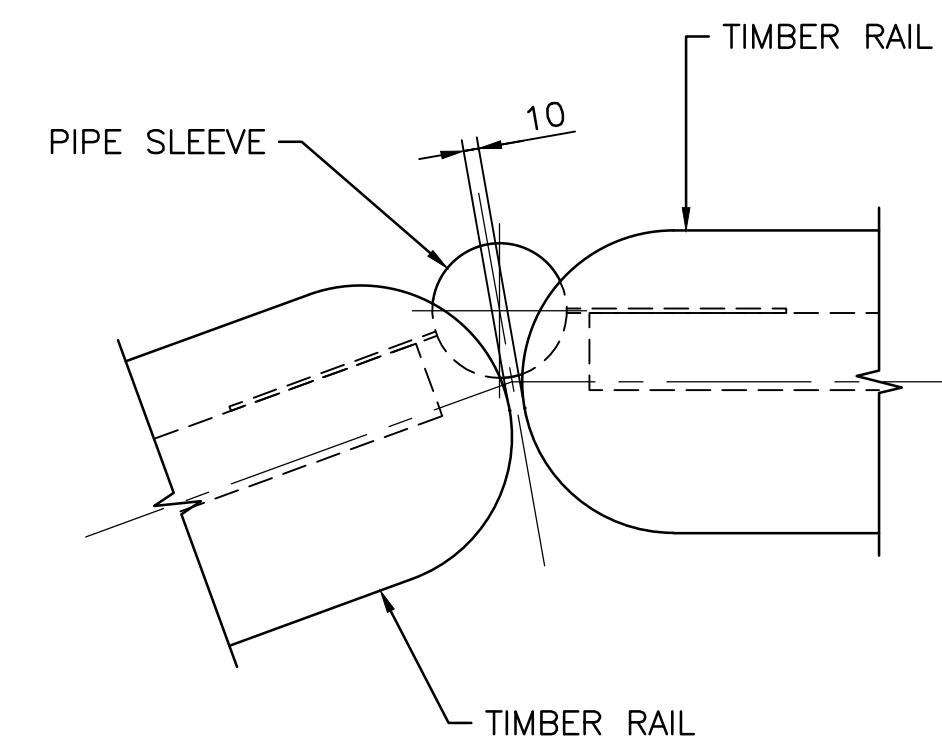
POST SLEEVE PLAN
1:2



TOP RAIL AND BRACKET DETAIL
1:2



POST SLEEVE ELEVATION
1:10



PLAN AT CHANGE IN ALIGNMENT
1:5



**PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST**

WATERTON LAKES NATIONAL PARK



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A	detail number	A
B	source drawing no.	B
C	detail on drawing no.	C

project title **RED ROCK CANYON
TRAIL LOOP AND BRIDGES** titre du projet

drawing title **TRAIL RAILING DETAILS** titre du dessin

designed by	K. WILLIS	conçu par	
drawn by	A. HEWITT	dessiné par	
approved by	H. TROFANENKO	approuvé par	
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC	
scale	AS SHOWN	échelle	
project no.	2051	projet no.	15
date	DECEMBER 2019	date	OF 33

BRIDGE GENERAL NOTES

GENERAL

1. THE SCOPE OF WORK FOR BRIDGES CONSISTS OF THE FOLLOWING GENERAL TASKS:
 - MODIFICATIONS TO THE EXISTING LOWER, MIDDLE AND BAUERMAN CREEK BRIDGES.
 - REMOVAL AND REPLACEMENT OF THE UPPER BRIDGE.
2. CONFIRM ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS OR COMMENCING FABRICATION.
3. ELEVATION OF UPPER BRIDGE IS APPROXIMATE ONLY. SET DECK ELEVATION BASED ON ABUTMENT ELEVATION AS CONFIRMED IN THE FIELD. ADJUST OTHER ELEVATIONS TO SUIT.
4. SOUTH RAMP SPAN IS SHOWN LEVEL BUT MAY BE SLOPED AT UP TO 4% IF REQUIRED TO MEET EXISTING GRADES. CONFIRM SLOPE REQUIREMENTS IN THE FIELD BEFORE PREPARING SHOP DRAWINGS OR COMMENCING FABRICATION.
5. BRIDGE PIER HAS BEEN DESIGNED CONSERVATIVELY BASED ON EXPECTED ELEVATIONS. AFTER FOUNDATION ELEVATIONS HAVE BEEN CONFIRMED BY FIELD SURVEY THIS DESIGN MAY BE MODIFIED. PROVIDE ELEVATIONS TO THE DEPARTMENTAL REPRESENTATIVE A MINIMUM OF FIVE (5) BUSINESS DAYS PRIOR TO START OF SHOP DRAWING PREPARATION IN ORDER TO ALLOW SUCH MODIFICATIONS.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
7. ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
8. ALL MATERIALS USED IN THE WORK SHALL BE NEW.
9. TAKE ALL REASONABLE AND NECESSARY STEPS TO PREVENT MATERIALS FROM ENTERING THE WATERCOURSE.
10. RESTORE ANY DAMAGE TO ACCESS ROUTES OR SURROUNDING AREA AFTER CONSTRUCTION IS COMPLETE.

CONSTRUCTION LOADS

1. THE LOWER, MIDDLE AND BAUERMAN CREEK BRIDGES HAVE BEEN EVALUATED FOR CONSTRUCTION LOADS BASED ON THE FOLLOWING ASSUMPTIONS:
 - TWO AXLE VEHICLE.
 - AXLE SPACING 2 m TO 4 m.
 - 33% / 67% WEIGHT DISTRIBUTION BETWEEN AXLES.
 - 5 km/h MAXIMUM SPEED.
 - ONLY ONE VEHICLE ON THE BRIDGE AT A TIME.
2. EVALUATION WAS COMPLETED FOR THE GIRDERS ONLY. LOCAL DAMAGE TO ELEMENTS SUCH AS THE TIMBER DECK MAY RESULT. CONTRACTOR IS RESPONSIBLE FOR THE REPAIR OF ANY SUCH DAMAGE, SHOULD THESE LOADS BE TAKEN OVER THE REHABILITATED STRUCTURES.
3. WITH NO CHANGES TO THE STRUCTURES, THE TOTAL VEHICLE WEIGHT SHALL NOT EXCEED THE FOLLOWING:
 - LOWER BRIDGE: 5 000 kg
 - MIDDLE BRIDGE: 2 000 kg
 - BAUERMAN CREEK BRIDGE: 7 000 kg
4. WITH THE ADDITION OF DIAGONAL BRACING BETWEEN THE GIRDERS, AT THE TOP FLANGE OR DECK LEVEL, THESE LOADS MAY BE INCREASED TO:
 - LOWER BRIDGE: 10 000 KG
 - MIDDLE BRIDGE: 10 000 KG
 - BAUERMAN CREEK BRIDGE: 15 000 KG
5. IN ORDER FOR INCREASED LOADS TO BE PERMITTED, SHOP DRAWINGS OF THE PROPOSED BRACING SHALL BE SUBMITTED FOR REVIEW.
6. SHOP DRAWINGS SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF ALBERTA.
7. IF THE PERMANENT BRACING DETAIL IS USED, SHOP DRAWINGS ARE STILL REQUIRED BUT NO SEAL IS NECESSARY.

MATERIALS

1. CAST-IN-PLACE CONCRETE SHALL MEET THE REQUIREMENTS FOR EXPOSURE CLASS C-1 AS DEFINED IN CSA STANDARD A23.1. MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS SHALL BE 30 MPa.
2. CONCRETE REINFORCEMENT SHALL BE GRADE 400R IN ACCORDANCE WITH CSA STANDARD G30.18.
3. CHAMFER ALL EXPOSED CORNERS 25 x 25 UNLESS NOTED OTHERWISE.
4. DRILLED ANCHORS SHALL BE HILTI HAS-R316SS OR APPROVED EQUIVALENT ONLY.
5. ANCHOR BOLTS SHALL BE GRADE 55 IN ACCORDANCE WITH ASTM STANDARD F1554 OR APPROVED EQUIVALENT ONLY.
6. PROVIDE ALL ANCHORS AND ANCHOR BOLTS WITH A DOUBLE-NUT LOCKING SYSTEM.
7. EMBED DRILLED ANCHORS AND REINFORCEMENT MINIMUM 150mm. ENSURE THAT PROJECTION LENGTH ALLOWS A MINIMUM OF 20mm OF THREADED LENGTH PAST THE SECOND (LOCKING) NUT.
8. ADHESIVE FOR ANCHORAGE OF REINFORCEMENT AND DRILLED ANCHORS SHALL BE HILTI HIT HY-200 OR APPROVED EQUIVALENT ONLY.
9. STRUCTURAL STEEL SHALL BE ATMOSPHERIC CORROSION RESISTANT ("WEATHERING STEEL"), GRADE 350A OR BETTER IN ACCORDANCE WITH CSA STANDARD G40.21.
10. TIMBER FOR NAILERS SHALL BE D.FIR-LARCH SELECT STRUCTURAL GRADE AND SHALL CONFORM TO CSA STANDARD O141.

11. ALL OTHER TIMBER SHALL BE SPRUCE-PINE-FIR, HEM-FIR OR D.FIR-LARCH, NO. 1 OR BETTER, AND SHALL CONFORM TO CSA STANDARD O141.
12. ALL TIMBER SHALL BE UNTREATED.
13. TIMBER DIMENSIONS ARE SPECIFIED IN MILLIMETERS AND ARE ACTUAL ROUGH-SAWN DIMENSIONS, NOT NOMINAL DIMENSIONS.
14. TIMBER FOR RAILS SHALL BE FREE OF SLIVERS AND SANDED SMOOTH TO THE PROFILE SHOWN.
15. HEX BOLTS FOR TIMBER CONNECTIONS SHALL BE IN ACCORDANCE WITH ASTM STANDARD A307, SHALL BE HOT-DIP GALVANIZED AND SHALL BE PROVIDED WITH OVERSIZE WASHERS AT BOTH HEAD AND NUT ENDS.
16. CARRIAGE BOLTS AND CAP SCREWS SHALL BE STAINLESS STEEL IN ACCORDANCE WITH ASTM STANDARD F593, OR APPROVED EQUIVALENT ONLY.
17. FASTEN DECK TO NAILERS USING TYPE RSS "RUGGED STRUCTURAL SCREWS" AS MANUFACTURED BY GRK FASTENERS, OR APPROVED EQUIVALENT ONLY. MINIMUM 2 SCREWS PER CONNECTION, MINIMUM 6 DIAMETER. PREDRILL ALL SCREWS.
18. PLACE DECK PLANKS WITH A CLEAR SPACE OF 6 mm TO 10 mm BETWEEN ADJACENT PLANKS.
19. FASTEN NAILERS TO STEEL BEAMS USING COUNTERSUNK 10 DIAMETER HEX HEAD BOLTS.
20. FASTEN TIMBER CURB TO DECK PLANKS USING 10 DIAMETER CARRIAGE BOLTS EACH SIDE OF SPLICE LOCATIONS AND AT A MAXIMUM SPACING OF 600 BETWEEN BOLTS.

MICROPILES

1. MICROPILES ARE REQUIRED BELOW THE UPPER BRIDGE MAIN SUPPORTS i.e. THE ABUTMENT AT THE NORTH END AND THE BRIDGE PIER AT THE SOUTH END.
2. TWO PILES ARE REQUIRED AT THE ABUTMENT; FOUR PILES ARE REQUIRED AT THE BRIDGE PIER.
3. PILES SHALL EXTEND A MINIMUM OF 5 METERS BELOW EXISTING GRADE.
4. PILES AT THE ABUTMENT SHALL BE DESIGNED FOR A FACTORED AXIAL LOAD OF 210 kN IN COMPRESSION AND 125 kN IN UPLIFT.
4. PILES AT THE BRIDGE PIER SHALL BE DESIGNED FOR A FACTORED AXIAL LOAD OF 225 kN IN EITHER COMPRESSION OR UPLIFT.
5. IF REQUIRED, SERVICE LOADS IN PILES MAY BE ESTIMATED BASED ON AN OVERALL LOAD FACTOR OF 1.5 FOR COMPRESSION AND 1.4 FOR UPLIFT.
6. PILES AND ASSOCIATED CONNECTIONS SHALL BE DESIGNED BY THE CONTRACTOR.
7. A MINIMUM OF 1 PILE AT EACH LOCATION SHALL BE PROOF-TESTED TO 1.67 TIMES THE PILE DESIGN LOAD.
8. SUBMIT FULL DETAILS OF THE PROPOSED PILES AND METHODS FOR INSTALLATION AND PROOF-TESTING FOR REVIEW A MINIMUM OF 10 WORKING DAYS BEFORE THE PROPOSED START DATE FOR INSTALLATION. THIS SUBMISSION SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF ALBERTA.



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
PERMIT TO PRACTICE NUMBER: P2528

DATE 2020.04.27

0	ISSUED FOR TENDER	2020.04.27
REVISIONS	DESCRIPTION	DATE

A

C

A detail number
number du detail

B

source drawing no.
de dessin no.

C

detail on drawing no.
detail sur dessin no.

A

B

C

project title

titre du projet

RED ROCK CANYON
TRAIL LOOP AND BRIDGES

drawing title

titre du dessin

BRIDGE
GENERAL NOTES

designed by

K. WILLIS

conçu par

drawn by

A. HEWITT

dessiné par

approved by

H. TROFANENKO

approuvé par

PCA Project Manager

M. VILLENEUVE

Administrateur de Projets APC

scale

AS SHOWN

échelle

sheet

16

feuille

project no.

2051

projet no.

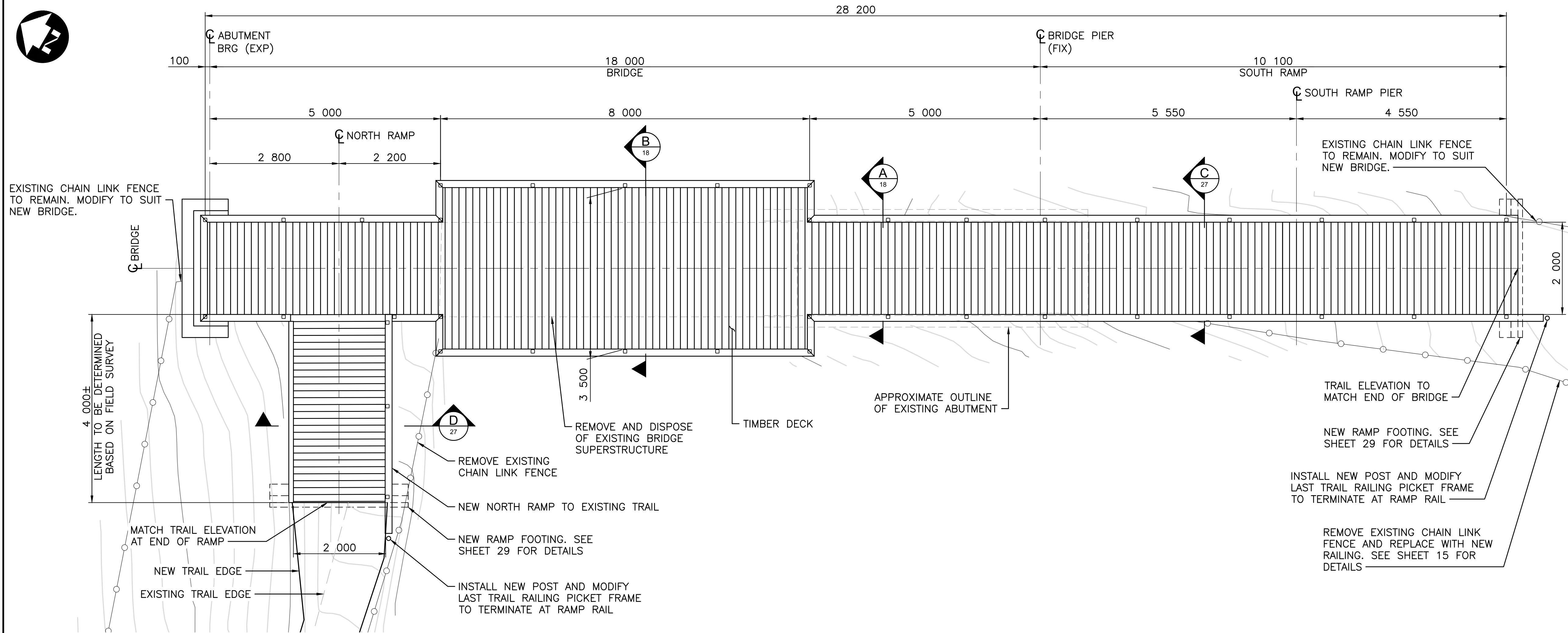
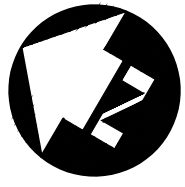
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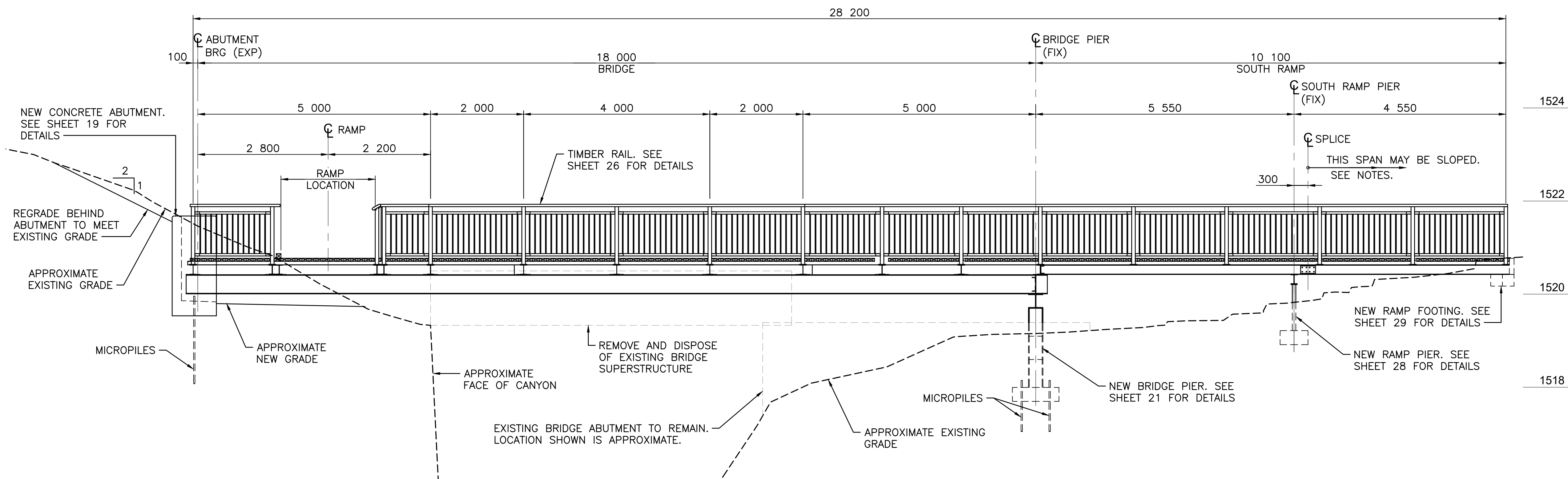
date

OF

33



PLAN
1:50



ELEVATION
1:50



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
PERMIT TO PRACTICE NUMBER: P2528

DATE 2020.04.27

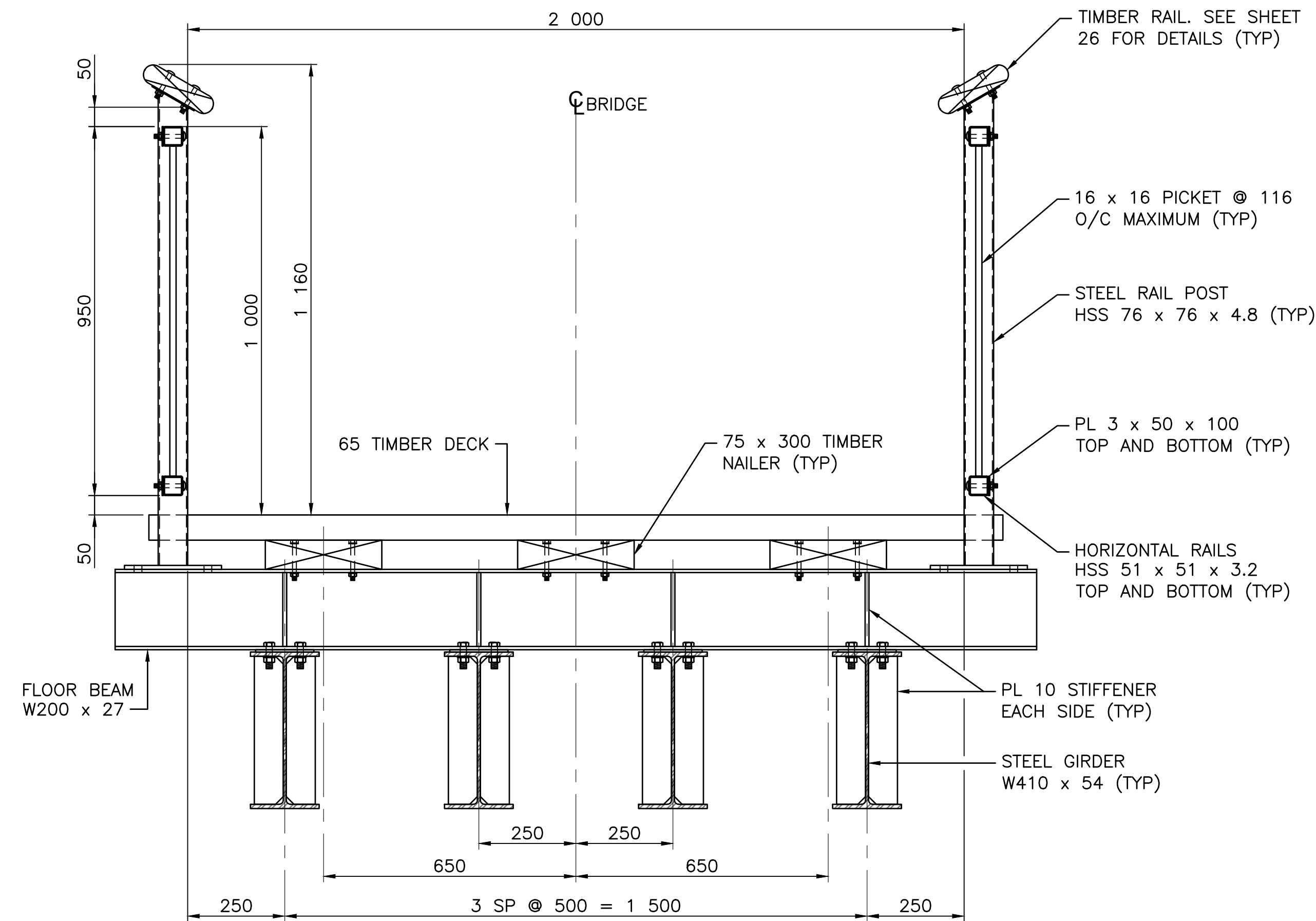
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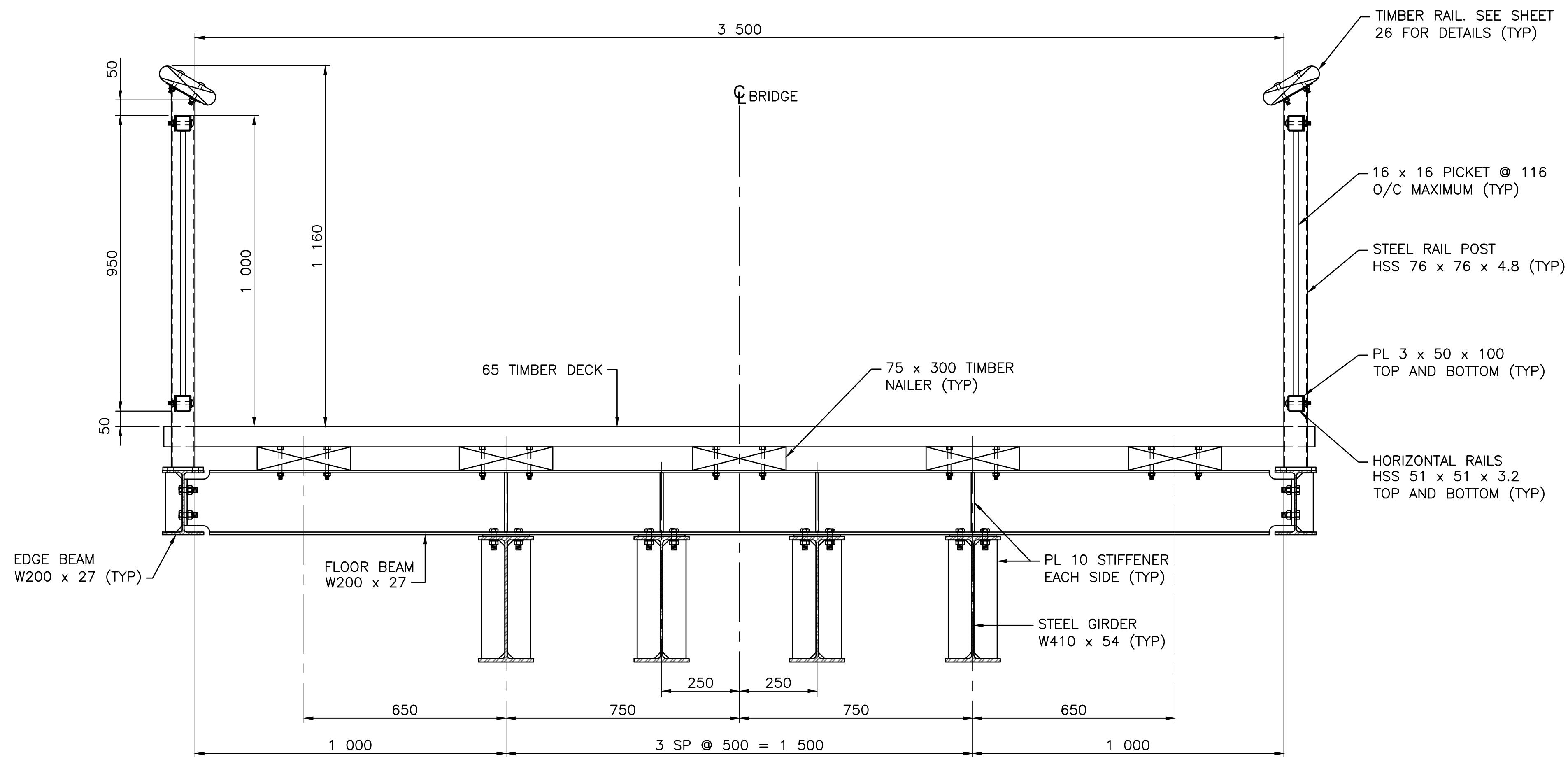
project title
titre du projet
**RED ROCK CANYON
TRAIL LOOP AND BRIDGES**

drawing title
titre du dessin
**UPPER BRIDGE
GENERAL ARRANGEMENT**

designed by conçu par	K. WILLIS	drawn by dessiné par	R. BARNES	approved by approuvé par	H. TROFANENKO
PCA Project Manager Administrateur de Projets APC	M. VILLENEUVE	scale échelle	AS SHOWN	project no. projet no.	2051
date	DECEMBER 2019	sheet feuille	17	OF	33



A TYPICAL BRIDGE SECTION
17 1:10



B LOOKOUT AREA SECTION
17 1:10



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



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C	detail on drawing no. detail sur dessin no.	C

project title **RED ROCK CANYON
TRAIL LOOP AND BRIDGES** titre du projet

drawing title **UPPER BRIDGE
TYPICAL BRIDGE SECTIONS** titre du dessin

designed by **K. WILLIS** conçu par

drawn by **R. BARNES** dessiné par

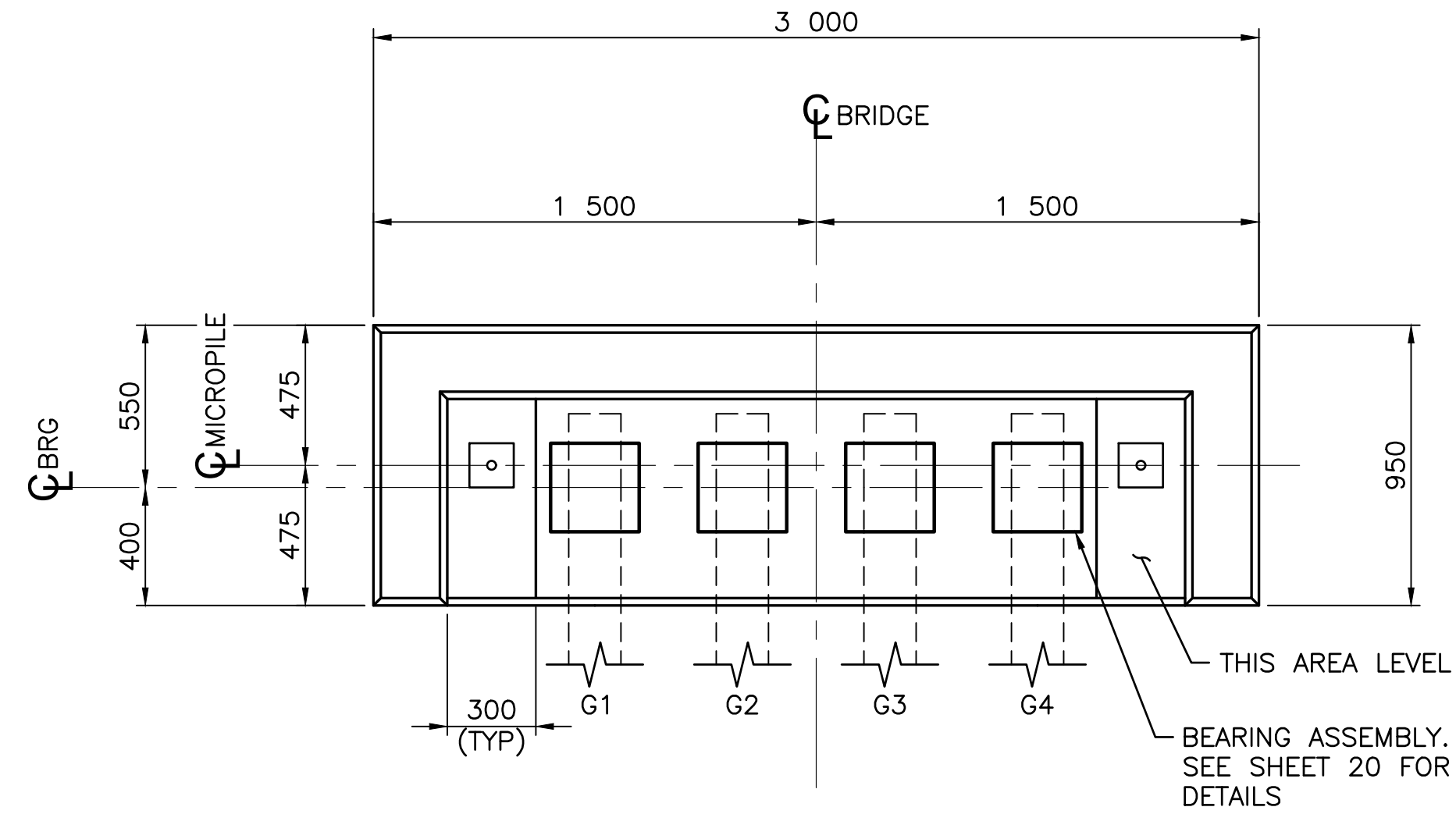
approved by **H. TROFANENKO** approuvé par

PCA Project Manager **M. VILLENEUVE** Administrateur de Projets APC

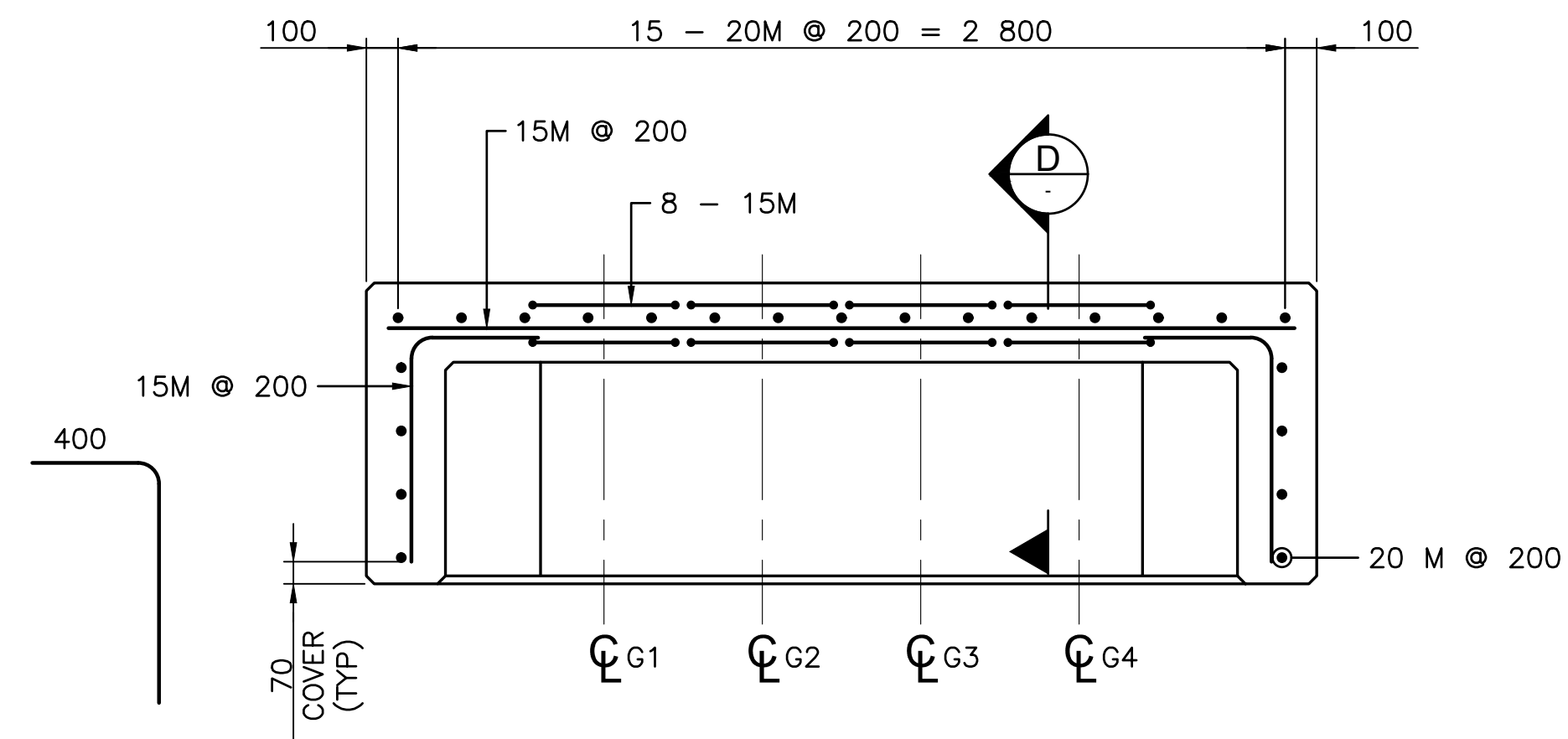
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project no. **2051** projet no. 18

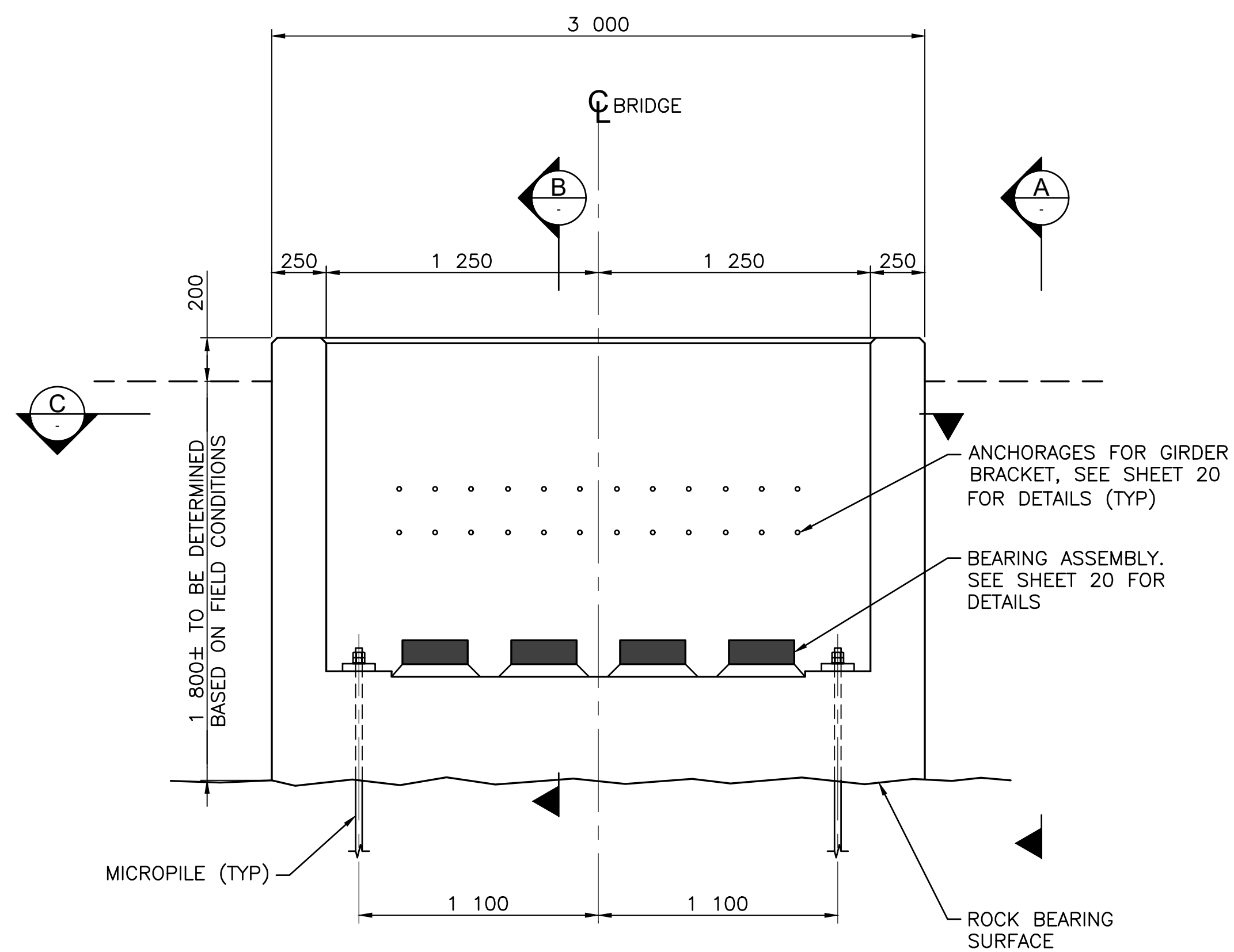
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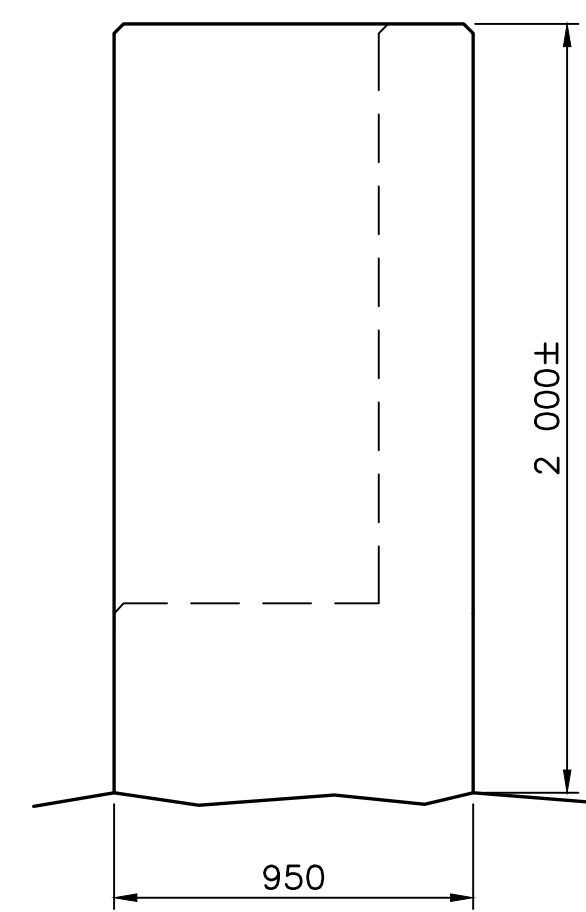
ABUTMENT FOUNDATION PLAN
1:20



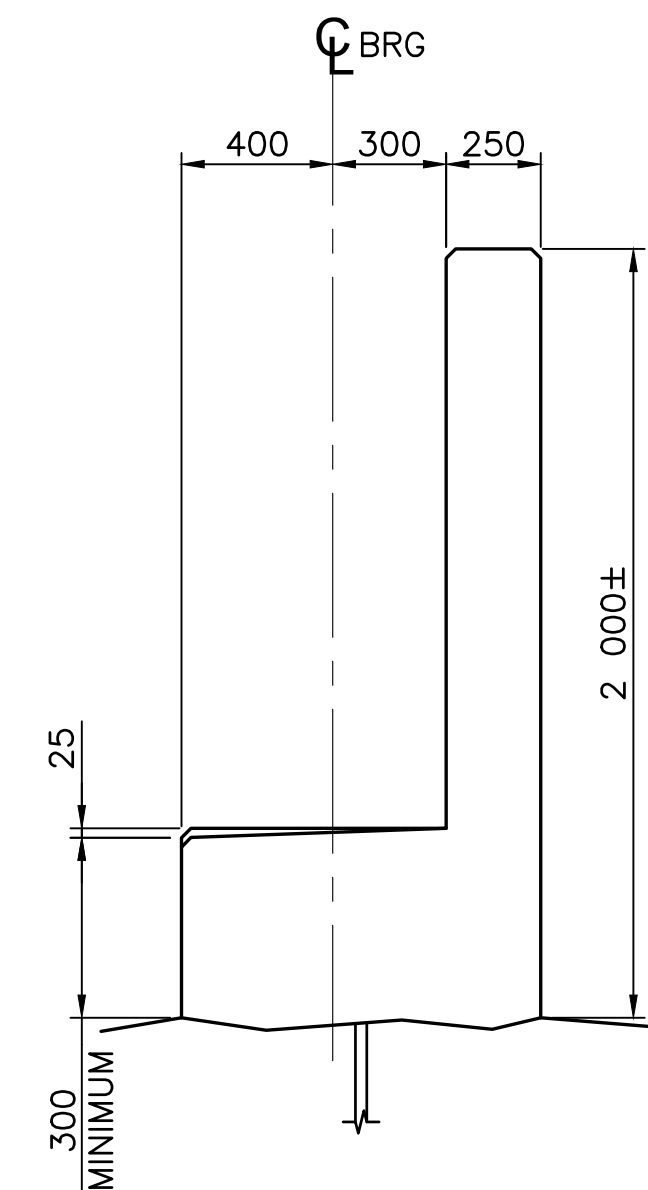
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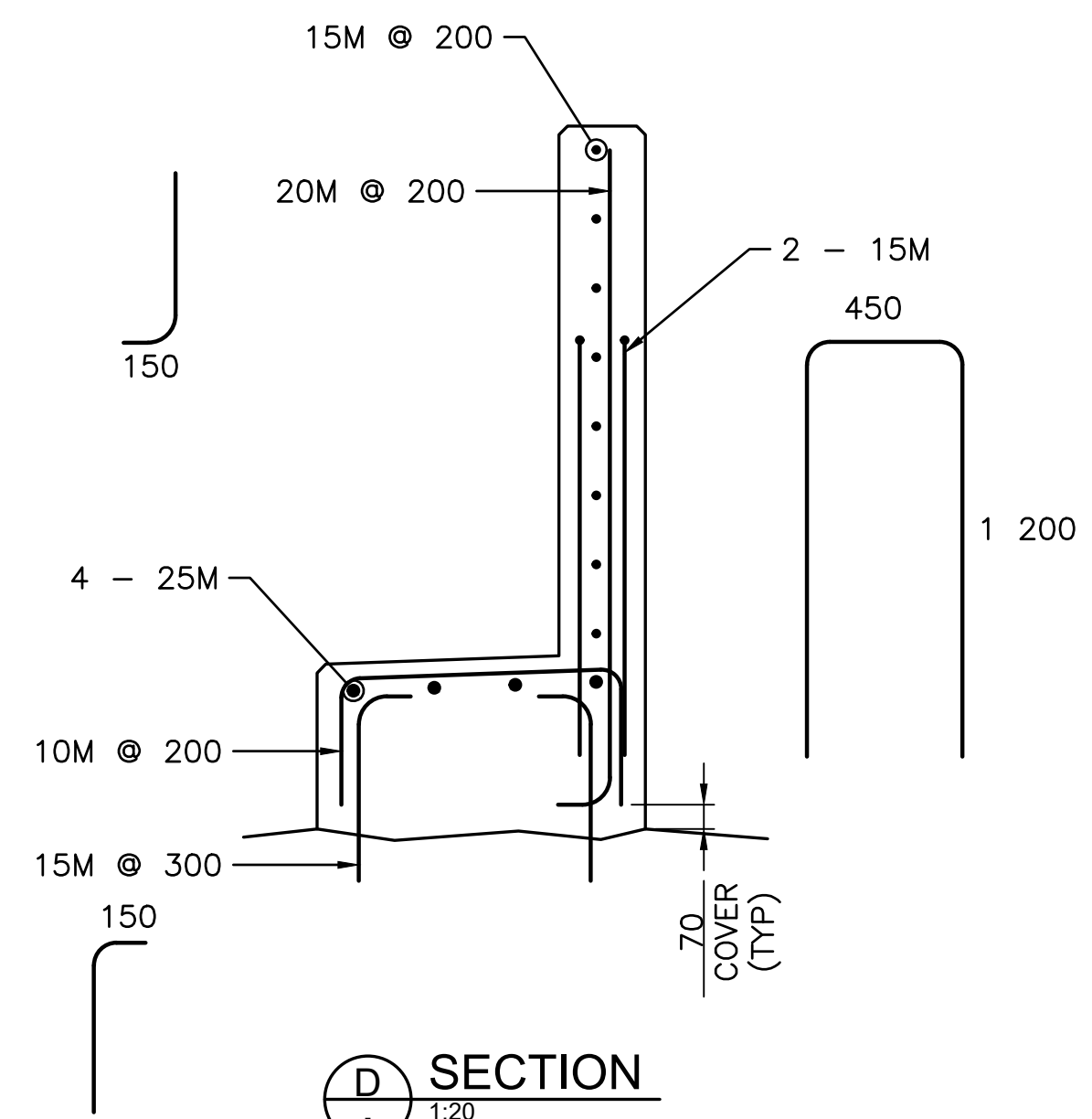
ABUTMENT FOUNDATION ELEVATION
1:20



SECTION A
1:20



SECTION B
1:20



SECTION D
1:20



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
PERMIT TO PRACTICE NUMBER: P2528

DATE 2020.04.27

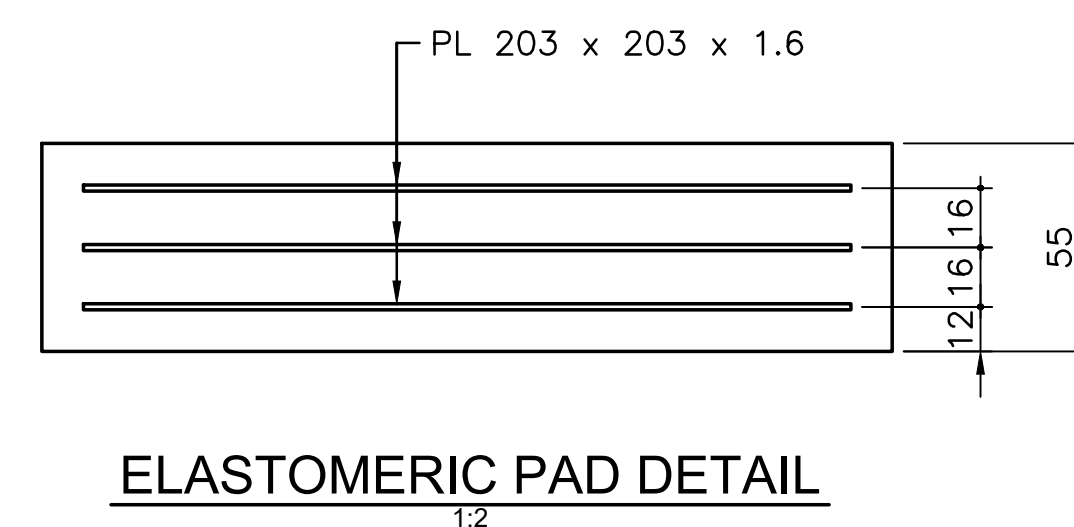
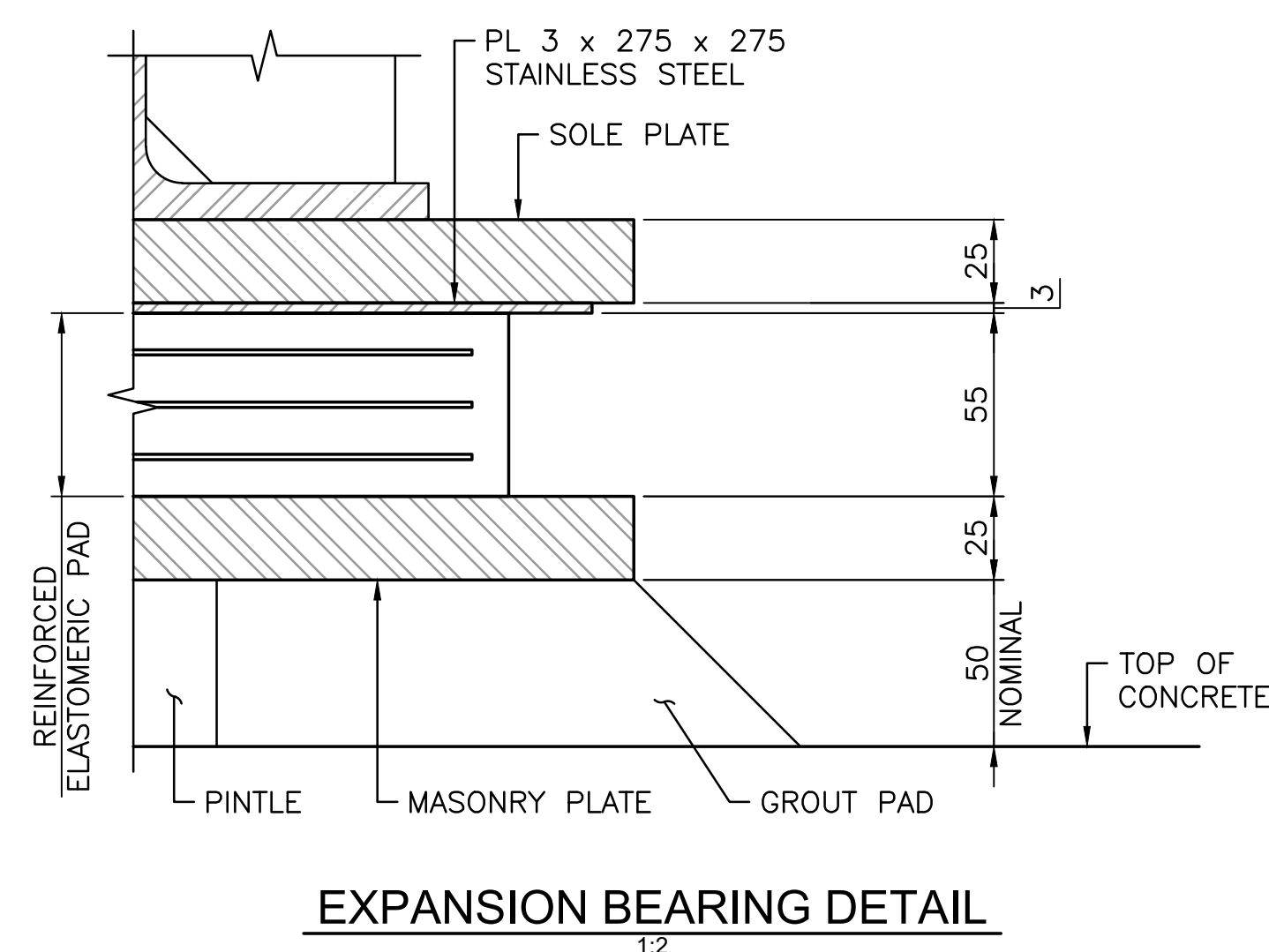
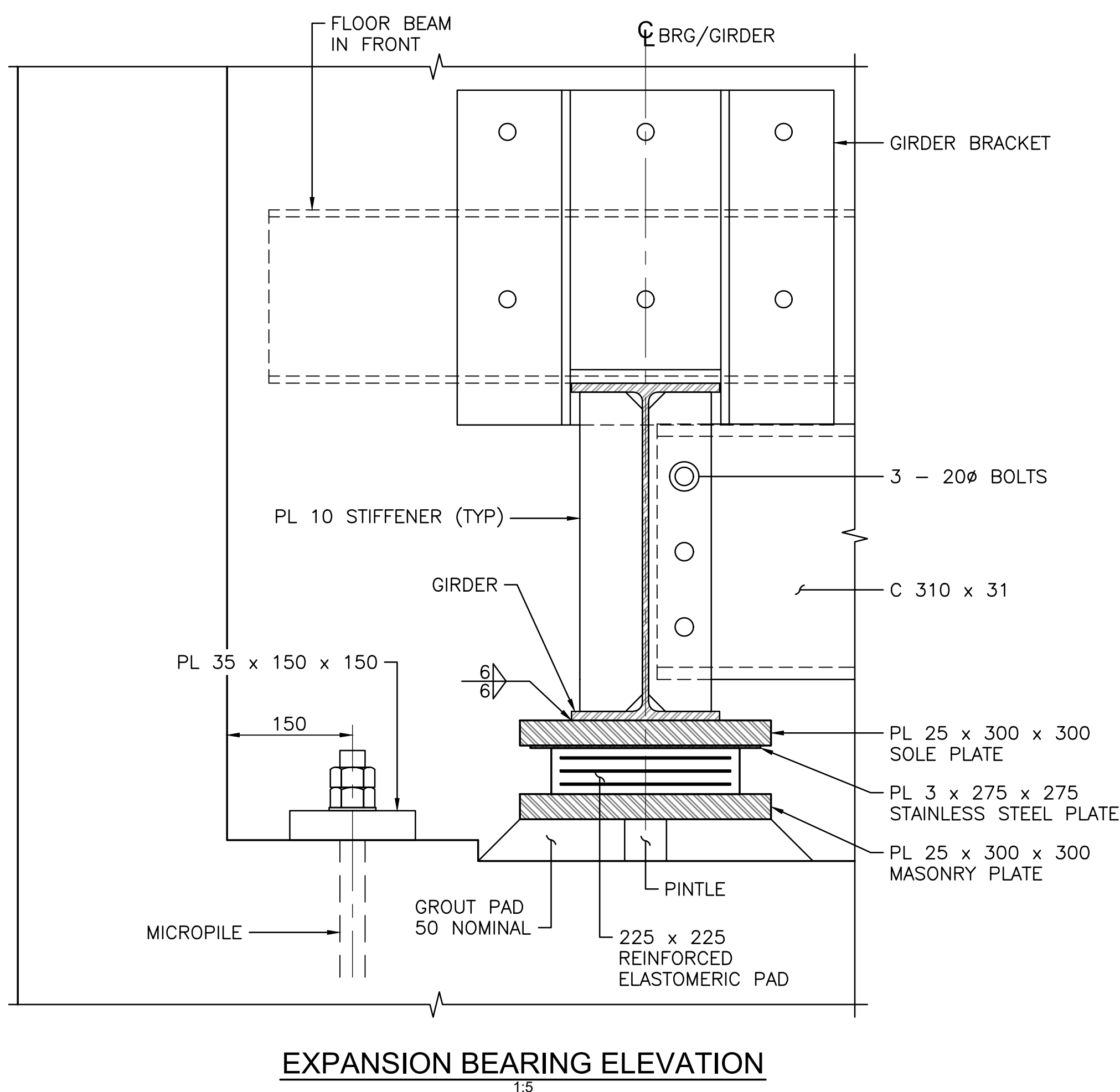
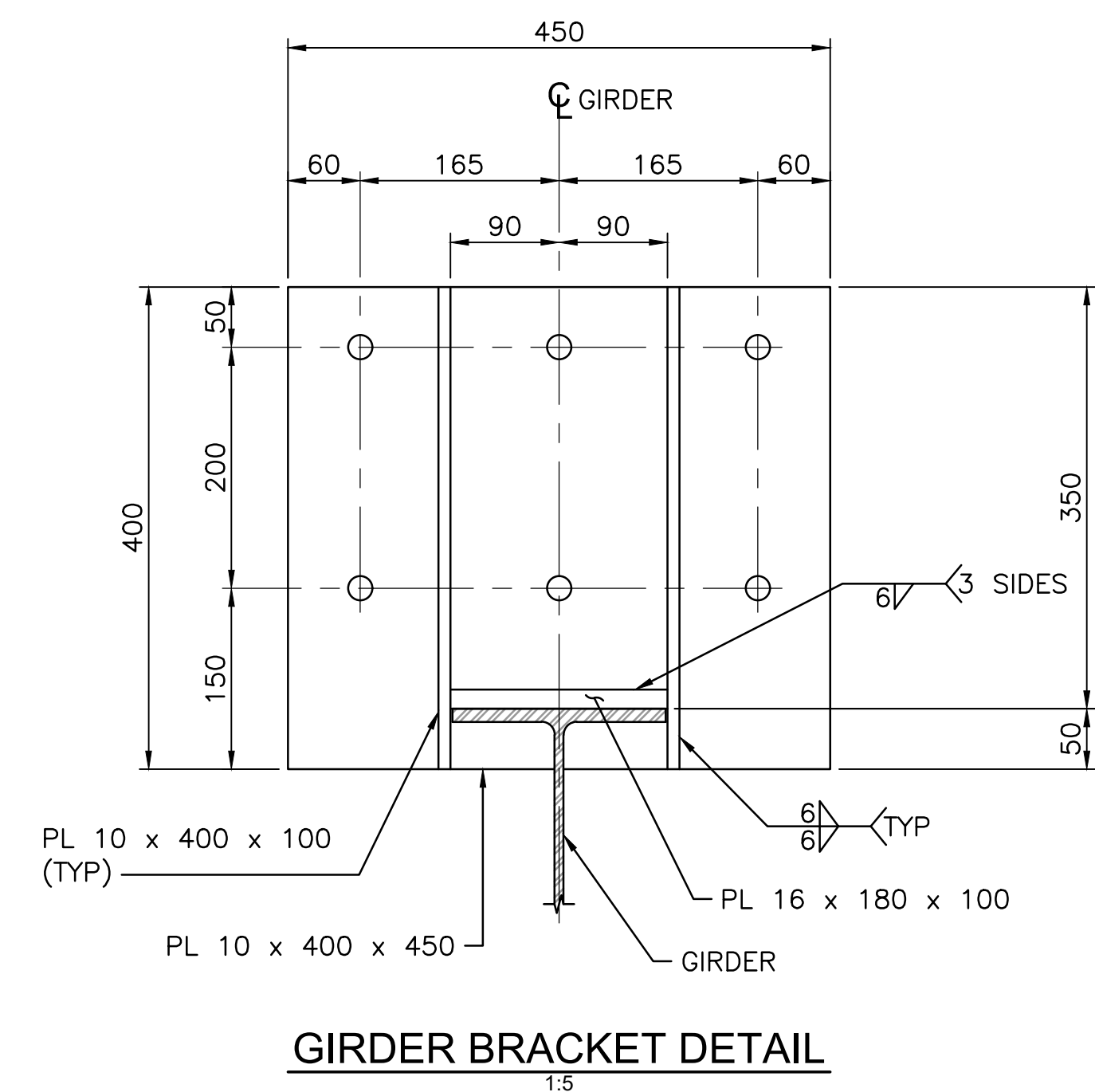
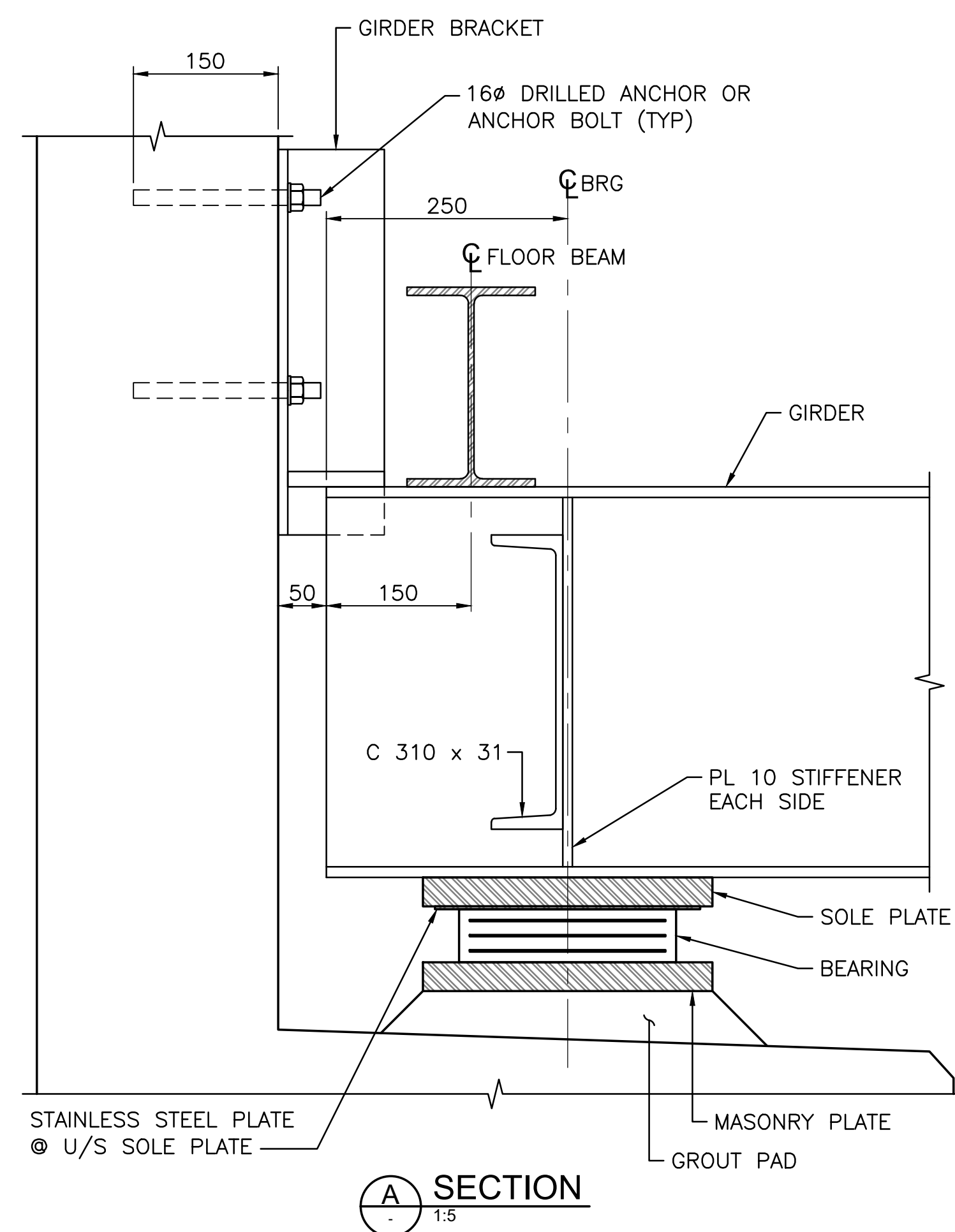
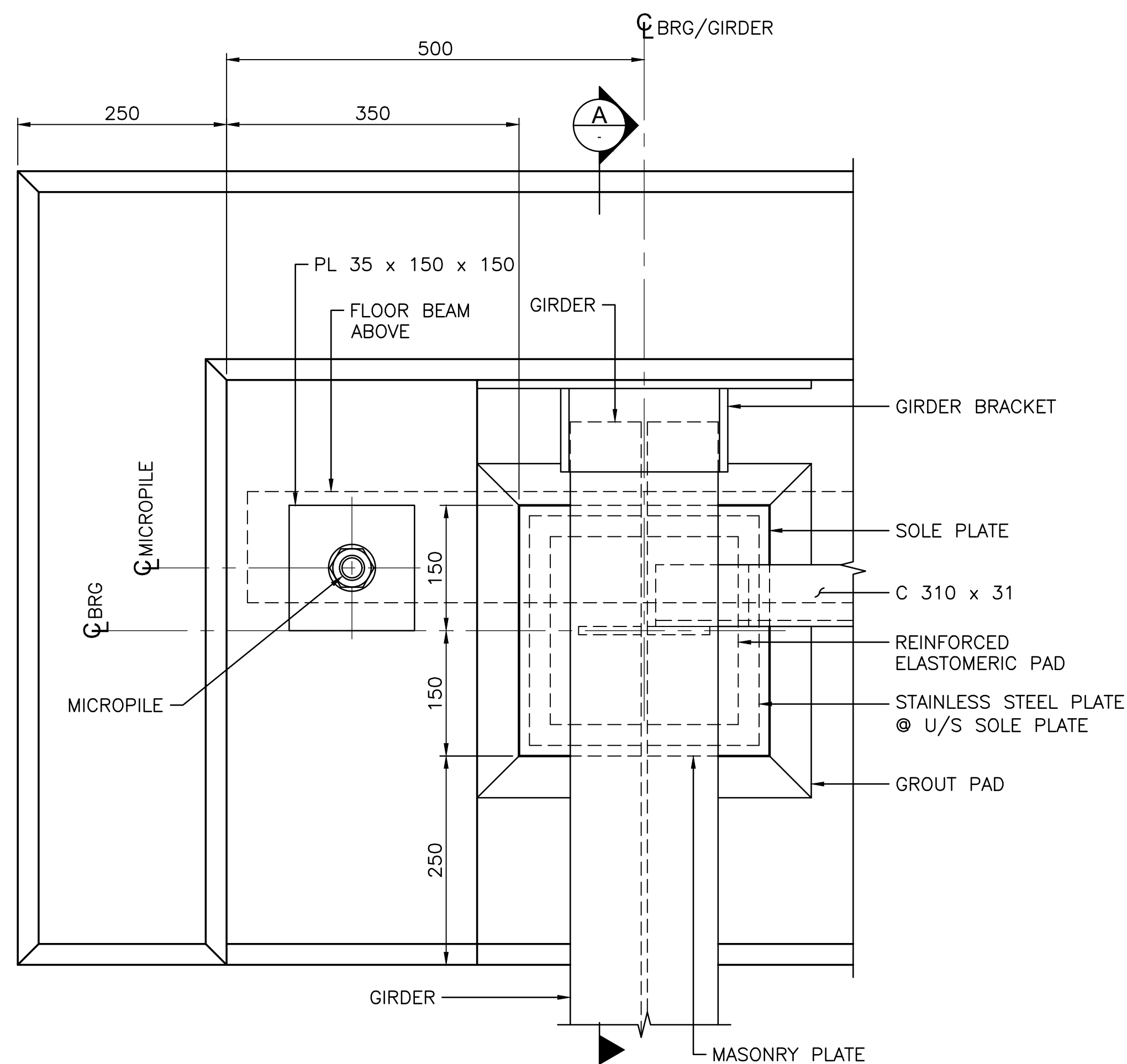
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0	ISSUED FOR TENDER	2020.04.27

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C	detail on drawing no. detail sur dessin no.	C

project title
**RED ROCK CANYON
TRAIL LOOP AND BRIDGES**
titre du projet

drawing title
**UPPER BRIDGE
ABUTMENT FOUNDATION DETAILS**
titre du dessin

designed by K. WILLIS	conçu par
drawn by A. HEWITT	dessiné par
approved by H. TROFANENKO	approuvé par
PCA Project Manager M. VILLENEUVE	Administrateur de Projets APC
scale AS SHOWN	échelle
project no. 2051	projet no.
date DECEMBER 2019	date
19	OF 33



Client **PARKS CANADA AGENCY** Client
PROJECT DELIVERY SERVICES WEST



WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
PERMIT TO PRACTICE NUMBER: P2528

2020.04.27

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detail sur dessin no.	
project title	titre du projet

Project title

RED ROCK CANYON
TRAIL LOOP AND BRIDGES

drawing title	titre du dessin
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UPPER BRIDGE ABUTMENT BEARING DETAILS

designed by **K. WILLIS** concu par

drawn by **A. HEWITT** dessiné par

approved by **H. TROFANENKO** approve par

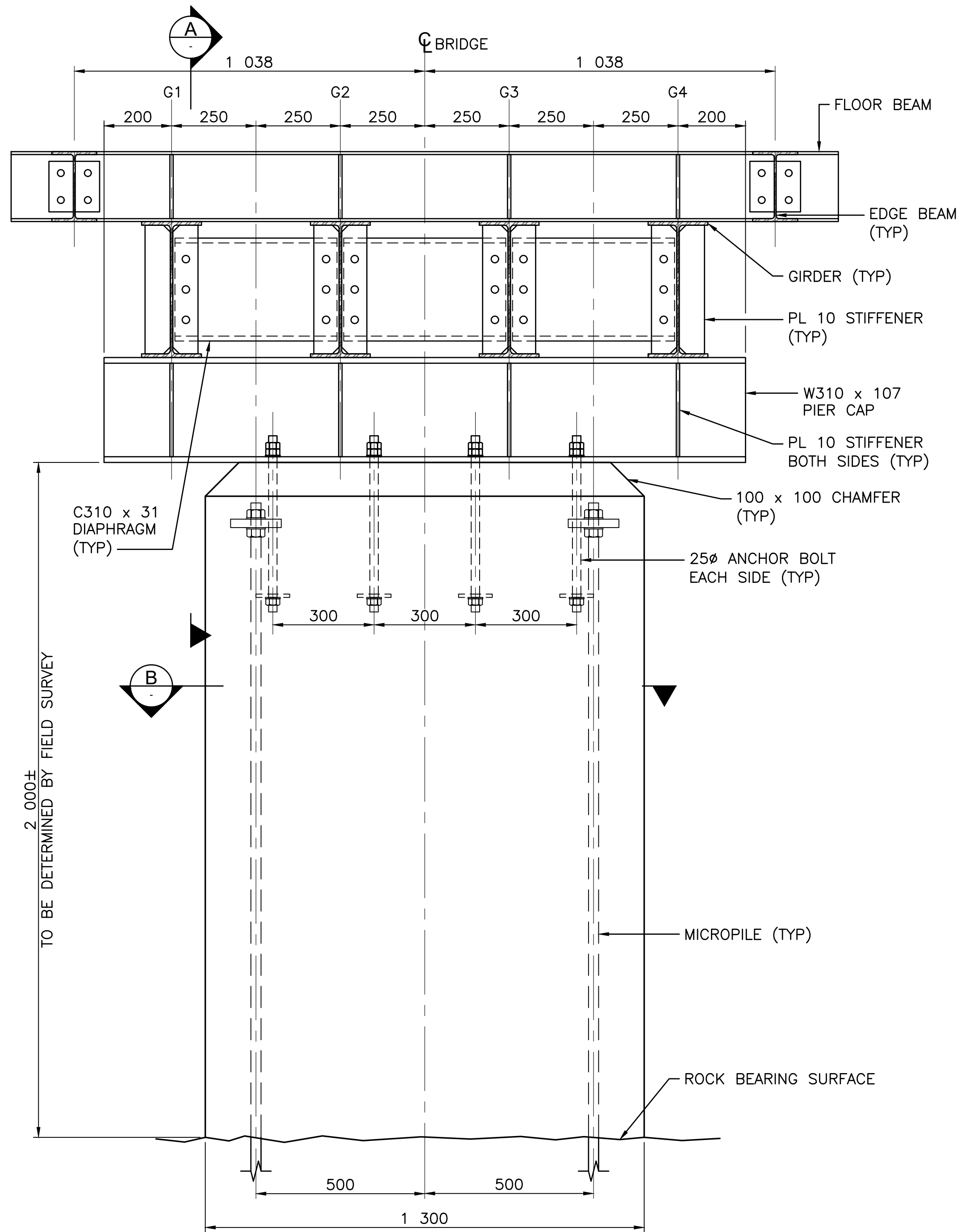
PCA Project Manager Administrateur de Projets APC

M. VILLENEUVE

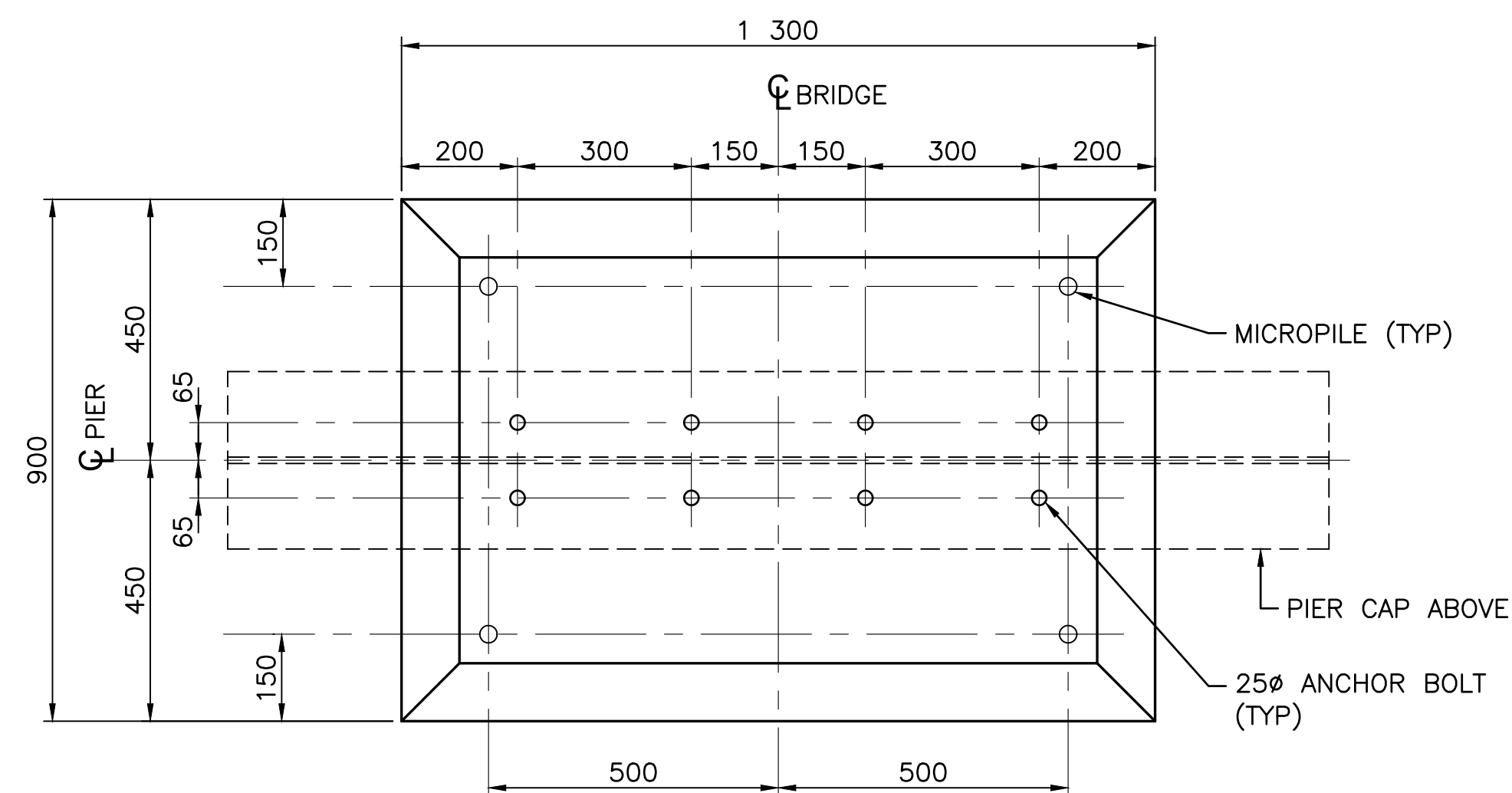
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AS SHOWN			

project no.	2051	projct no.	20
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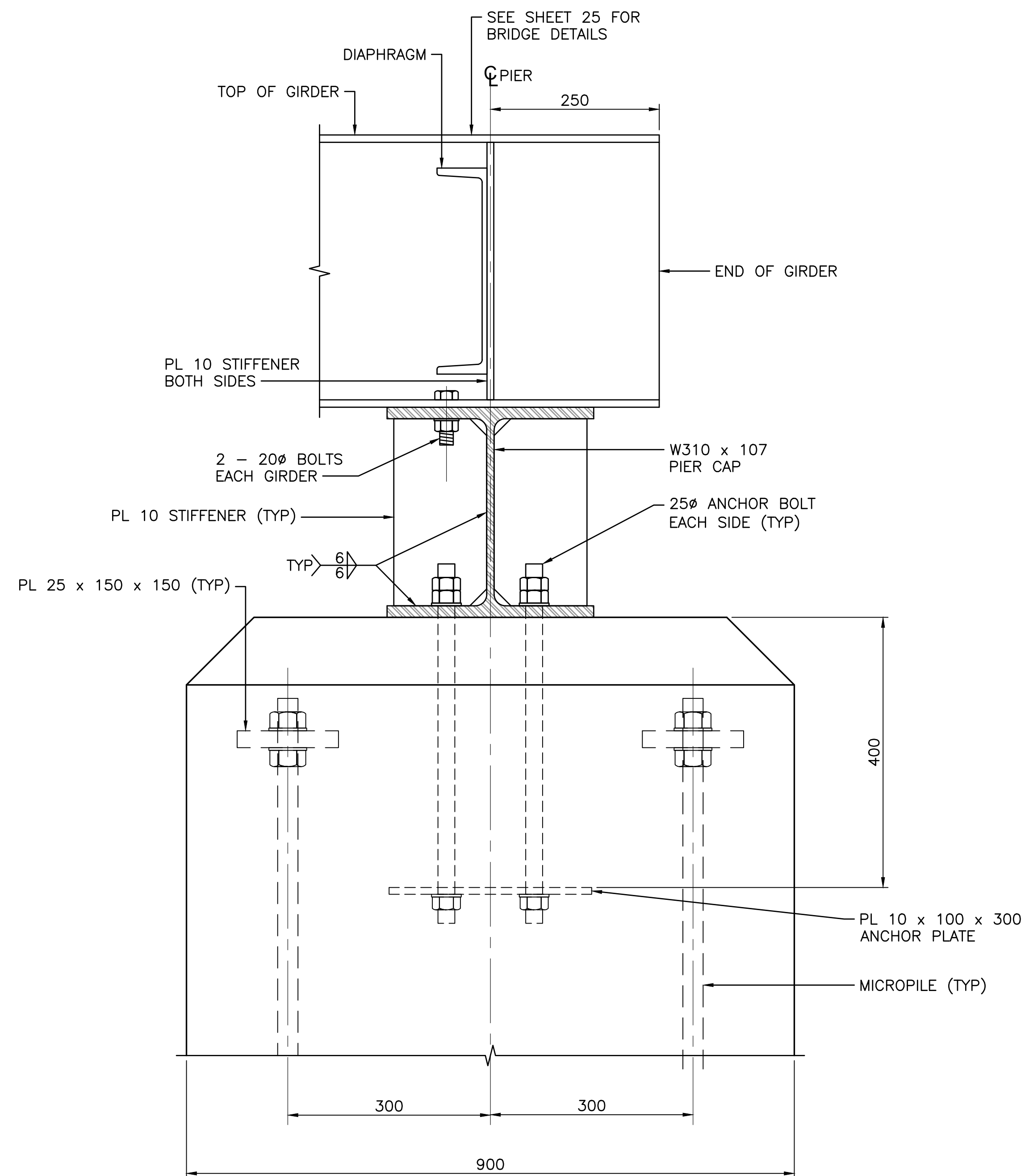
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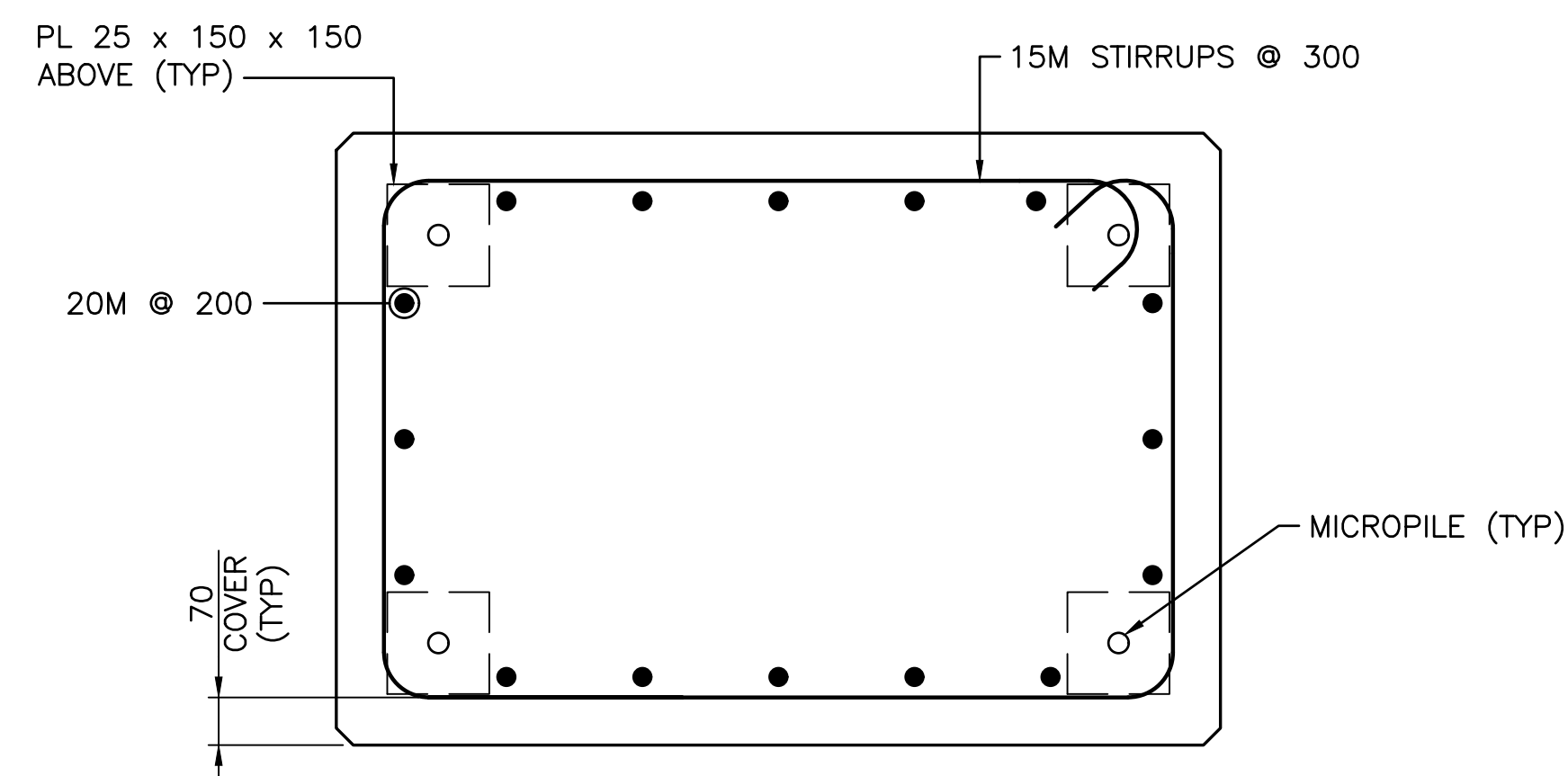
BRIDGE PIER ELEVATION
1:10



BRIDGE PIER FOUNDATION PLAN
1:10



SECTION A
1:5



SECTION B
1:10



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
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2020.04.15

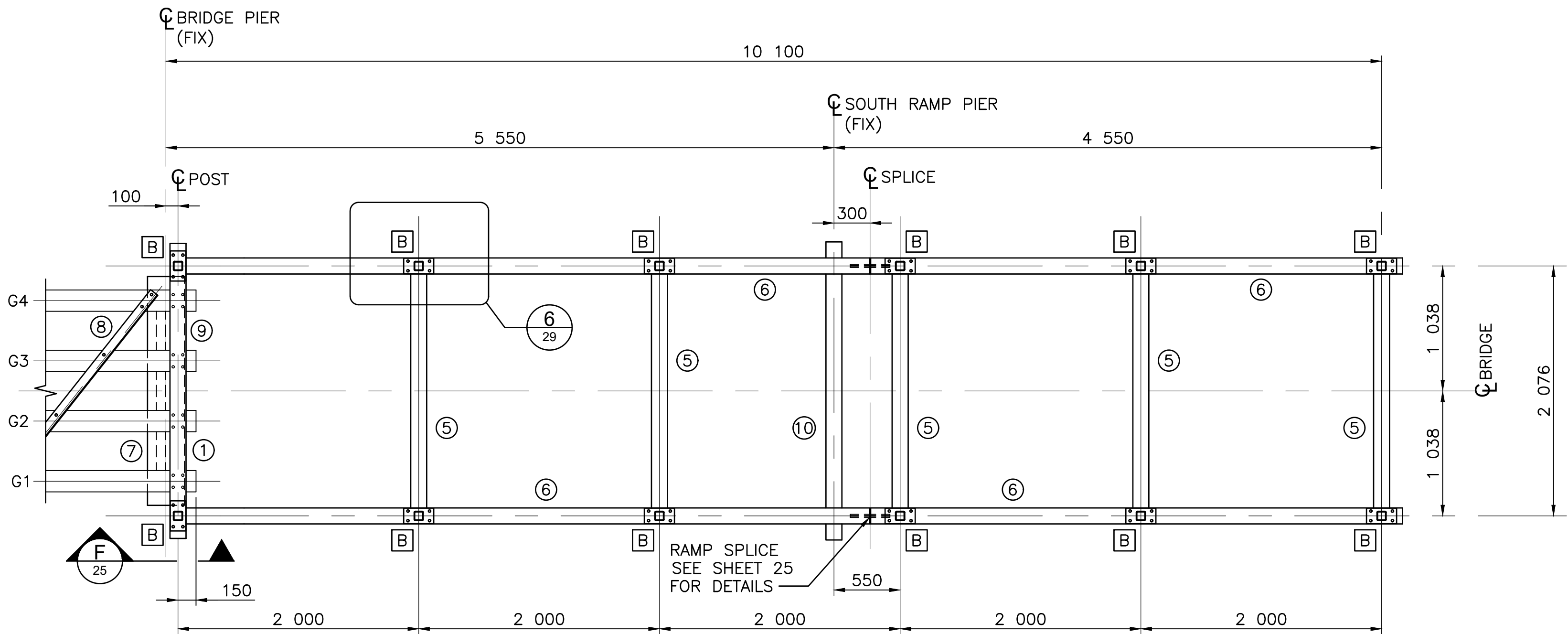
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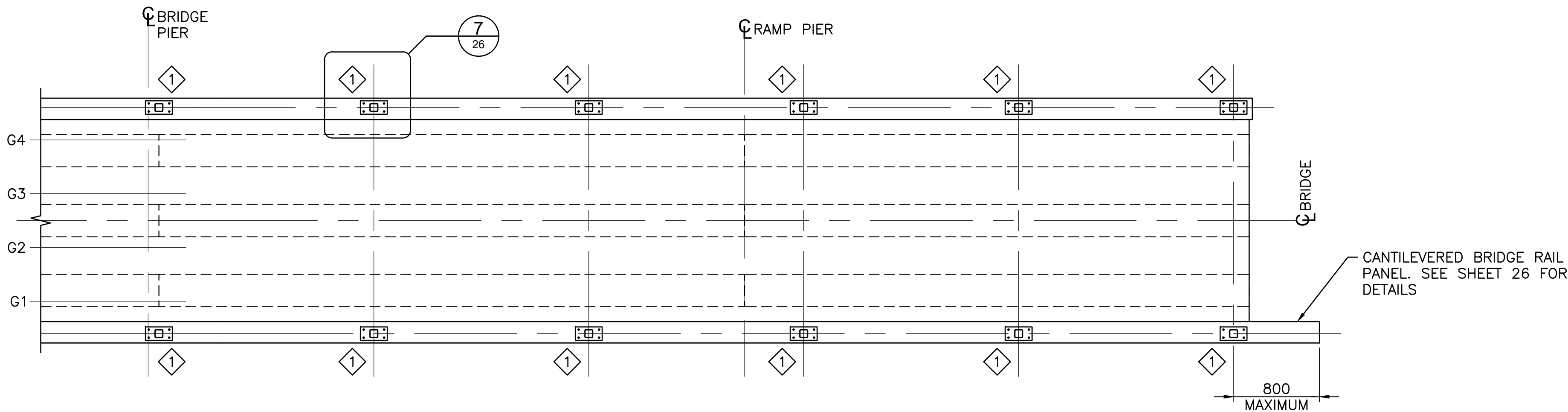
RED ROCK CANYON
TRAIL LOOP AND BRIDGES

UPPER BRIDGE
BRIDGE PIER DETAILS
CONCRETE ALTERNATIVE

designed by	K. WILLIS	conçu par	
drawn by	A. HEWITT	dessiné par	
approved by	H. TROFANENKO	approuvé par	
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC	
scale	AS SHOWN	échelle	sheet
project no.	2051	projet no.	22
date	DECEMBER 2019	date	OF 33



SOUTH RAMP
STEEL FRAMING SCHEMATIC
 1:30
 *DECK AND RAILING NOT SHOWN FOR CLARITY



SOUTH RAMP
DECK FRAMING SCHEMATIC
 1:30
 *STEEL FRAMING NOT SHOWN FOR CLARITY

NOTE:
 1 DENOTES RAIL CONNECTION PLATE TYPE

MEMBER SIZES AND LOCATION		
MARK	LOCATION	SIZE
①	FLOOR BEAM	W200 x 27
②	EDGE BEAM	W200 x 27
③	FLOOR BEAM	W200 x 27
④	FLOOR BEAM	W200 x 27
⑤	FLOOR BEAM	W200 x 27
⑥	BEAM	W200 x 27
⑦	DIAPHRAGM	C310 x 31
⑧	LATERAL BRACING	L 76 x 76 x 6.4
⑨	BRIDGE PIER CAP	C310 x 107
⑩	RAMP PIER CAP	W200 x 27
	RAIL POST	HSS 76 x 76 x 4.8



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
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DATE 2020.04.15

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C	detail on drawing no. detail sur dessin no.	C

RED ROCK CANYON
TRAIL LOOP AND BRIDGES

UPPER BRIDGE
FRAMING SCHEMATICS

2 OF 2

designed by **K. WILLIS** concu par

drawn by **A. HEWITT** dessine par

approved by **H. TROFANENKO** approuve par

PCA Project Manager **M. VILLENEUVE** Administrateur de Projets APC

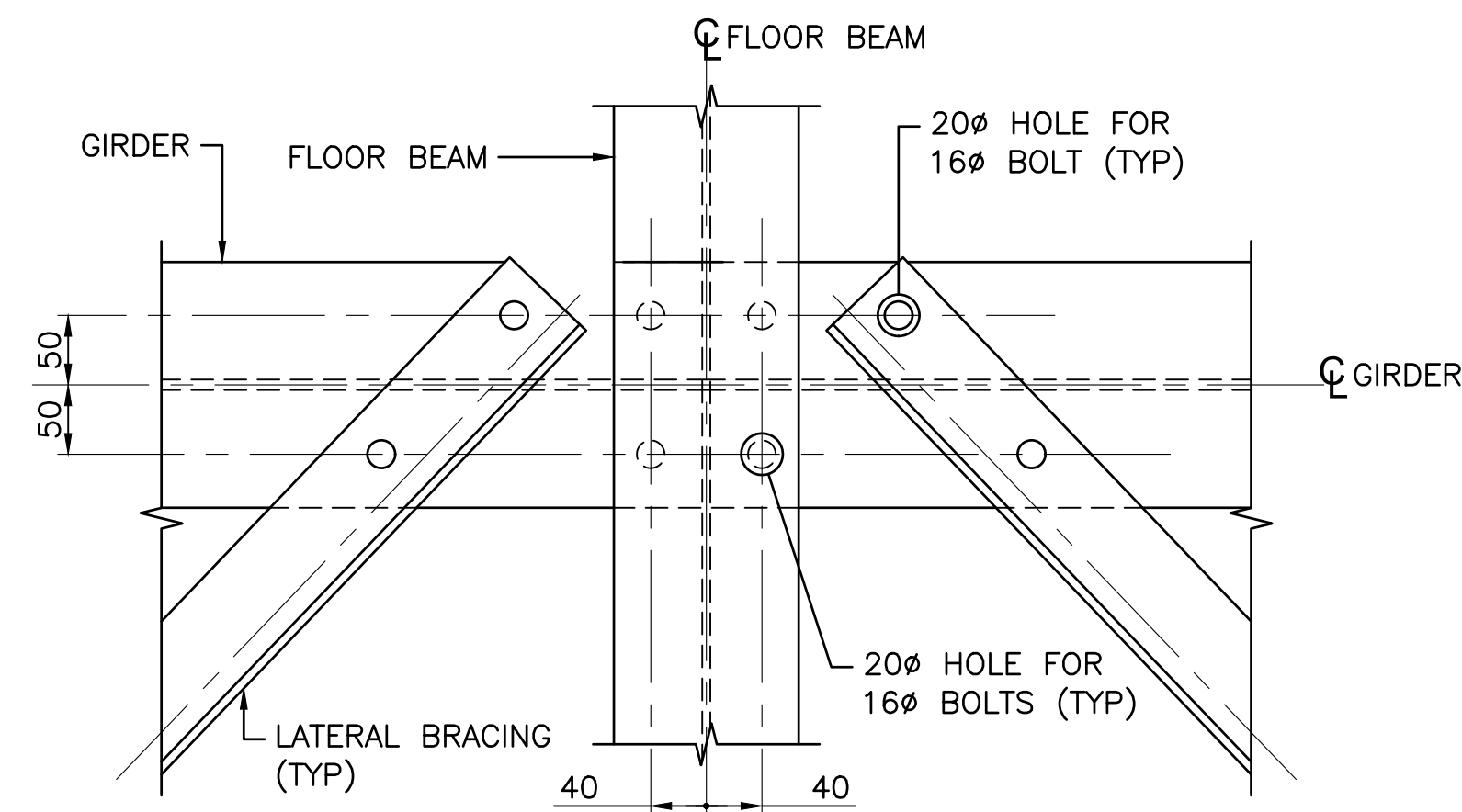
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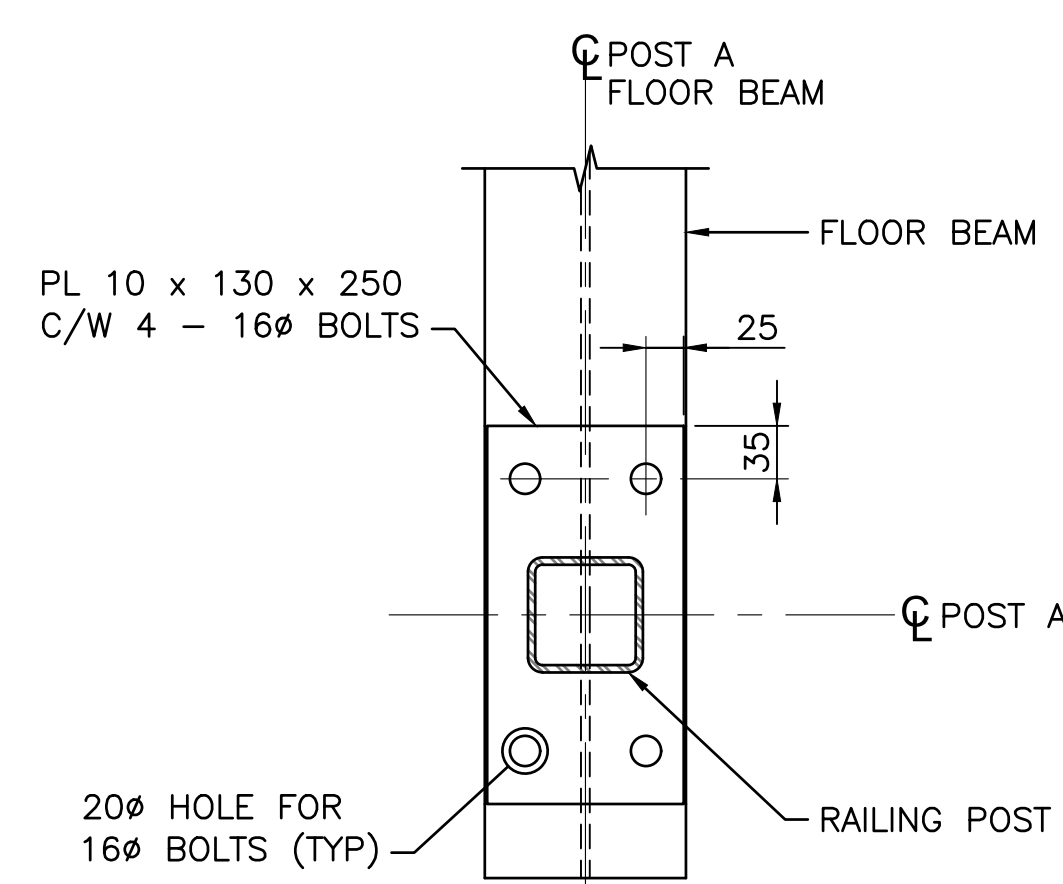
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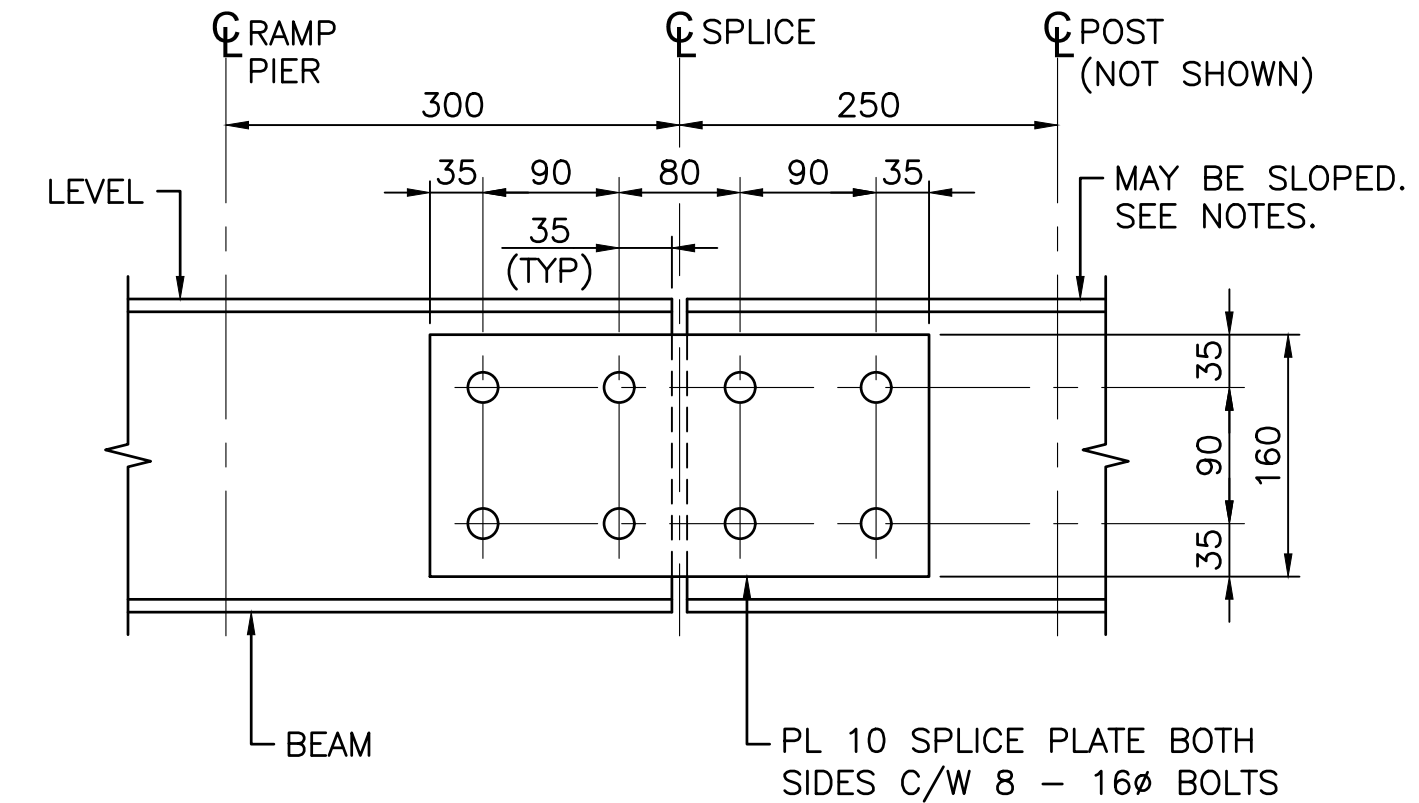
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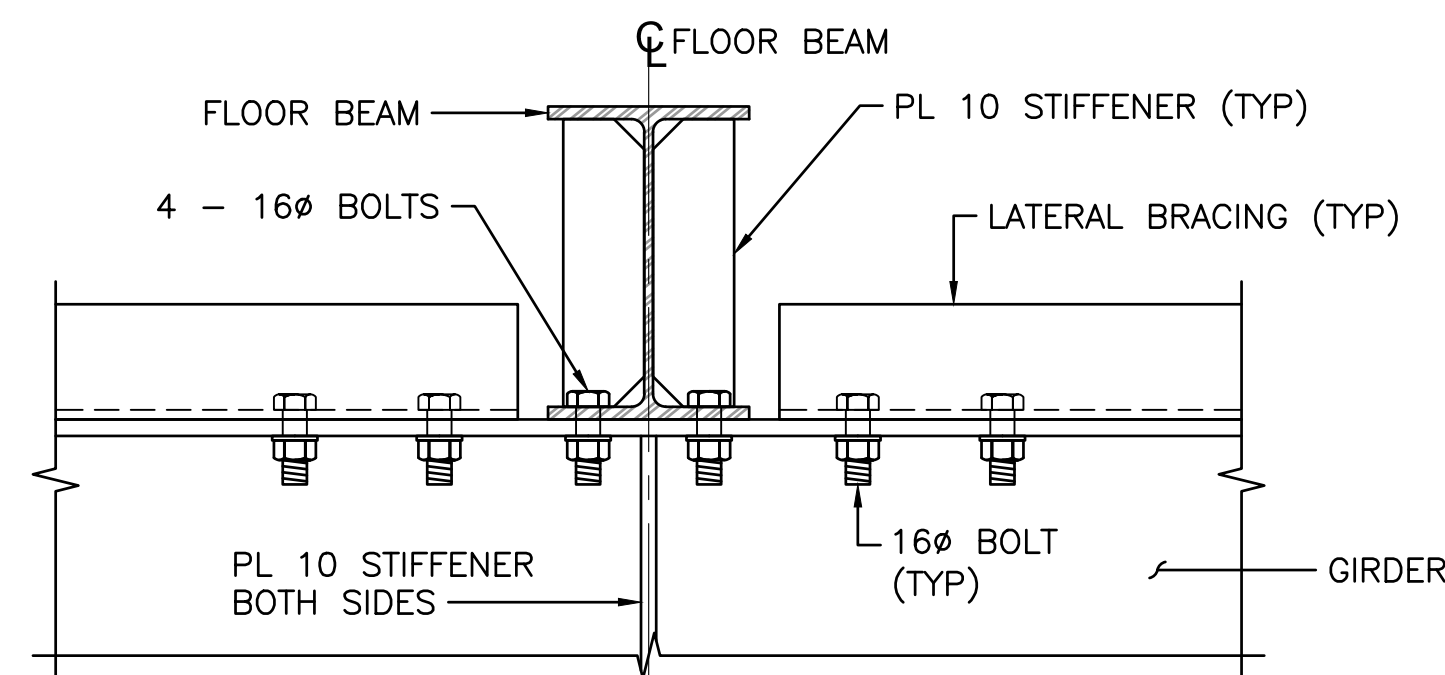
1 TYPICAL BRACING CONNECTION
23 1:5



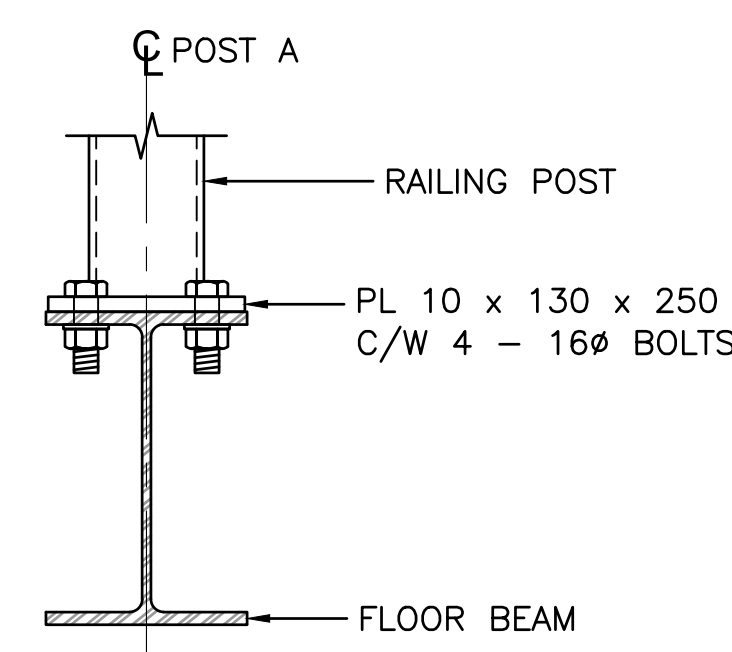
3 TYPICAL POST A DETAIL
23 1:5



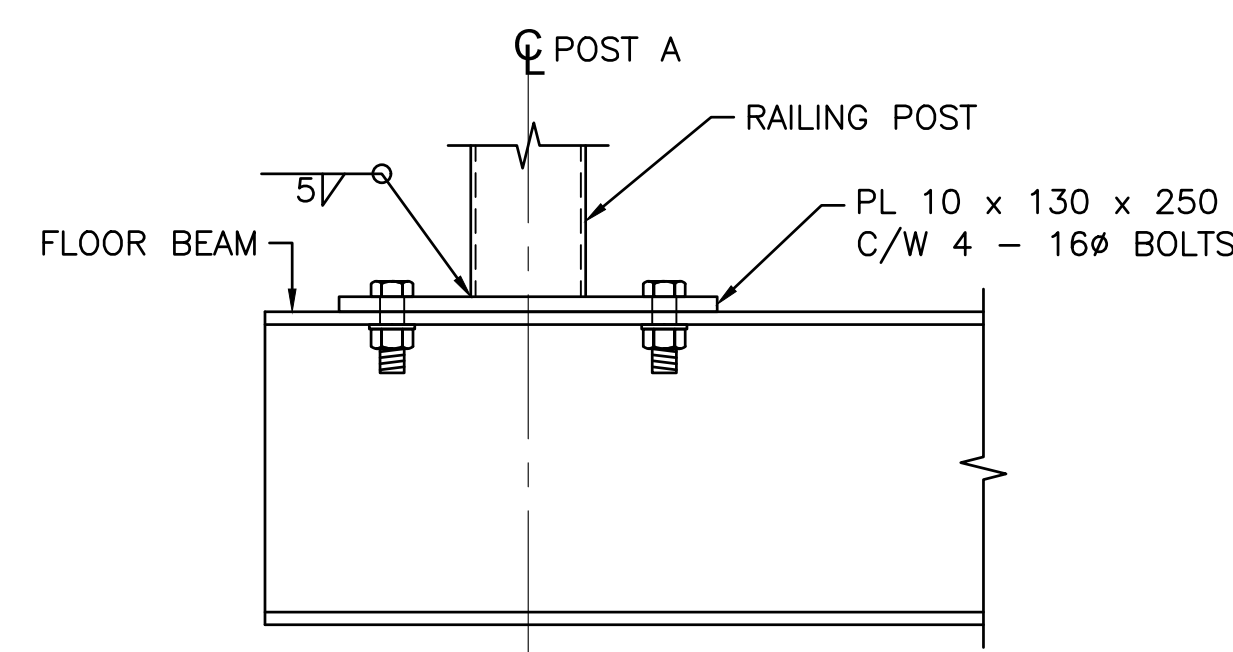
RAMP SPLICE DETAIL
1:5



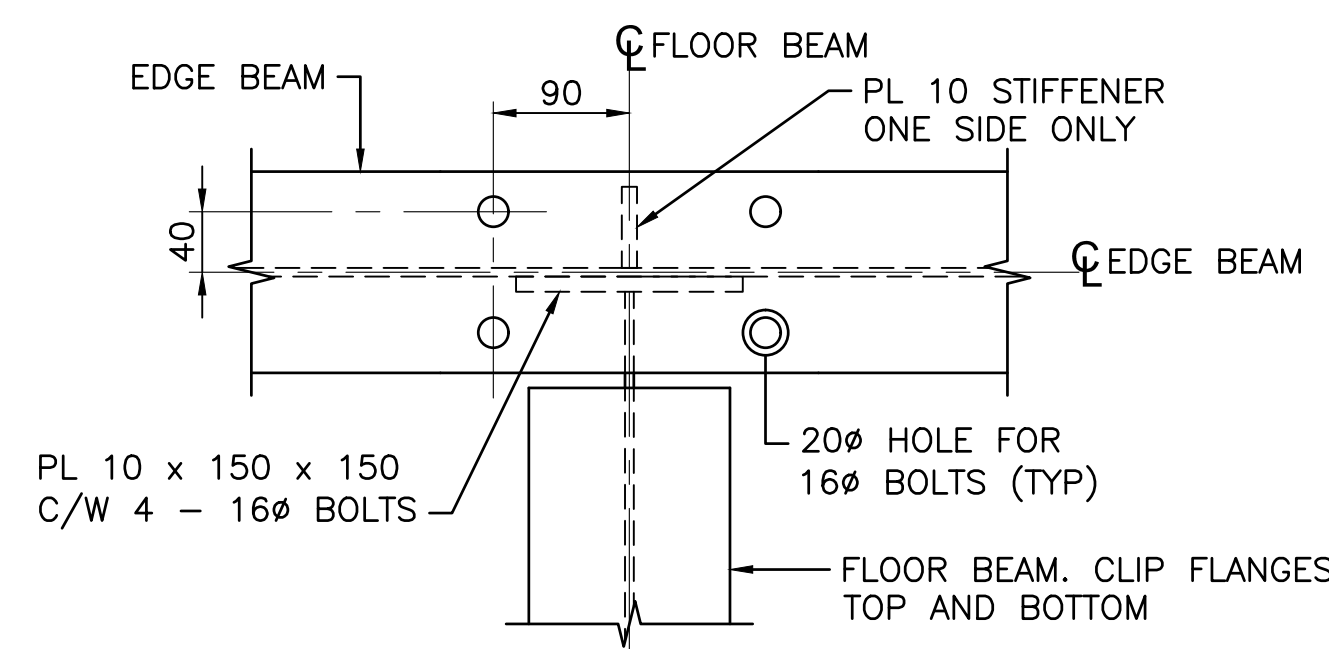
A SECTION
23 1:5



B SECTION
23 1:5

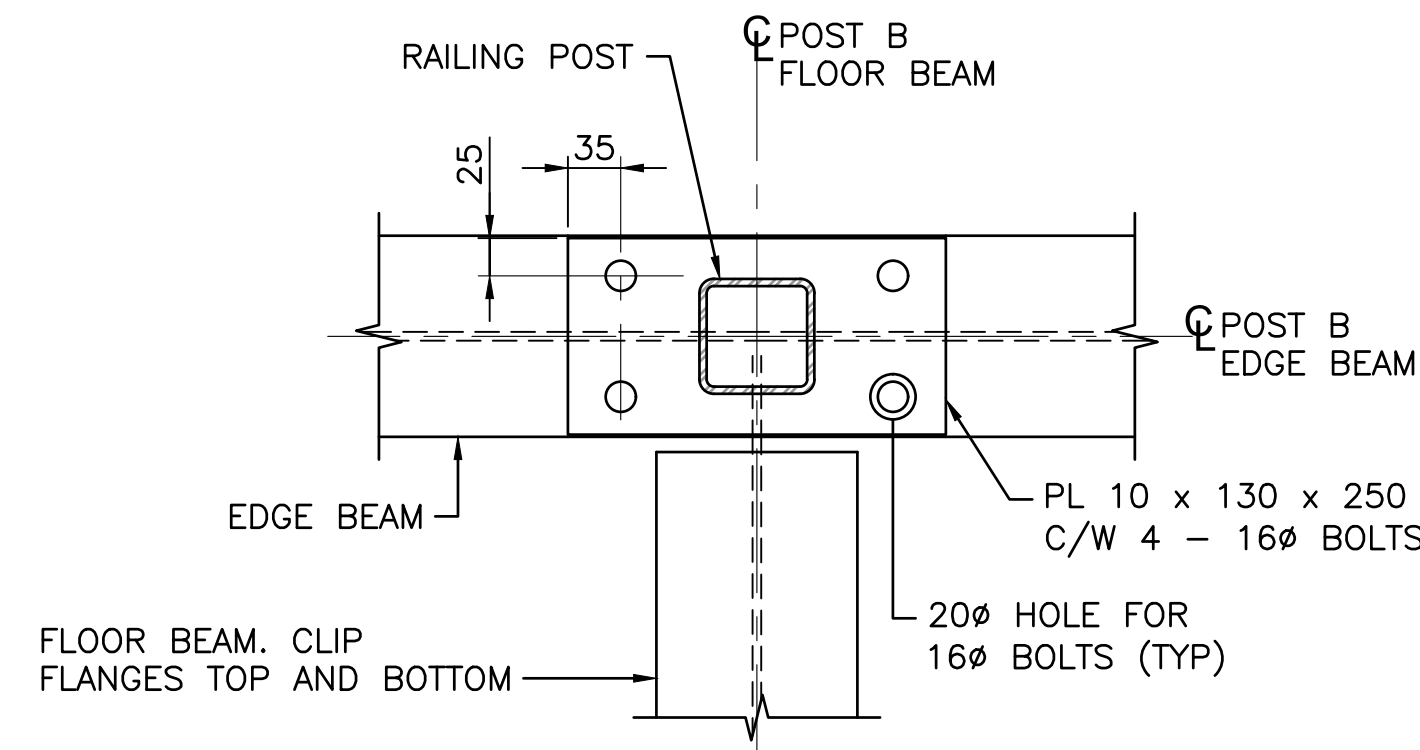


C SECTION
23 1:5



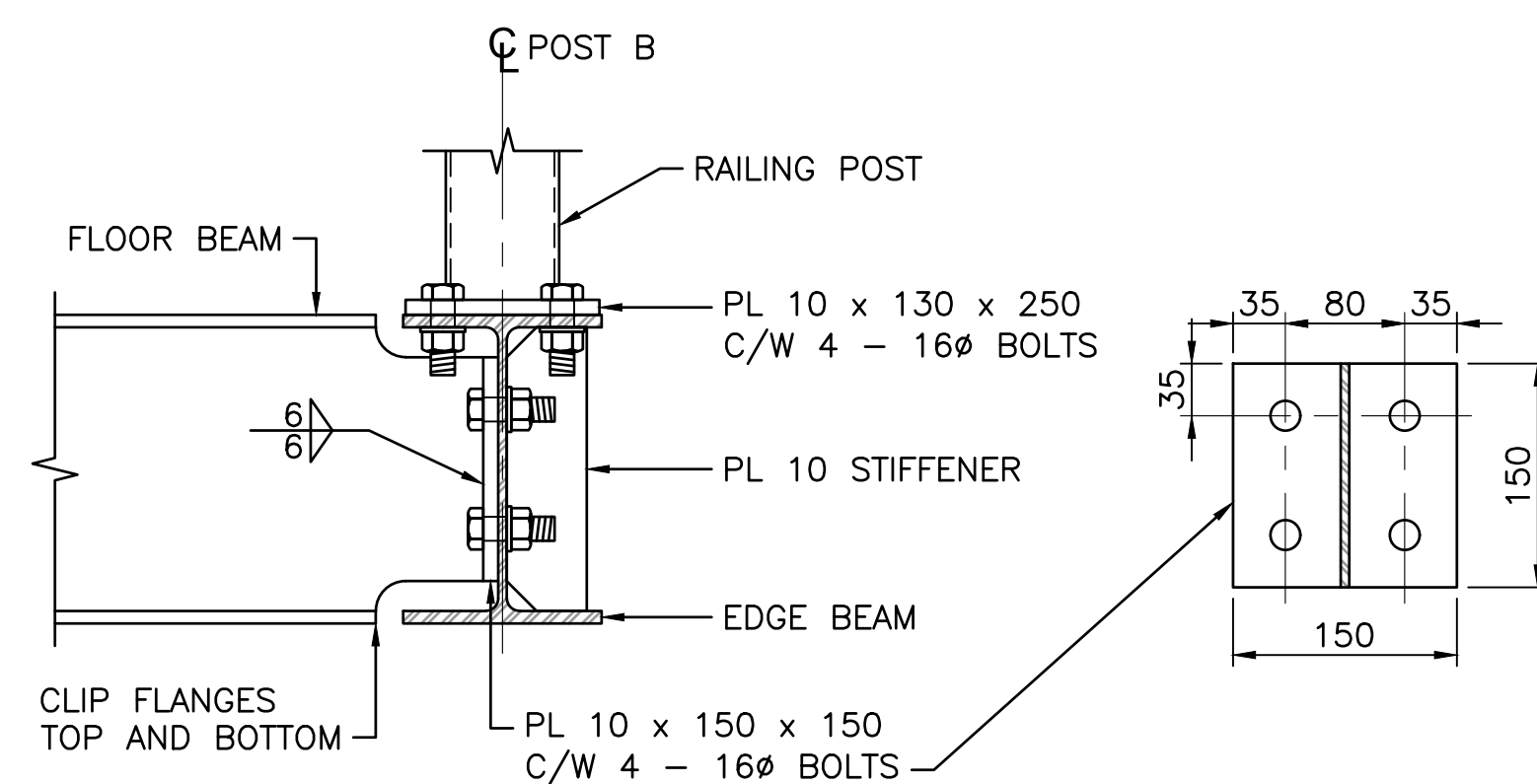
2 TYPICAL FRAME CONNECTION
23 1:5

*POST DETAILS NOT SHOWN FOR CLARITY

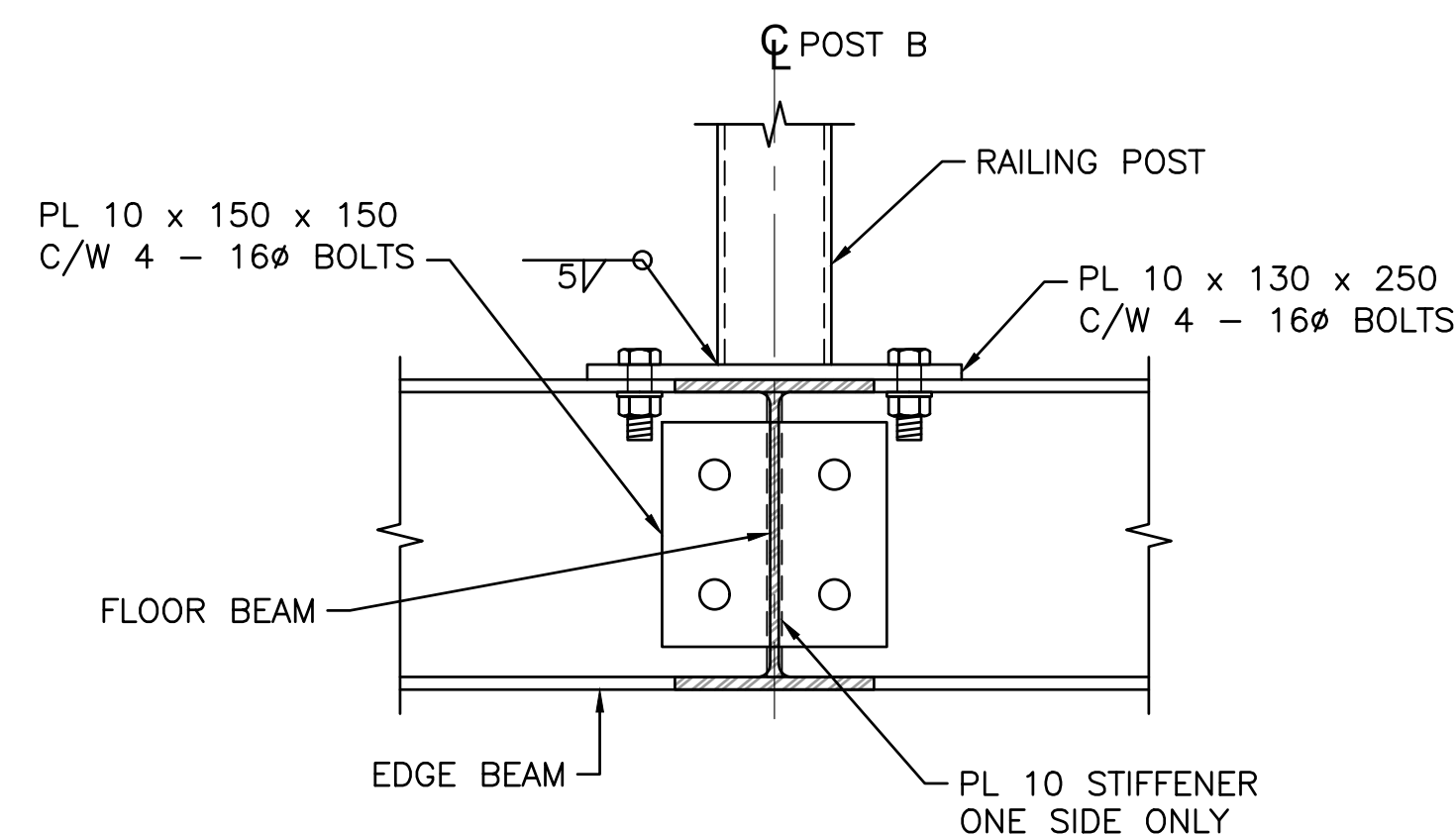


4 TYPICAL POST B DETAIL
23 1:5

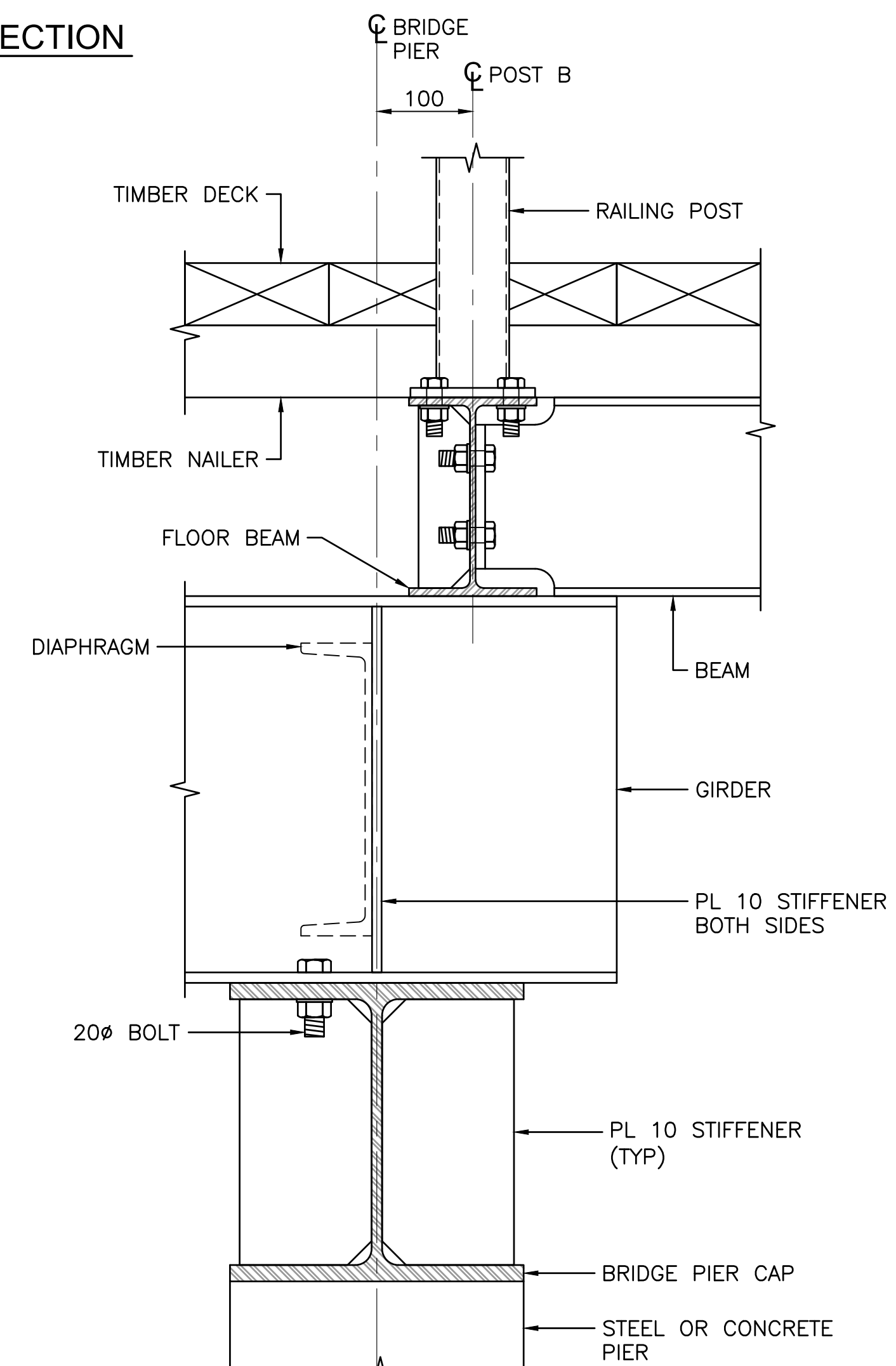
*CONNECTION DETAILS NOT SHOWN FOR CLARITY



E SECTION
23 1:5



D SECTION
23 1:5



F SECTION
23/24 1:5



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
PERMIT TO PRACTICE NUMBER: P2528

DATE 2020.04.15

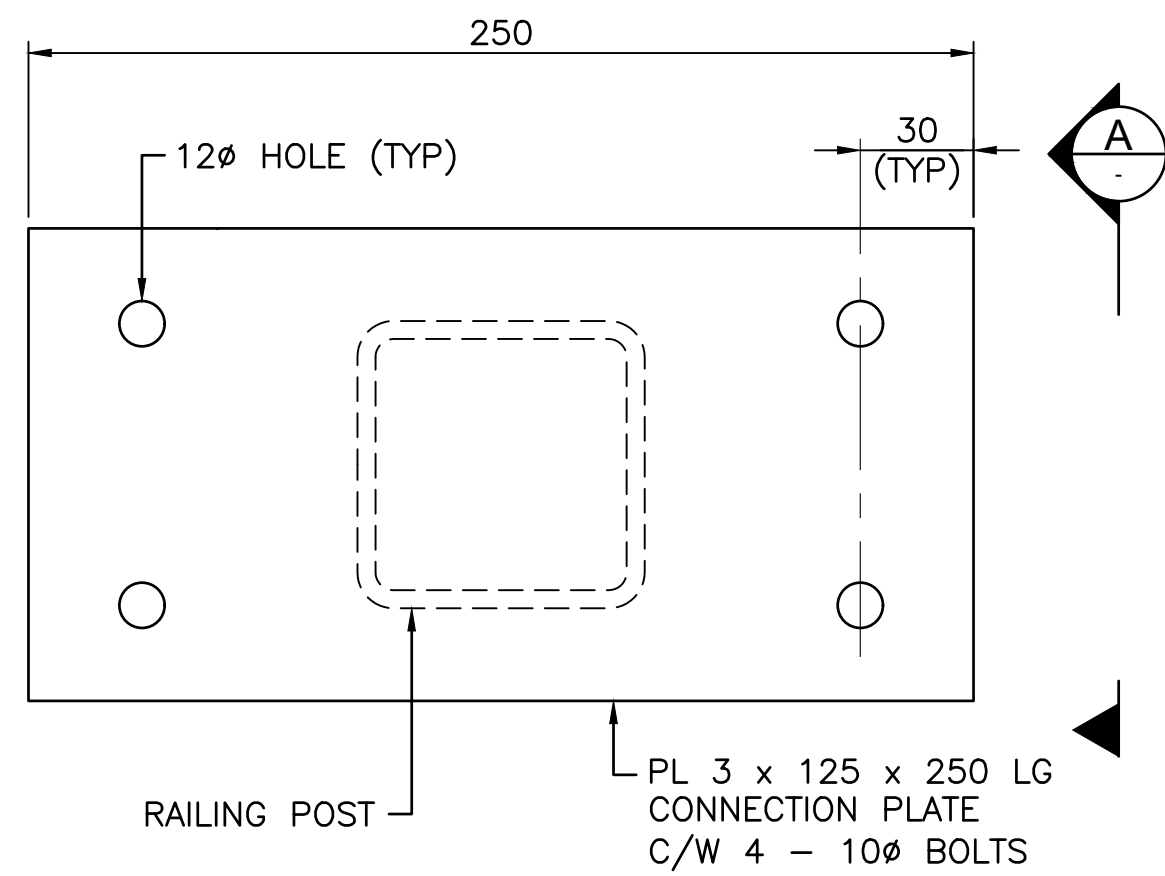
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0	ISSUED FOR TENDER	2020.04.15

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C	detail on drawing no. détail sur dessin no.	C

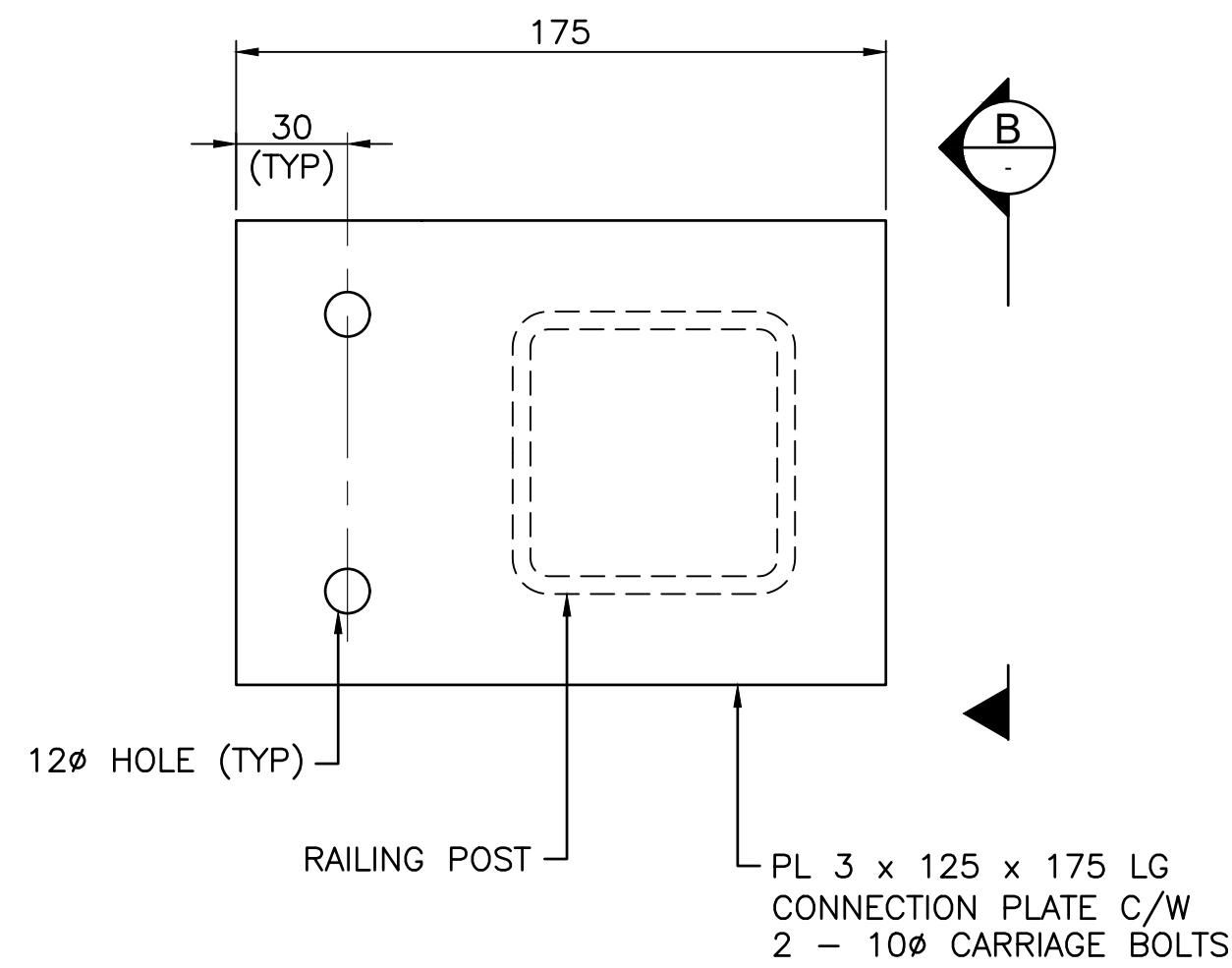
project title RED ROCK CANYON
TRAIL LOOP AND BRIDGES

drawing title UPPER BRIDGE
FRAME DETAILS

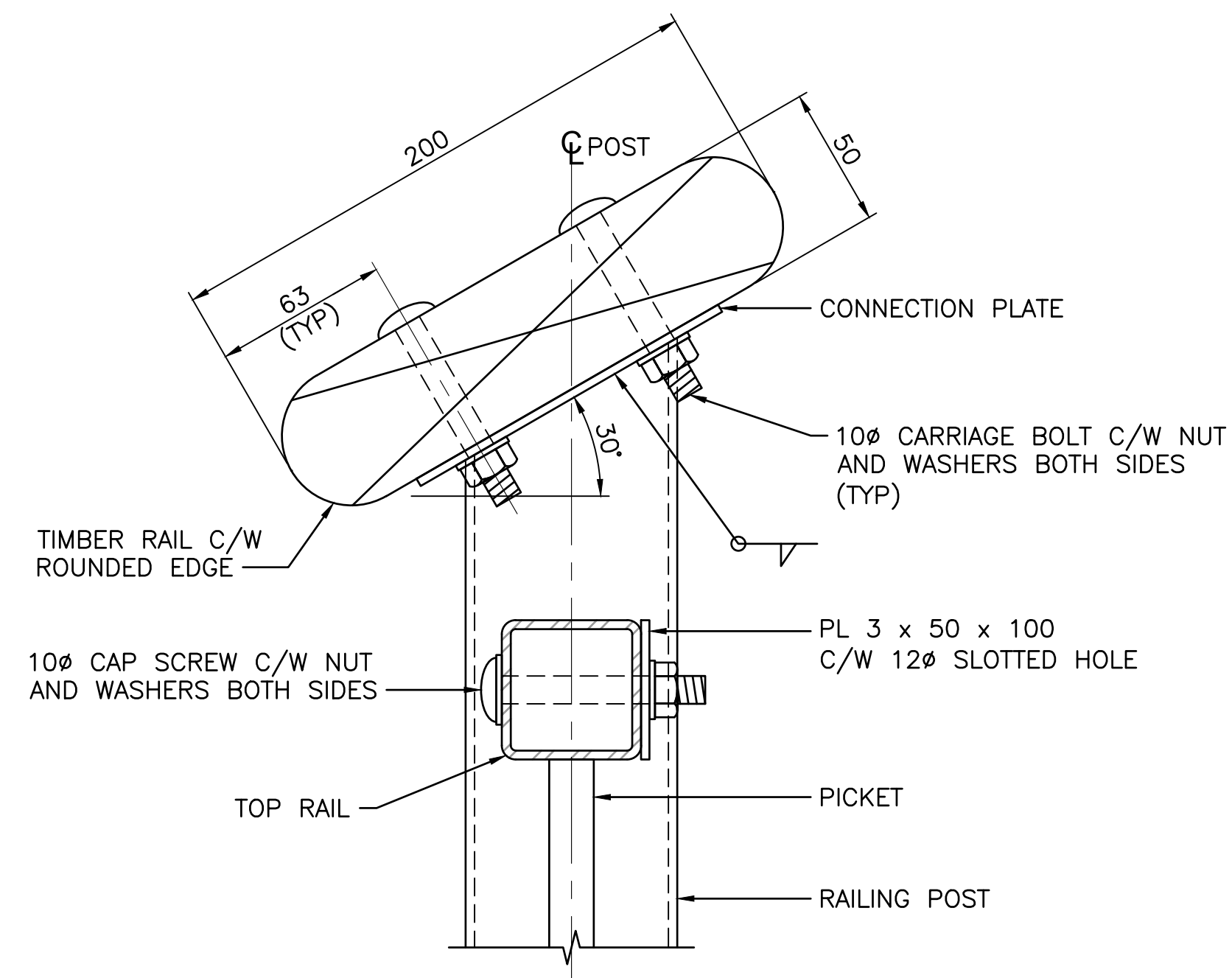
designed by	K. WILLIS	conçu par
drawn by	A. HEWITT	dessiné par
approved by	H. TROFANENKO	approuvé par
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC
scale	AS SHOWN	échelle
project no.	2051	projet no.
date	DECEMBER 2019	date
		sheet 25 OF 33



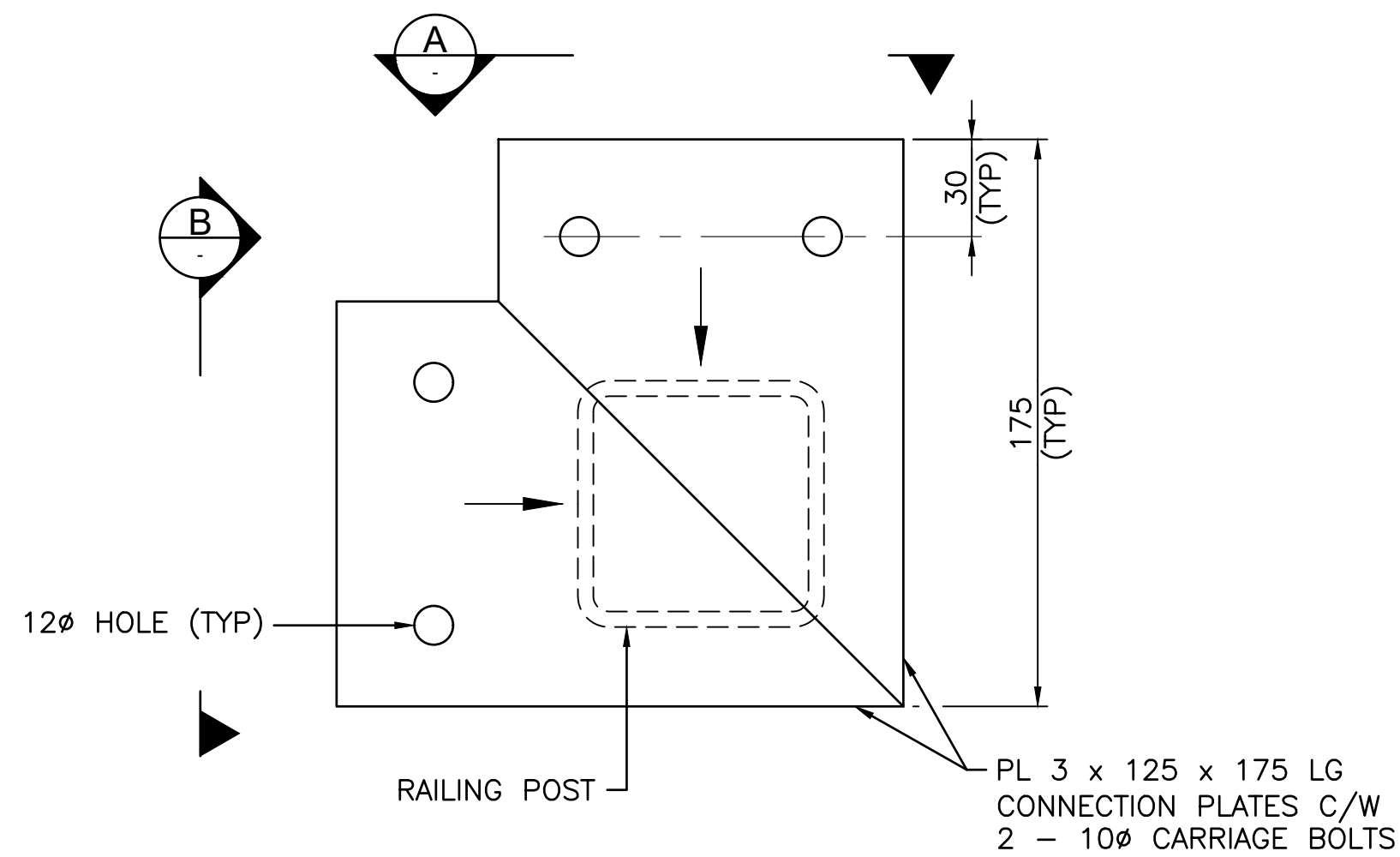
7 TYPE 1 CONNECTION PLATE DETAIL
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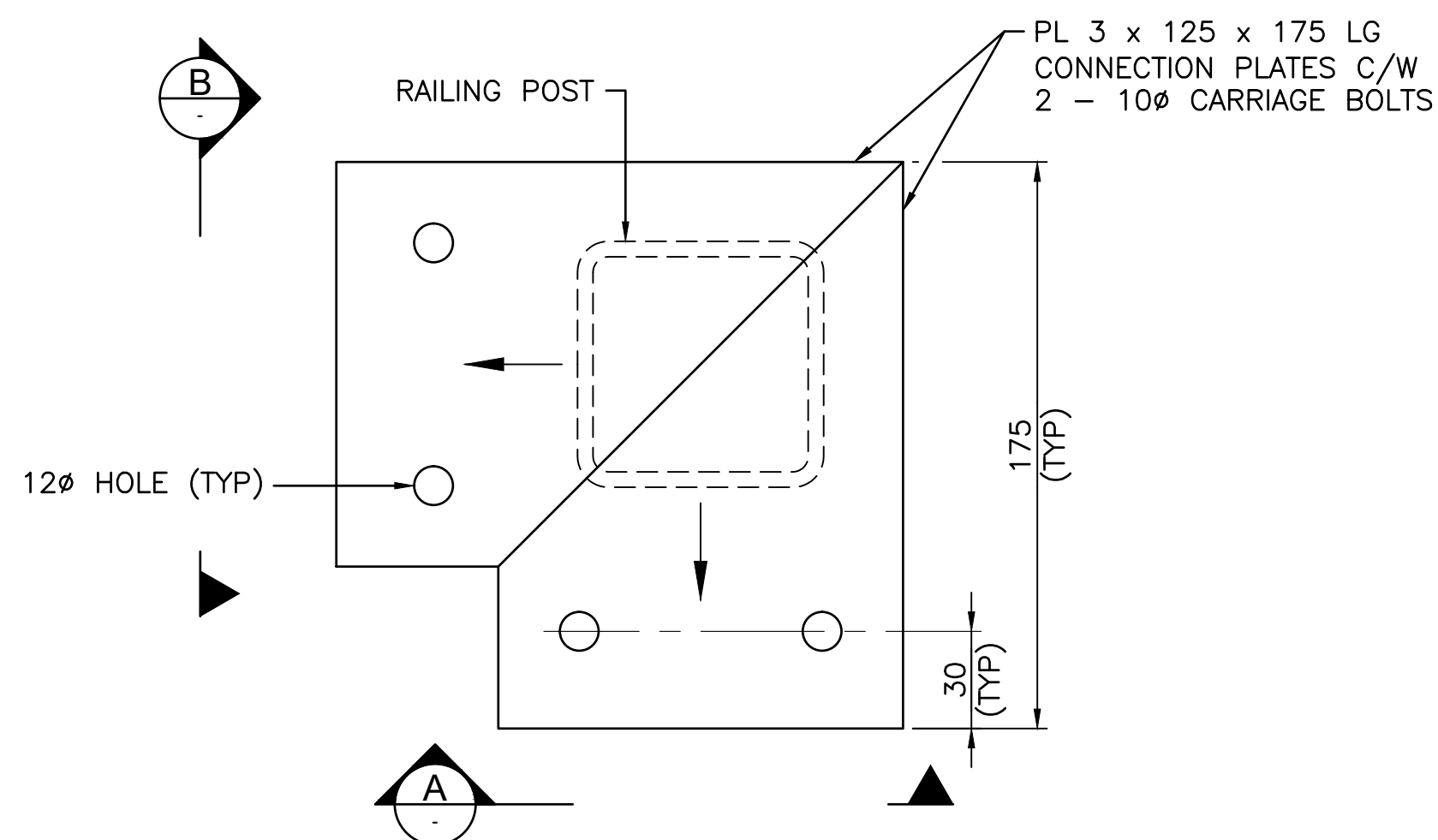
10 TYPE 4 CONNECTION PLATE DETAIL
23 1:2



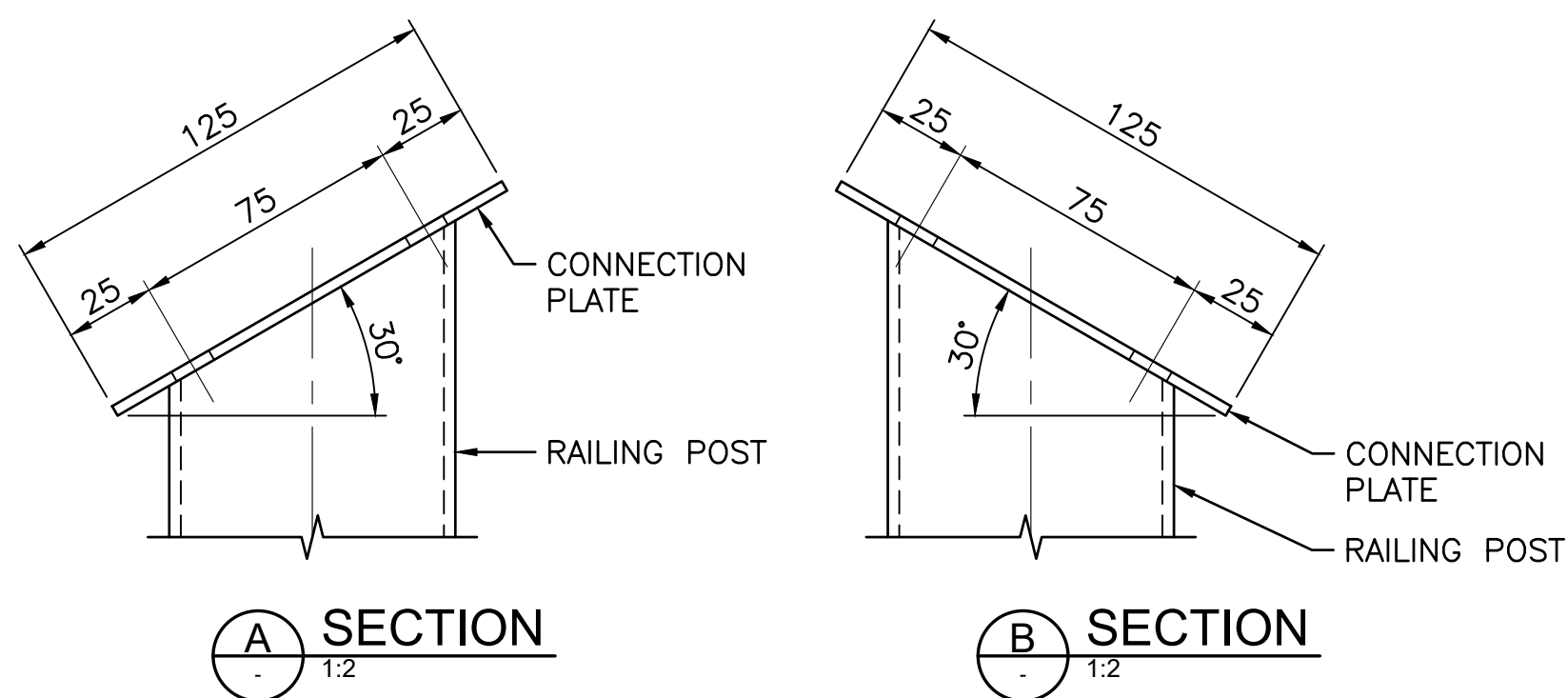
TIMBER RAIL CONNECTION DETAIL
1:2
*UPPER BRIDGE SHOWN, EXISTING BRIDGES SIMILAR



8 TYPE 2 CONNECTION PLATE DETAIL
23 1:2

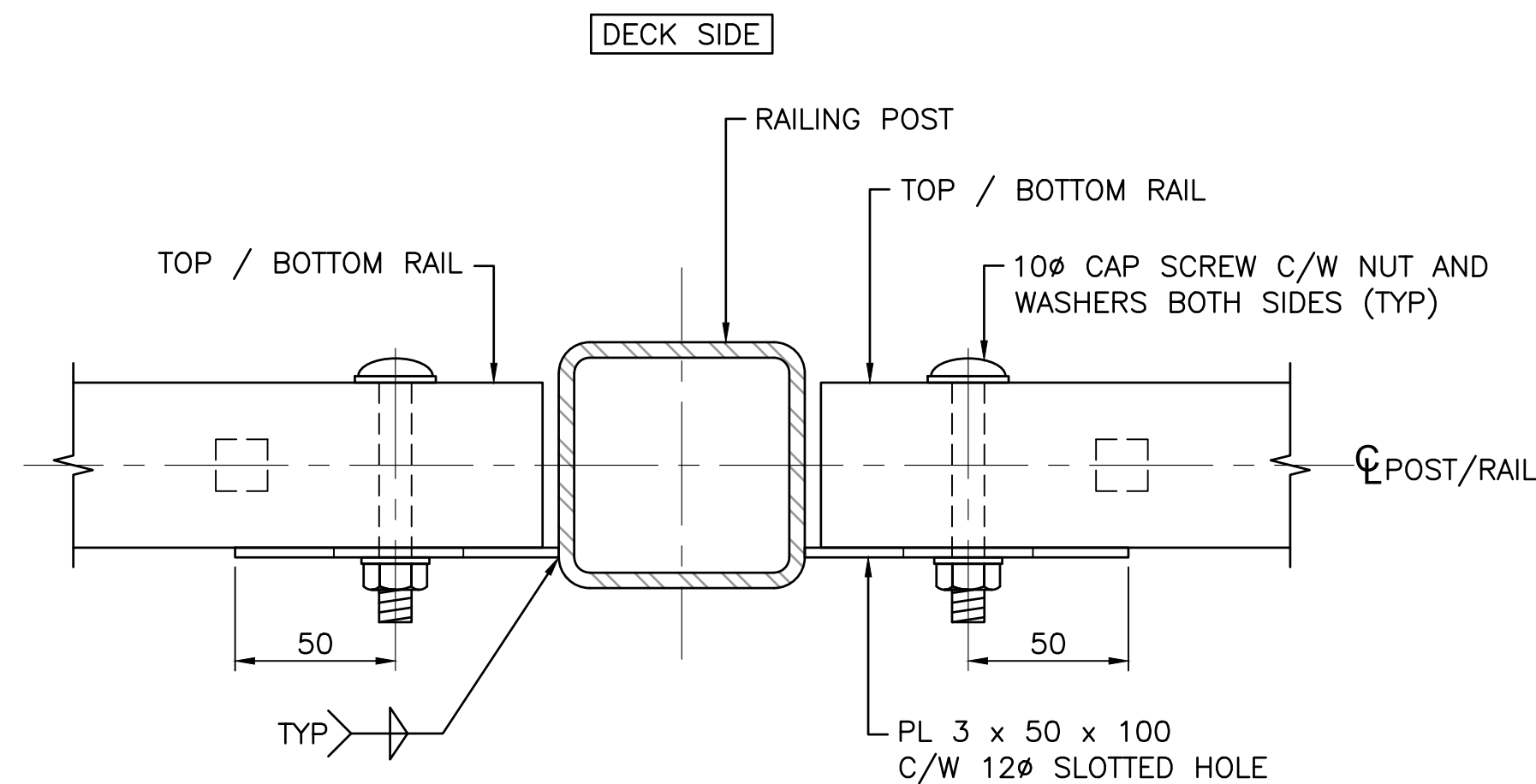


9 TYPE 3 CONNECTION PLATE DETAIL
23 1:2

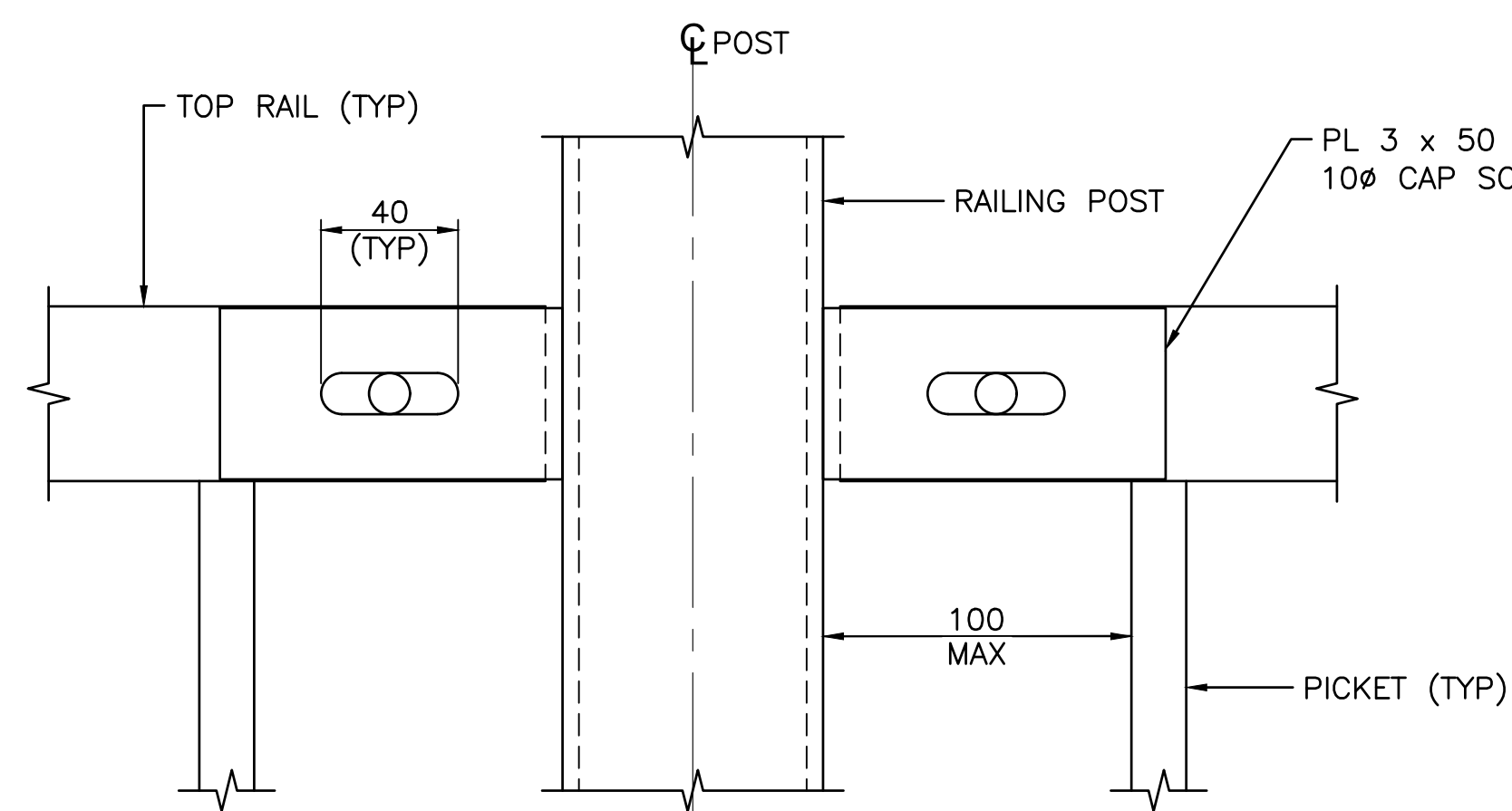


A SECTION
1:2

B SECTION
1:2

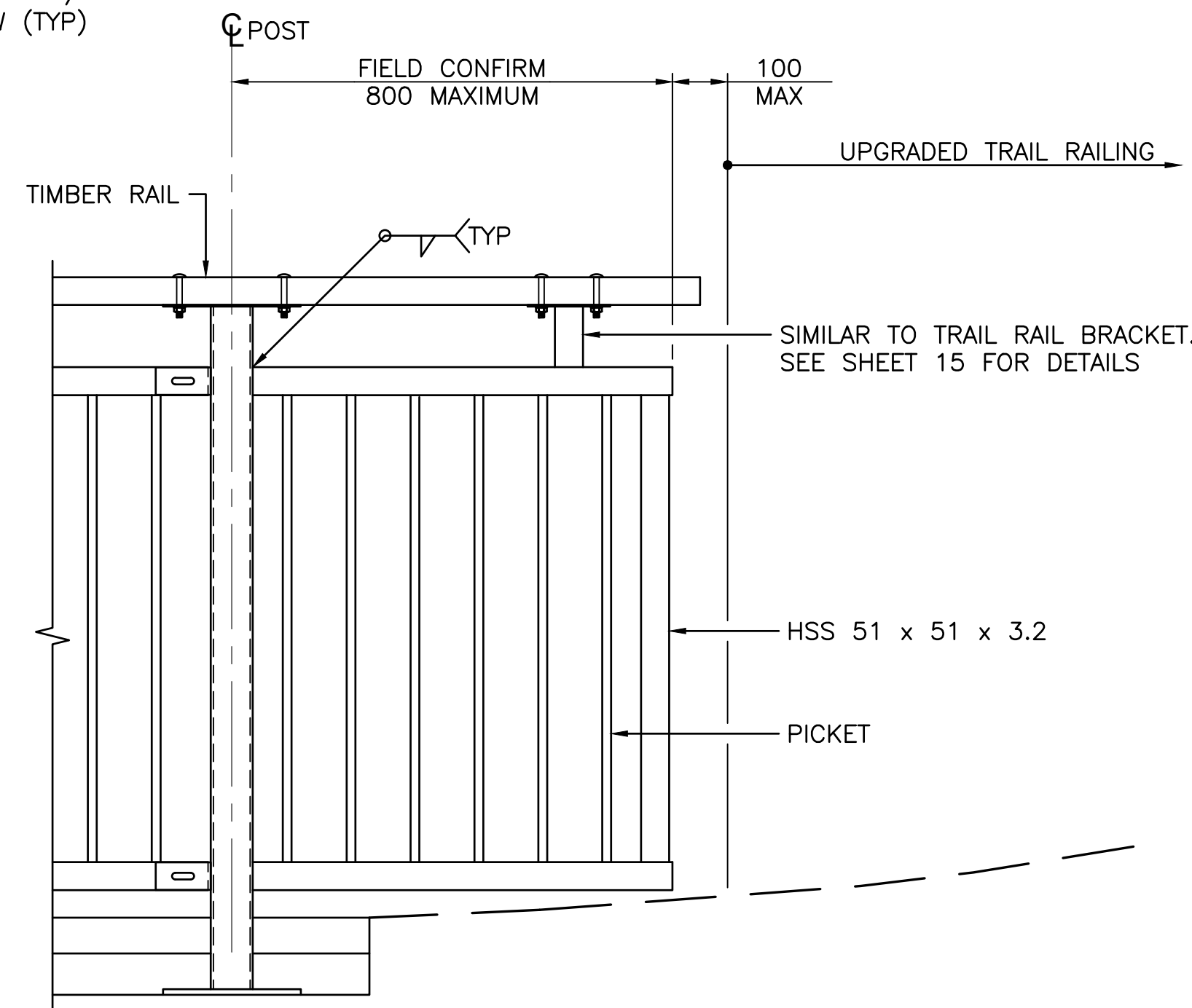


PLAN



EXTERIOR ELEVATION

TYPICAL RAILING CONNECTION
1:2
*TOP RAIL SHOWN, BOTTOM RAIL SIMILAR



EXTERIOR ELEVATION

BRIDGE TO TRAIL RAILING TRANSITION
1:10

*SOUTH RAMP CORNER SHOWN, NORTH RAMP CORNER SIMILAR



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
PERMIT TO PRACTICE NUMBER: P2528
DATE 2020.04.15

REVISIONS	DESCRIPTION	DATE
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B	source drawing no. de dessin no.	B
C	detail on drawing no. detail sur dessin no.	C

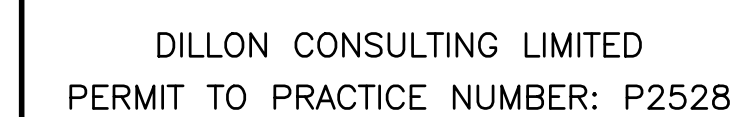
project title
**RED ROCK CANYON
TRAIL LOOP AND BRIDGES**
titre du projet

drawing title
**UPPER BRIDGE
RAILING DETAILS**
titre du dessin

designed by K. WILLIS	conçu par
drawn by A. HEWITT	dessiné par
approved by H. TROFANENKO	approuvé par
PCA Project Manager M. VILLENEUVE	Administrateur de Projets APC
scale AS SHOWN	échelle
project no. 2051	projet no.
date DECEMBER 2019	date
	sheet 26 of 33





WATERTON LAKES NATIONAL PARK



DATE 2020.04.15

0	ISSUED FOR TENDER	2020.04.11
REVISIONS	DESCRIPTION	DATE

QUESTION	ANSWER	MARKS
	<p>A detail number number du detail</p> <p>B source drawing no. de dessin no.</p> <p>C detail on drawing no. detail sur dessin no.</p>	

detail sur dessin no.	
project title	titre du projet

project title

titre du

**RED ROCK CANYON
TRAIL LOOP AND BRIDGES**

drawing title	titre du dessin
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UPPER BRIDGE
TYPICAL RAMP SECTIONS

1 OF 2

designed by **K. WILLIS** concu par

drawn by **A. HEWITT** dessine par

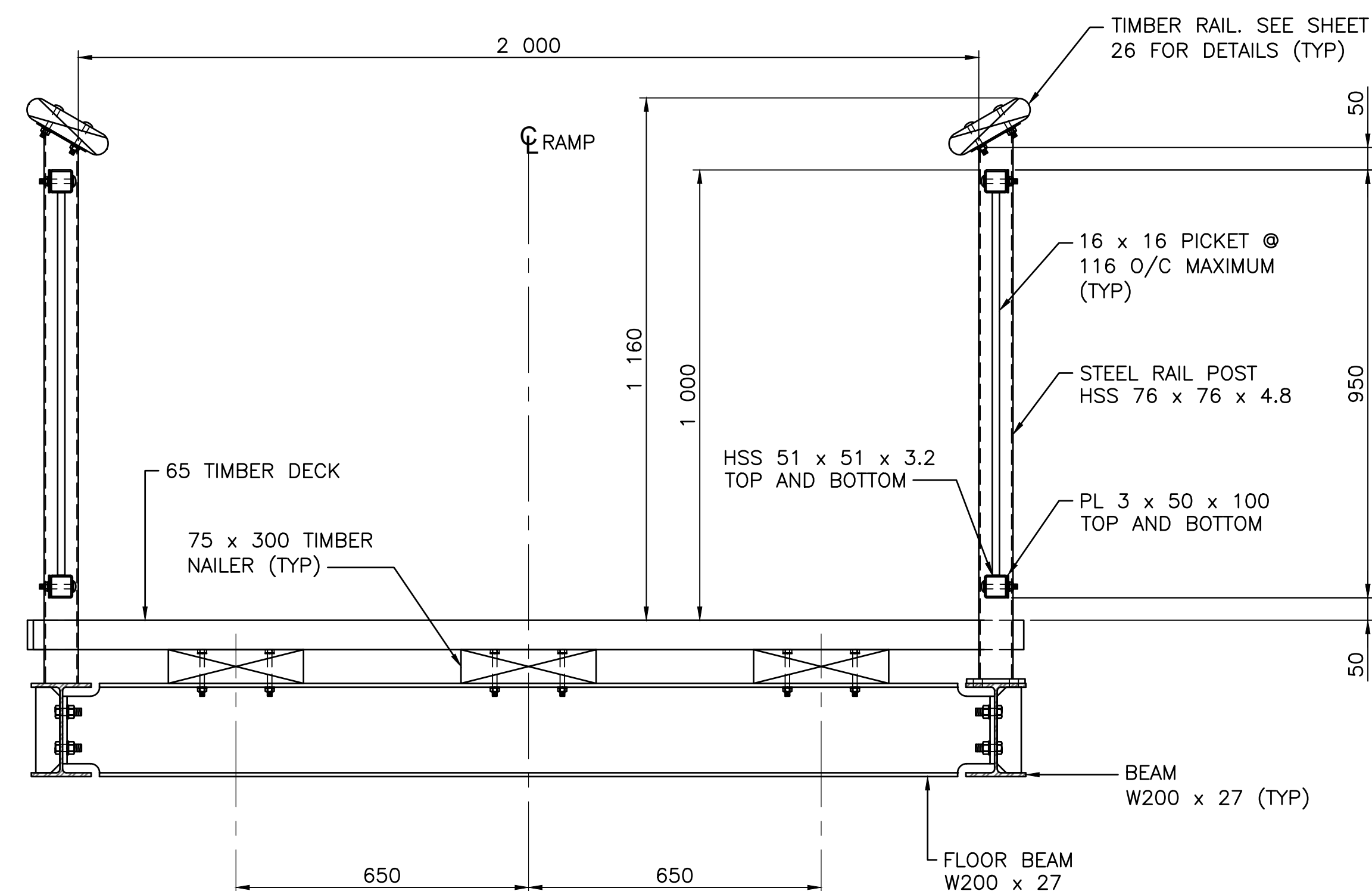
approved by	approuvé par
H. TROFANENKO	

PCA Project Manager	Administrateur de Projets APC
M. VILLENEUVE	

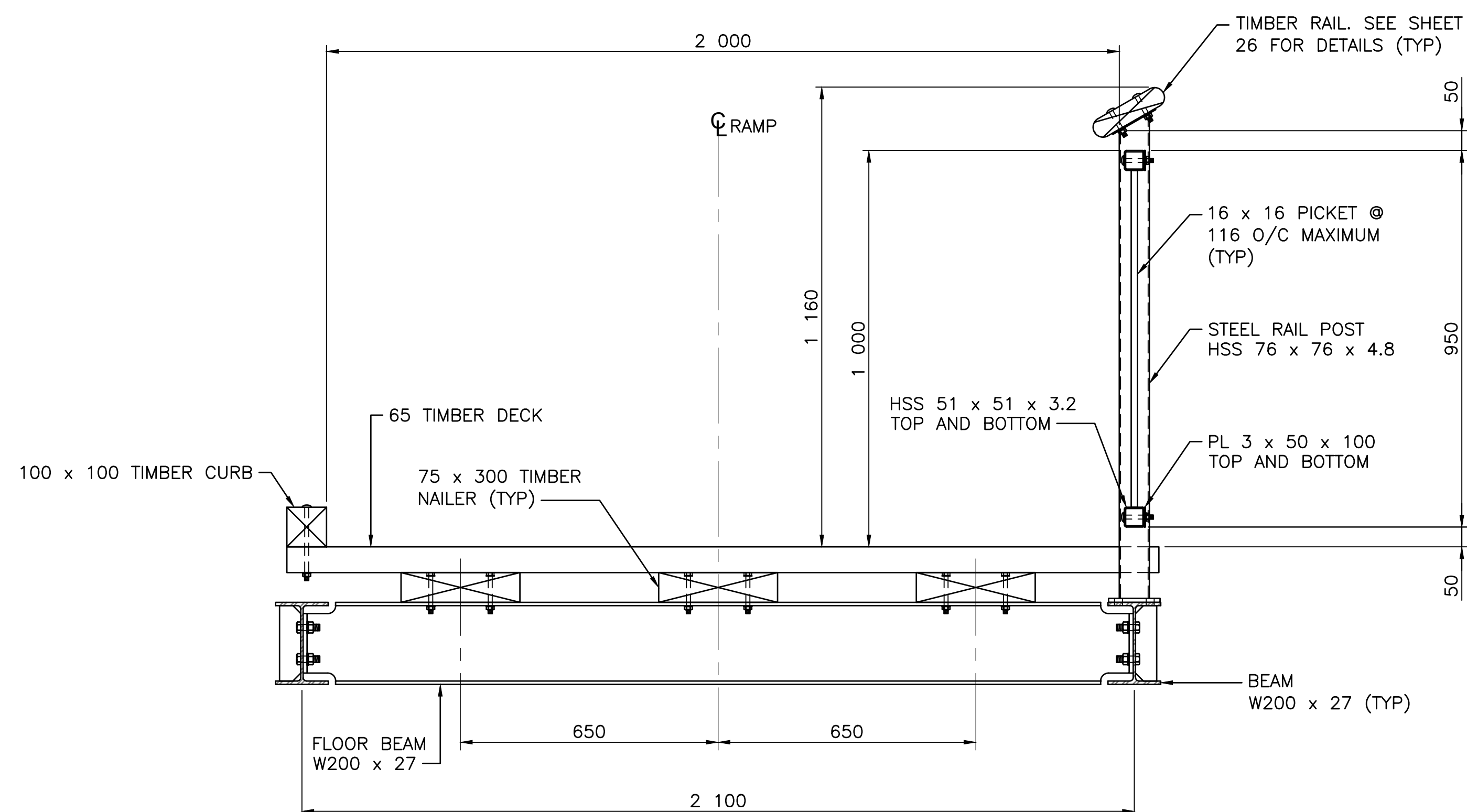
scale	AS SHOWN	echelle	sheet	feuille
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project no.	2051	projct no.	27
tit.		tit.	25 33

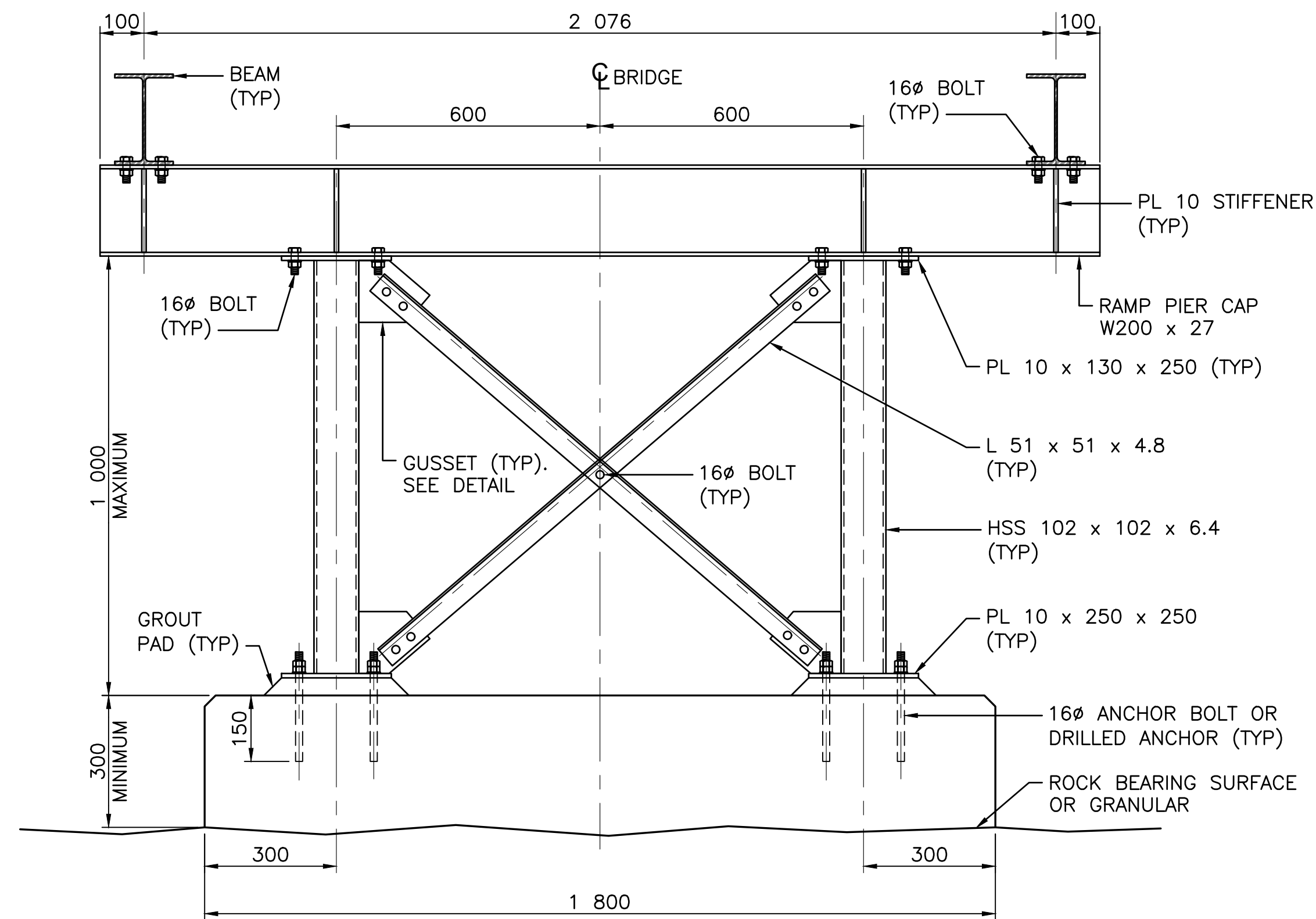
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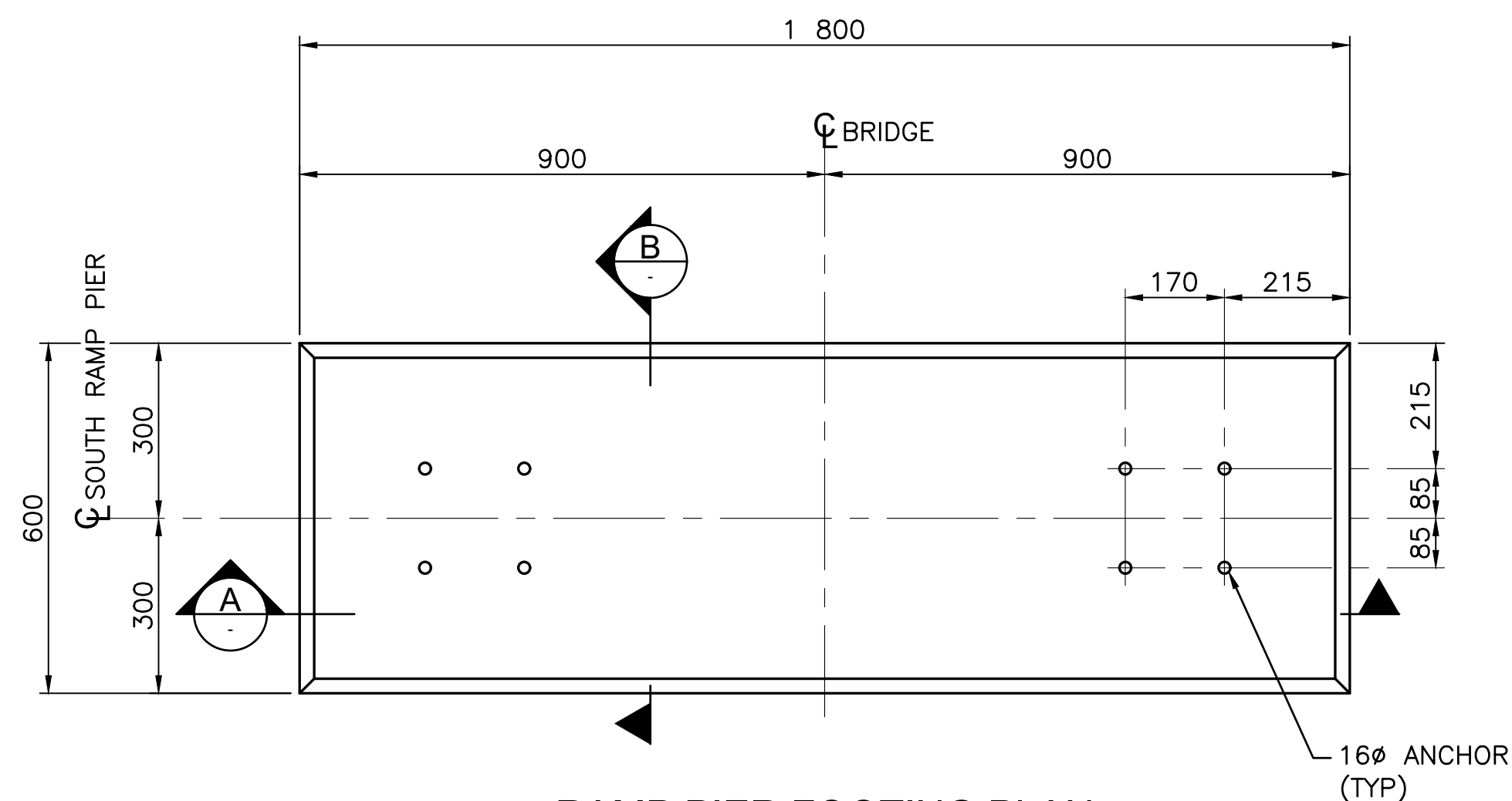
SOUTH RAMP SECTION



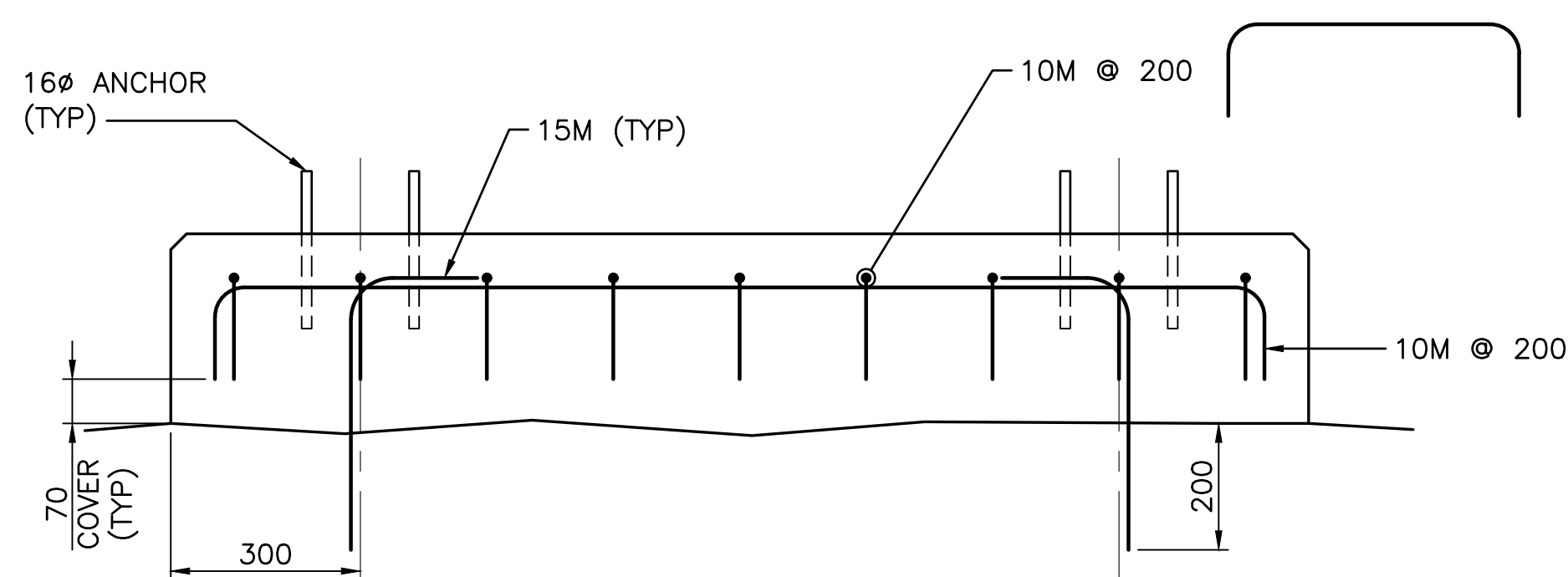
D NORTH RAMP SECTION
17 1:10



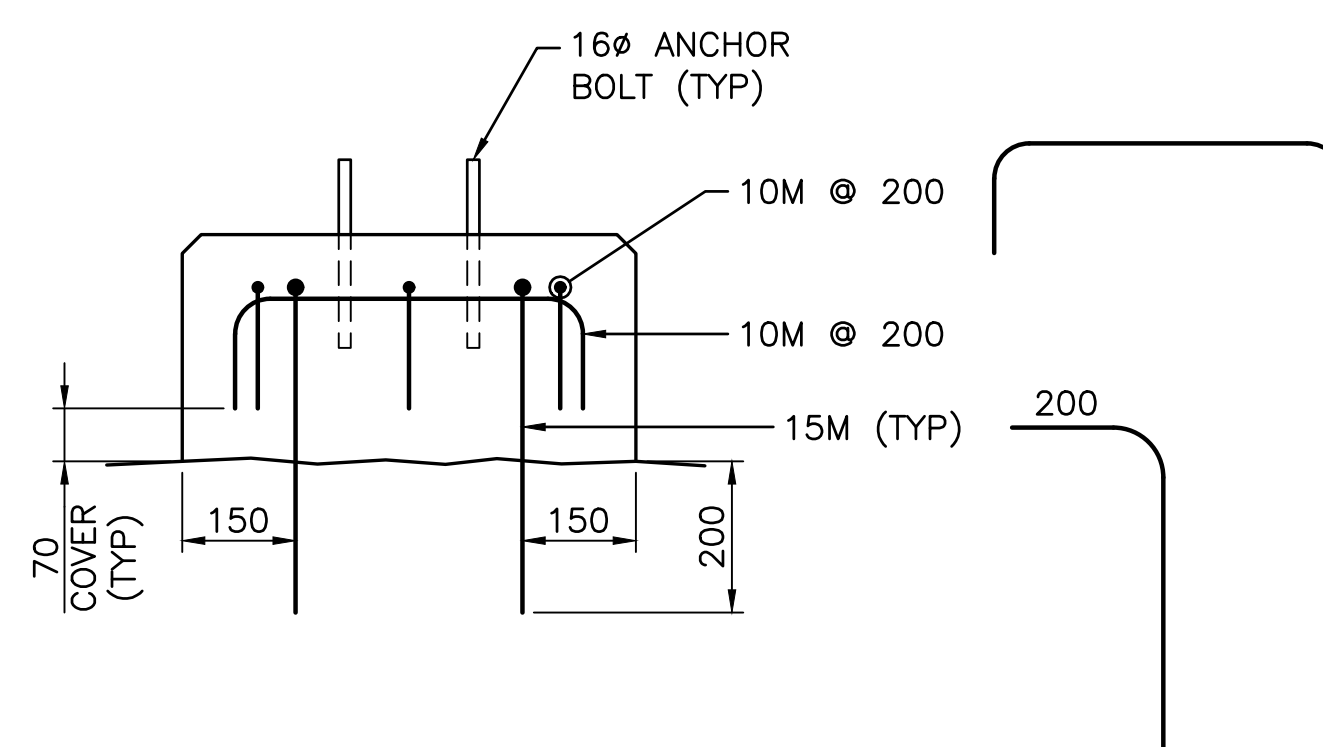
RAMP PIER ELEVATION
1:10



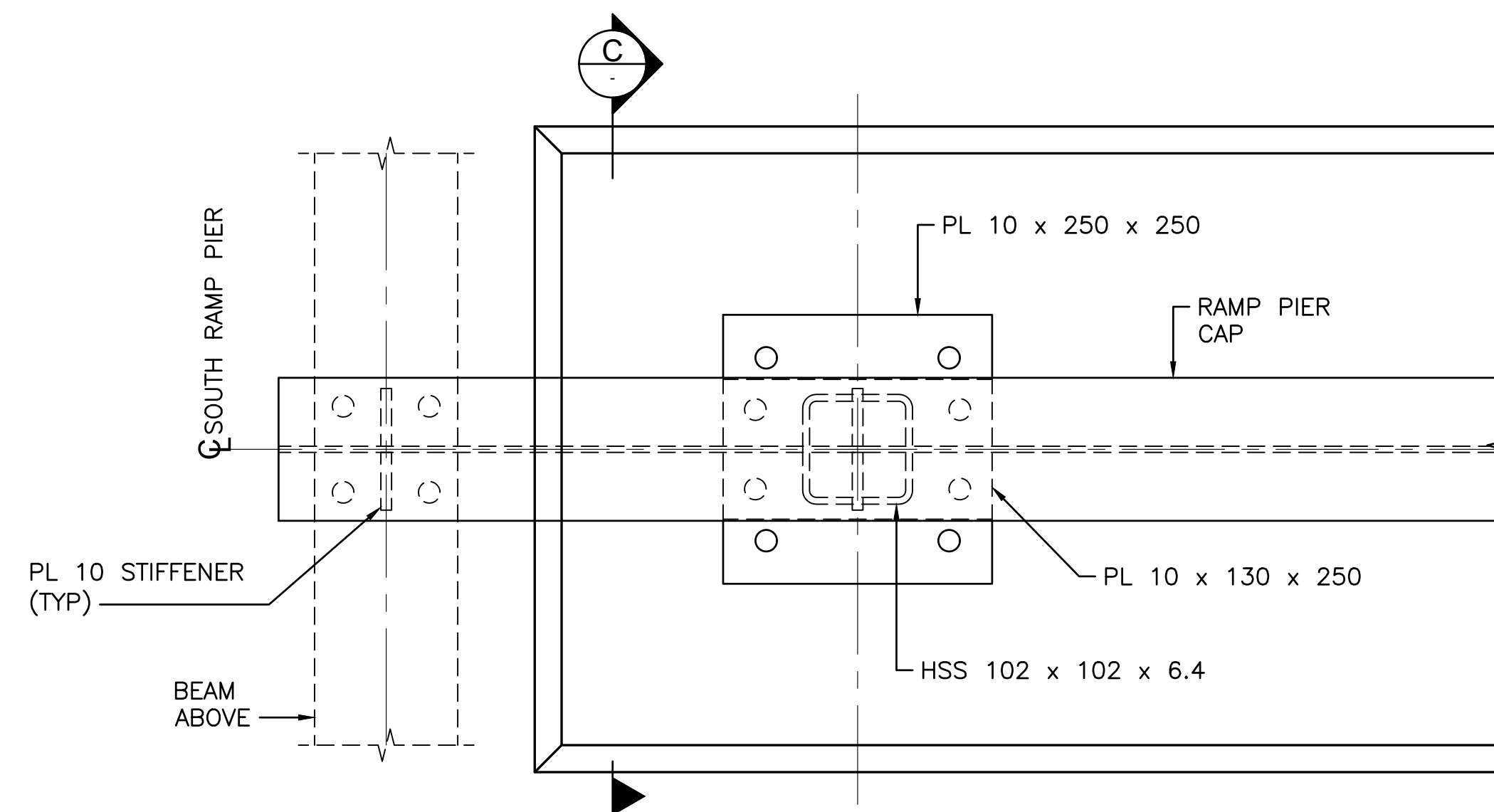
RAMP PIER FOOTING PLAN
1:10



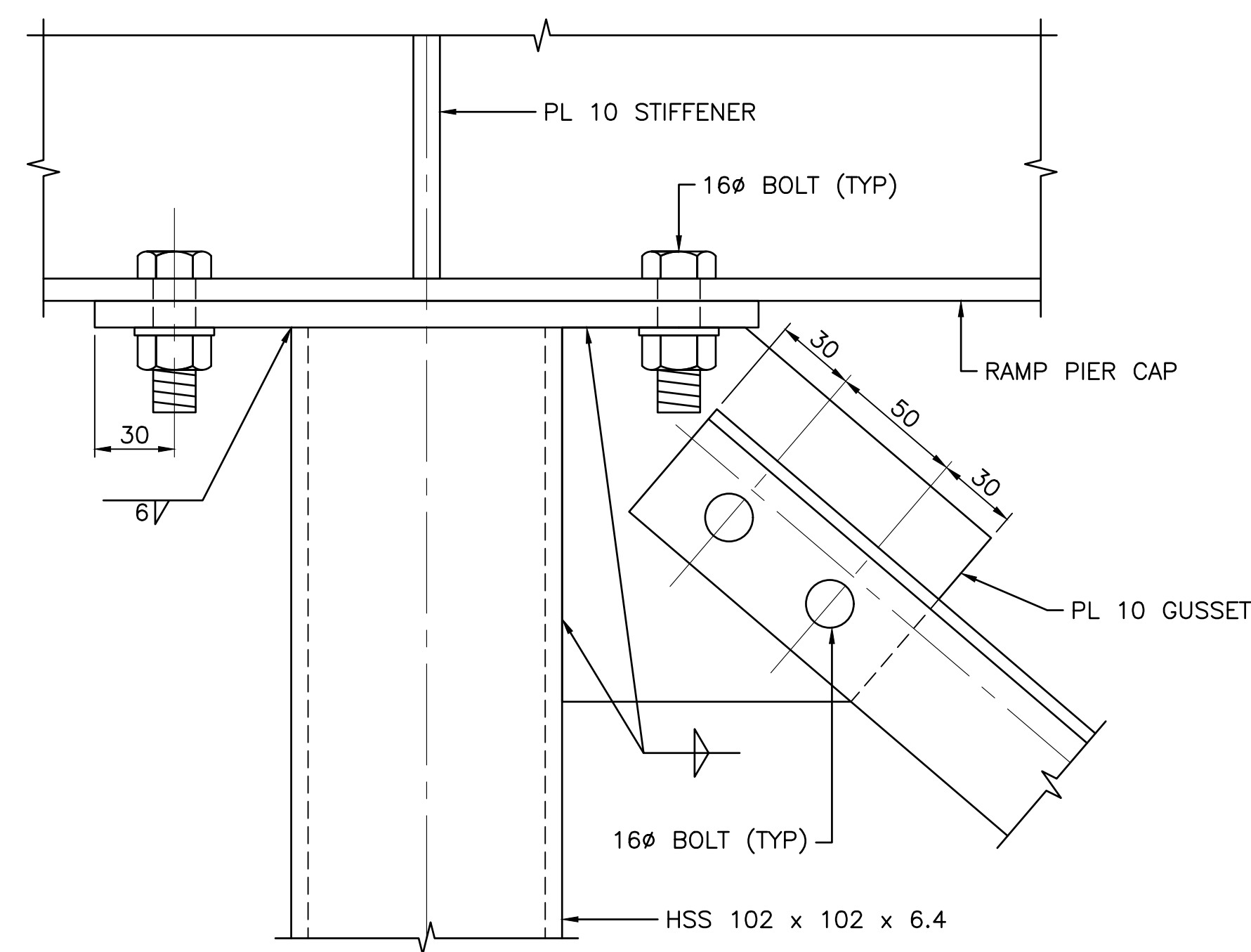
SECTION A
1:10



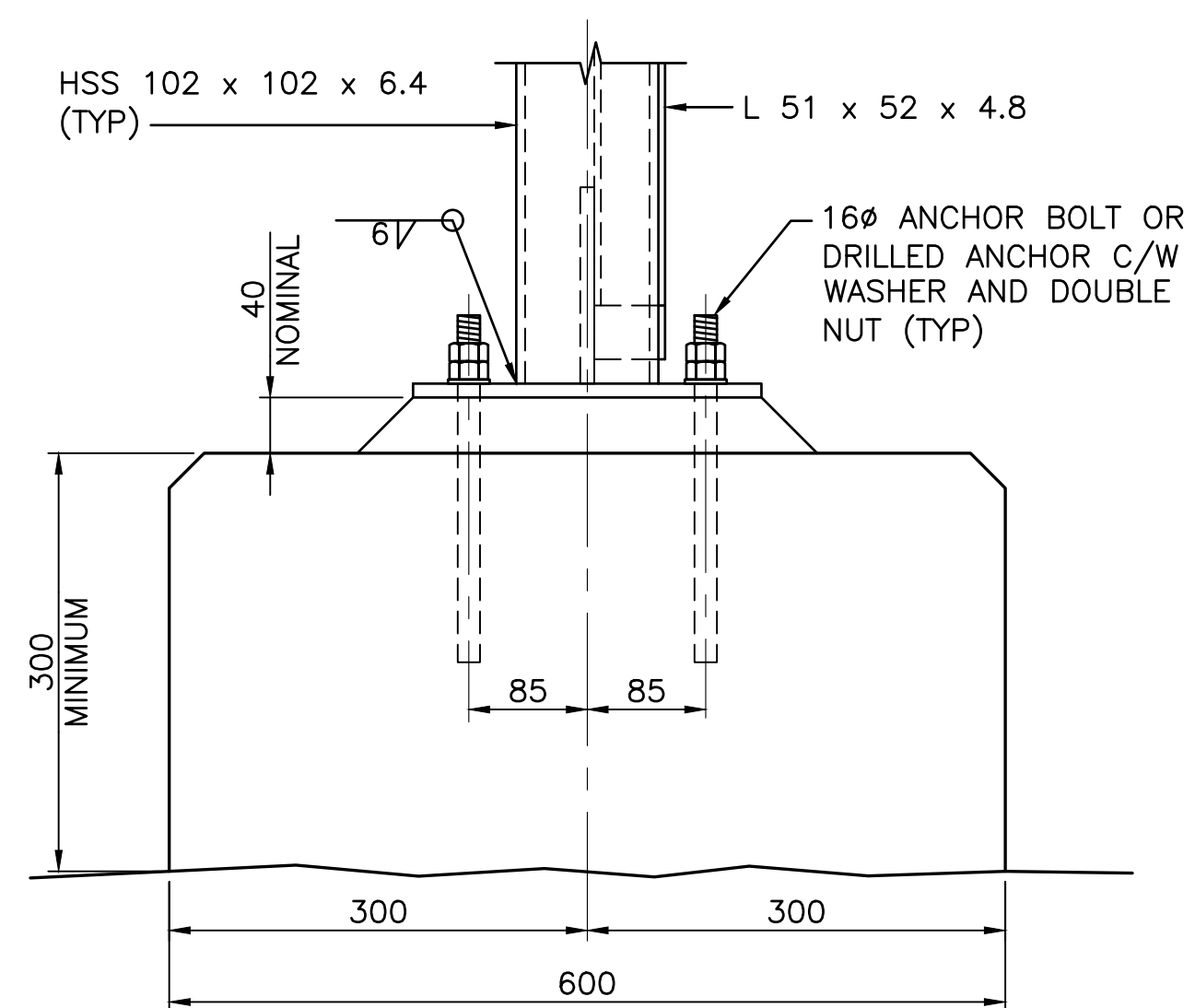
SECTION B
1:10



RAMP PIER PLAN
1:5



GUSSET DETAIL
1:2



SECTION C
1:5



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



DILLON CONSULTING LIMITED
PERMIT TO PRACTICE NUMBER: P2528

DATE 2020.04.15

REVISIONS	DESCRIPTION	DATE
0	ISSUED FOR TENDER	2020.04.15

A	detail number number du détail	A
B	source drawing no. de dessin no.	B
C	detail on drawing no. détail sur dessin no.	C

project title **RED ROCK CANYON**
TRAIL LOOP AND BRIDGES

drawing title **UPPER BRIDGE**
RAMP PIER DETAILS

designed by **K. WILLIS**

drawn by **A. HEWITT**

approved by **H. TROFANENKO**

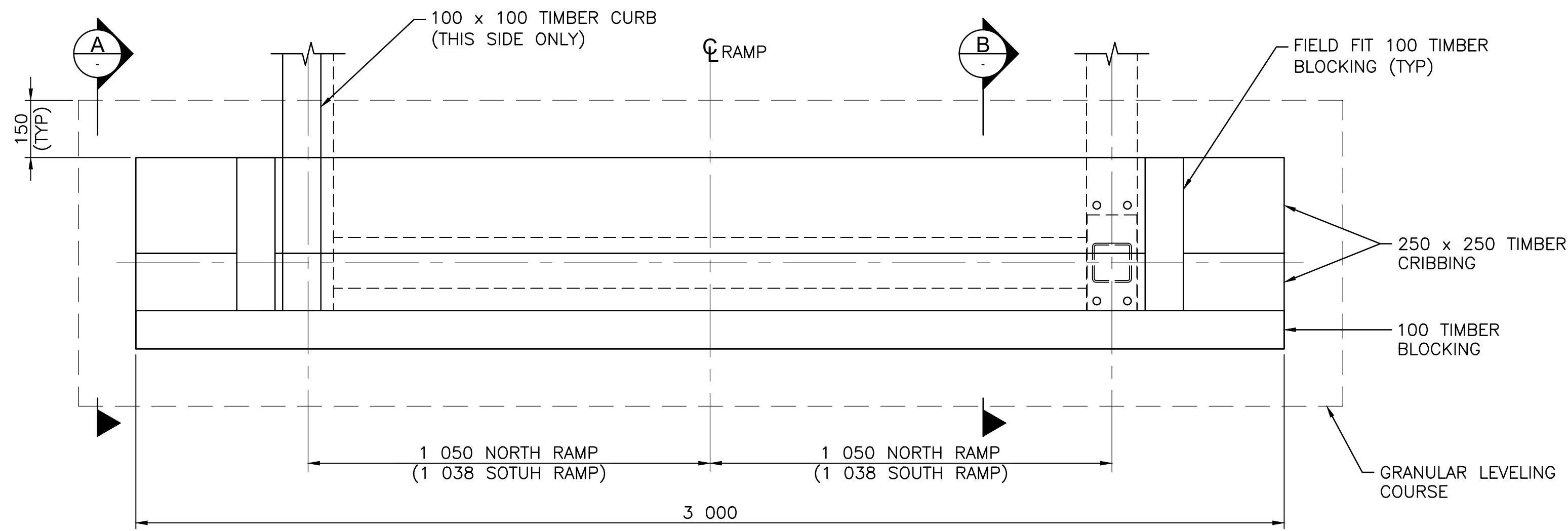
PCA Project Manager **M. VILLENEUVE**

scale **AS SHOWN**

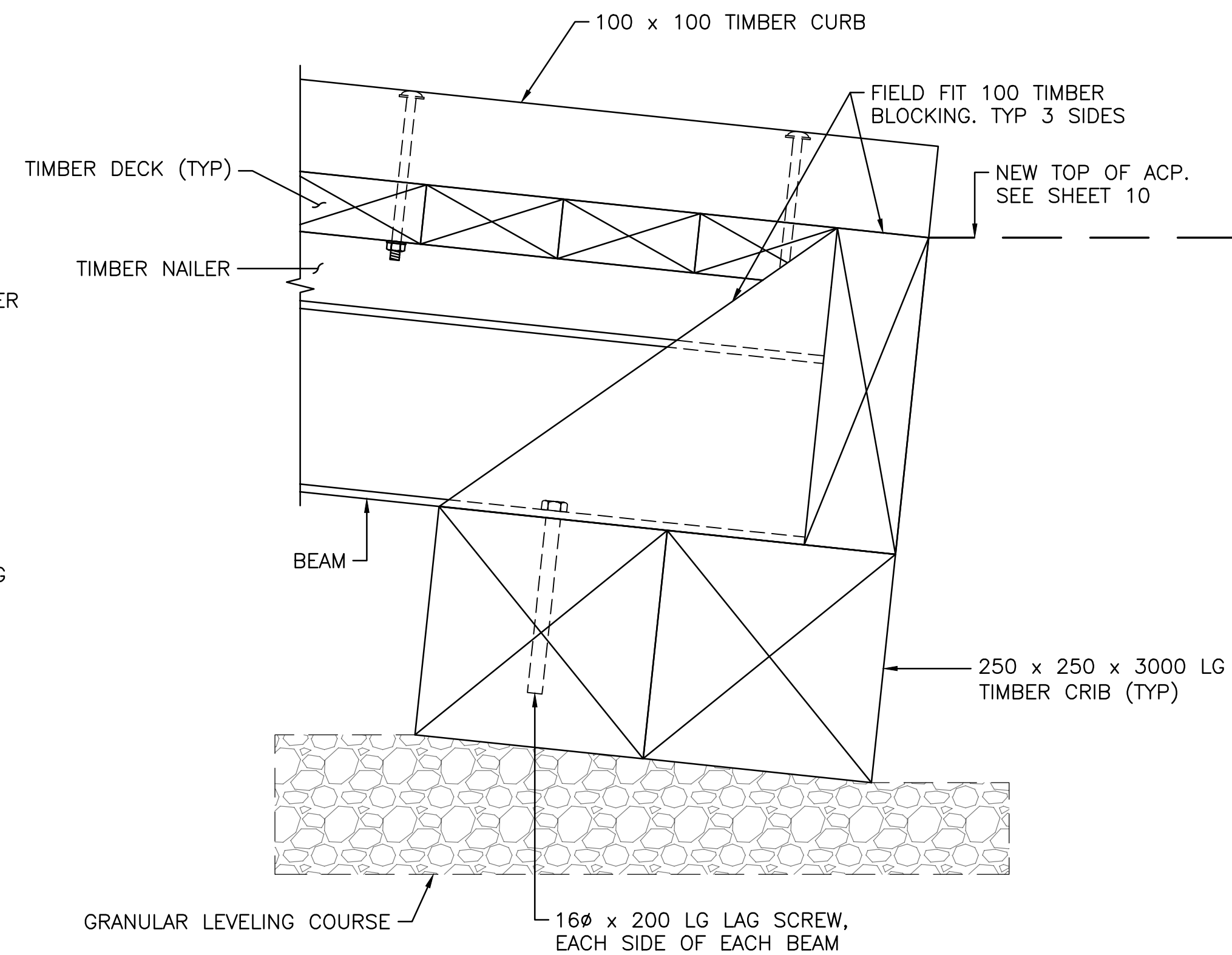
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date **DECEMBER 2019**

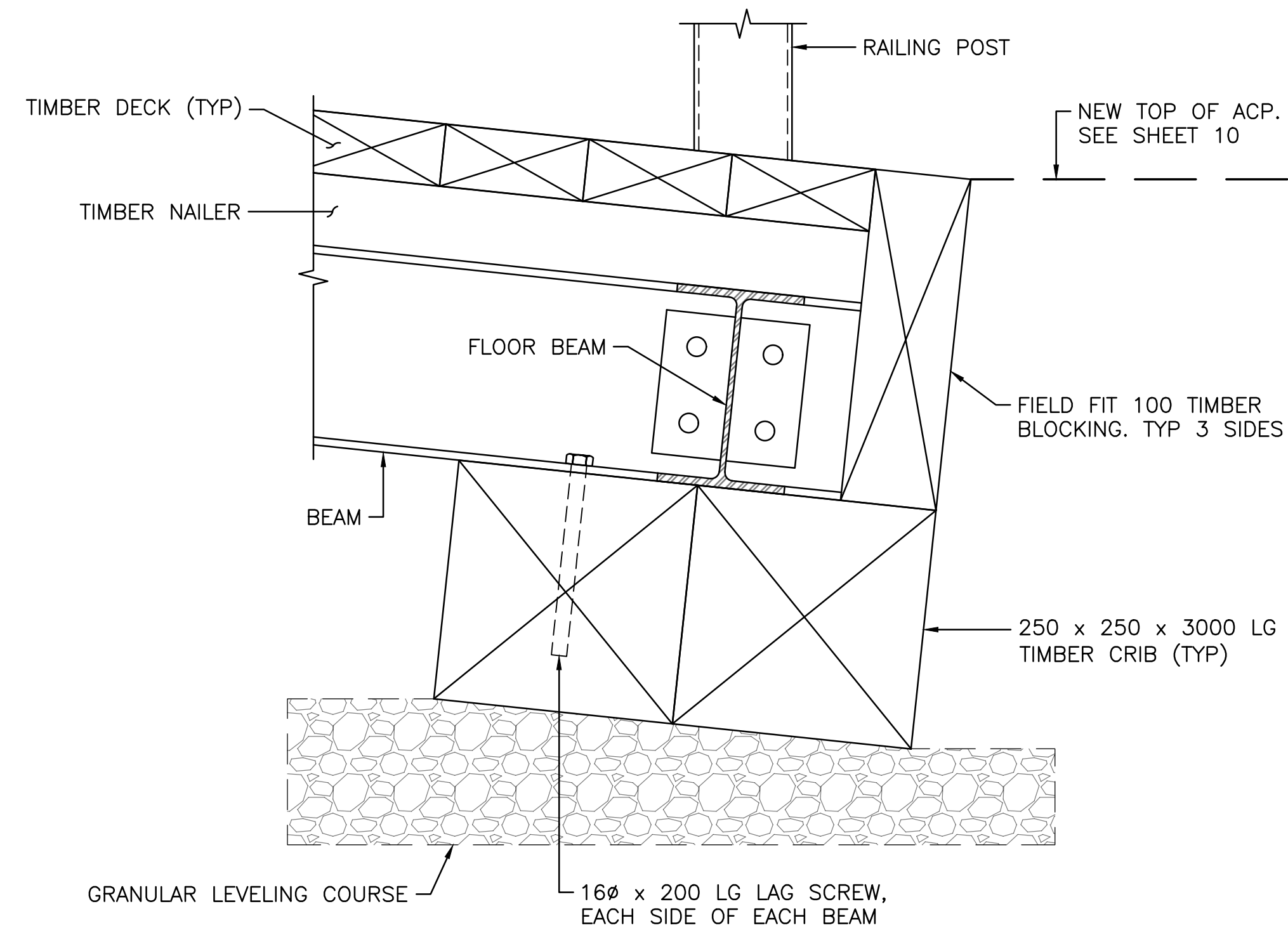
28
OF 33



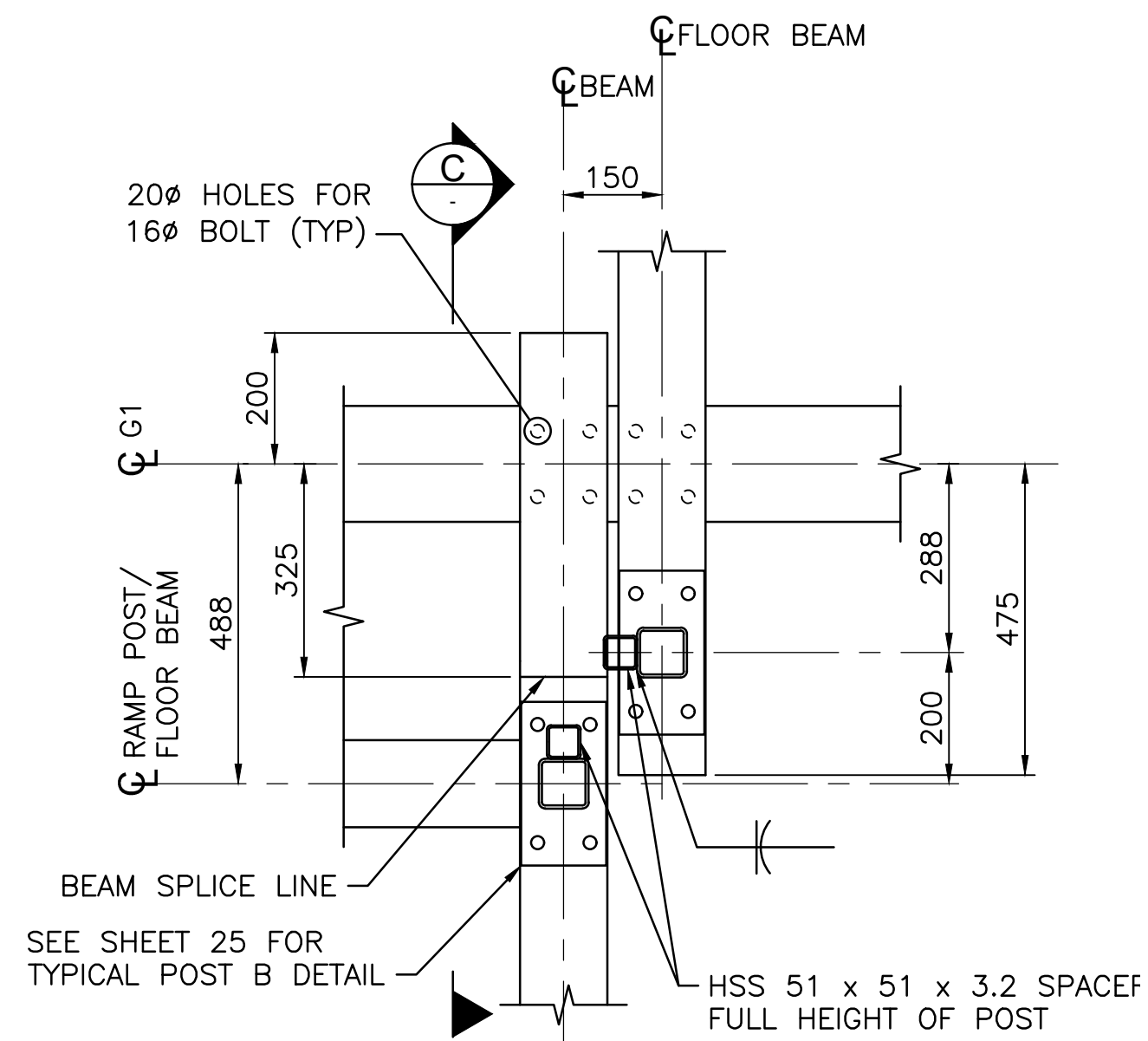
RAMP FOOTING PLAN
1:10
*NORTH RAMP SHOWN, SOUTH RAMP SIMILAR



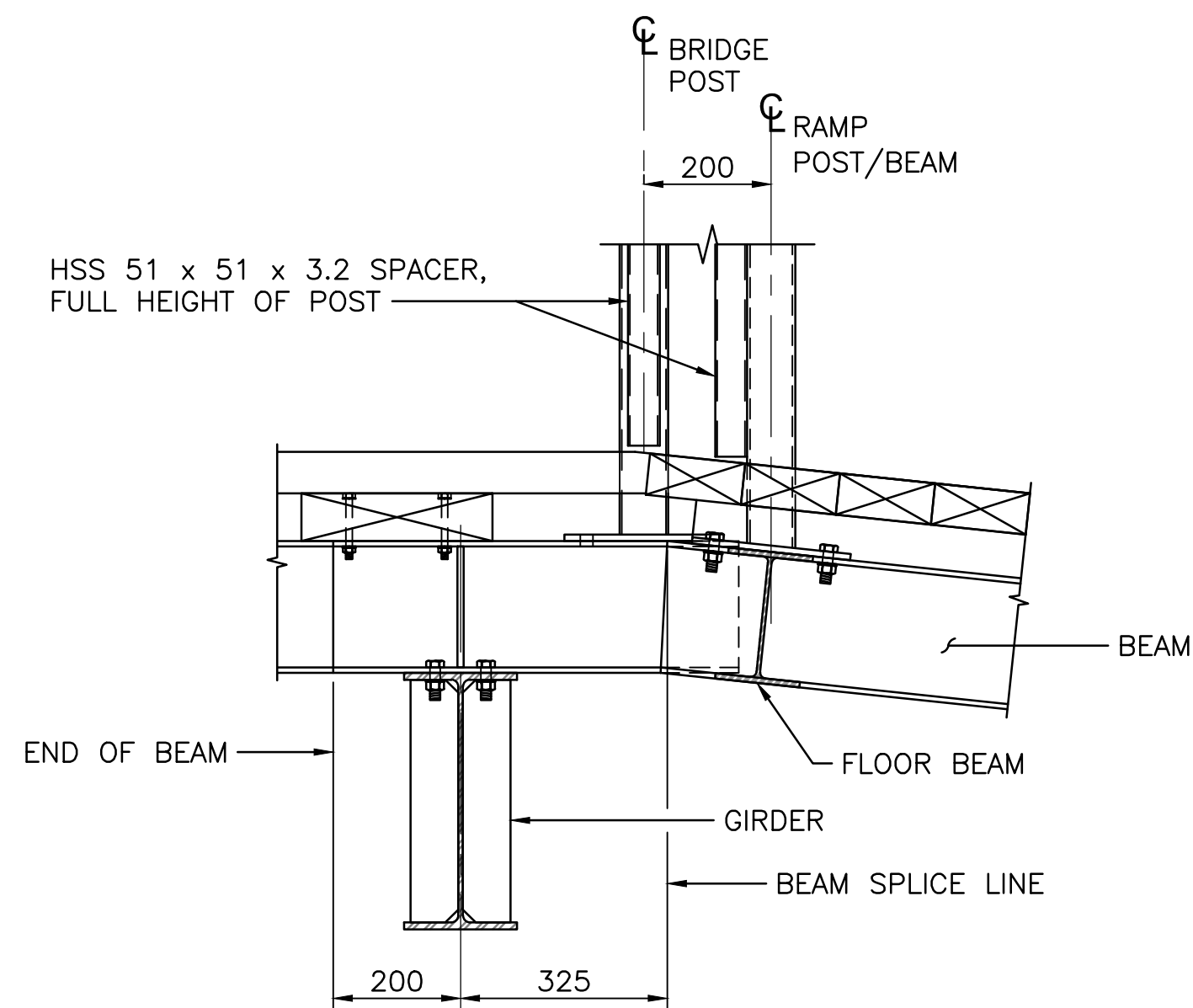
A SECTION
1:5



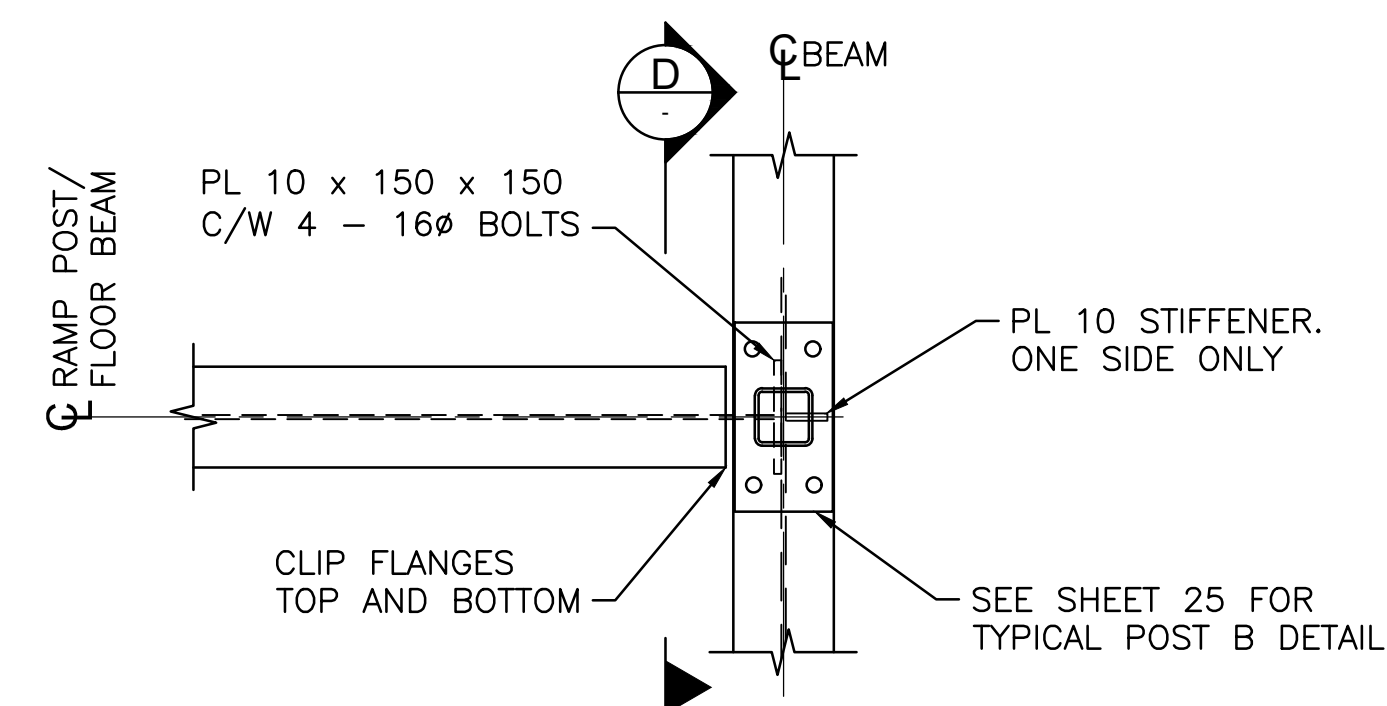
B SECTION
1:5



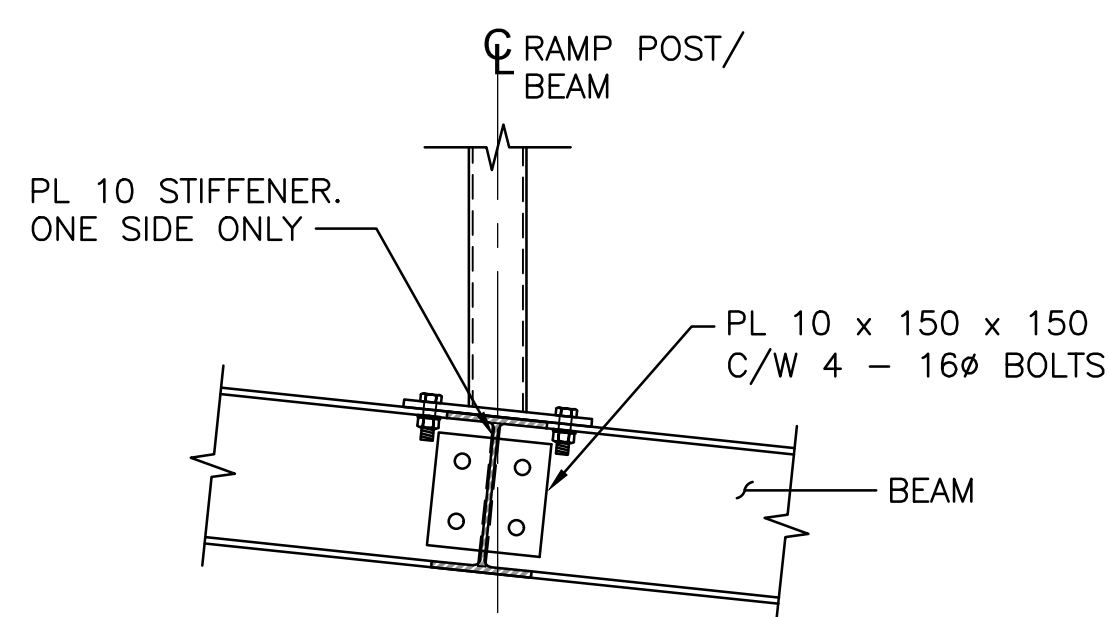
5 DETAIL
1:10



C SECTION
1:10



6 DETAIL
1:10



D SECTION
1:10
NORTH RAMP SHOWN,
SOUTH RAMP SIMILAR



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



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DATE 2020.04.27

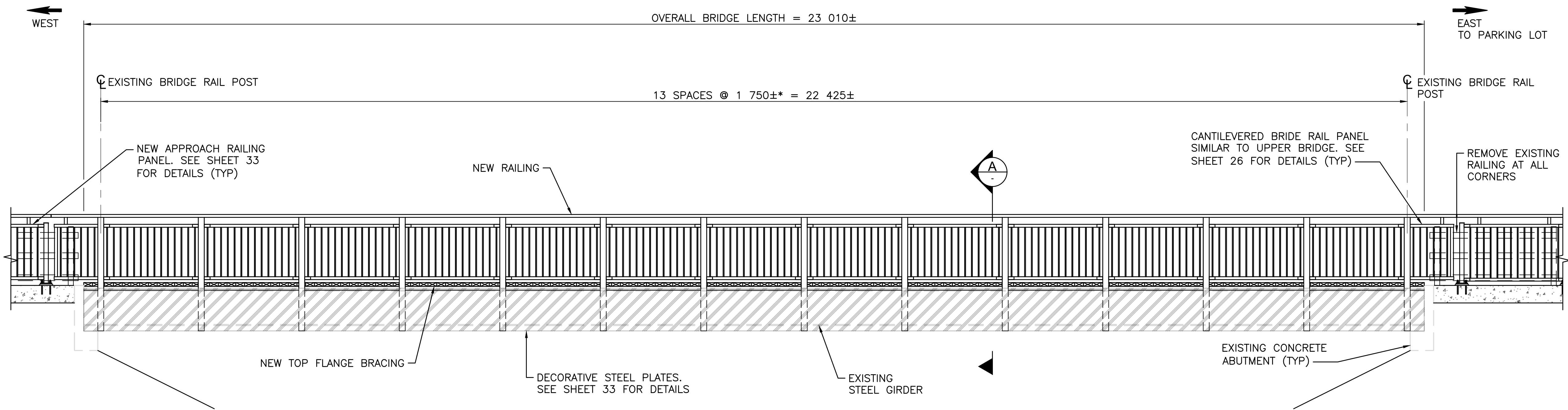
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A	detail number number du detail	A
B	source drawing no. de dessin no.	B
C	detail on drawing no. detail sur dessin no.	C

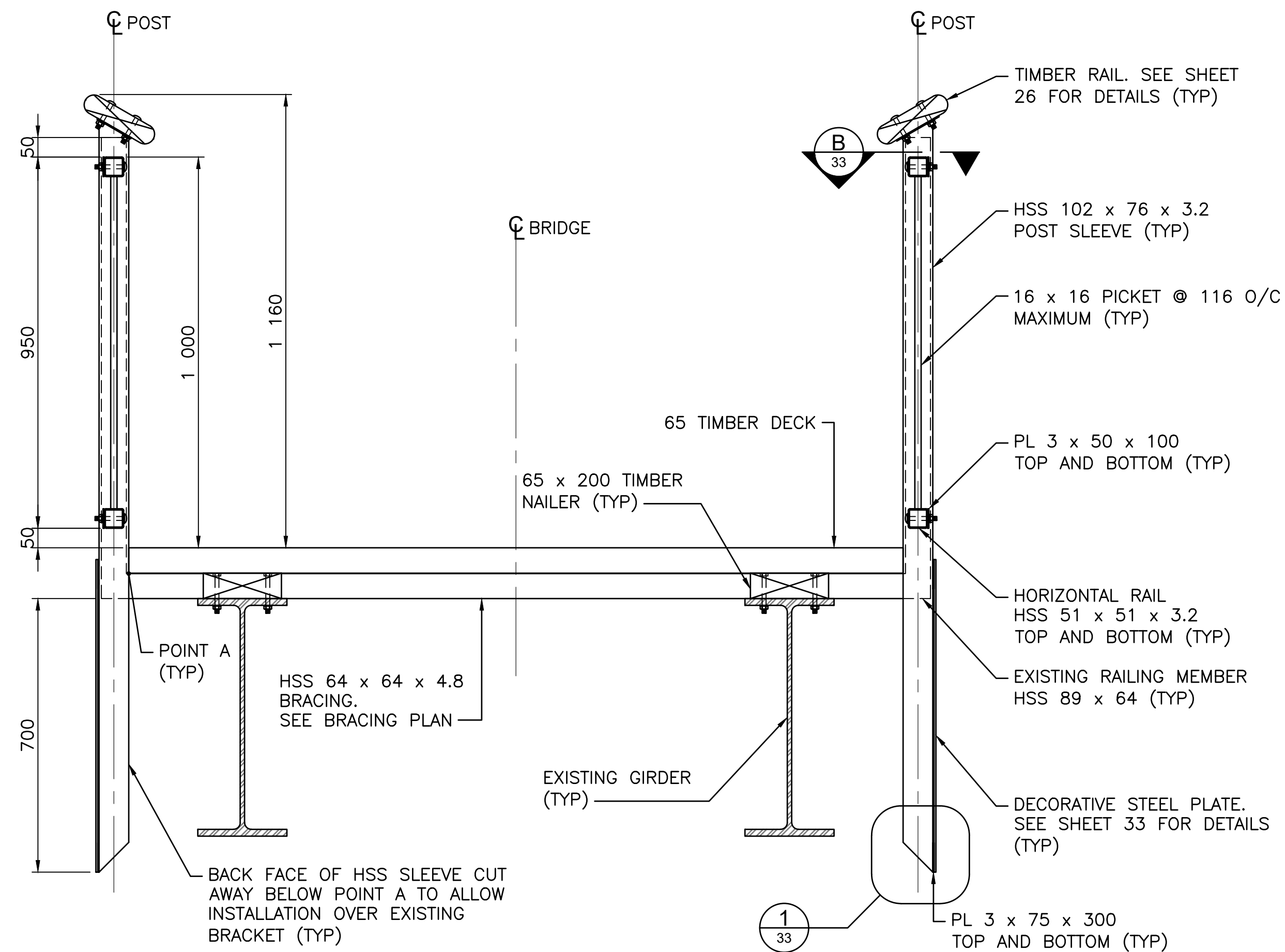
project title **RED ROCK CANYON TRAIL LOOP AND BRIDGES** titre du projet

drawing title **UPPER BRIDGE RAMP DETAILS** titre du dessin

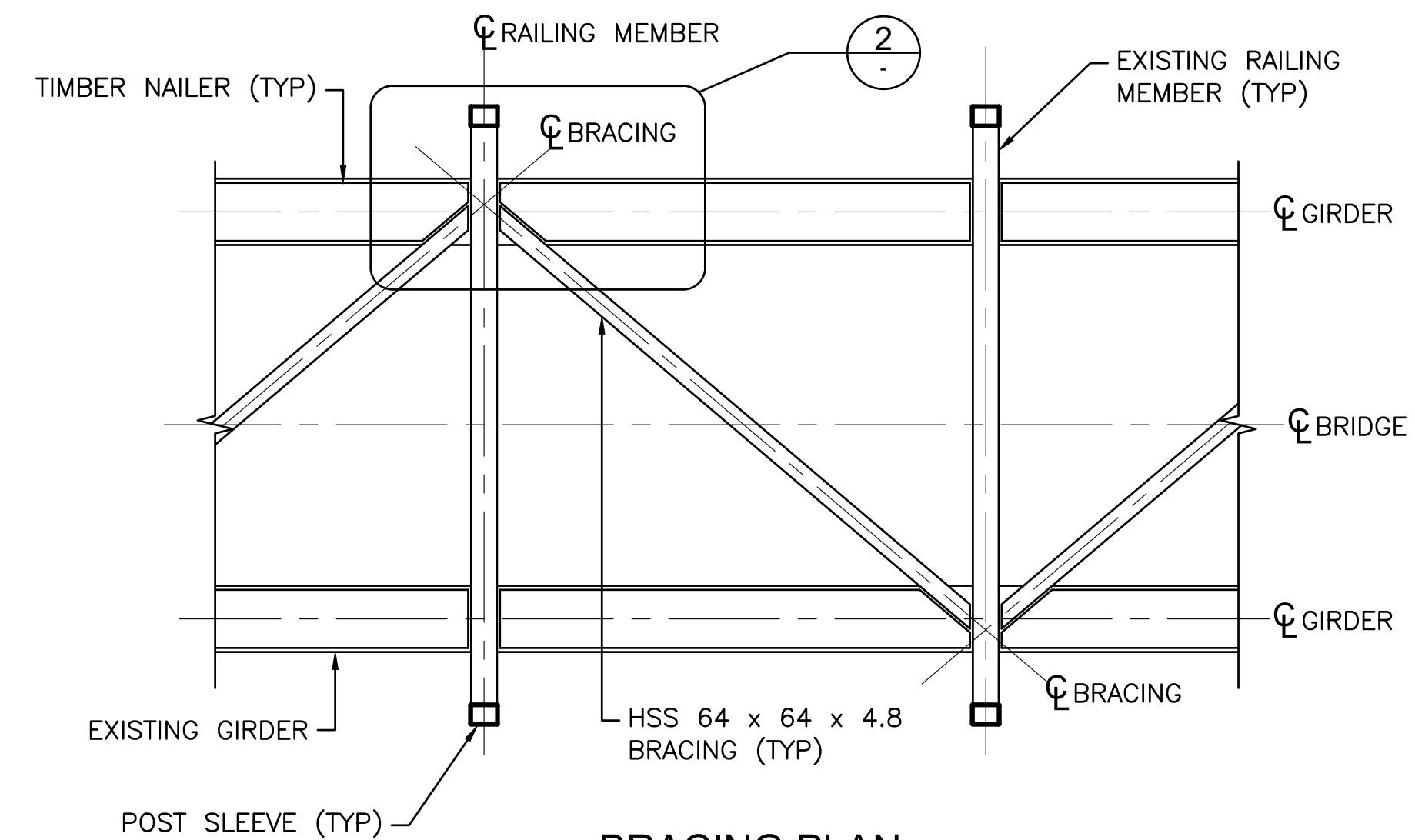
designed by K. WILLIS	conçu par
drawn by A. HEWITT	dessiné par
approved by H. TROFANENKO	approuvé par
PCA Project Manager M. VILLENEUVE	Administrateur de Projets APC
scale AS SHOWN	échelle
project no. 2051	projet no.
date DECEMBER 2019	date
29	sheet OF 33



MIDDLE BRIDGE ELEVATION
1:40

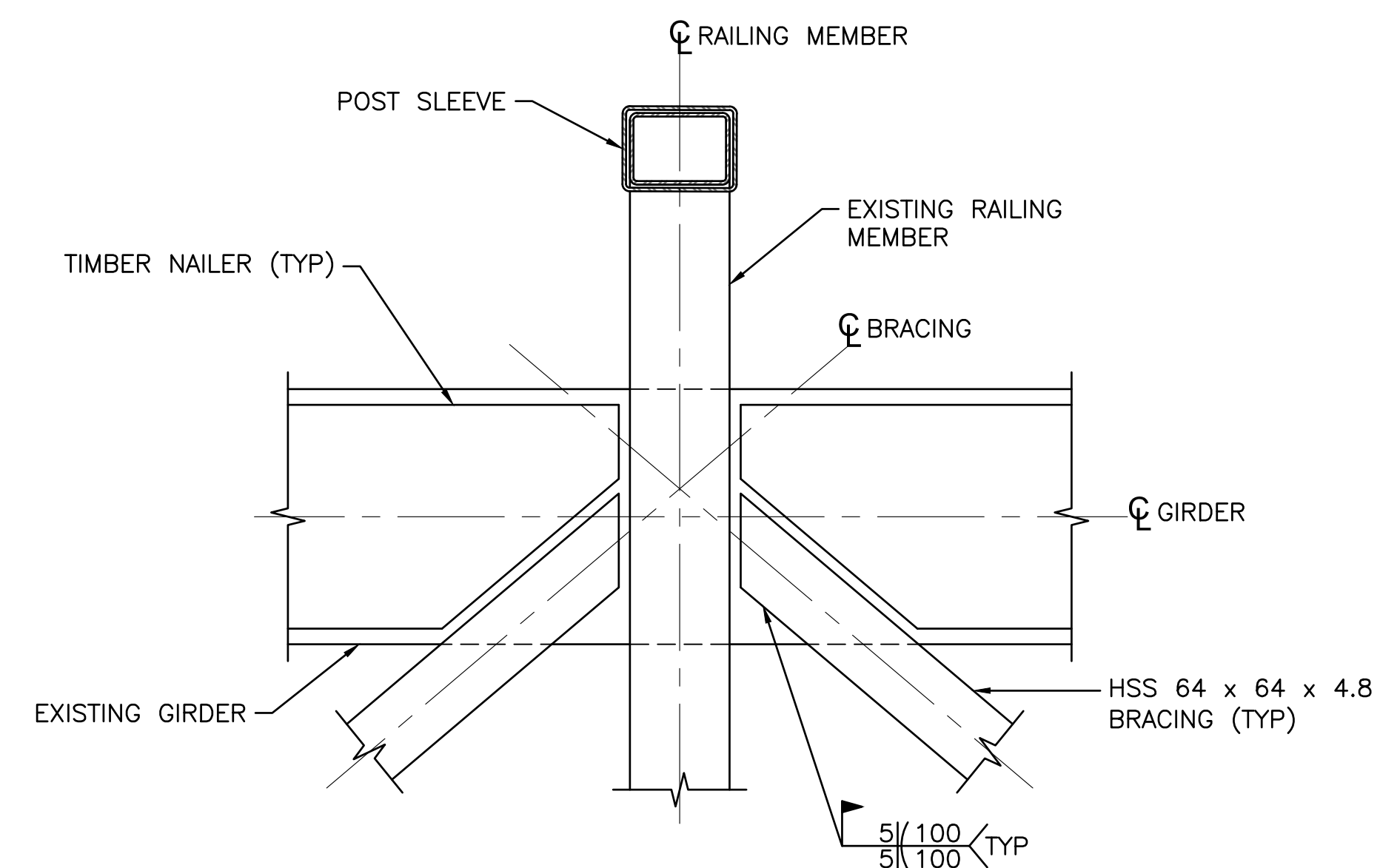


A SECTION
1:10



BRACING PLAN
1:20

*MIDDLE BRIDGE SHOWN, BAUERMAN CREEK BRIDGE SIMILAR



2 DETAIL
1:5



PARKS CANADA AGENCY
PROJECT DELIVERY SERVICES WEST

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PERMIT TO PRACTICE NUMBER: P2528

DATE 2020.04.15

REVISIONS	DESCRIPTION	DATE
0	ISSUED FOR TENDER	2020.04.15

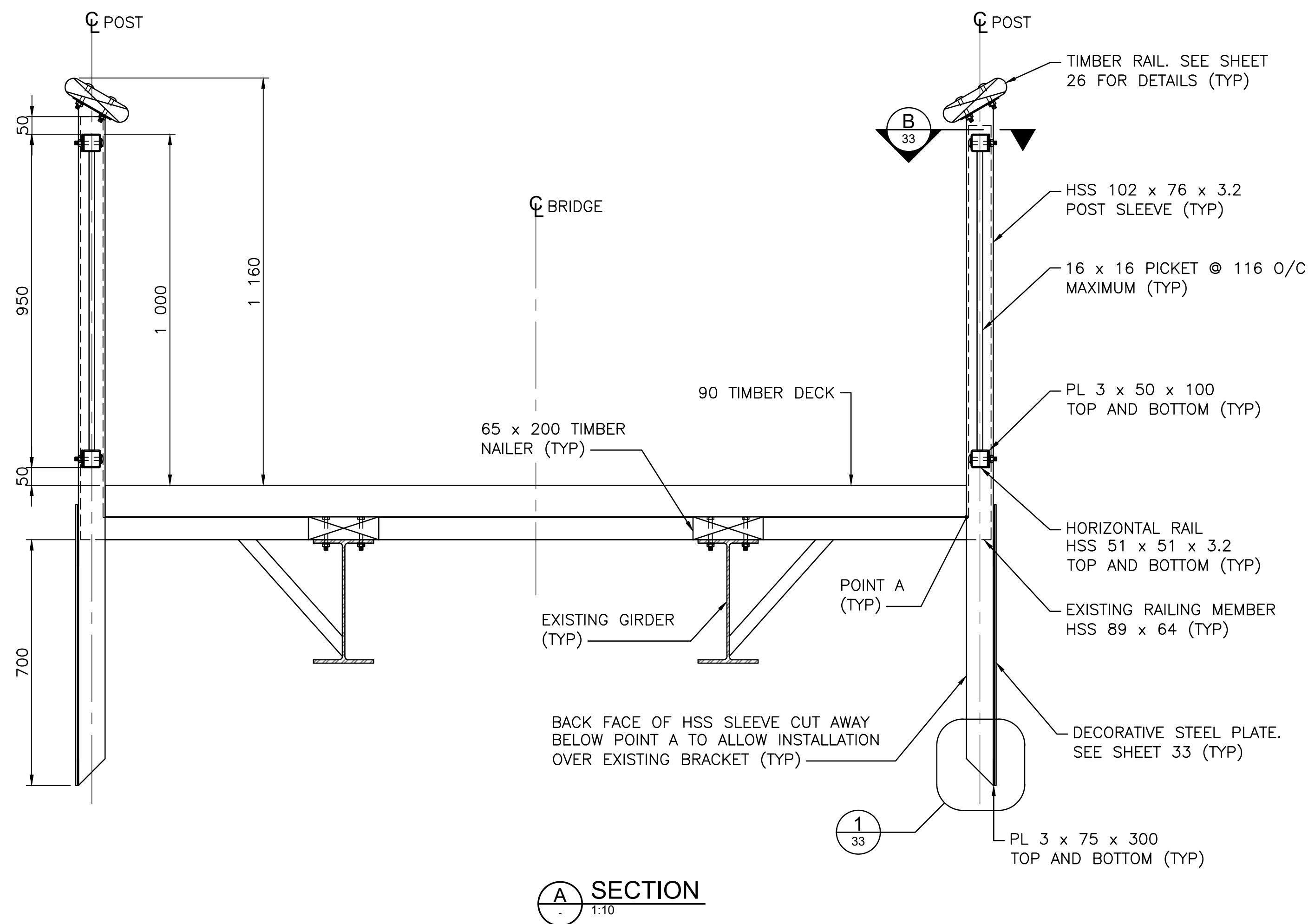
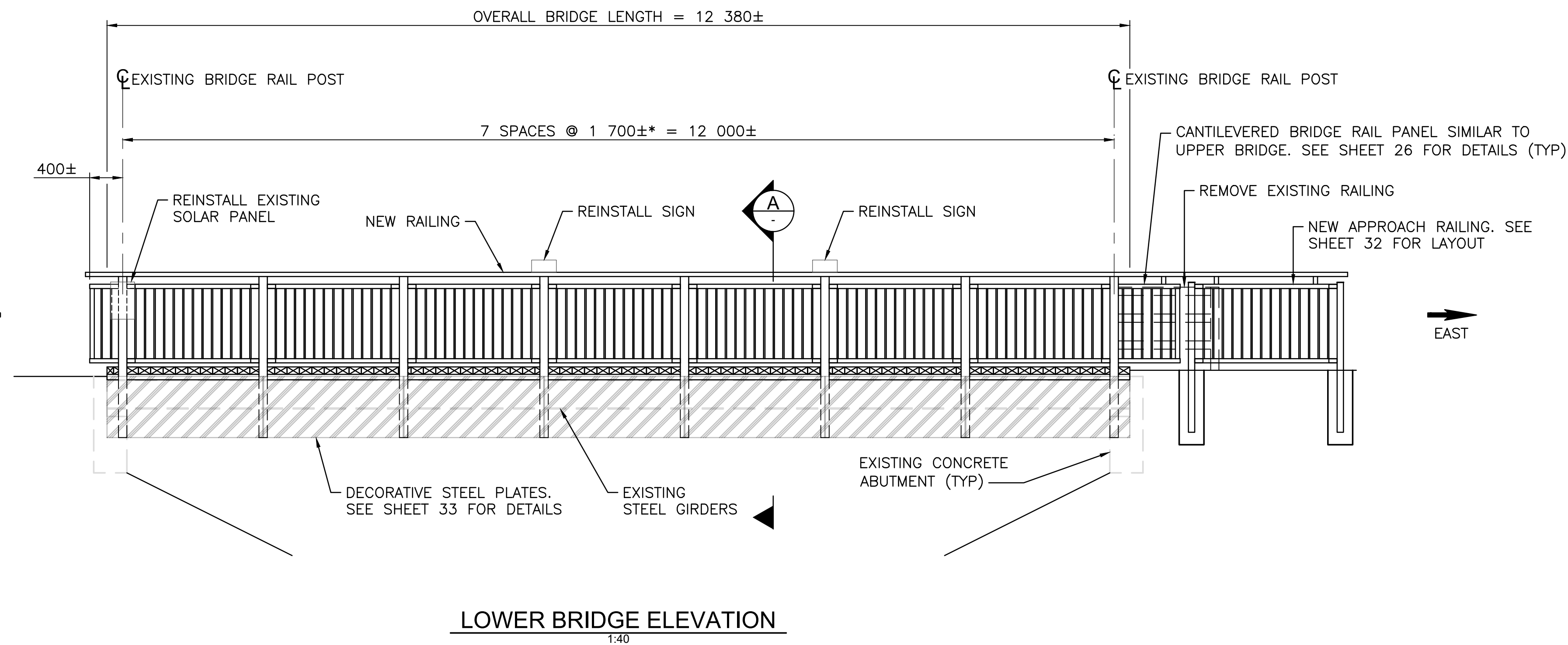
A	detail number number du detail	A
B	source drawing no. de dessin no.	B
C	detail on drawing no. detail sur dessin no.	C

project title **RED ROCK CANYON TRAIL LOOP AND BRIDGES** titre du projet

drawing title **EXISTING BRIDGE MODIFICATIONS MIDDLE BRIDGE** titre du dessin

designed by **K. WILLIS** conçu par
drawn by **R. BARNES** dessiné par
approved by **H. TROFANENKO** approuvé par
PCA Project Manager **M. VILLENEUVE** Administrateur de Projets APC

scale **AS SHOWN** échelle
project no. **2051** projet no.
date **DECEMBER 2019** date
sheet **30** feuille
OF **33**



Client
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DATE 2020.04.27

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0	ISSUED FOR TENDER	2020.04.27

A	detail number number du détail	A
B	source drawing no. de dessin no.	B
C	detail on drawing no. détail sur dessin no.	C

project title
RED ROCK CANYON
TRAIL LOOP AND BRIDGES

drawing title
EXISTING BRIDGE MODIFICATIONS
LOWER BRIDGE

designed by
K. WILLIS

drawn by
R. BARNES

approved by
H. TROFANENKO

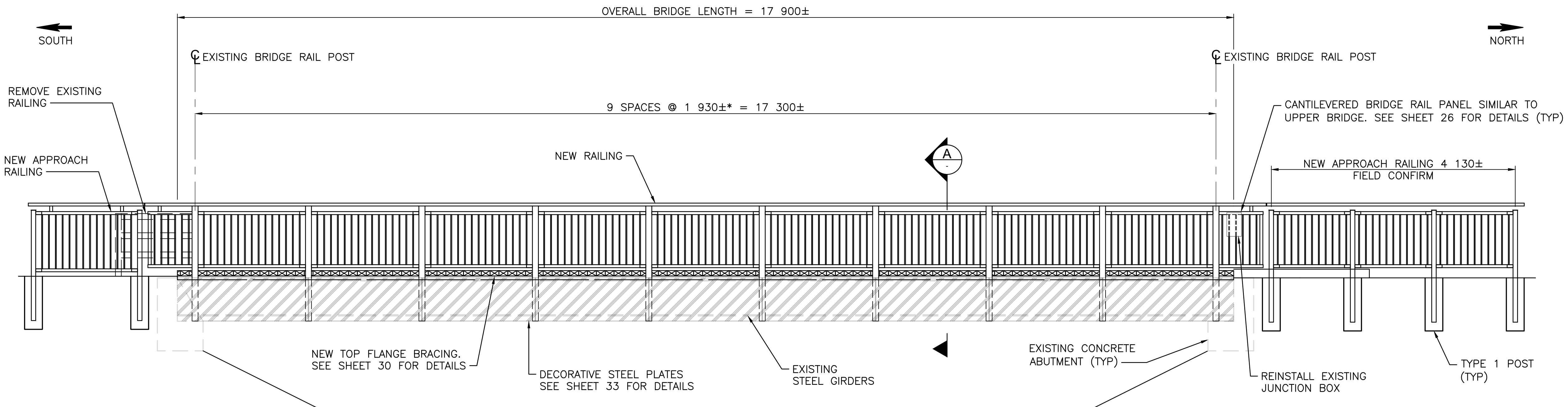
PCA Project Manager
M. VILLENEUVE

scale
AS SHOWN

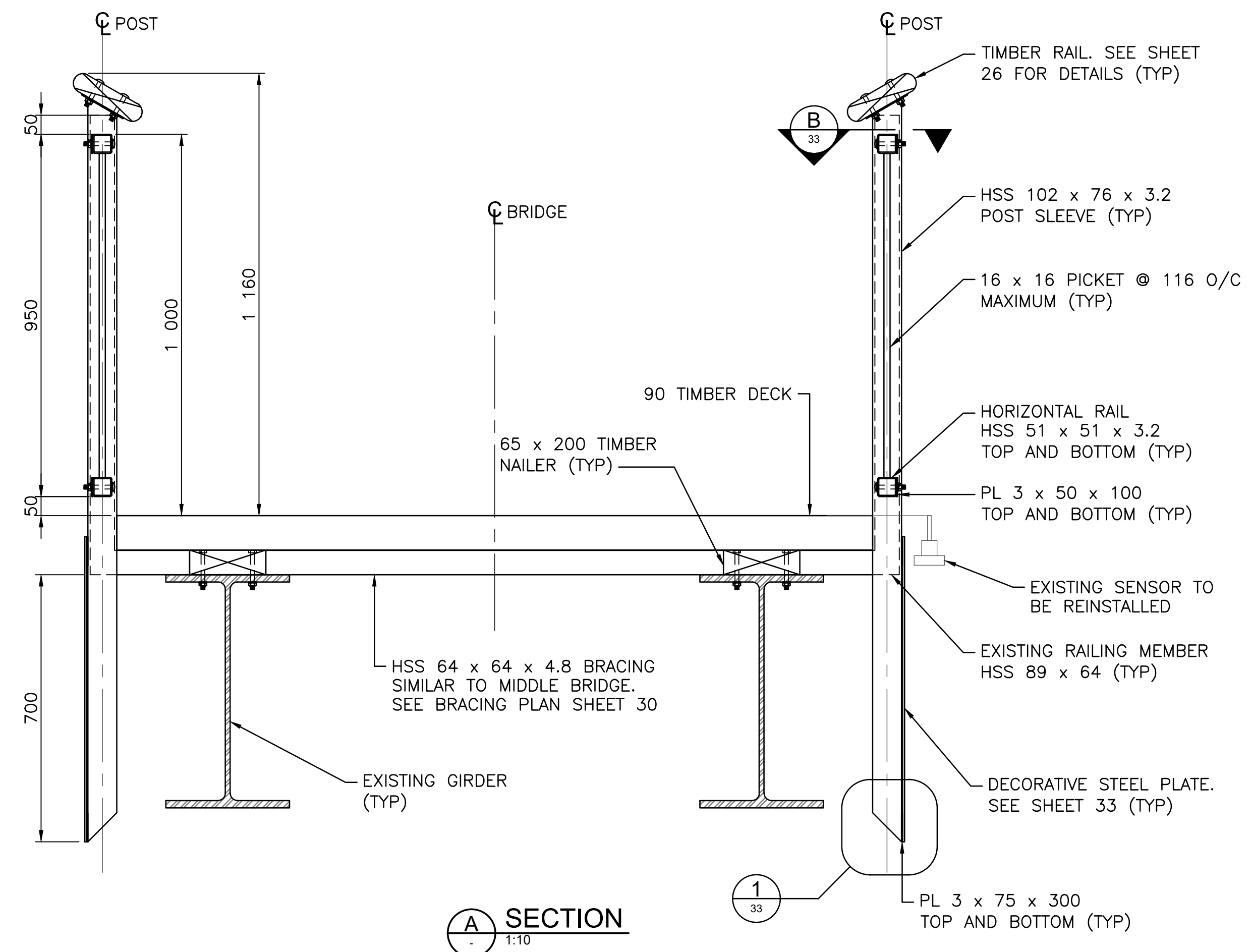
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2051

date
DECEMBER 2019

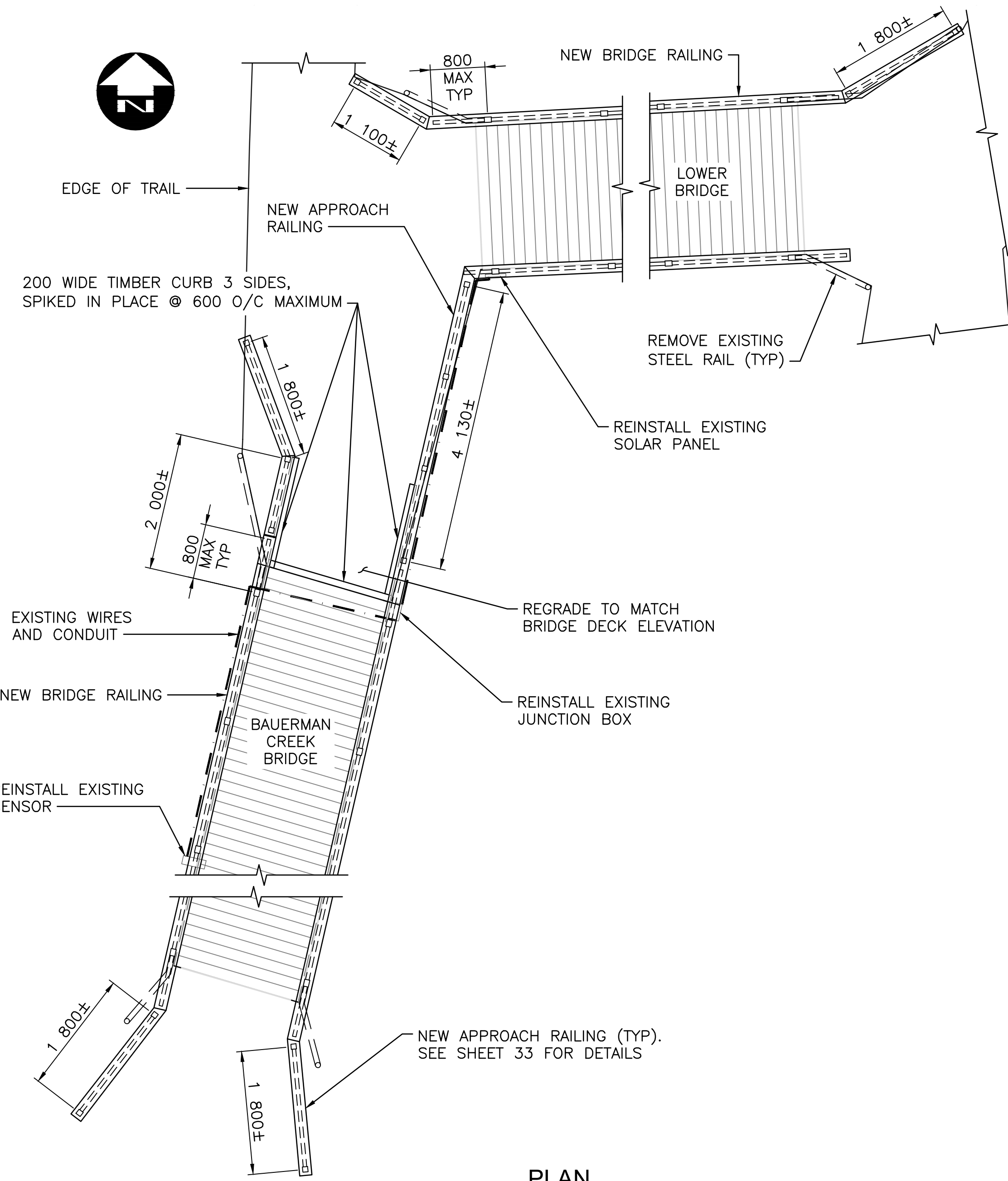
31
OF 33



BAUERMAN CREEK BRIDGE ELEVATION
1:40



SECTION A-A
1:10



PLAN
1:50

APPROACH RAILING NOTES

1. THE EXACT LAYOUT OF RAILINGS ON THE APPROACHES TO THE MIDDLE, LOWER AND BAUERMAN CREEK BRIDGES WILL BE DETERMINED IN THE FIELD.
2. IN GENERAL, THE APPROACH RAIL SYSTEM WILL CONSIST OF A SECTION CANTILEVERED FROM THE END POST OF THE STRUCTURE COMBINED WITH ONE OR MORE PANELS OF STANDALONE APPROACH RAIL, SOME OF WHICH WILL BE FOUNDED ON CONCRETE SHAFTS AND SOME OF WHICH WILL BE DIRECTLY MOUNTED TO A CONCRETE SLAB.
3. THE LENGTH OF THE CANTILEVERED SECTIONS AND OF THE STANDALONE PANELS WILL VARY WITH LOCATION.
4. THE GENERAL LAYOUT WILL BE DETERMINED IN THE FIELD BY THE DEPARTMENTAL REPRESENTATIVE, IN CONSULTATION WITH THE CONSULTANT AND THE CONTRACTOR. ONCE THIS LAYOUT HAS BEEN DECIDED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DETAILING THE REQUIRED RAILING ELEMENTS, INCLUDING ANY SURVEY THAT MAY BE NECESSARY.
5. THE DRAWINGS SHOW AN ASSUMED LAYOUT TO BE USED FOR TENDER PURPOSES. IF THE FINAL LAYOUT VARIES SIGNIFICANTLY FROM THE ASSUMED LAYOUT SHOWN ON THE DRAWINGS, AN APPROPRIATE ADJUSTMENT TO THE TENDER PRICE WILL BE NEGOTIATED.



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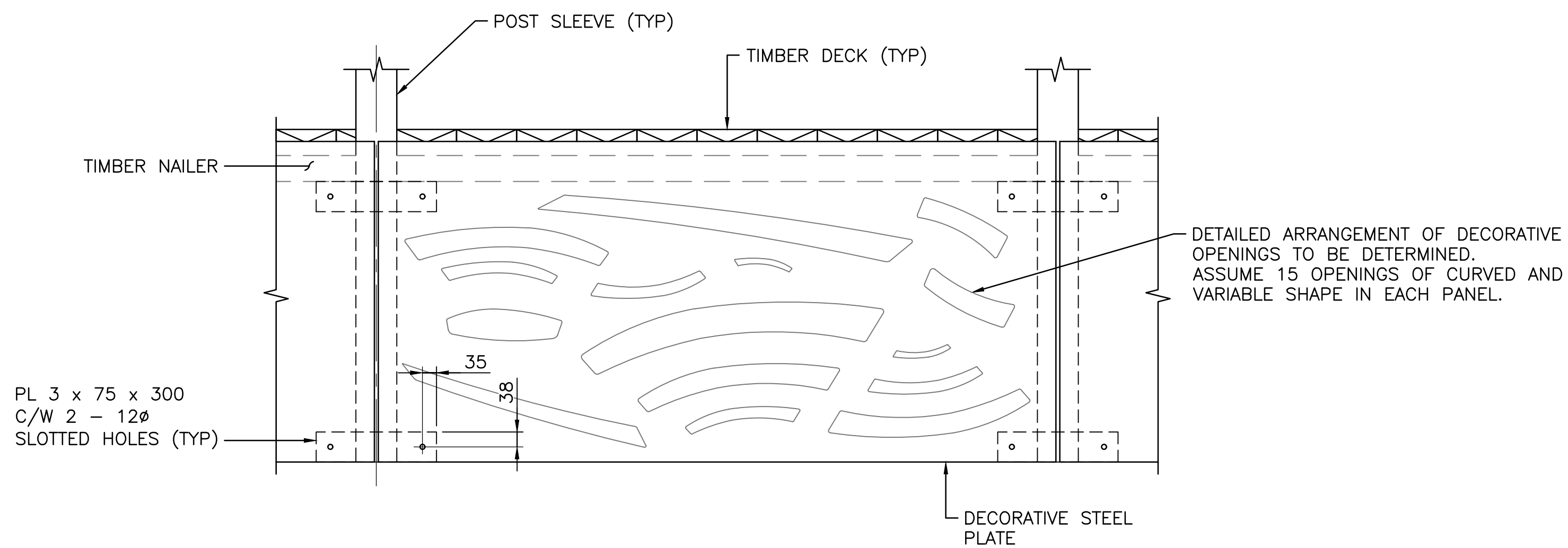
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0	ISSUED FOR TENDER	2020.04.27

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C	number du detail	B
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	de dessin no.	
	C detail on drawing no.	
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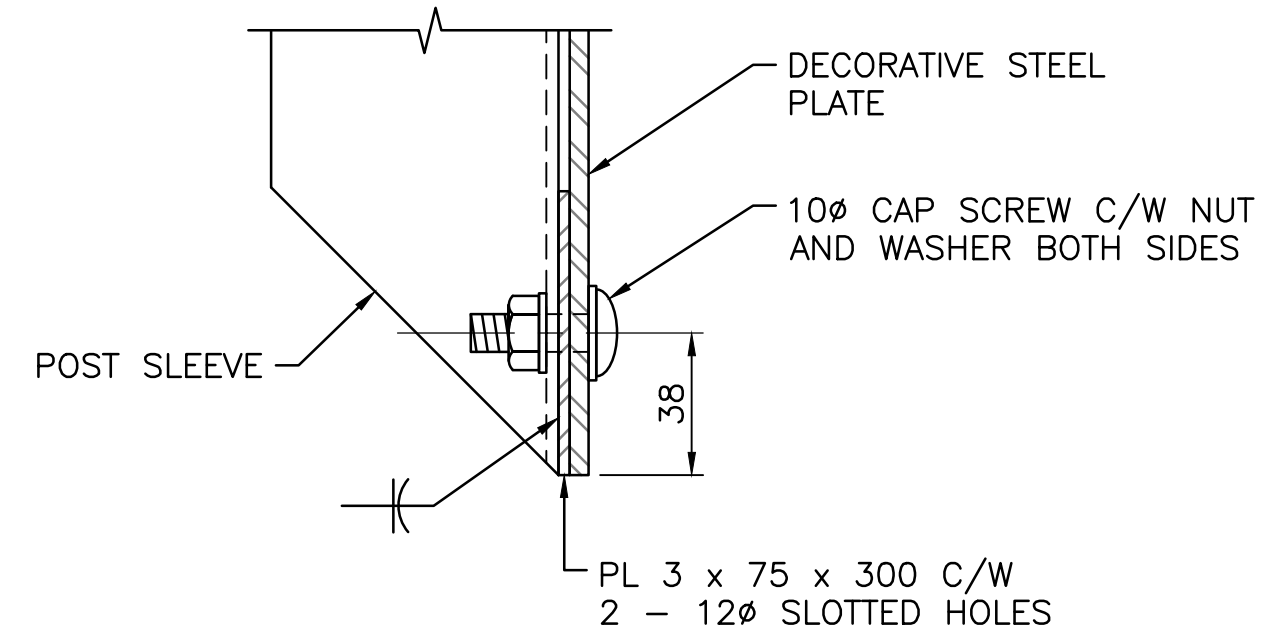
project title **RED ROCK CANYON**
TRAIL LOOP AND BRIDGES

drawing title **EXISTING BRIDGE MODIFICATIONS**
BAUERMAN CREEK BRIDGE

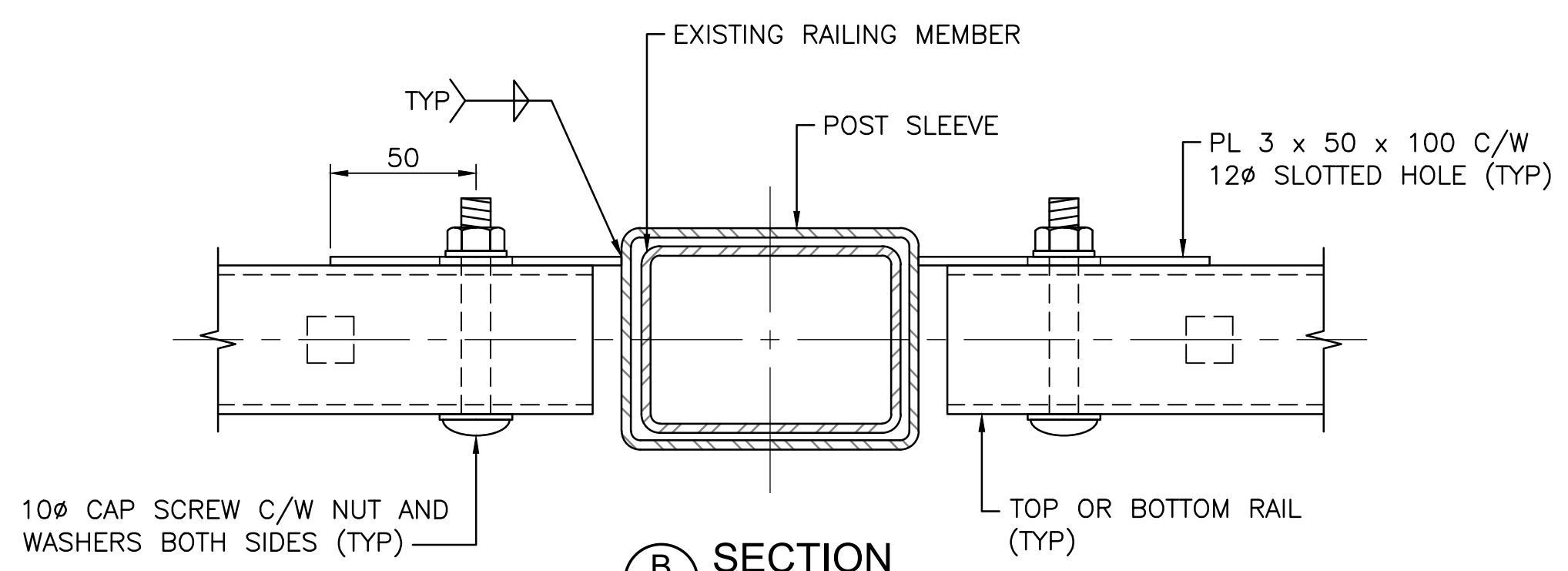
designed by	K. WILLIS	conçu par
drawn by	R. BARNES	dessiné par
approved by	H. TROFANENKO	approuvé par
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC
scale	AS SHOWN	échelle
project no.	2051	projet no.
date	DECEMBER 2019	date
		sheet 32 OF 33



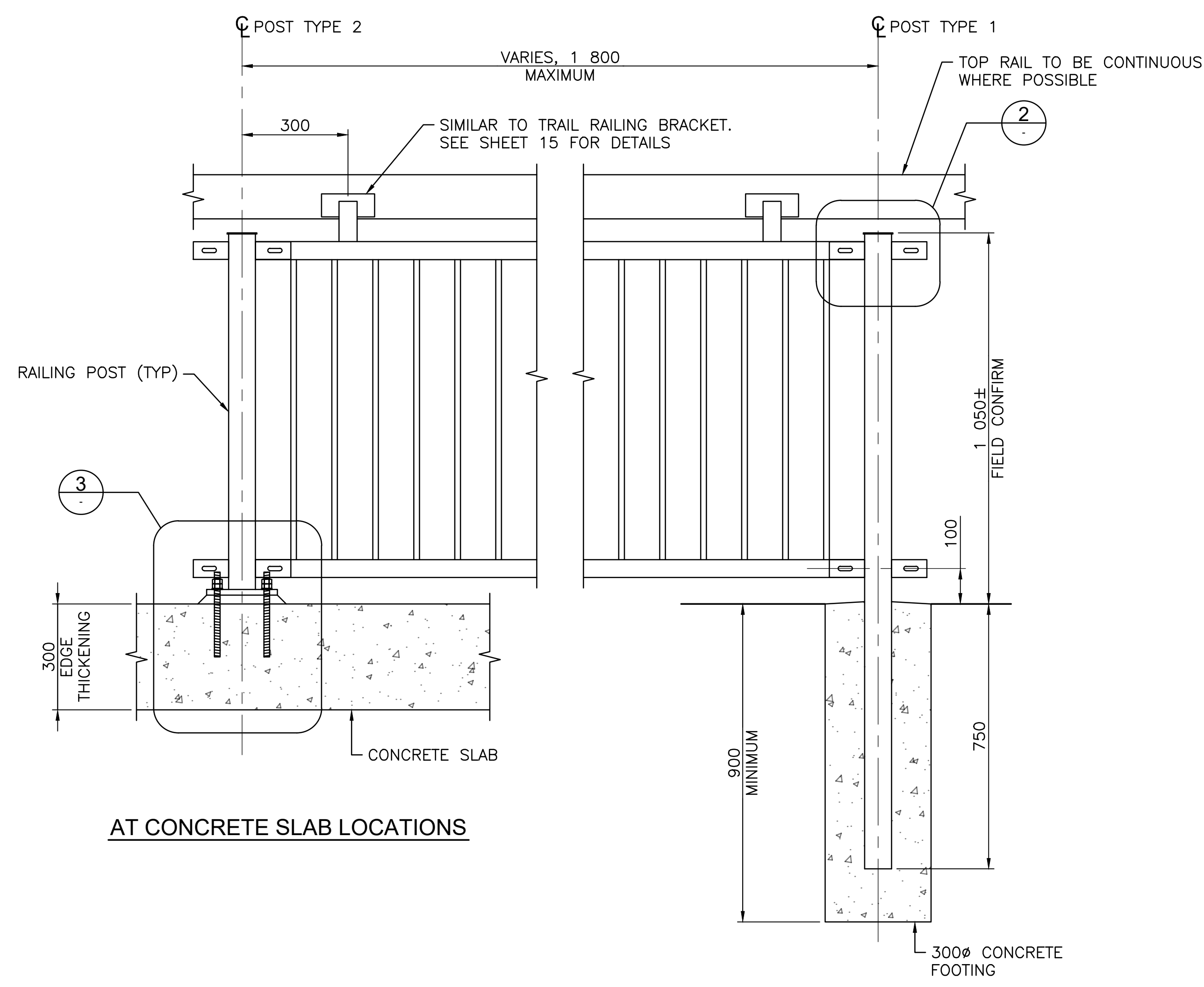
DECORATIVE STEEL PLATE DETAIL
1:10



1 DETAIL
30/31/32 1:2



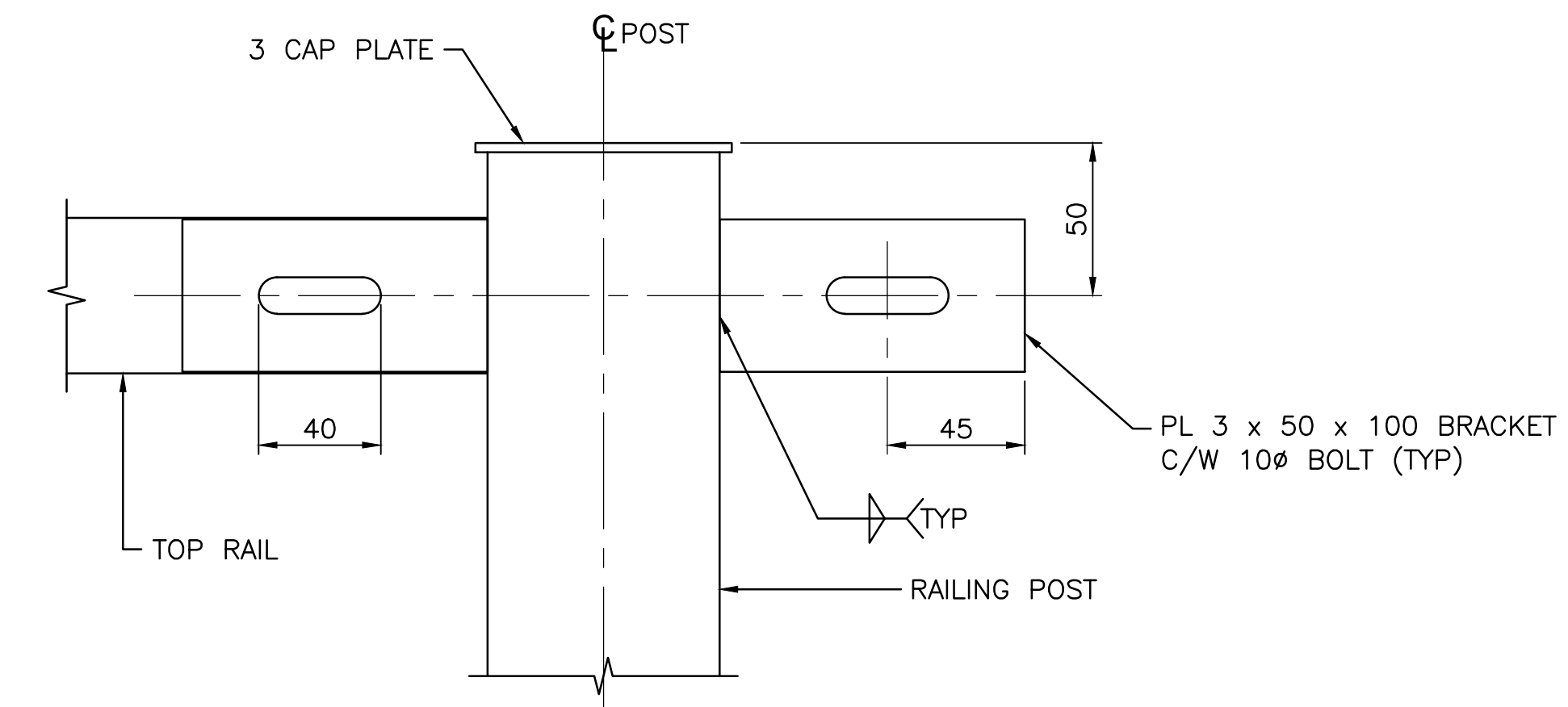
B SECTION
30/31/32 1:2



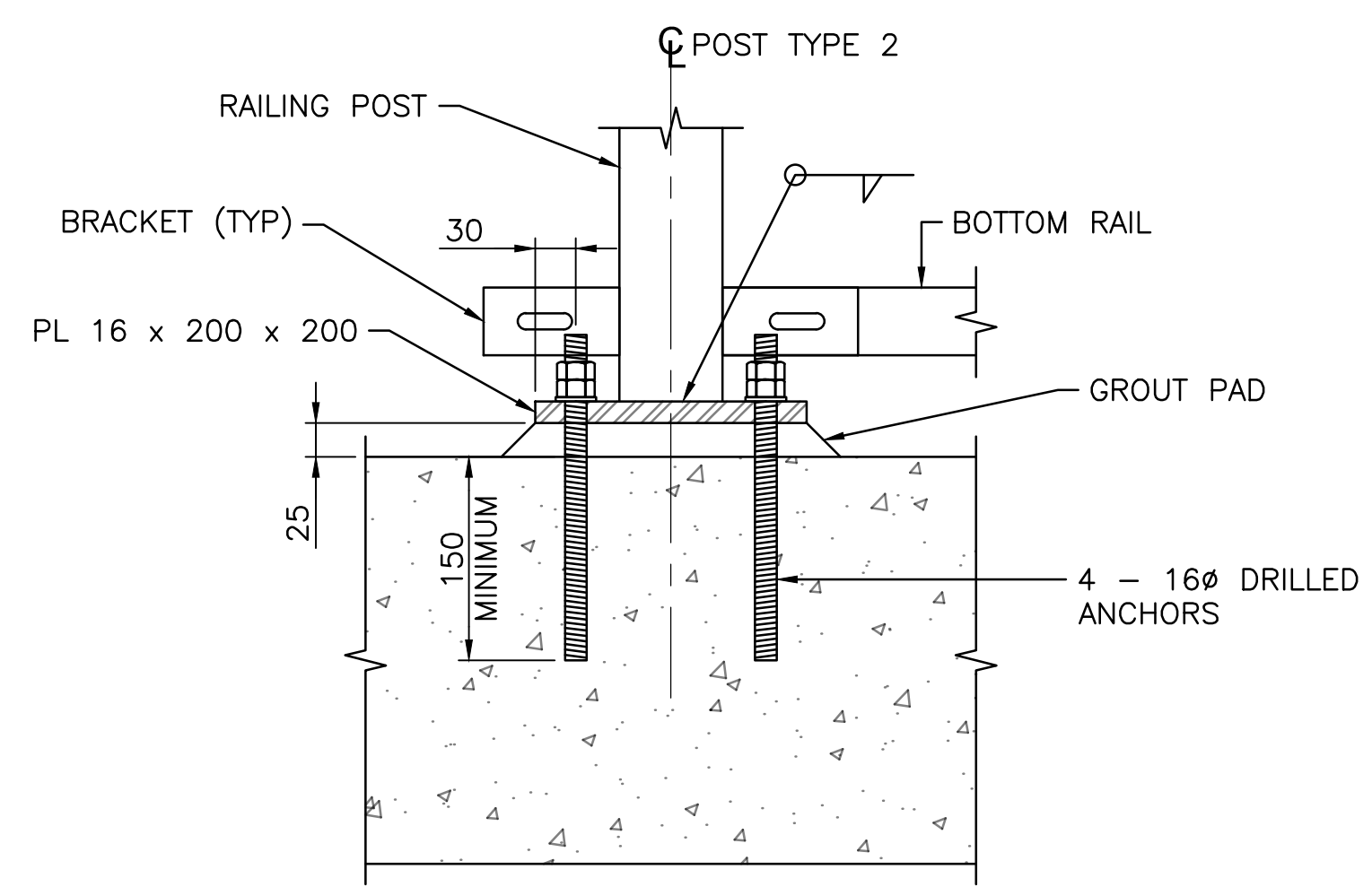
AT CONCRETE SLAB LOCATIONS

AT ALL OTHER LOCATIONS

TYPICAL APPROACH PANEL AND POST CONNECTIONS
1:10



2 DETAIL
1:2



3 SLAB CONNECTION DETAIL
1:5



Client **PARKS CANADA AGENCY**
PROJECT DELIVERY SERVICES WEST

WATERTON LAKES NATIONAL PARK



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A	detail number	A
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C	detail on drawing no.	C

project title **RED ROCK CANYON TRAIL LOOP AND BRIDGES** titre du projet

drawing title **EXISTING BRIDGE MODIFICATIONS DETAILS** titre du dessin

designed by	K. WILLIS	conçu par
drawn by	A. HEWITT	dessiné par
approved by	H. TROFANENKO	approuvé par
PCA Project Manager	M. VILLENEUVE	Administrateur de Projets APC
scale	AS SHOWN	échelle
project no.	2051	projet no.
date	DECEMBER 2019	date
		sheet 33 OF 33