BRITISH
COLUMBIA

Ministry of Transportation & Infrastructure

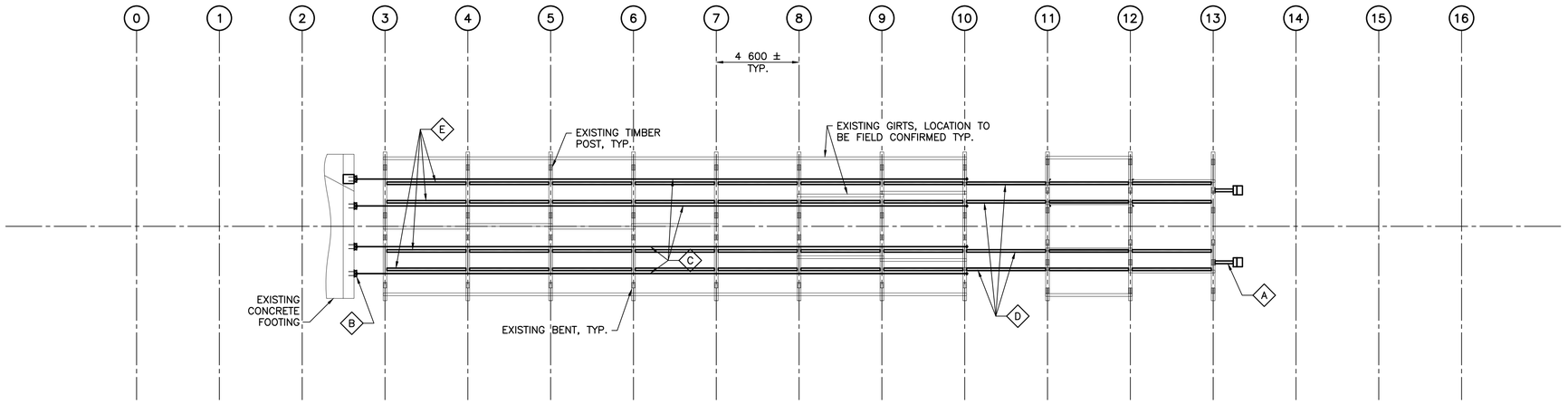
Bridge Project

Holt Creek Trestle Bridge - Mile 59.7

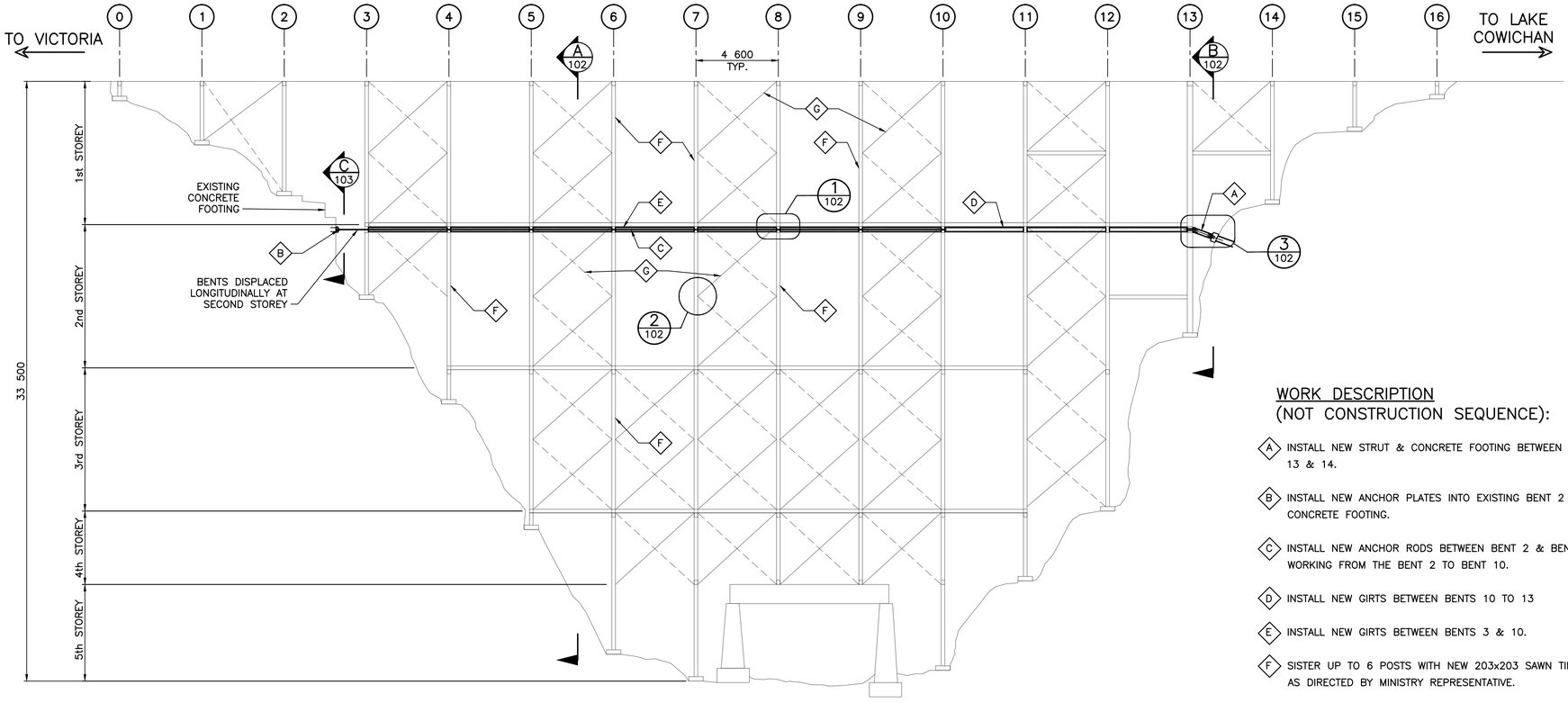
Emergency Repair

Cowichan Valley Trail

H-308j-pc(07-08)



PLAN – SECOND STOREY
SCALE 1:150



ELEVATION – DOWNSTREAM
SCALE 1:150

WORK DESCRIPTION
(NOT CONSTRUCTION SEQUENCE):

A. INSTALL NEW STRUT & CONCRETE FOOTING BETWEEN BENTS 13 & 14.

B. INSTALL NEW ANCHOR PLATES INTO EXISTING BENT 2 CONCRETE FOOTING.

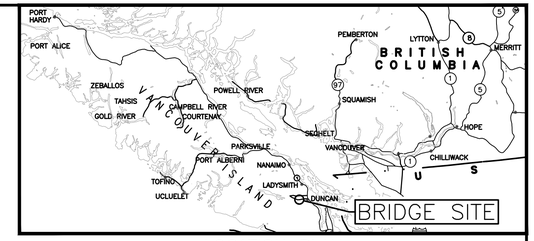
C. INSTALL NEW ANCHOR RODS BETWEEN BENT 2 & BENT 10. WORKING FROM THE BENT 2 TO BENT 10.

D. INSTALL NEW GIRTS BETWEEN BENTS 10 TO 13

E. INSTALL NEW GIRTS BETWEEN BENTS 3 & 10.

F. SISTER UP TO 6 POSTS WITH NEW 203x203 SAWN TIMBERS AS DIRECTED BY MINISTRY REPRESENTATIVE.

G. REPLACE UP TO 30 BRACES WITH NEW 76x254 SAWN TIMBERS AS DIRECTED BY MINISTRY REPRESENTATIVE.



LOCATION PLAN
N.T.S.

THE BRIDGE IS PART OF THE GLENORA TRAILS HEAD PARK LOCATED JUST OFF SHAWNIGAN ROAD – APPROXIMATELY 9 km WEST OF DUNCAN.

DRAWING NO.	DRAWING TITLE
2232–100	COVER SHEET
2232–101	GENERAL ARRANGEMENT
2232–102	REPAIR WORK DETAILS – SHEET 1
2232–103	REPAIR WORK DETAILS – SHEET 2
REFERENCE DRAWING	
2000 / 27–01	PROPOSED NEW DECK DETAILS
2000 / 27–02	PROPOSED REPAIRS AND ADDITIONS

NOTES:

1. DESIGN SPECIFICATION:
   a. CSA S6–14 CANADIAN HIGHWAY BRIDGE DESIGN CODE (CHBDC)
   b. BC MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE BRIDGE STANDARDS AND PROCEDURES MANUAL (BSM) VOL. 1 SUPPLEMENT TO CHBDC S6–14
2. LIVE LOAD: PEDESTRIAN LOADING: 4 kPa.
3. DESIGN:
   a. THE INTENT OF THE WORK IN THIS DRAWING PACKAGE IS TO ALLOW SHORT TERM USE OF THE BRIDGE FOR NORMAL PEDESTRIAN TRAFFIC. THE TIME LIMIT ON THE REPAIR, WITHOUT FURTHER REMEDIATION, IS 3 YEARS, ASSUMING NO FURTHER DETERIORATION IS DISCOVERED.
   b. THE REPAIRS IN THIS DRAWING PACKAGE ADDRESS STABILITY AND LIFE SAFETY ISSUES WITH THE BRIDGE – THE REPAIRS DO NOT BRING THE BRIDGE UP TO CURRENT CODE STANDARDS WITH RESPECT TO SEISMIC, WIND, AND MAINTENANCE VEHICLES.
   c. DRAWINGS HAVE BEEN PREPARED WITHOUT THE BENEFIT OF GEOTECHNICAL INPUT.
   d. THE RETROFIT GIRTS AND ANCHOR RODS ARE DESIGNED TO STABILIZE THE BENTS IN THE LONGITUDINAL DIRECTION AT THE SECOND STOREY. DESIGN LOAD = 25 kN.
4. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE. FIELD CONFIRM
5. ALL TEMPORARY WORKS, INCLUDING CONSTRUCTION ACCESS, SHORING OR BRACING, EXCAVATION, SURFACE AND GROUND WATER CONTROL DURING CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR.
6. CONTRACTOR SHALL VERIFY LOCATION OF UTILITIES AND UNDERGROUND SERVICES AND BE RESPONSIBLE FOR MAINTAINING THEM DURING WORK ACTIVITIES.
7. EXISTING CONSTRUCTION ALTERED OR DAMAGED DURING COURSE OF WORK SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
8. ALL CONCRETE SHALL CONFORM TO STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (SS211).
9. ALL CONCRETE REINFORCING SHALL CONFORM TO STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (SS412).
10. CONCRETE SHALL BE TARGET TRAFFIC PATCH COARSE. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
11. ALL EXPOSED EDGES OF CONCRETE TO BE CHAMFERED 20 UNLESS NOTED OTHERWISE.
12. ALL REINFORCING STEEL TO CONFORM TO CSA G30.18M, GRADE 400R.
13. REINFORCING STEEL TO HAVE THE FOLLOWING COVERS:
    FORMED SURFACES = 70mm
    CAST AGAINST SOIL = 100mm
14. ALL STEEL FABRICATION SHALL CONFORM TO STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (SS422).
15. ALL STEEL PLATES AND SECTIONS SHALL CONFORM TO CSA 40.20/G40.21 GRADE 300W UNLESS NOTED OTHERWISE.
16. FIELD WELDING BY COMPANY CERTIFIED TO CSA W47.1 DIVISION 1, 2 OR 3.
17. ALL TIMBER TO BE ROUGH SAWN DOUGLAS FIR No. 2 GRADE OR BETTER.
18. BOLTS AND THREADBAR TO ASTM A307 GRADE B.
19. ALL BOLTED TIMBER CONNECTIONS PROVIDE MALLEABLE IRON WASHERS WHERE BEARING ON WOOD MEMBERS ONLY.
20. DYWIDAG THREADBAR TO BE GRADE 517/690 TO CSA G30.18M.
21. TEST 25% OF THREADBAR ANCHORS AT BENT 2 FOOTING TO PULLOUT LOAD OF 25kN.

Consultant Logo
Associated Engineering

Rev	Date	Description	Init
A	2018–03–22	ISSUED FOR CONSTRUCTION	M.H.

REVISIONS

BRITISH COLUMBIA | Ministry of Transportation & Infrastructure
South Coast Region

VANCOUVER ISLAND DISTRICT
COWICHAN VALLEY TRAIL

HOLT CREEK TRESTLE BRIDGE EMERGENCY REPAIR
GENERAL ARRANGEMENT

PREPARED UNDER THE DIRECTION OF
M. HORNER, P.ENG
ENGINEER OF RECORD
DATE 2018–03–22

PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – M. M. HORNER # 28714 – 2018-03-22

DESIGNED M. HORNER DATE 2018–03–22
CHECKED D. HARRISON DATE 2018–03–22
DRAWN V. LAM DATE 2018–03–22
SCALE
NEGATIVE No.

FILE No. | PROJECT No. | REG. 1 | DRAWING No. 2232–101 | A

AUTHORIZED BY

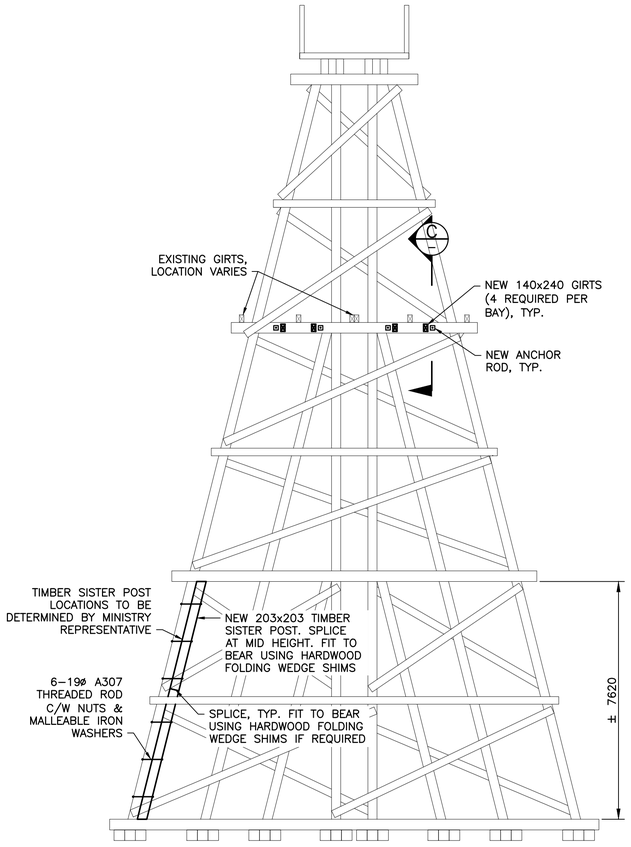
DIRECTOR, ENGINEERING — DATE

REGIONAL DIRECTOR, HIGHWAYS — DATE

CANCEL PRINTS BEARING PREVIOUS LETTER

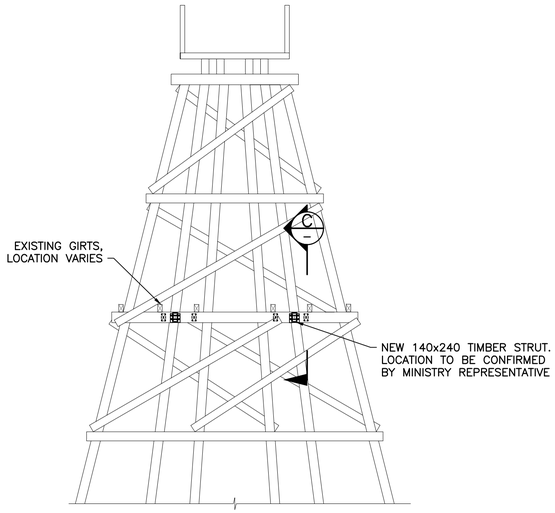
FILE: P:\20182232\00_HOLT_CRK_TRSTL_RHV\WORKING_DWGS\300_STRUCTURAL\2232-101.DWG
PLOTTED : March-22-18

H-308k-r-ce(03-16)



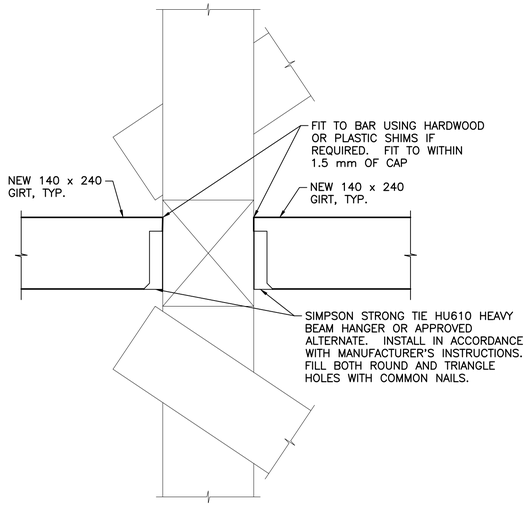
SECTION A
SCALE 1:100
101

BENT 3 TO 10, TYPICAL



SECTION B
SCALE 1:100
101

BENT 13



SECTION C
SCALE 1:10
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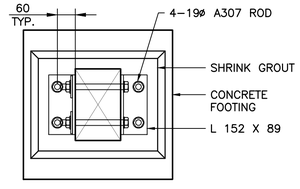

SECTION E
SCALE 1:10
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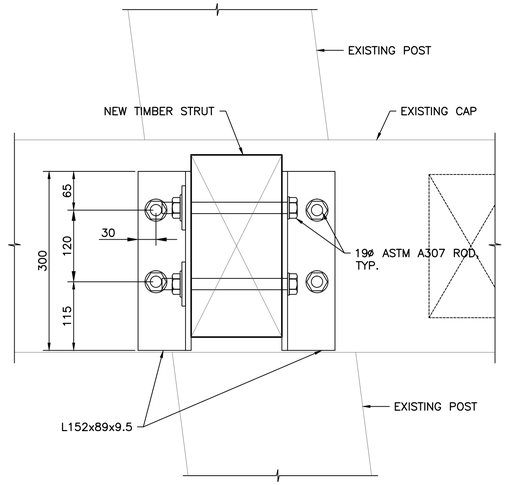


SECTION D
SCALE 1:5
–

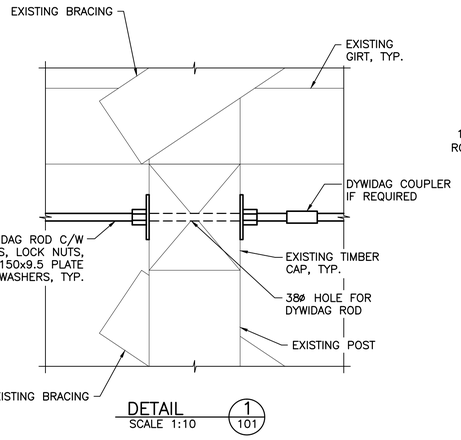
NOTES:

1. FOR GENERAL NOTES, SEE DWG. 2232–101.

CONSTRUCTION SEQUENCE NOTES:

1. CONTRACTOR TO REMOVE ALL LOOSE OBJECTS OR HANGING BRACING THAT CONSTITUTE A HAZARD IN ORDER TO SAFELY PERFORM WORK IN ACCORDANCE WITH WORK SAFE BC STANDARDS.
2. REMOVE ADDITIONAL BRACING OR LOOSE TIMBER CONSIDERED BY THE MINISTRY REPRESENTATIVE TO BE POTENTIALLY DANGEROUS, FOR FUTURE ACCESS AND INSPECTION.
3. DO NOT REMOVE ANY BRACING TIMBER OR BOLTS WITHOUT MINISTRY REPRESENTATIVE PERMISSION
4. INSTALL NEW CONCRETE FOOTINGS AND STRUTS.
5. INSTALL NEW GIRTS BETWEEN BENTS 11, 12 & 13. USE HARDWOOD OR PLASTIC SHIMS TO ENSURE END BEARING AT ALL CONNECTIONS. SHIMS TO COVER MINIMUM 80% OF THE GIRT FACE.
6. INSTALL ANCHOR HARDWARE AT BENT 2 CONCRETE FOOTING.
7. INSPECT 2ND STOREY CAPS FROM BENT 3 THROUGH 10 TO DETERMINE SUITABLE LOCATION FOR NEW ANCHOR RODS. WORKING WITH THE MINISTRY REPRESENTATIVE, CHOOSE A LOCATION FOR THE EXTERIOR ANCHOR RODS NEAR THE OUTSIDE OF THE CAP. FOR THE INTERIOR ANCHOR RODS, CHOOSE A LOCATION CLOSE TO THE CENTRE SPLICE PLATE TO MINIMIZE OR ELIMINATE OBSTACLES THAT WOULD REQUIRE BLOCKING.
8. INSTALL ANCHOR RODS BETWEEN BENT 2 FOOTING AND BENT 10, WORKING SEQUENTIALLY FROM BENT 2 FOOTING. TIGHTEN NUTS TO SNUG TIGHT. DO NOT TENSION ANCHOR RODS. EXPECTED DEFLECTION OF ANCHOR RODS UNDER SELF WEIGHT AT MIDSPAN IS 8 mm. ANCHOR RODS SHALL BE CONTINUOUS FROM THE BENT 2 FOOTING THROUGH TO BENT 10. APPROVED COUPLERS PERMITTED.
9. INSTALL NEW GIRTS BETWEEN BENTS 3 & 10.
10. INSTALL NEW SISTERED POSTS AND BRACING AS DIRECTED BY THE MINISTRY REPRESENTATIVE.

FOLDING HARDWOOD WEDGES DETAILS
SCALE 1:5



DETAIL 1
SCALE 1:10
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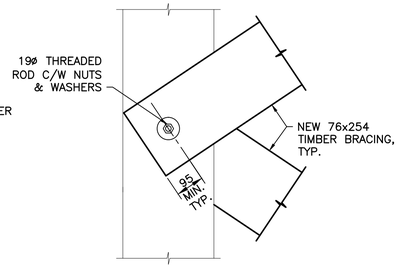

DETAIL 2
SCALE 1:10
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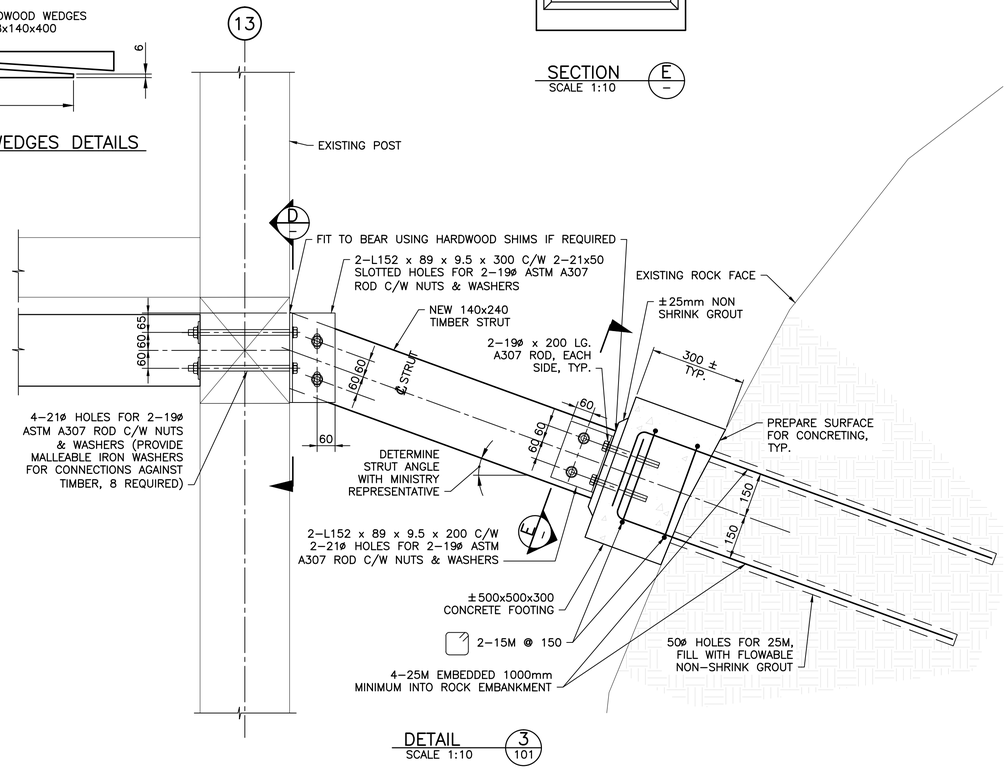


DETAIL 3
SCALE 1:10
101

Consultant Logo
Associated Engineering

Rev	Date	Description	Init
A	2018–03–22	ISSUED FOR CONSTRUCTION	M.H.

REVISIONS

BRITISH COLUMBIA
Ministry of Transportation & Infrastructure
South Coast Region

VANCOUVER ISLAND DISTRICT
COWICHAN VALLEY TRAIL

HOLT CREEK TRESTLE BRIDGE EMERGENCY REPAIR
REPAIR WORK DETAILS – SHEET 1

PREPARED UNDER THE DIRECTION OF
M. HORNER, P.ENG
ENGINEER OF RECORD
DATE 2018–03–22

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — M. M. HORNER — # 28714 — 2018-03-22

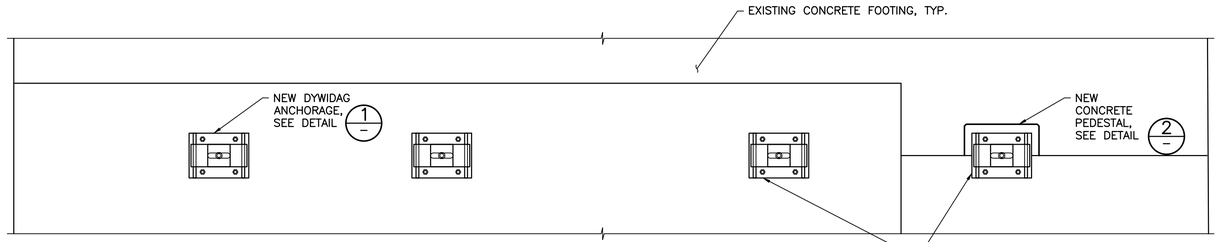
DESIGNED M. HORNER DATE 2018–03–22
CHECKED D. HARRISON DATE 2018–03–22
DRAWN V. LAM DATE 2018–03–22
SCALE
NEGATIVE No.

FILE No. | PROJECT No. | REG. 1 | DRAWING No. 2232–102 | A

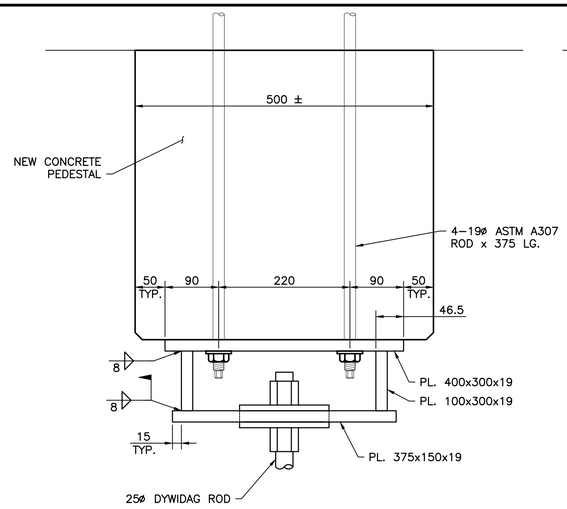
CANCEL PRINTS BEARING PREVIOUS LETTER

FILE: P:\2018\2232\00_HOLT_CRK_TRSTL_RHA WORKING_DWGS\300_STRUCTURAL\2232–102.DWG
PLOTTED: 1 March–22–18

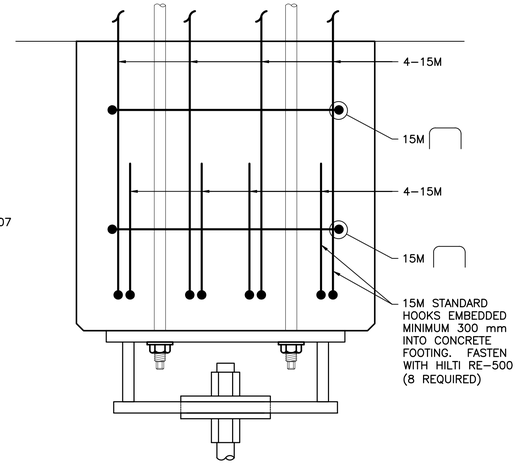
H–308r––00(03–16)



SECTION C/101
SCALE 1:20

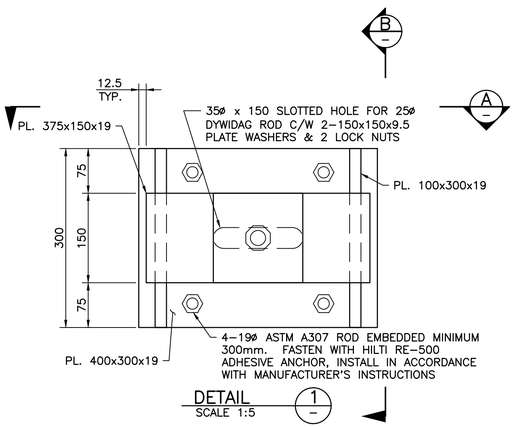


SECTION C/–
SCALE 1:5

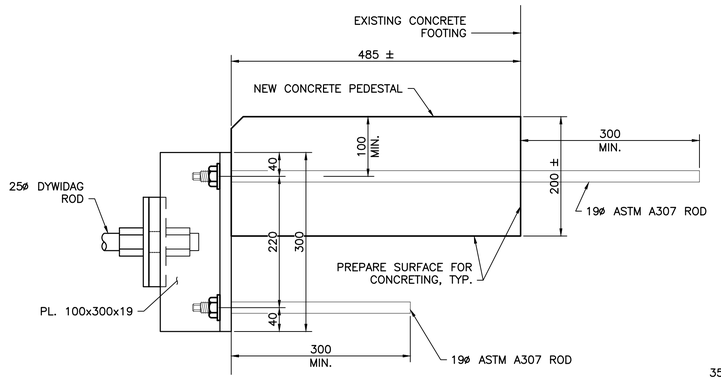


SECTION C/–
SCALE 1:5

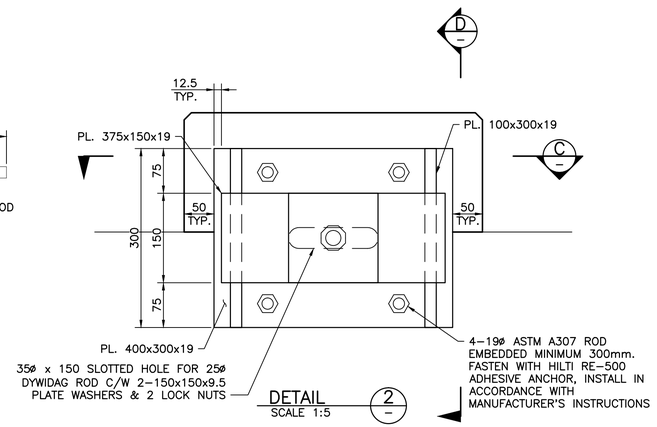
(PEDESTAL REINFORCEMENT DETAILS)



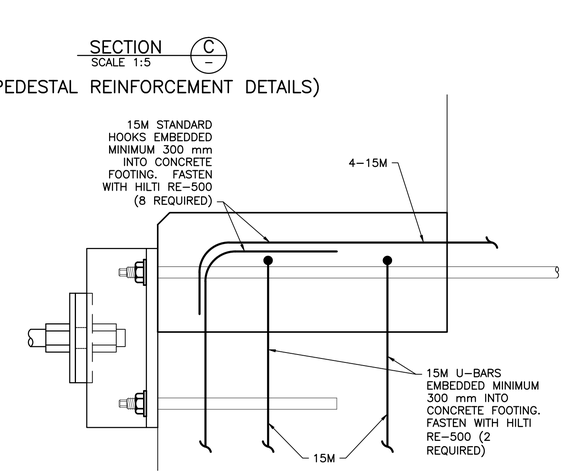
DETAIL 1/–
SCALE 1:5



SECTION D/–
SCALE 1:5



DETAIL 2/–
SCALE 1:5



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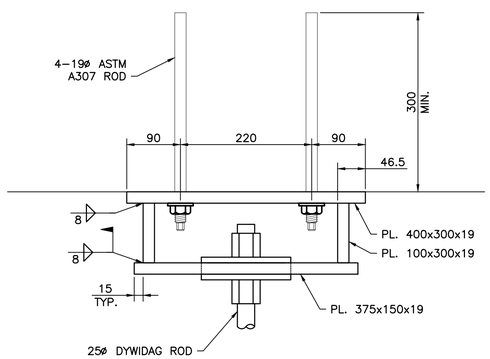
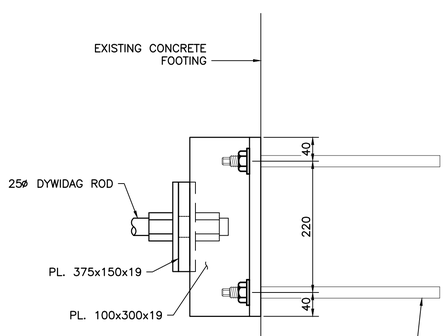
(PEDESTAL REINFORCEMENT DETAILS)



SECTION A/–
SCALE 1:5



SECTION B/–
SCALE 1:5

NOTES:

1. FOR GENERAL NOTES, SEE DWG. 2232–101.

Consultant Logo: Associated Engineering

Rev	Date	Description	Init
A	2018–03–22	ISSUED FOR CONSTRUCTION	M.H.

REVISIONS

BRITISH COLUMBIA | Ministry of Transportation & Infrastructure
South Coast Region

VANCOUVER ISLAND DISTRICT
COWICHAN VALLEY TRAIL

HOLT CREEK TRESTLE BRIDGE EMERGENCY REPAIR
REPAIR WORK DETAILS – SHEET 2

PREPARED UNDER THE DIRECTION OF
M. HORNER, P.ENG
ENGINEER OF RECORD
DATE 2018–03–22

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — M. M. HORNER # 28714 — 2018-03-22

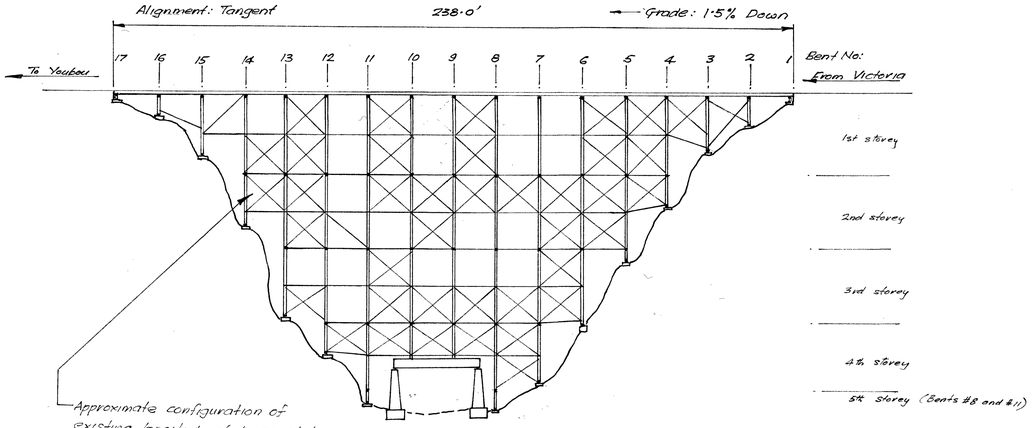
DESIGNED M. HORNER DATE 2018–03–22
CHECKED D. HARRISON DATE 2018–03–22
DRAWN V. LAM DATE 2018–03–22
SCALE
NEGATIVE No.

FILE No. | PROJECT No. | REG. 1 | DRAWING No. 2232–103 | A

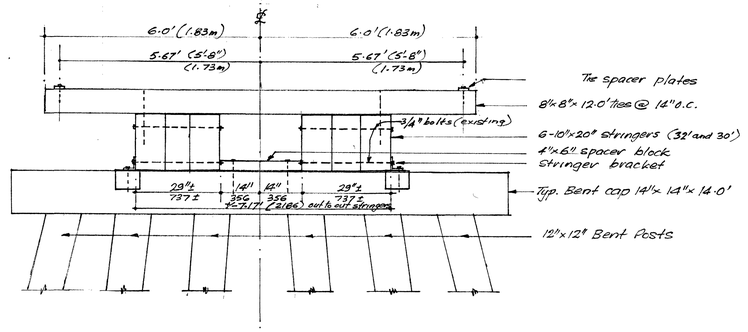
CANCEL PRINTS BEARING PREVIOUS LETTER

FILE: P:\20182232\00_HOLT_CRK_TRSTL_RPR\WORKING_DWGS\300_STRUCTURAL\2232–103.DWG
PLOTTED : March–22–18

H–308r–rev(03–16)



Elevation
not to scale



Typical Cross Section at Top (as designed)

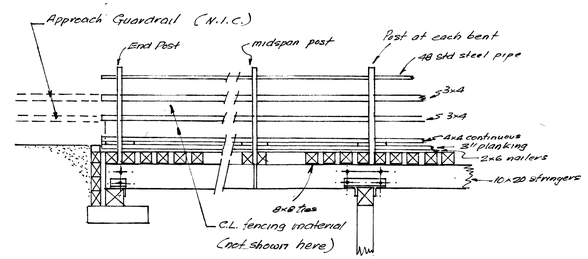
Scale: 1/2" to 1'-0" (do not scale)

Record of Existing Principal Structural Elements

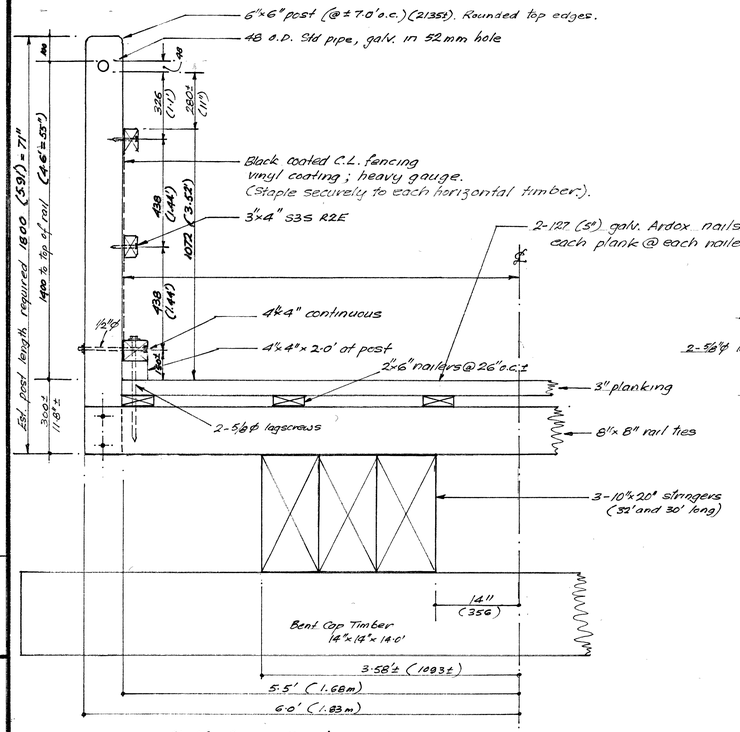
(taken from CNR drawings - some variations may exist)

Scope of Work to be done :—

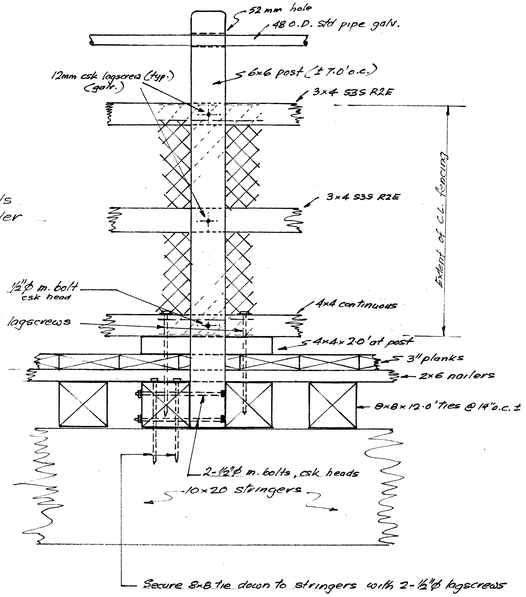
1. Remove and dispose of existing flat bar tie spacers ; provide and install approx 12 new 8"x8"x 12' ties where required
2. Provide all materials, equipment, and labour for new deck and guardrails, all as shown on this drawing and as specified.
3. Repair and replace missing and deteriorated timbers in bent caps, posts, sills, and cross braces as shown on Sheet 02
4. Replace missing or deteriorated longitudinal diagonals, struts, and girts, as shown on Sheet 02 (Drawing No 2000/27-02).
5. Replace deteriorated mudsills, as noted on Sheet 02 ; approx. quantity : 30 pcs. 12"x12"x 4'-0'
6. Reconstruct bent support and foundation, Bent # 5 , as detailed on this sheet and Sheet 02.
7. Add new levelling strips (6"x6"x 12'-0") on top of end bulkheads; reconstruct decking and guardrails - two barrel stands.
8. New approach guardrails required at each end, both sides.
9. Clear and grub right of way for 3.0m beyond the feet of bent towers , both sides . Approved disposal of debris.
10. Do other repairs, discovered as work proceeds, as called for by the Engineer (extra work item).



Typical Longitudinal Detail
Do not scale



Half Cross Section of Proposed Deck and Guardrail.
1" to 1'-0"



Longitudinal View at Post
1" to 1'-0"

Details of Proposed New Work

Specifications :—

1. New timber to be Douglas Fir Group A No2 or better, "Joist & Plank", to CSA 086 current edition, except: Guardrail stringers may be Hem Fir, Group B, No2 or better ; walkway material may be Group B, No1, Common.
2. All new wood to be pressure treated to CSA-080-M with a minimum average net retention of ACA (or CCA) of 5.6 kg/m³, determined by assay.
3. Wherever possible, ensure that all wood is pre-cut and/or pre-drilled prior to treatment. Swab necessary field cuts with preservative.
4. Use galvanized Ardox nails for planks, two nails each plank at each 2x6 nailing strip. All bolts and lagscrews to be galvanized.
5. Adhere to all requirements environmental and regulatory agencies, and follow WCB requirements for bridge and other construction.
6. Concrete to be in accordance with CSA A23, current edition, 3000 psi @ 28 days. Foundation to Engineer's satisfaction.

FIGURE 2

Province of British Columbia - L.U.C.O.

SCALE: as shown | APPROVED BY: M. Holden P.Eng. | DRAWN BY MH

DATE: 28 June 2000 | REVISED

Mile 59.7

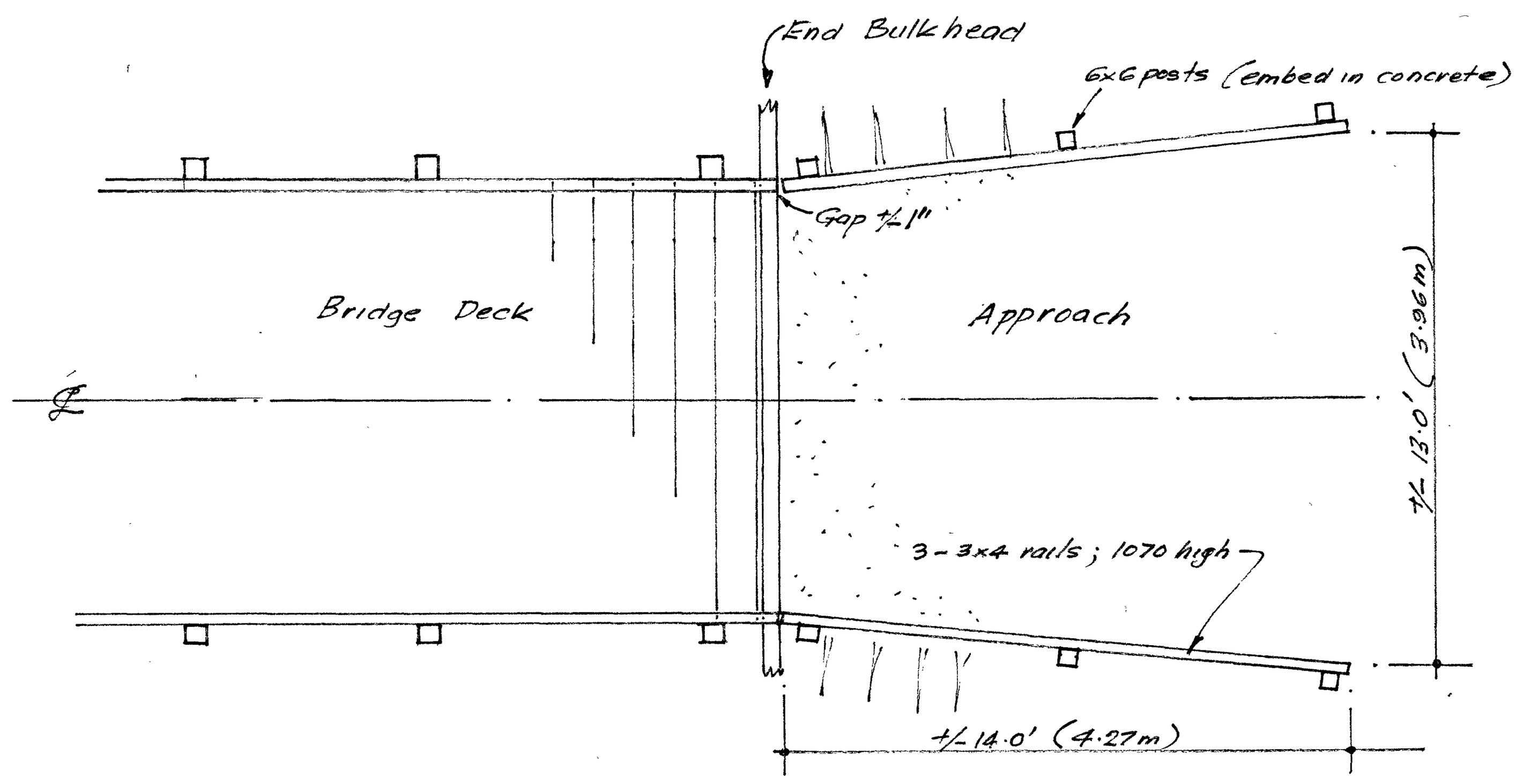
CNR Cowichan Subdiv. + Holt Creek Trestle - Mile 59.7

Proposed New Deck Details

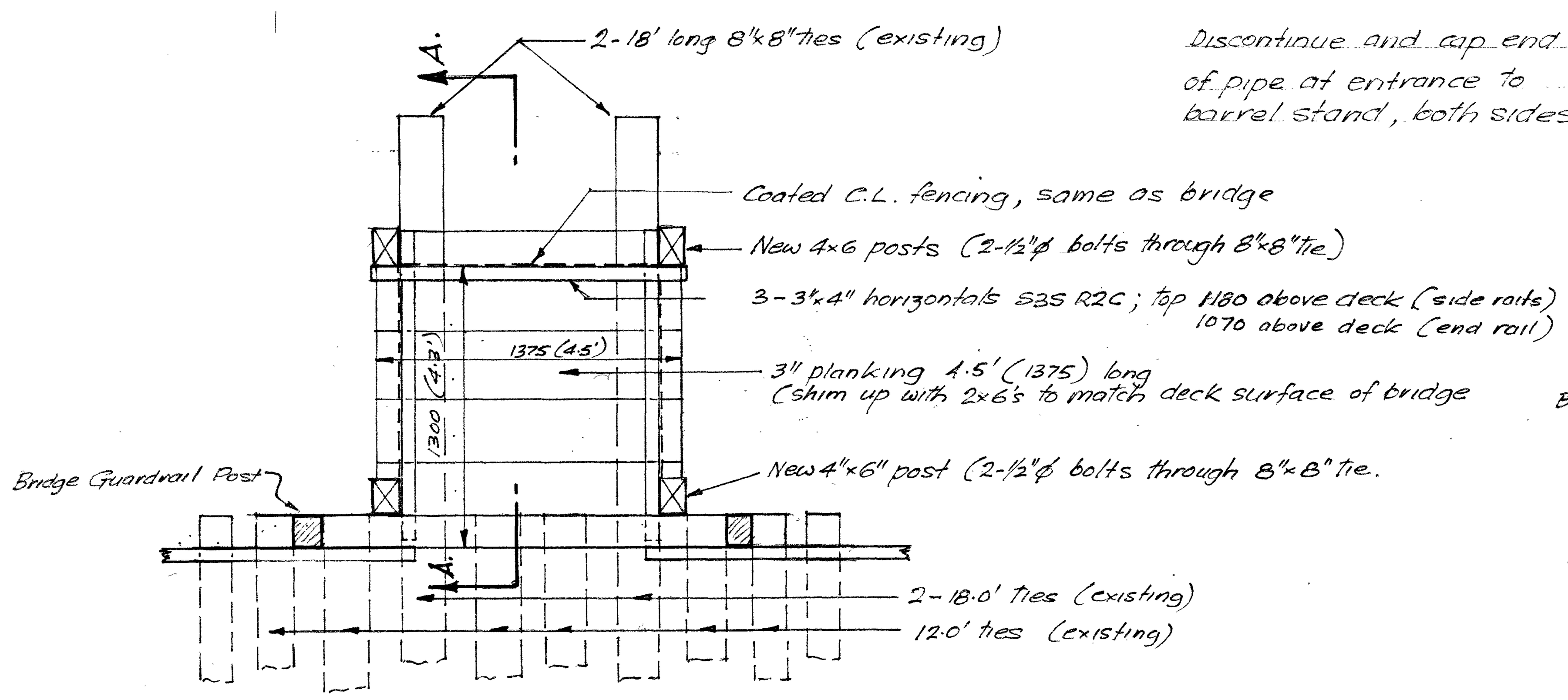
DRAWING NUMBER 2000/27-01

M. Holden P.Eng. 28 June 2000

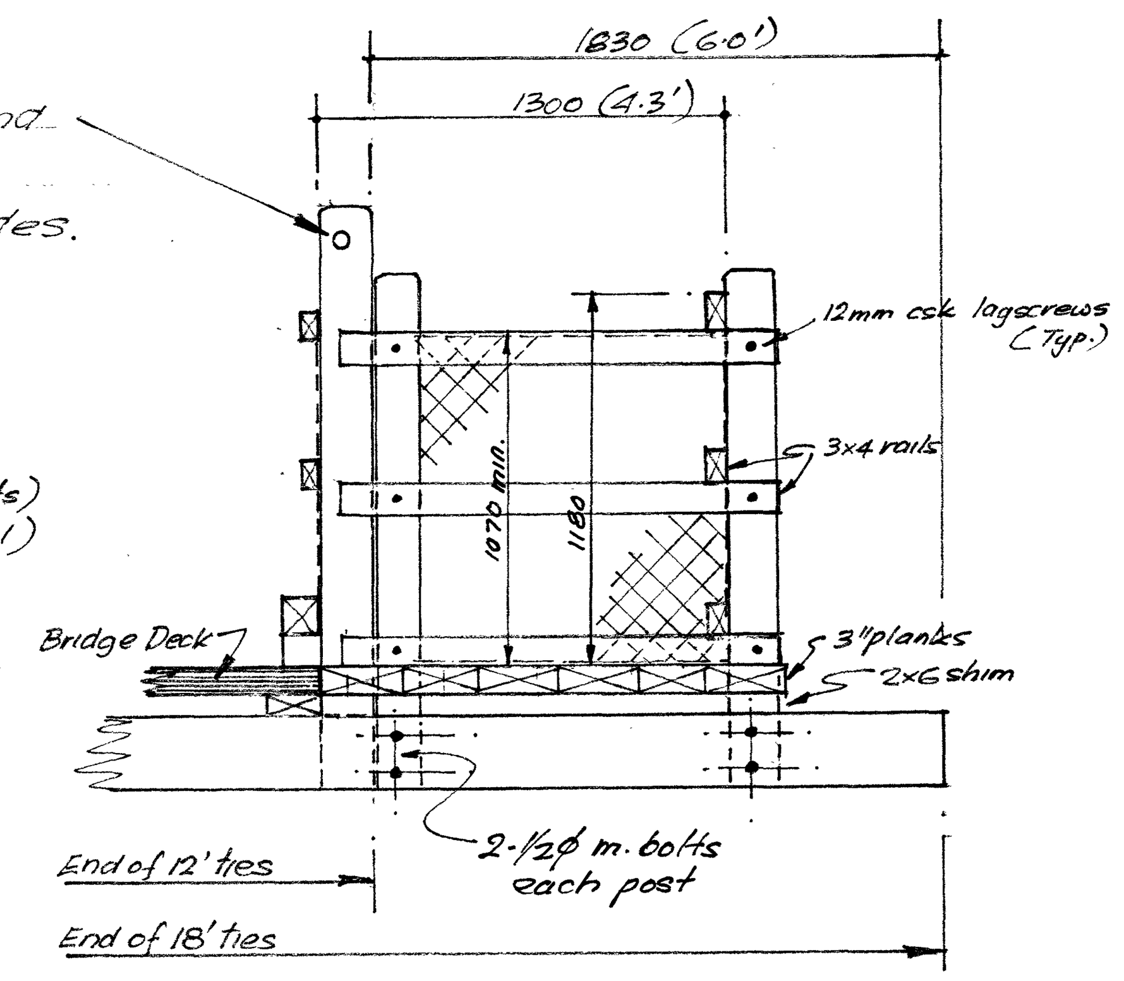
MARTIN HOLDEN & ASSOCIATES. Consulting Engineers,
PH6-2277 OAK BAY AVENUE, VICTORIA, B.C. V8R 1G6.
TEL: (250) 592 3639; FAX: (250) 592 3641.



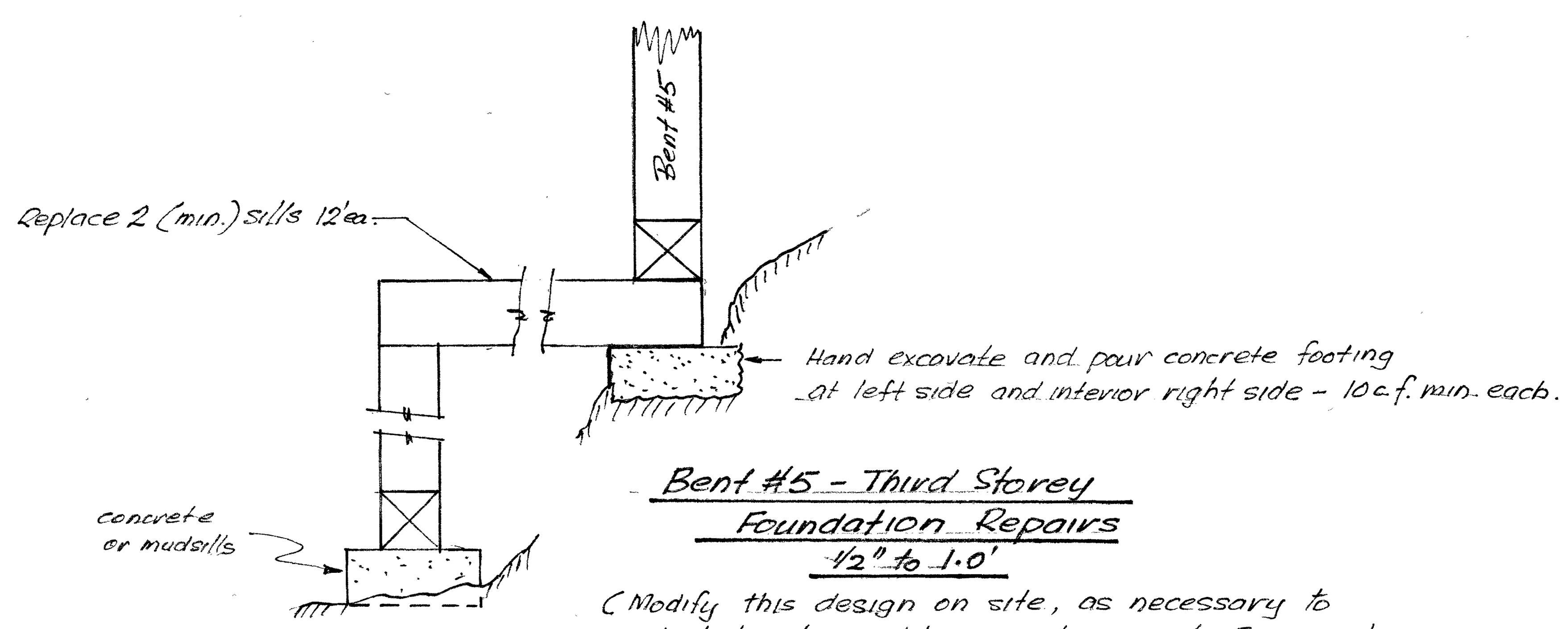
Plan View of Approach Guardrail Flair
1/4" to 1.0'



Barrel Stand – Plan
1/2" to 1.0'

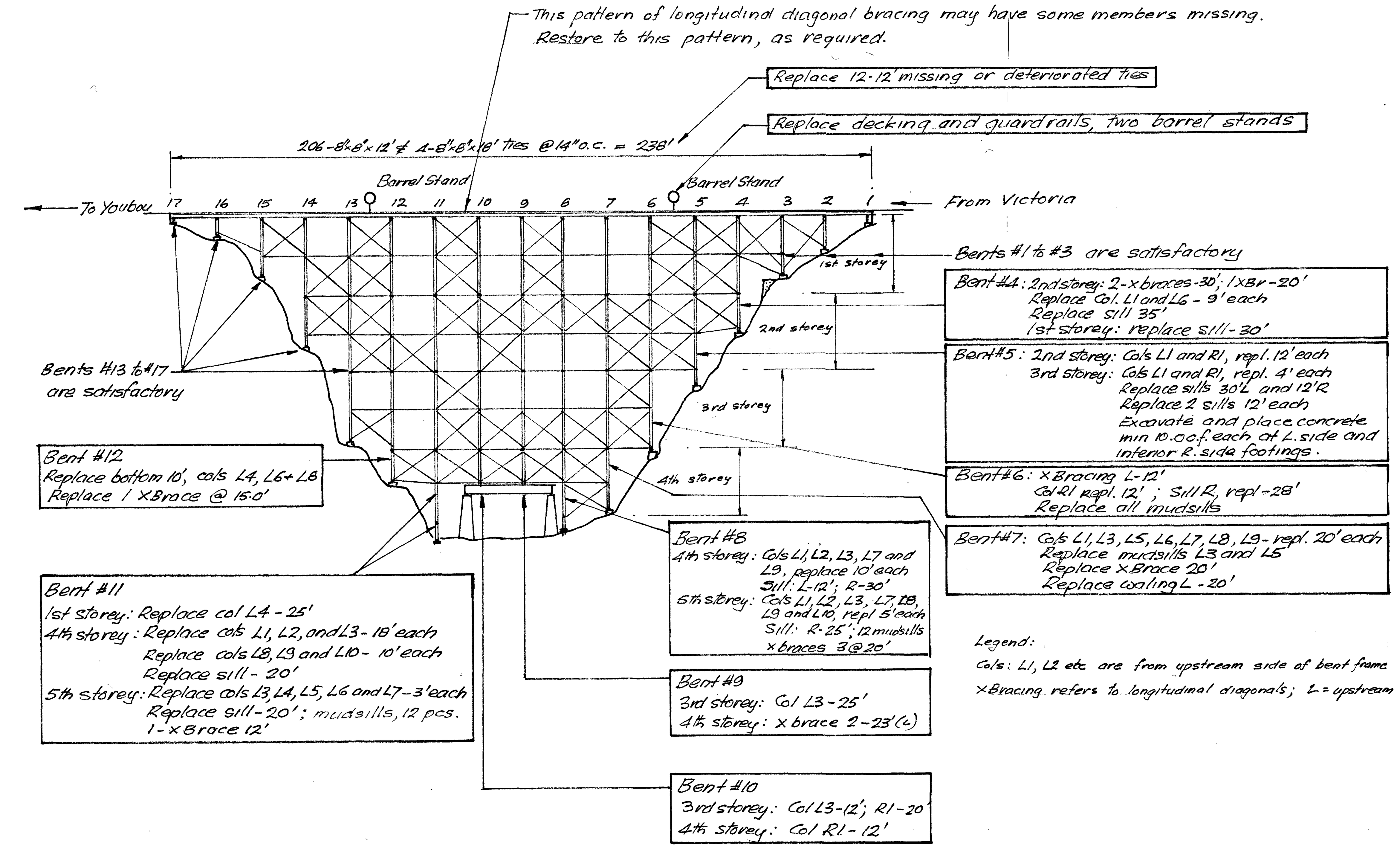


Section A-A
1/2" to 1.0'



Bent #5 – Third Storey
Foundation Repairs
1/2" to 1.0'

(Modify this design on site, as necessary to adapt to site conditions - changes to Engineer's approval.)



Notes:-

1. Bent #8 has a 5th storey ± 5.0' high; Bent #11 has a 5th storey ± 3.0' high.
2. The actual pattern of existing longitudinal x Bracing may be different from above diagram. Restore to above pattern.
3. Member sizes for replacements (nom.):– Columns 12"x12"; sills 12"x12"; walers 2-3"x10"; x braces 3"x10"; struts 6"x10"; long. diags 3"x10"; ties 8"x8"x12'; mudsills 12"x12"x4'
4. See Sheet 01 (Drawing No 2000/27-01) for specifications, and details of new deck and guardrails.
5. Construct approach guardrails to suit site; use design shown here as a guide (not in contract).
6. Work in river floodplain (Bents 7, 8 and 11) to be done with special care for environmental requirements
7. Secure chainlink fence material to each longitudinal guardrail timber by at least three staple nails, each section between posts.
8. Cap ends of guardrail top pipe.

FIGURE 3	Province of British Columbia – L.U.C.O.		
	SCALE: as shown	APPROVED BY: [signature] P.Eng.	DRAWN BY: MH
	DATE: 30 June 2000		REVISED
MARTIN HOLDEN & ASSOCIATES, Consulting Engineers PH6-2277 OAK BAY AVENUE, VICTORIA, B.C., V8R 1G6. TEL: (250) 592 3639; FAX: (250) 592 3641. [signature] P.Eng. 02 July 2000	CNR Cowichan Subdiv. - Holt Creek Trestle - Mile 53.7		
	Proposed Repairs and Additions		DRAWING NUMBER 2000/27-02