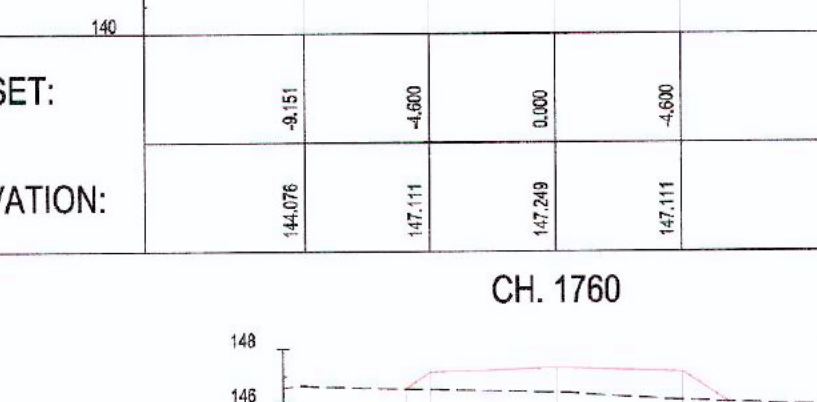
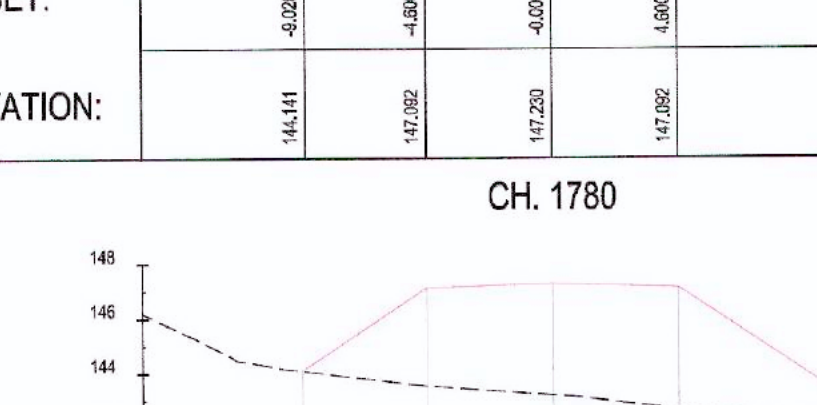
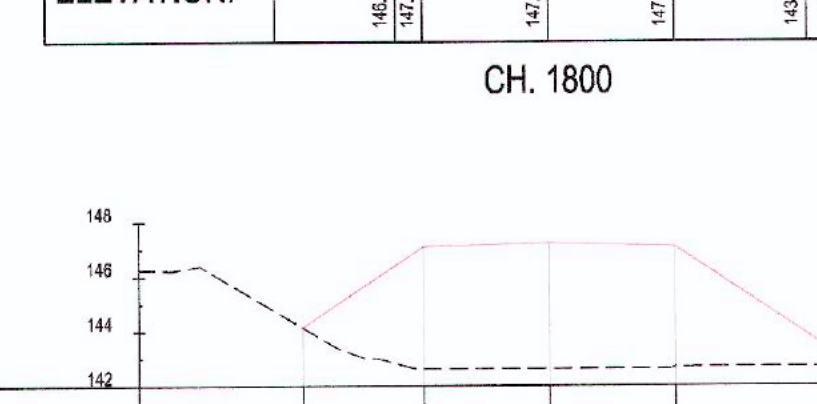
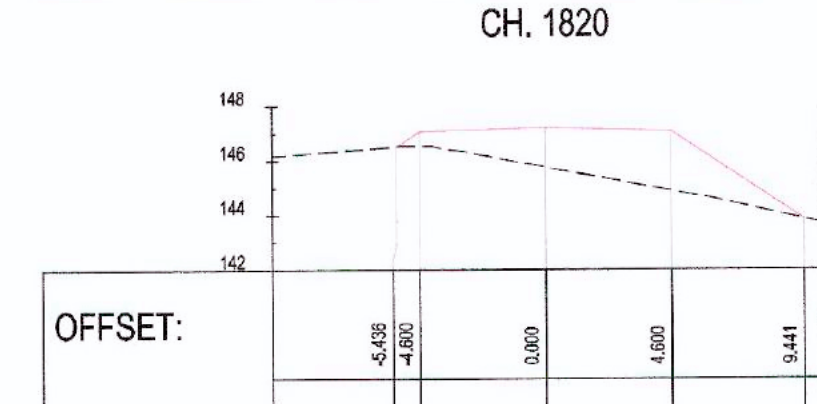
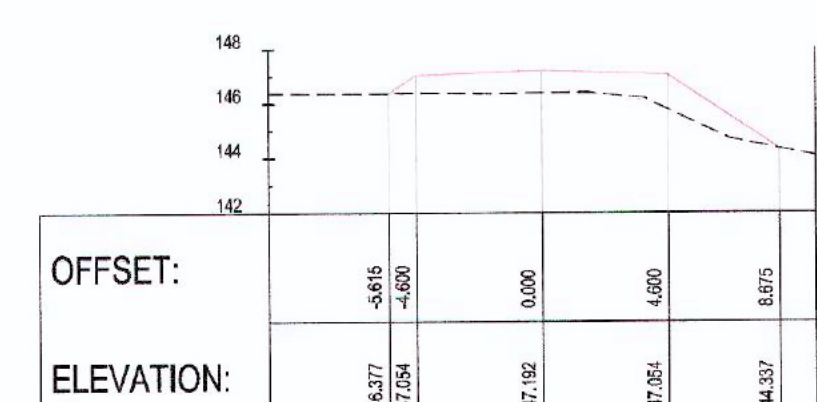
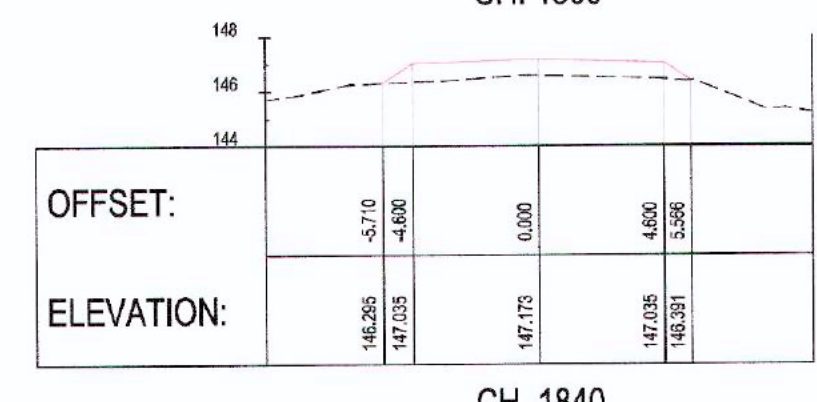
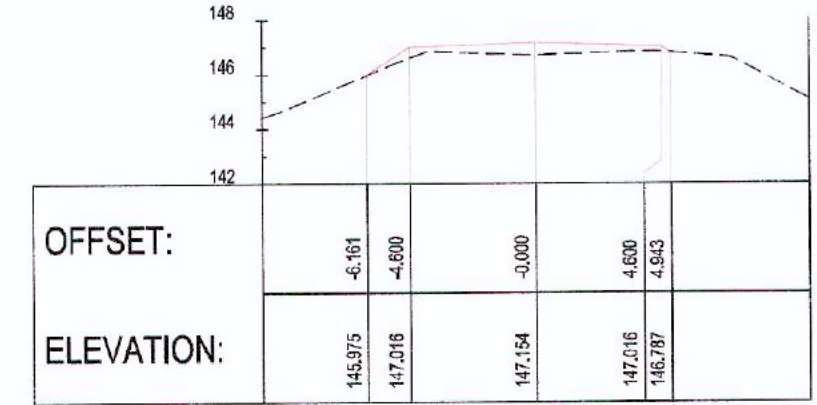
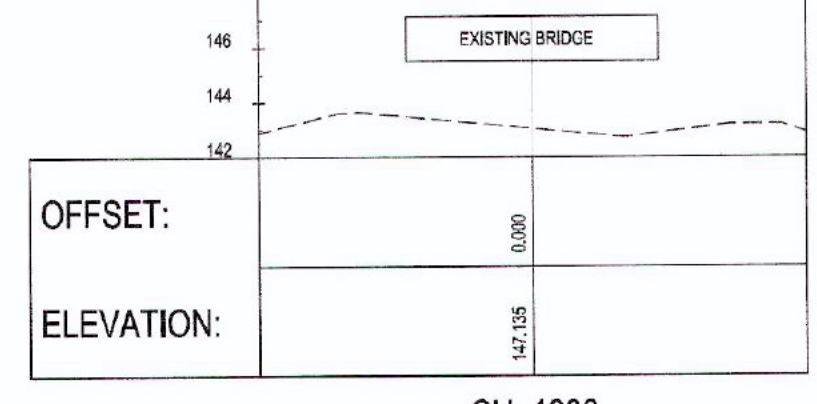
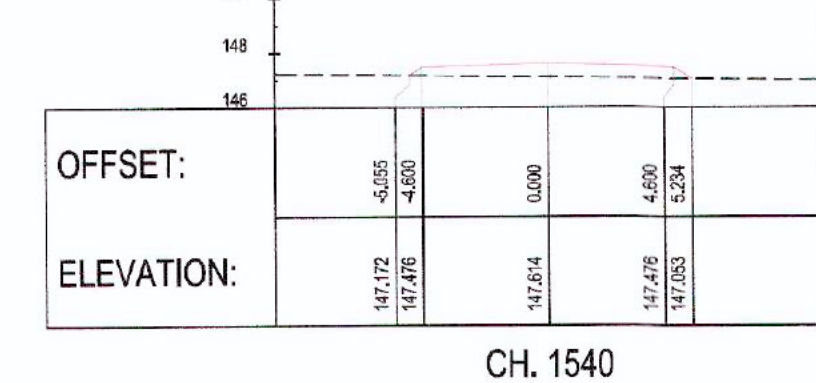
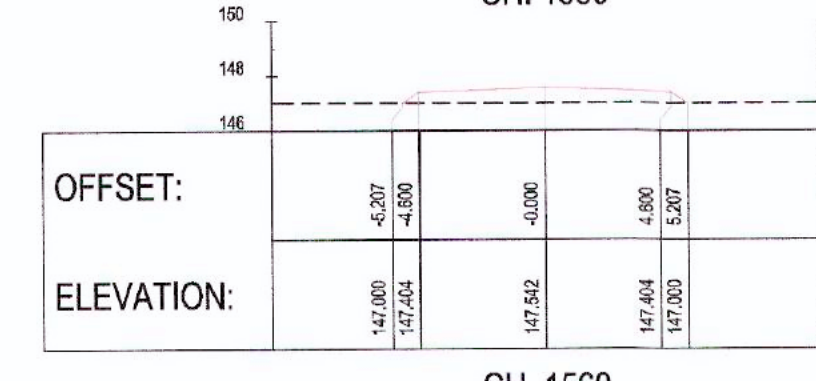
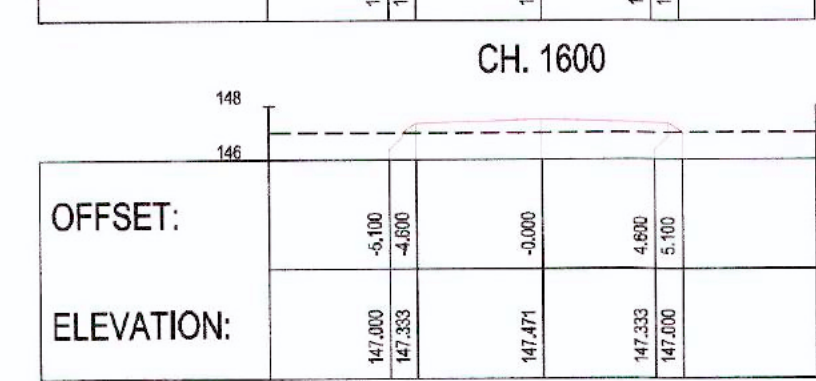
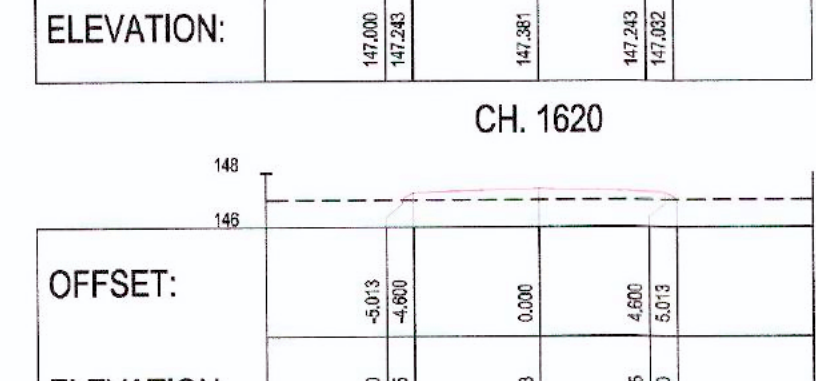
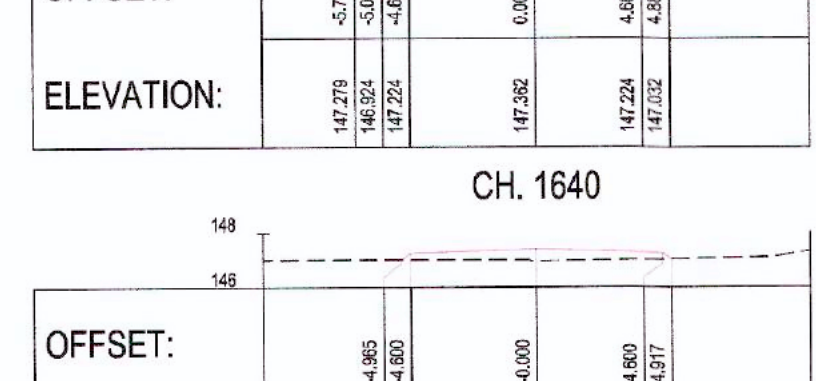
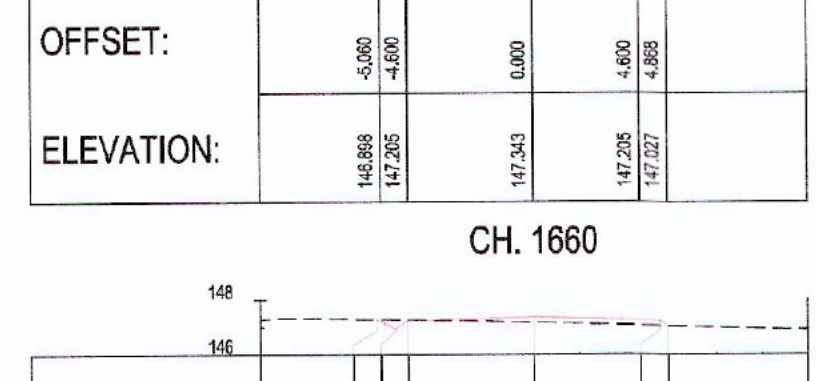
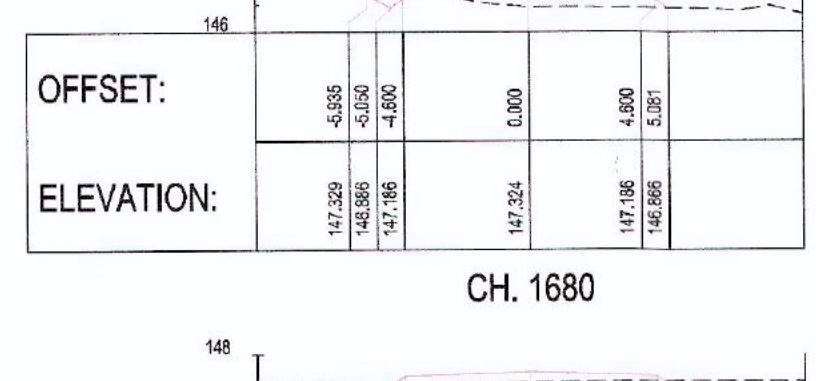
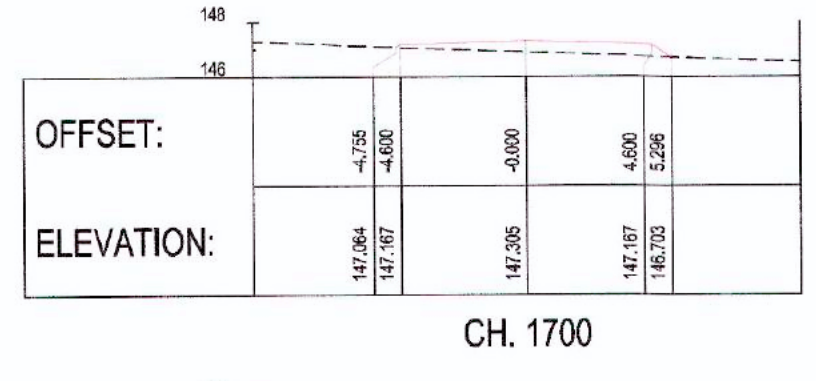
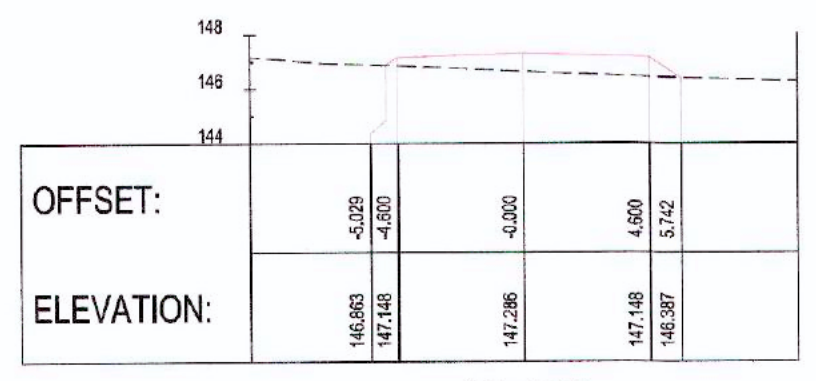
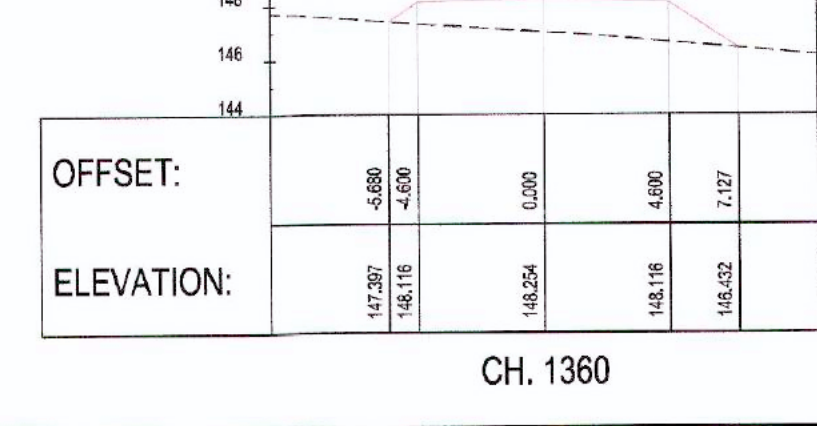
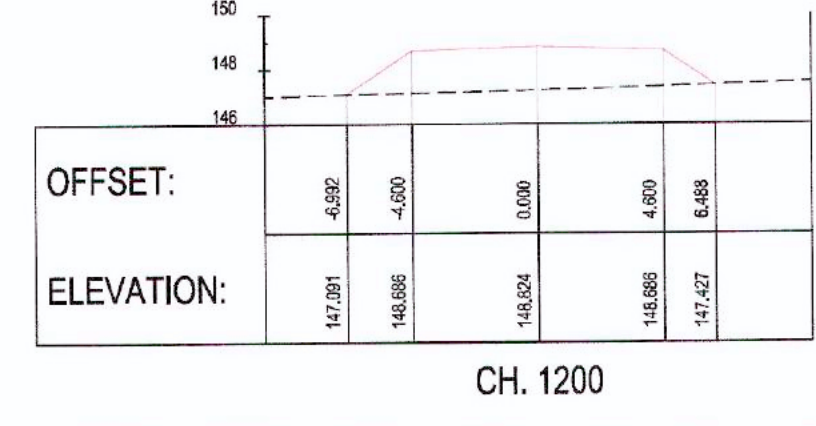
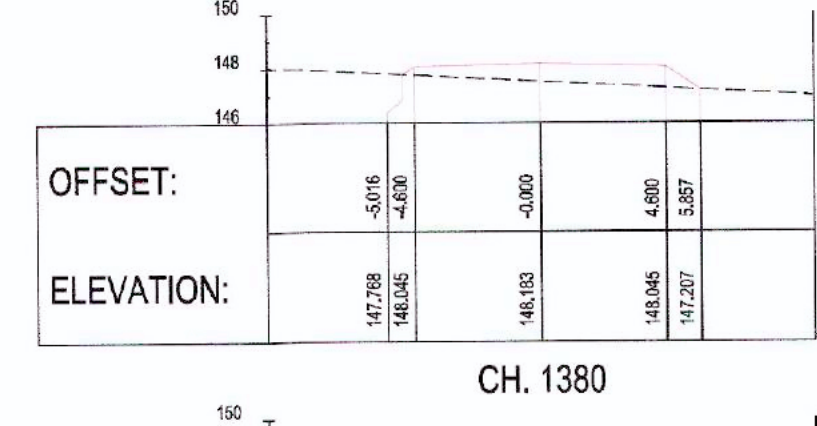
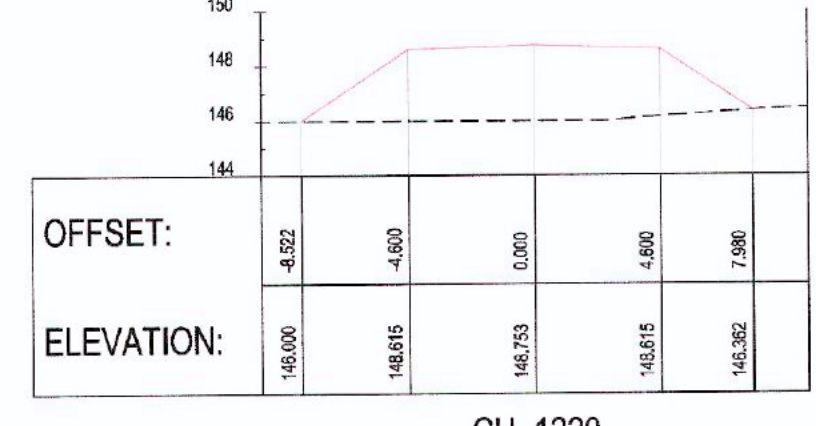
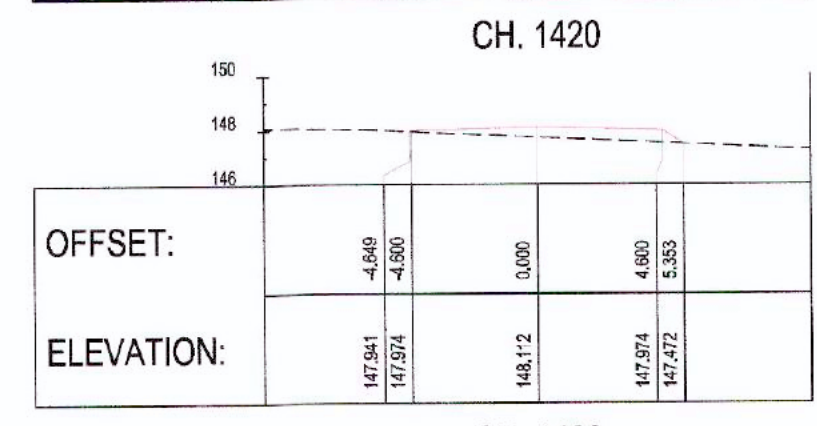
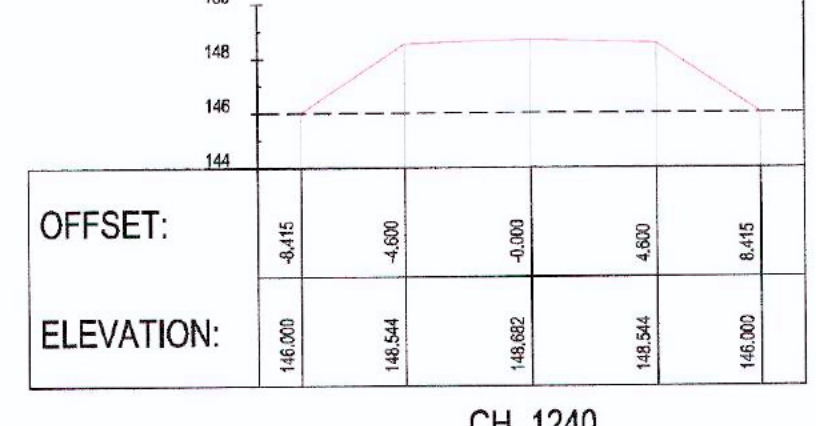
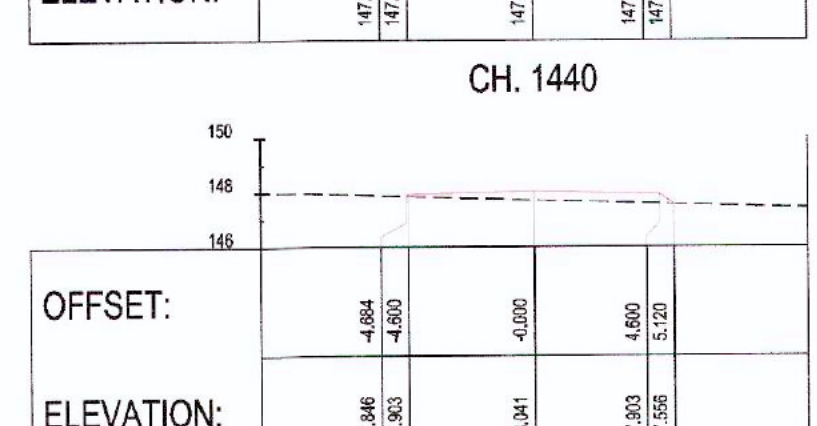
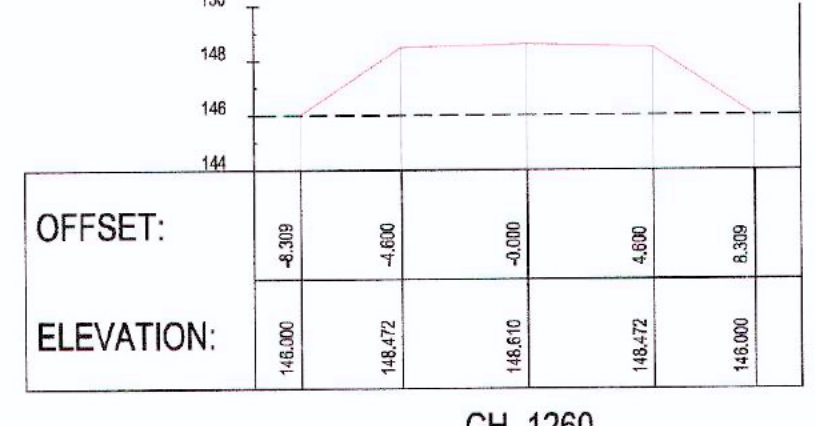
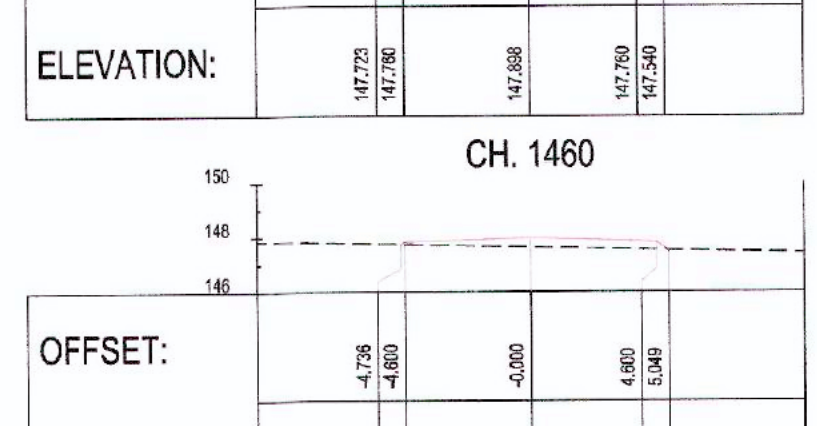
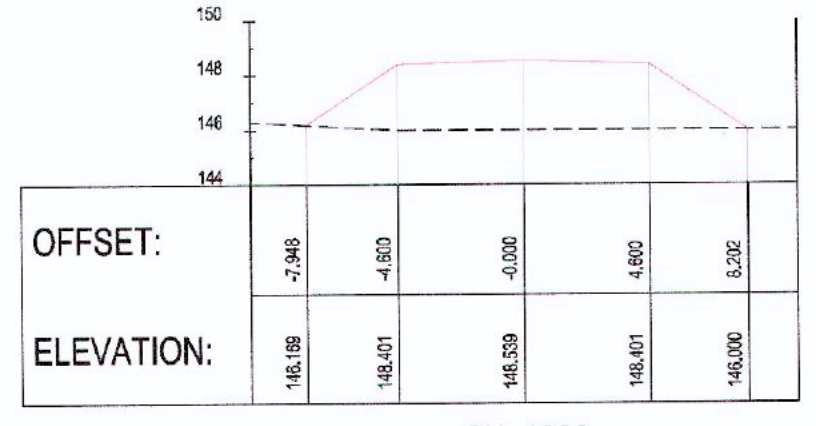
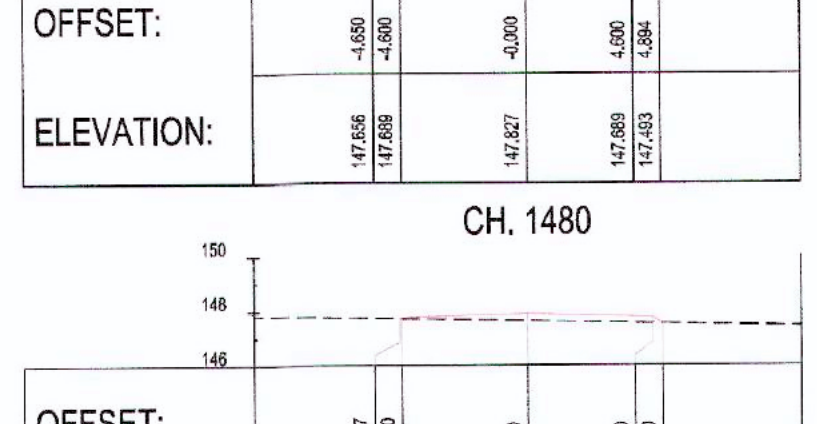
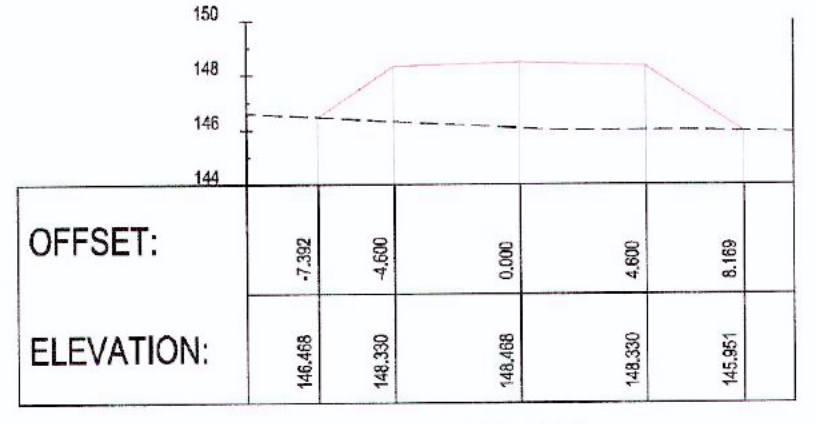
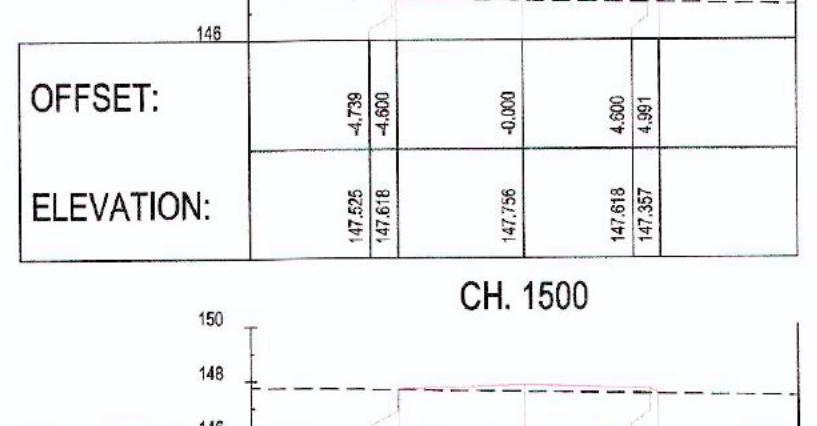
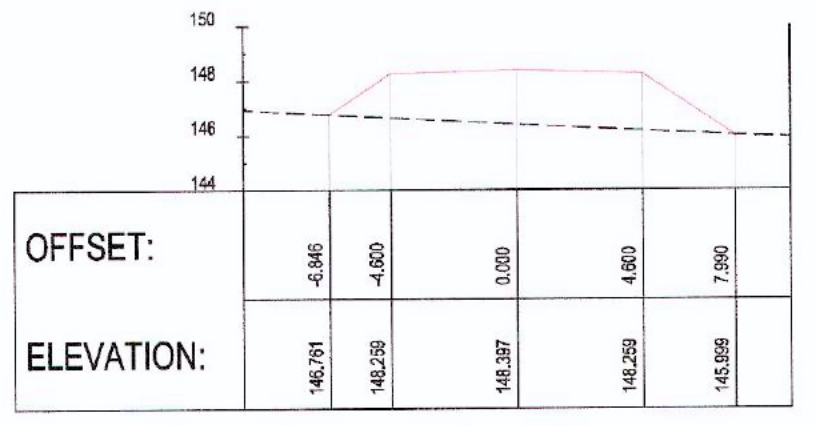
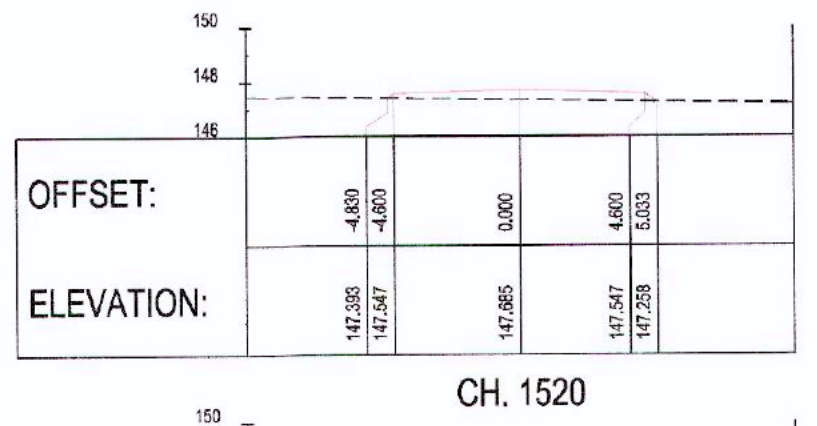
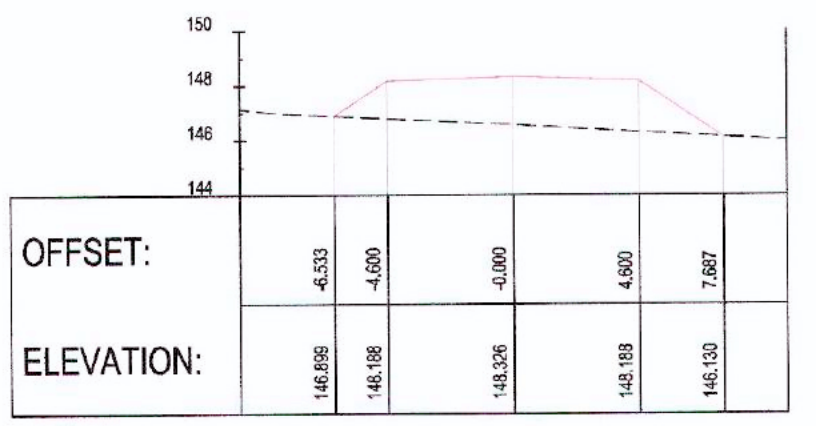


A
B
C
D
E
F



LEGEND :
 --- FORMATION
 --- NGL

PERMIT TO PRACTICE
 HATCH LTD.
 Signature: _____
 Date: _____
 PERMIT NUMBER: P-512
 The Association of Professional Engineers,
 Geologists and Geophysicists of Australia



APPROVED FOR CONSTRUCTION

| No. | DESCRIPTION | BY | CHK'D | DATE |
|-----|---------------------------|------|-------|------------|
| 0 | APPROVED FOR CONSTRUCTION | AJVN | | 2018/12/05 |

| REG. PROFESSIONAL | DESCRIPTION | BY | CHK'D | DATE |
|-------------------|-------------|----|-------|------|
| | | | | |

| DRAWING APPROVAL STATUS: | APPROVED FOR CONSTRUCTION |
|--------------------------|---------------------------|
| DRAFTSPERSON | A VAN NIEKERK |
| DESIGNER | A VAN NIEKERK |
| CHECKER | G JOHNSTONE |
| DESIGN COORD. | G JOHNSTONE |
| RESP. ENG. | D STANGER |
| LEAD DRG. ENG. | F VAN BILJON |
| AREA LEAD | F VAN BILJON |
| ENG. MANAGER | D STANGER |
| AREA MANAGER | F PITTMAN |

HATCH

Baffinland

BAFFINLAND IRON MINES LP
 MARY RIVER PROJECT

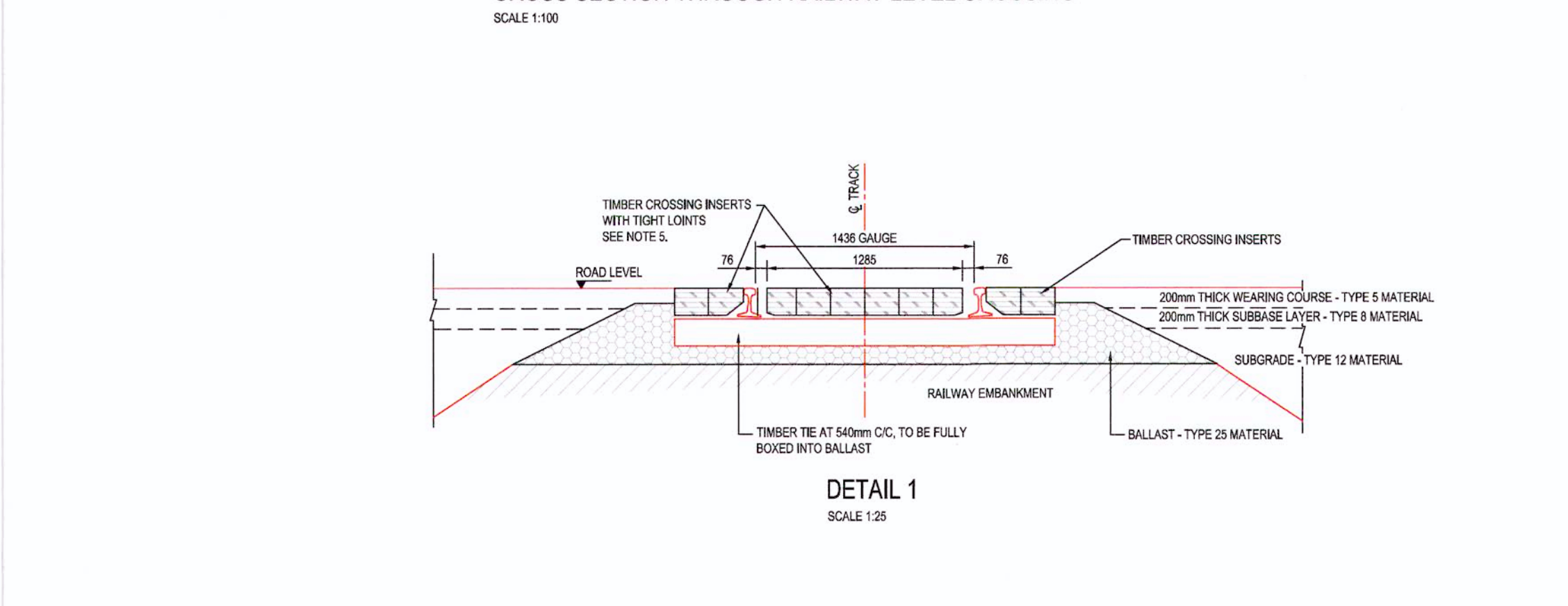
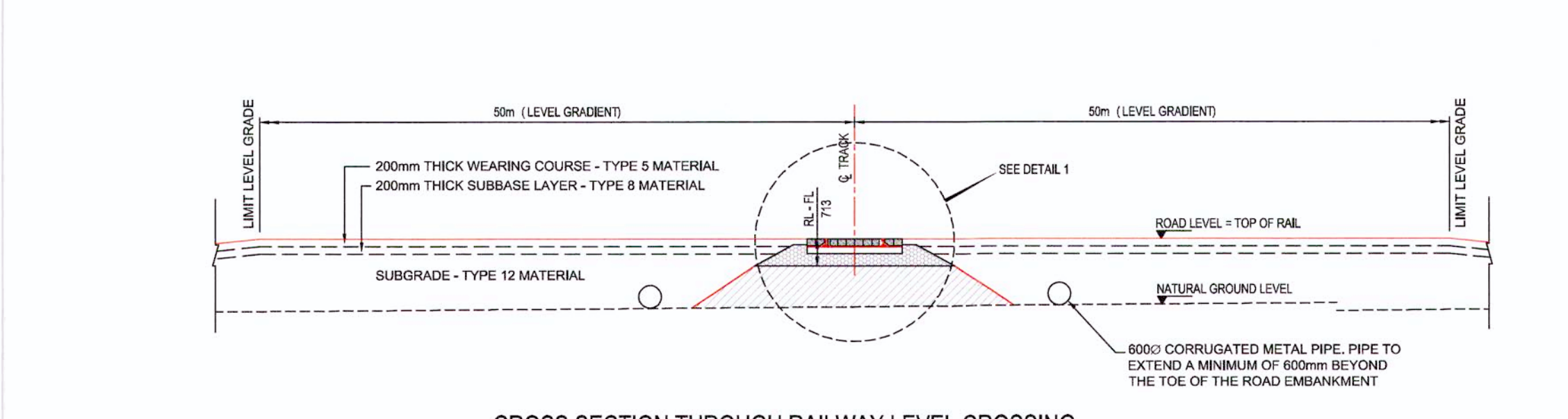
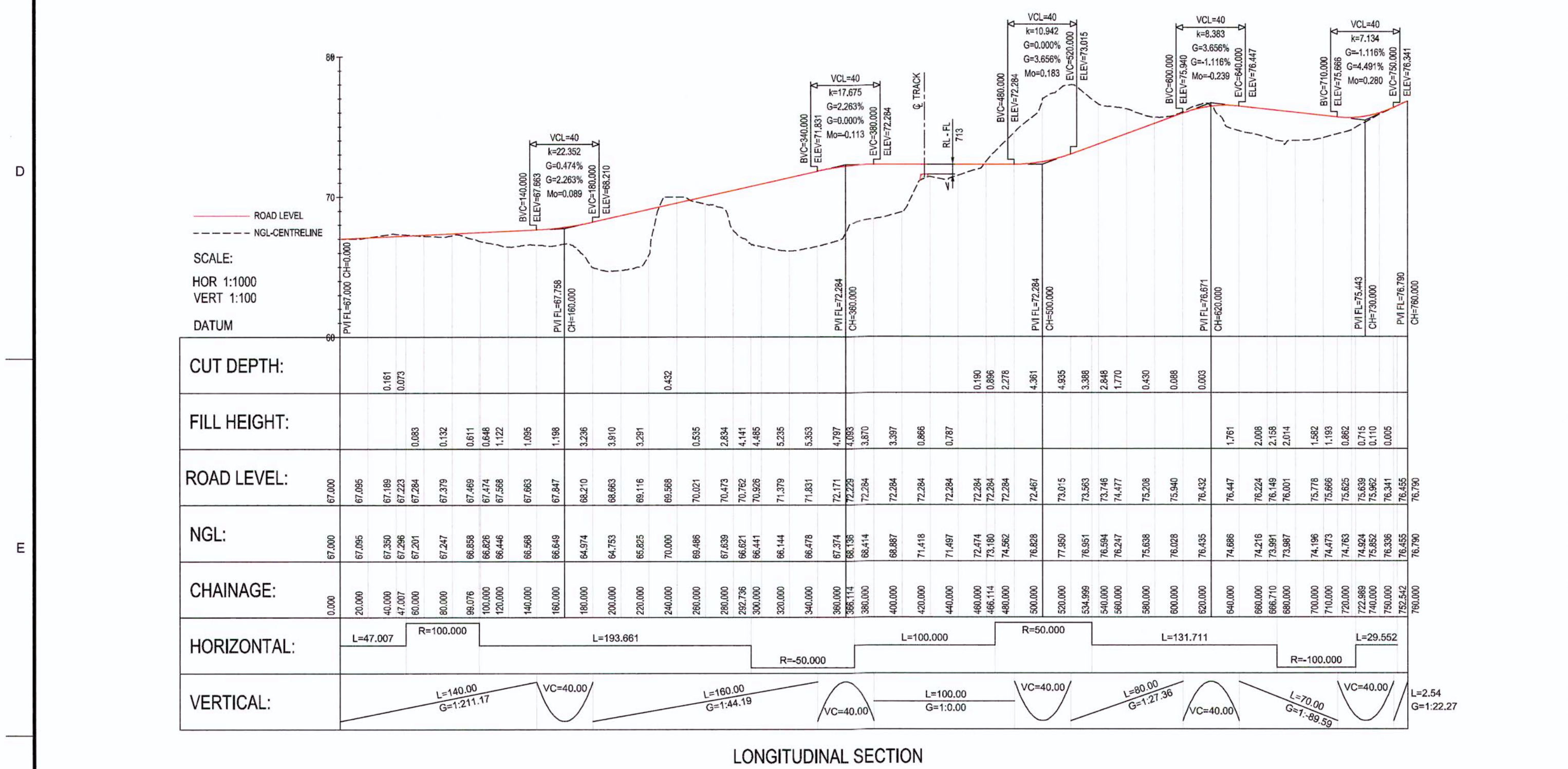
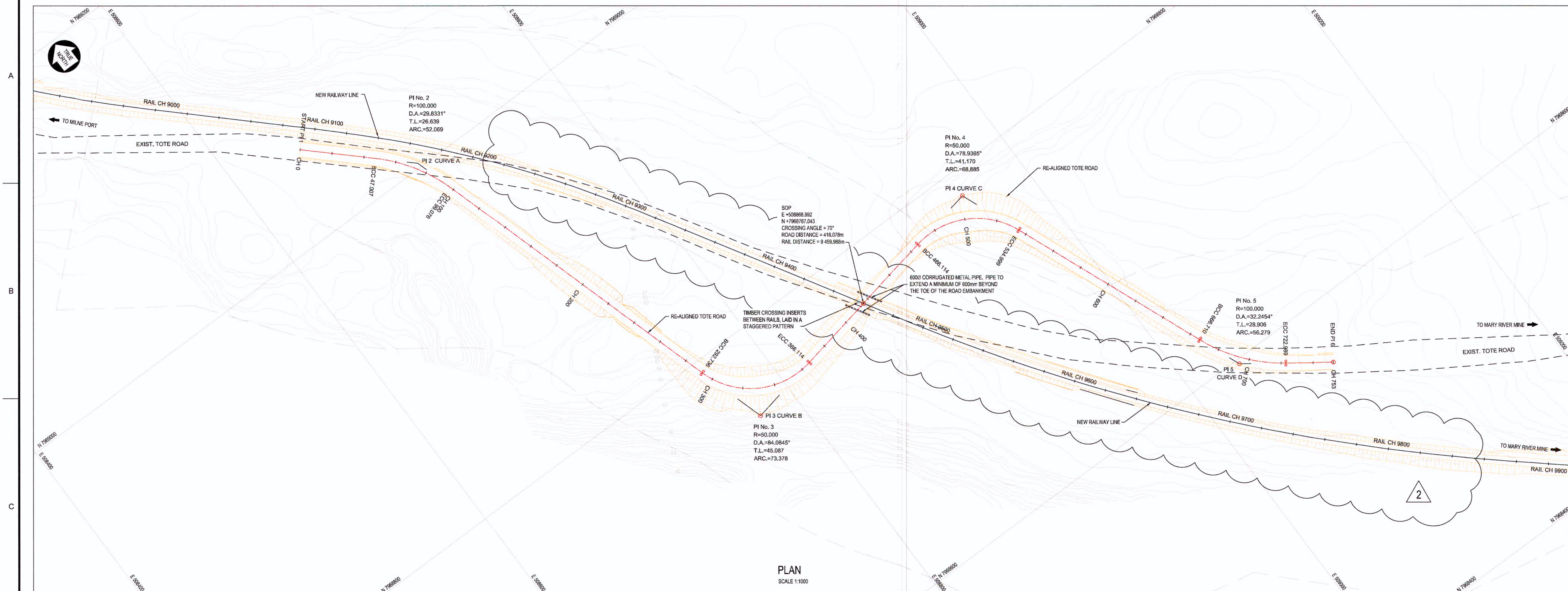
TOTE ROAD
 ROAD RELOCATION RAIL CH. 83+900 - 85+700
 CROSS SECTIONS CH. 1+200 TO CH. 1+880

SCALE: 1:200
 DWG. No. H353004-30000-224-273-0045-0001
 REV. 0

| DRAWING No. | DRAWING TITLE |
|---------------------------------|---------------------------------------------------------------------------------|
| H353004-30000-224-284-001-0001 | TYPICAL HAIL ROAD CROSS SECTION |
| H353004-30000-224-284-001-0001 | TYPICAL LEVEL CROSSING LAYOUT |
| H353004-30000-224-273-001-0001 | CROSS SECTIONS CH. 0+000 TO CH. 1+180 |
| H353004-30000-224-271-0054-0001 | TOTE ROAD RELOCATION LAYOUT AND LONGITUDINAL SECTION (CH. 83+900 TO CH. 85+700) |

SHEET SIZE: A0

LEVEL GRADE CROSSINGS



| NO. | DESCRIPTION | BY | CHKD | DATE | ROLE | NAME | SIGNATURE | DATE |
|-----|-------------------------------------------------------------|------|------|------------|--------------|-----------|--------------------|------------|
| 1 | APPROVED FOR CONSTRUCTION | AJVN | | 2018/04/06 | AREA MANAGER | F PITTMAN | <i>[Signature]</i> | 2018-11-16 |
| 2 | RAIL FORMATION AND CHANGE ALTERED THE SUIT RAIL REALIGNMENT | | | | ENG. MANAGER | D STANGER | <i>[Signature]</i> | 2018-11-16 |
| 3 | ROAD ALIGNMENT ALTERED TO SUIT CHANGED RAIL ALIGNMENT | | | | AREA MANAGER | F PITTMAN | <i>[Signature]</i> | 2018-11-16 |
| 4 | APPROVED FOR CONSTRUCTION | | | | | | | |

APPROVED FOR CONSTRUCTION

HATCH

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

TOTE ROAD
LAYOUT AND LONGITUDINAL SECTION
GRADE CROSSING AT CH. 9+460

SCALE: 1:1,000 OR AS NOTED

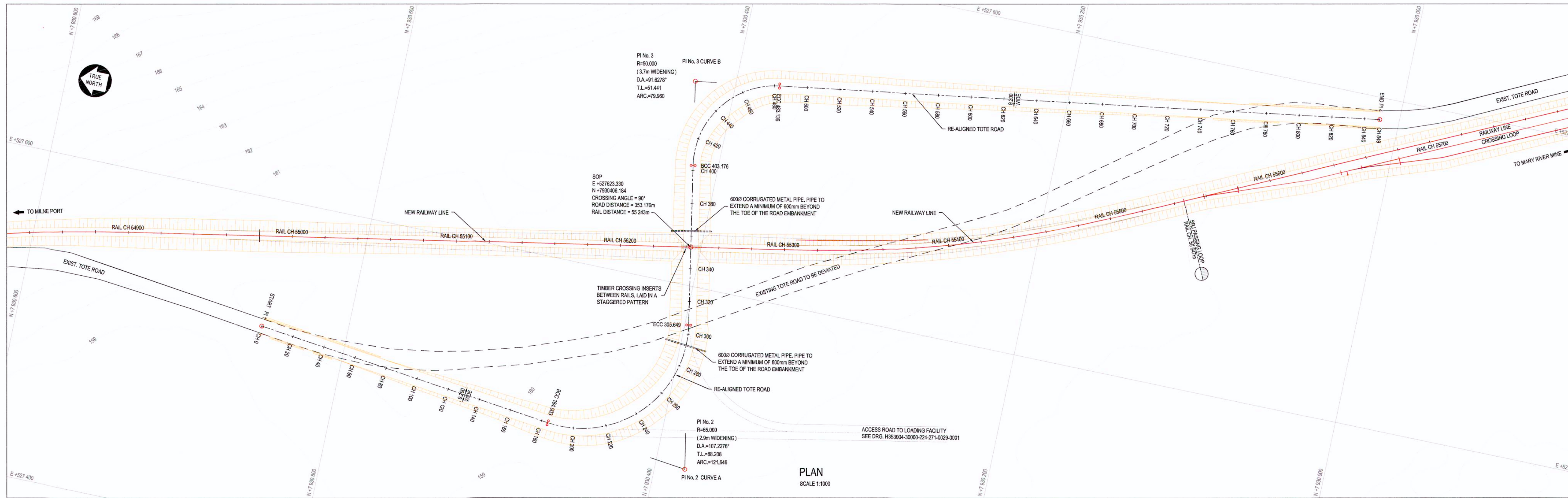
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REV 2

PERMIT TO PRACTICE
HATCH LTD.

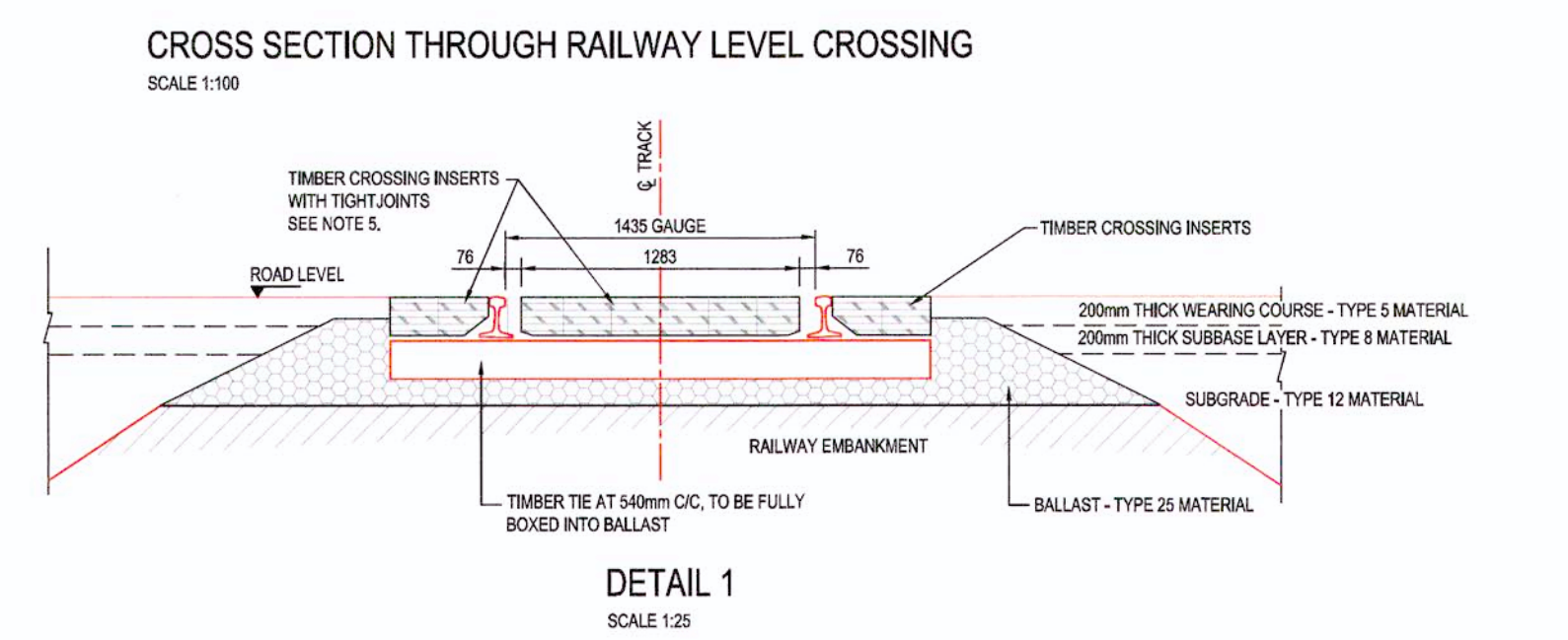
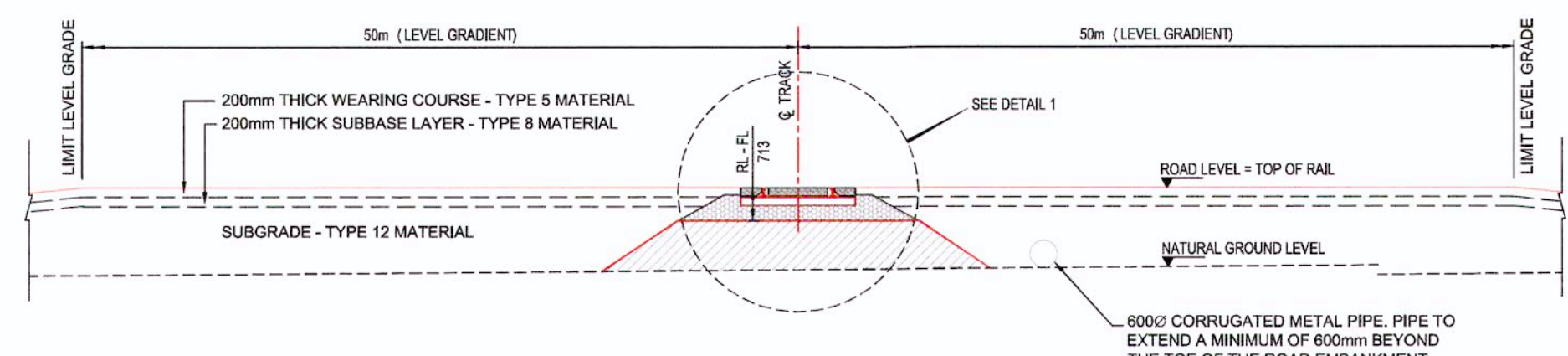
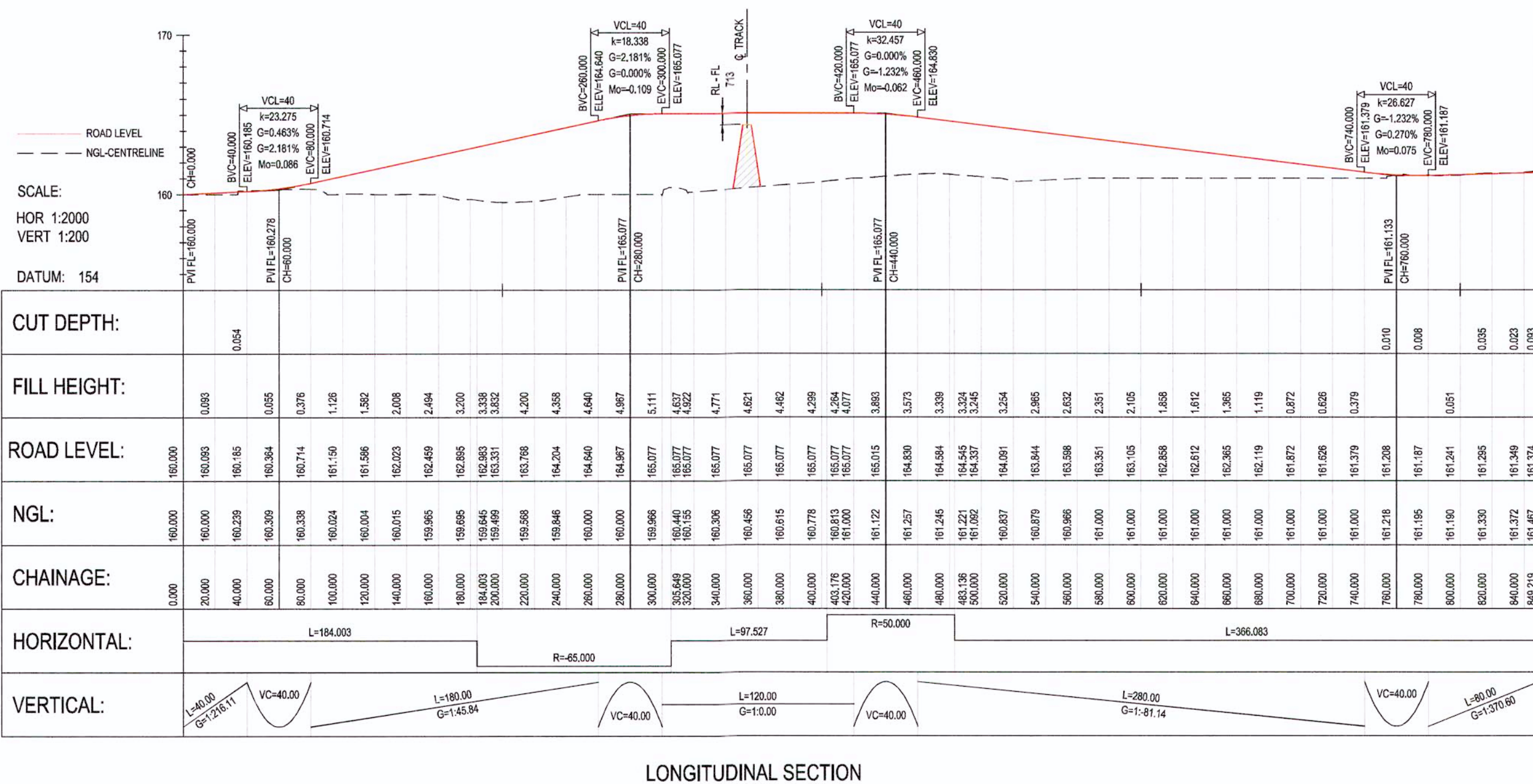
Signature: *[Signature]*
Date: 2018-11-17
PERMIT NUMBER: P-512
The Association of Professional Engineers, Geologists and Geophysicists of NEWFOUNDLAND

DRAFTSPERSON: A VAN NIEKERK NR 2018/02/17
DESIGNER: A VAN NIEKERK NR 2018/02/17
CHECKER: G JOHNSTONE
DESIGN COORD: G JOHNSTONE
RESP. ENG: D STANGER
LEAD DISC. ENG: F VAN BILJON
AREA LEAD: F VAN BILJON
2018/11/08
2018/04/06
2018/11/08
2018/11/16



- GENERAL NOTES:**
1. LIDAR SURVEY PROVIDED BY PHOTOSAT (2016)
 2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
 3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 1m.
 4. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
 5. TIMBER CROSSING INSERTS SHALL BE 175mm HIGH AND 225mm WIDE. INSERTS ARE TO BE FASTENED TO TIMBER TIES USING 35mm LONG LAG SCREWS. A MINIMUM DISTANCE OF 75mm SHALL BE MAINTAINED ON GAUGE SIDE THE RAIL HEAD AND THE NEAREST CROSSING INSERT.
 6. THIS DRAWING WAS PREVIOUSLY ISSUED AS: H353004-0000-224-271-0035-0001
 7. ALL CHANGES INDICATED FOR TOTE ROAD ARE LOCAL CHANGES.

| CO-ORDINATE LIST UTM (NAD83) ZONE 17 | | |
|--------------------------------------|------------|-------------|
| | E | N |
| PI 1 START | 527522.280 | 7930662.001 |
| BCC CURVE A | 527500.336 | 7930469.311 |
| PI CURVE A | 527489.816 | 7930381.723 |
| ECC CURVE A | 527576.581 | 7930397.622 |
| LEVEL CROSSING | 527623.330 | 7930406.194 |
| BCC CURVE B | 527672.512 | 7930415.191 |
| PI CURVE B | 527723.112 | 7930424.458 |
| ECC CURVE B | 527730.858 | 7930373.815 |
| PI 4 END | 527788.629 | 7930011.793 |



| DRAWING No. | REFERENCE DRAWINGS | DRAWING TITLE |
|----------------------------|--------------------|-------------------------------------------|
| H353004-30000-224-294-0007 | | ROAD SIGNAGE DETAIL |
| H353004-30000-224-294-0010 | | TYPICAL HAUL ROAD CROSS SECTION |
| H353004-30000-224-294-0009 | | TYPICAL LEVEL CROSSING LAYOUT |
| H353004-30000-224-273-0023 | | CROSS SECTIONS CH. 0.000m TO CH. 880.000m |

APPROVED FOR CONSTRUCTION

REG. PROFESSIONAL

1 ROAD ALIGNMENT ALTERED TO SUIT CHANGED RAILWAY ALIGNMENT.

2 APPROVED FOR CONSTRUCTION

No. DESCRIPTION BY CHKD DATE

HATCH

DRAFTSPERSON: A VAN NIEKERK NR 09/02/18

DESIGNER: A VAN NIEKERK NR 09/02/18

CHECKER: F VAN BILJON

DESIGN COORD.: F VAN BILJON

RESP. ENG.: D STANGER

LEAD DISC. ENG.: F VAN BILJON

AREA LEAD: F VAN BILJON

ENG. MANAGER: D STANGER

AREA MANAGER: F PITMAN

Signature: [Signature] DATE: 2018-10-18

Baffinland

BAFFINLAND IRON MINES LP

MARY RIVER PROJECT

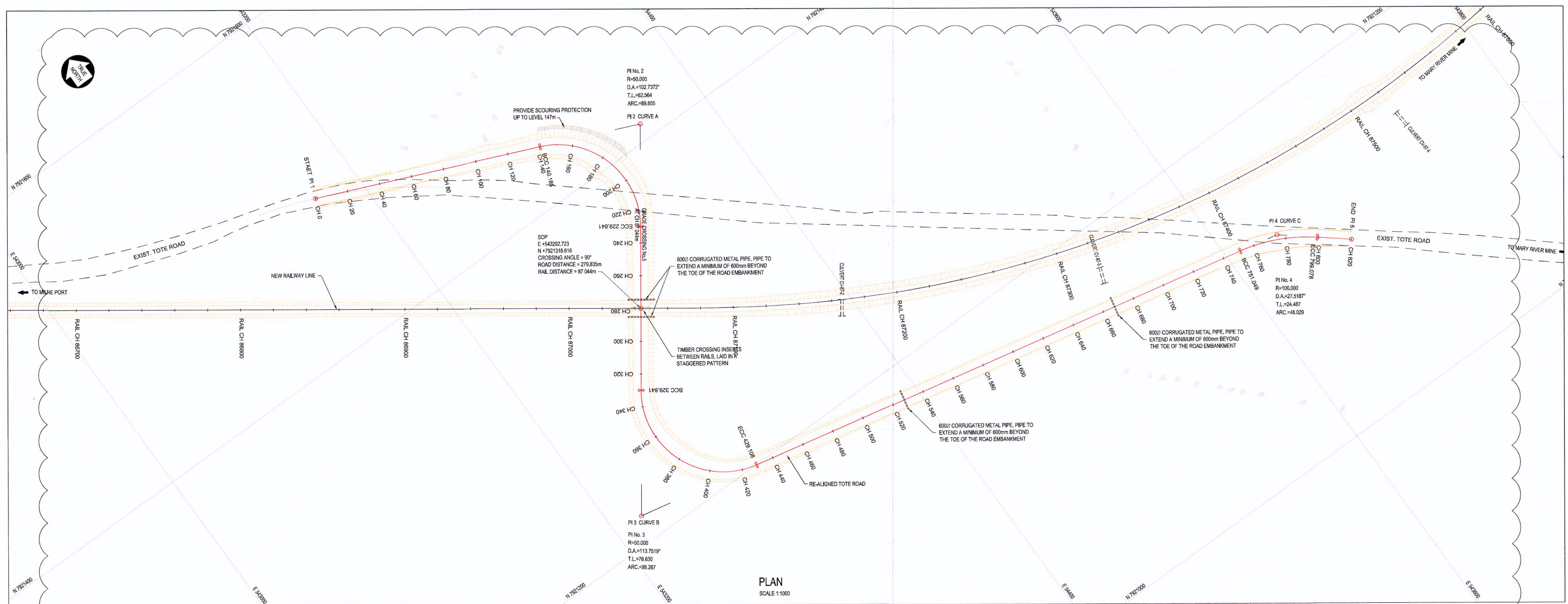
TOTE ROAD LAYOUT AND LONGITUDINAL SECTION

GRADE CROSSING AT CH. 55+243

SCALE: 1:1000

DWG. No: H353004-30000-224-271-0035-0001

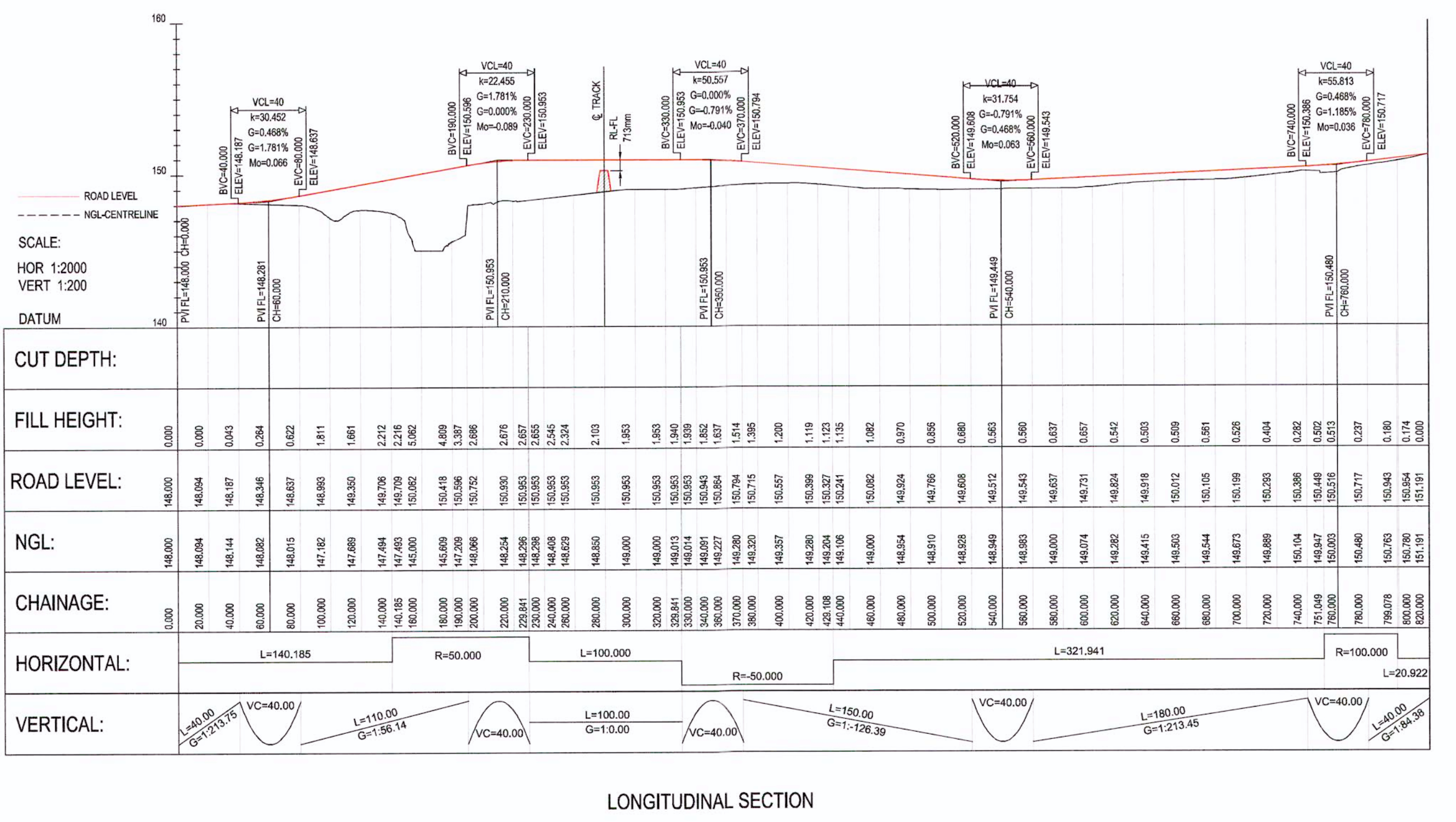
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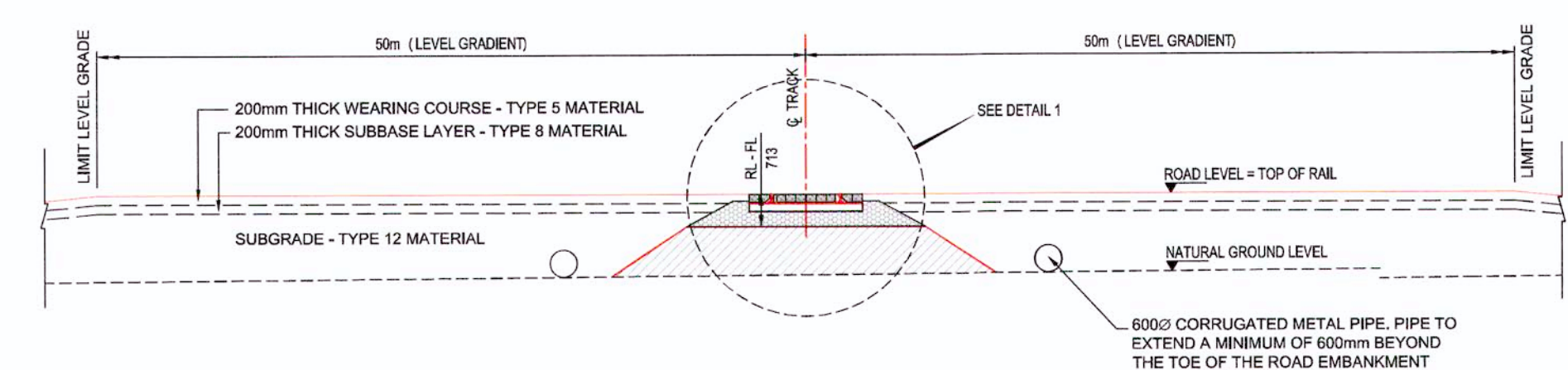
- GENERAL NOTES:**
- LIDAR SURVEY PROVIDED BY PHOTSAF (2016)
 - CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
 - CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 1m.
 - ALL DIMENSIONS SHOWN ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
 - TIMBER CROSSING INSERTS SHALL BE 170mm HIGH AND 220mm WIDE. INSERTS ARE TO BE FASTENED TO TIMBER TIES USING 305mm LONG LAG SCREWS. A MINIMUM DISTANCE OF 75mm SHALL BE MAINTAINED ON GAUGE SIDE THE RAIL HEAD AND THE NEAREST CROSSING INSERT.
 - THIS DRAWING WAS PREVIOUSLY ISSUED AS: H353004-30000-224-271-0036-0001
 - ALL CHANGES INDICATED FOR TOTE ROAD ARE LOCAL CHANGES.

| CO-ORDINATE LIST UTM (NAD83) ZONE 17 | | |
|--------------------------------------|------------|-------------|
| | E | N |
| PI 1 START | 543171.741 | 7921489.136 |
| BCC CURVE A | 543300.812 | 7921434.430 |
| PI CURVE A | 543358.415 | 7921410.016 |
| ECC CURVE A | 543321.901 | 7921359.213 |
| LEVEL CROSSING | 543282.719 | 7921318.812 |
| BCC CURVE B | 543263.537 | 7921278.011 |
| PI CURVE B | 543218.813 | 7921251.787 |
| ECC CURVE B | 543203.781 | 7921199.914 |
| BBC | 543608.740 | 7921123.228 |
| PI 4 CURVE C | 543652.698 | 7921128.156 |
| ECC CURVE C | 543651.588 | 7921112.589 |
| PI 5 END | 543687.748 | 7921059.288 |

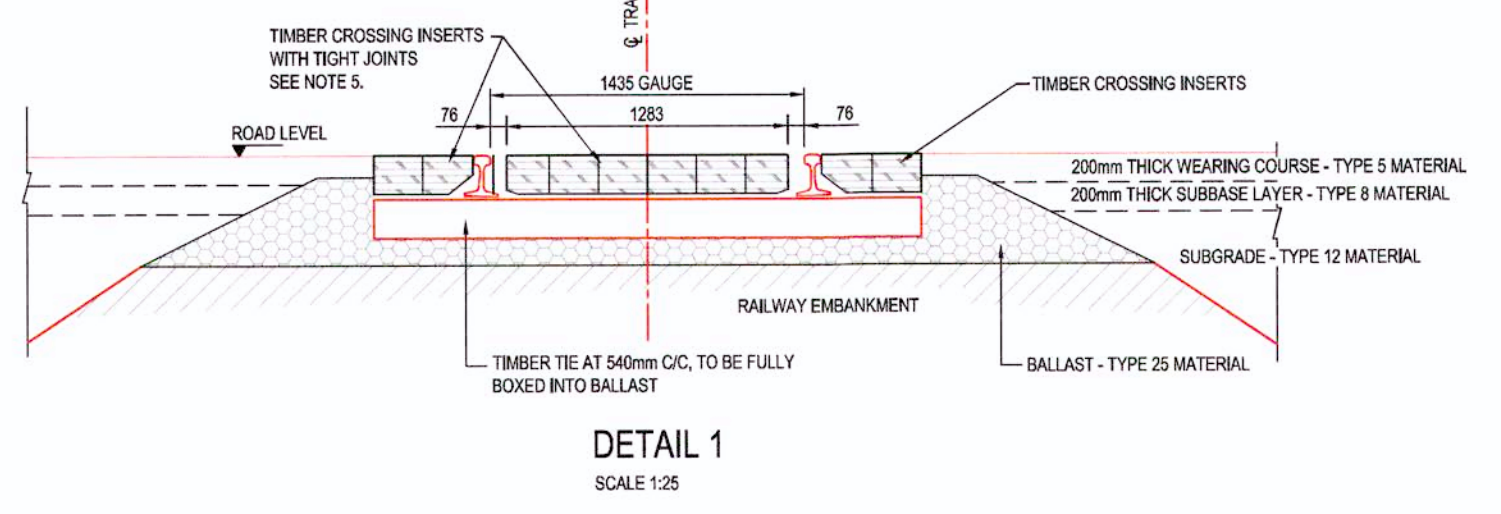
PLAN SCALE 1:1000



LONGITUDINAL SECTION



CROSS SECTION THROUGH RAILWAY LEVEL CROSSING SCALE 1:100



DETAIL 1 SCALE 1:25

| REFERENCE DRAWINGS | DRAWING TITLE |
|----------------------------|-------------------------------------------|
| H353004-30000-224-294-0007 | ROAD SIGNAGE DETAIL |
| H353004-30000-224-294-0010 | TYPICAL HAUL ROAD CROSS SECTION |
| H353004-30000-224-294-0007 | TYPICAL LEVEL CROSSING LAYOUT |
| H353004-30000-224-273-0024 | CROSS SECTIONS CH. 0.000m TO CH. 820.000m |

APPROVED FOR CONSTRUCTION

REG. PROFESSIONAL

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

TOTE ROAD
LAYOUT AND LONGITUDINAL SECTION
GRADE CROSSING AT CH. 87+044

SCALE: 1:1,000
DWG. No: H353004-30000-224-271-0036-0001

| NO. | DESCRIPTION | DATE | BY | CHKD | DATE | ROLE | NAME | SIGNATURE | DATE |
|-----|----------------------------------------------------|------------|------|------|------|--------------|---------------|-----------|------------|
| 1 | ROAD ALIGNMENT ALTERED TO SUIT NEW RAIL ALIGNMENT. | 2018/11/13 | AJVN | | | DESIGNER | A VAN NIEKERK | | 2018/02/22 |
| 0 | APPROVED FOR CONSTRUCTION. | 2018/04/06 | AJVN | | | AREA MANAGER | F PITTMAN | | 2018/02/22 |

DRAFTSPERSON: A VAN NIEKERK NR 2018/02/22

CHECKER: G JOHNSTONE NR 2018/02/22

DESIGN COORD: G JOHNSTONE

RESP. ENG: D STANGER

LEAD DISC. ENG: F VAN BILJON

AREA LEAD: F VAN BILJON

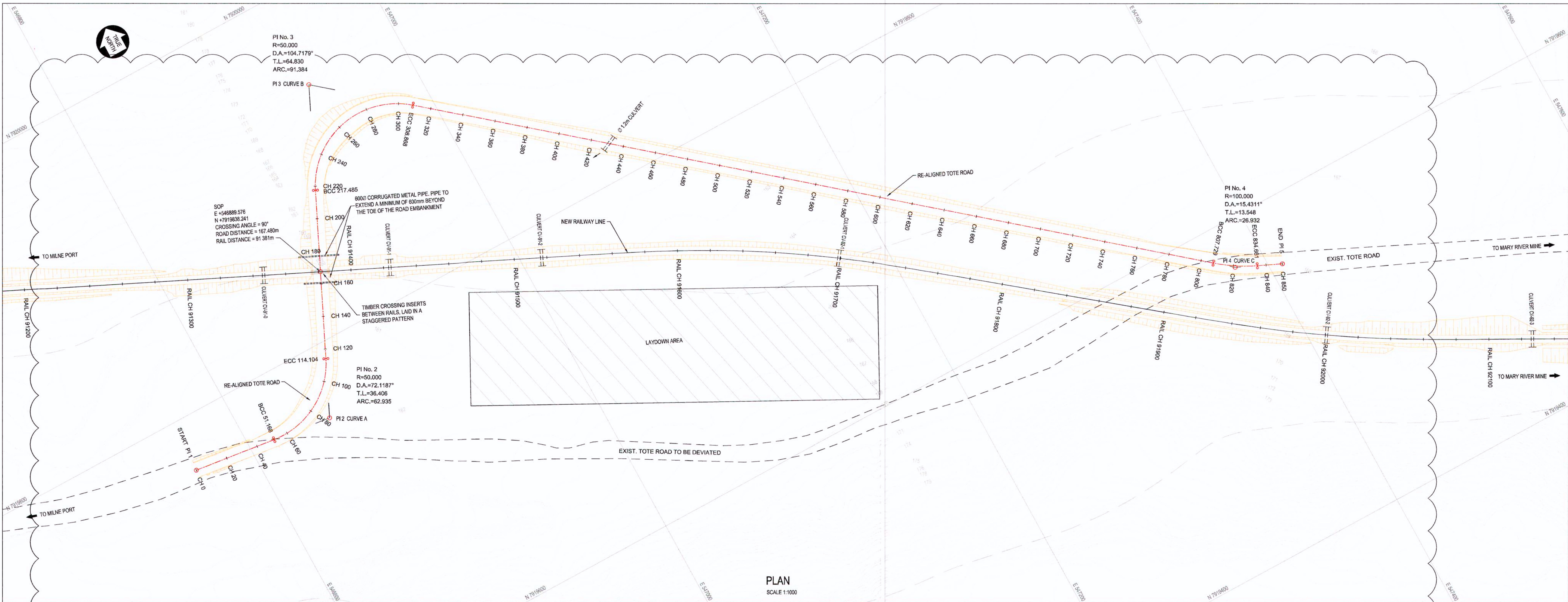
2018/11/13

ENG. MANAGER: D STANGER

2018/04/06

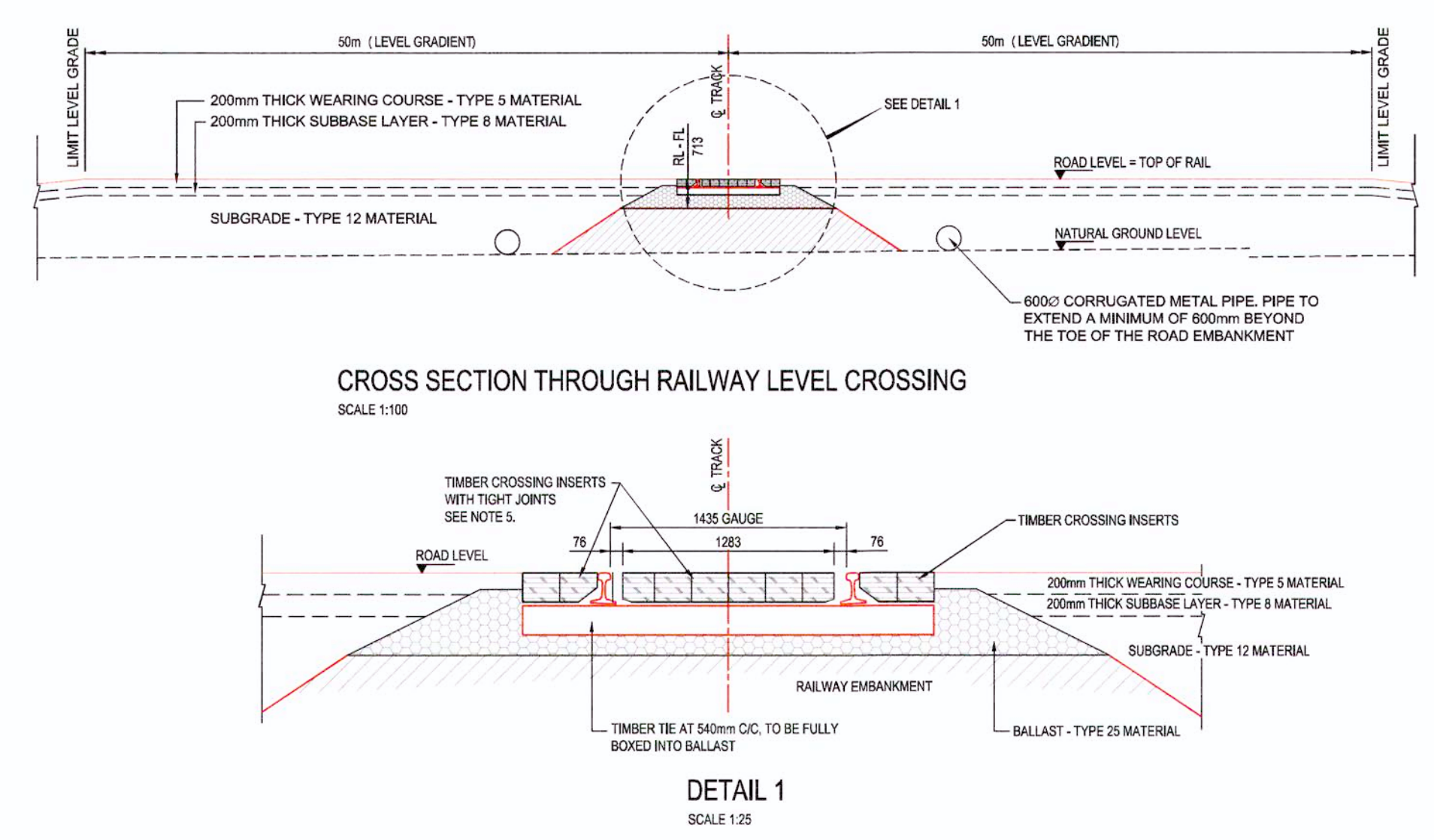
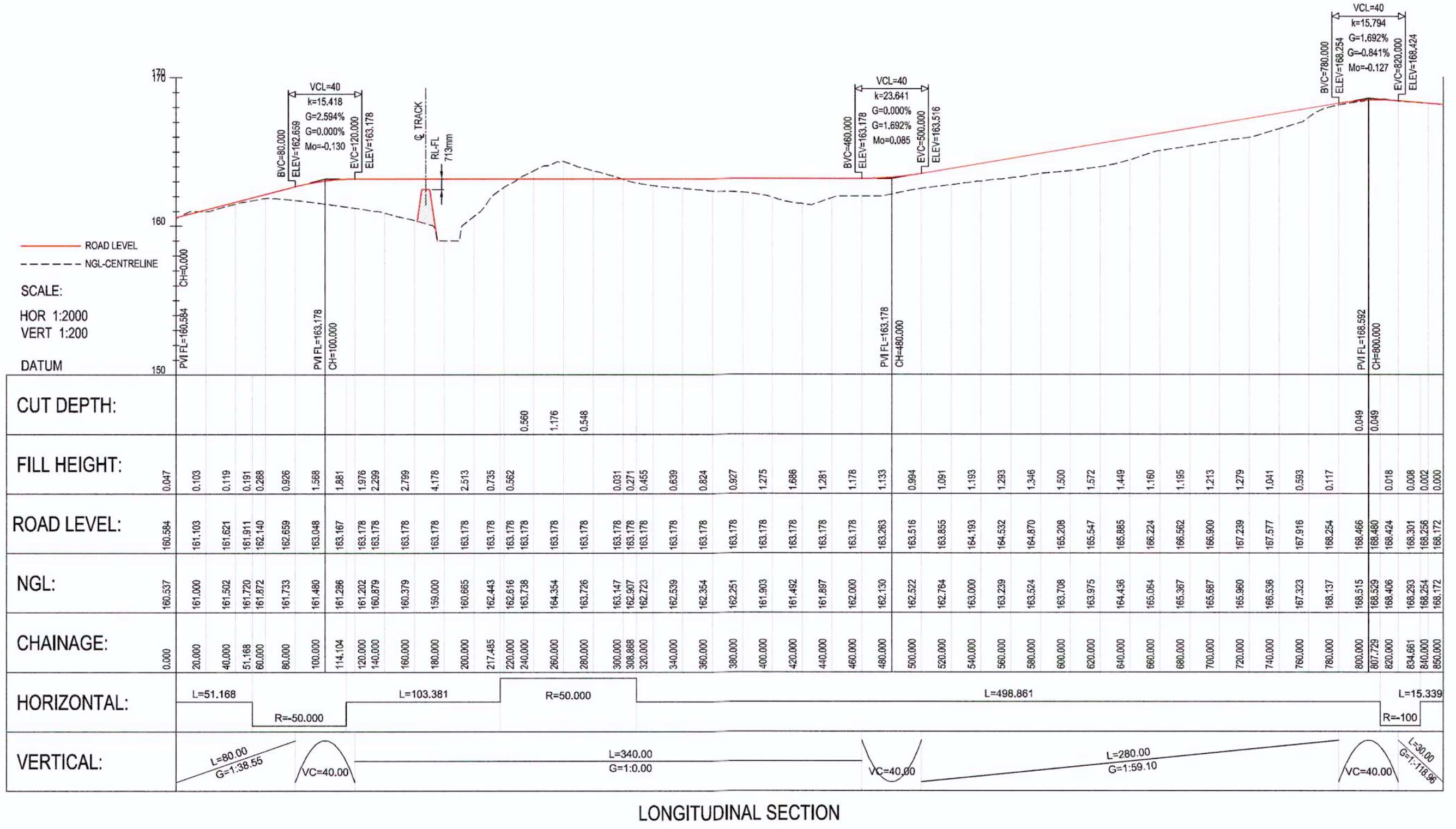
AREA MANAGER: F PITTMAN

DRAWING APPROVAL STATUS: Approved for Construction



- GENERAL NOTES:**
1. LIDAR SURVEY PROVIDED BY PHOTOSAT (2016)
 2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
 3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 1m. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
 4. TIMBER CROSSING INSERTS SHALL BE 178mm HIGH AND 228mm WIDE. INSERTS ARE TO BE FASTENED TO TIMBER TIES USING 305mm LONG LAG SCREWS. A MINIMUM DISTANCE OF 76mm SHALL BE MAINTAINED ON GAUGE SIDE THE RAIL HEAD AND THE NEAREST CROSSING INSERT.
 5. THIS DRAWING WAS PREVIOUSLY ISSUED AS: H353004-0000-224-272-0040-0001
 6. ALL CHAINAGES INDICATED FOR TOTE ROAD ARE LOCAL CHAINAGES.

| CO-ORDINATE LIST UTM (NAD83) ZONE 17 | | |
|--------------------------------------|------------|-------------|
| | E | N |
| PI 1 START | 546754.567 | 7919767.972 |
| BCC CURVE A | 546815.348 | 7919761.528 |
| PI 2 CURVE A | 546851.465 | 7919756.943 |
| ECC CURVE A | 546866.918 | 7919763.907 |
| LEVEL CROSSING | 546869.576 | 7919838.241 |
| BCC CURVE B | 546910.799 | 7919883.513 |
| PI 3 CURVE B | 546938.316 | 7919942.213 |
| ECC CURVE B | 546988.099 | 7919960.685 |
| BCC CURVE C | 547371.175 | 7919561.130 |
| PI 4 CURVE C | 547381.578 | 7919572.452 |
| ECC CURVE C | 547393.916 | 7919566.854 |
| PI 5 END | 547407.885 | 7919560.517 |



PERMIT TO PRACTICE
HATCH LTD.
Signature: [Signature]
Date: 2018-11-17
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geoscientists and Geographers of NEWTUN

APPROVED FOR CONSTRUCTION

HATCH

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

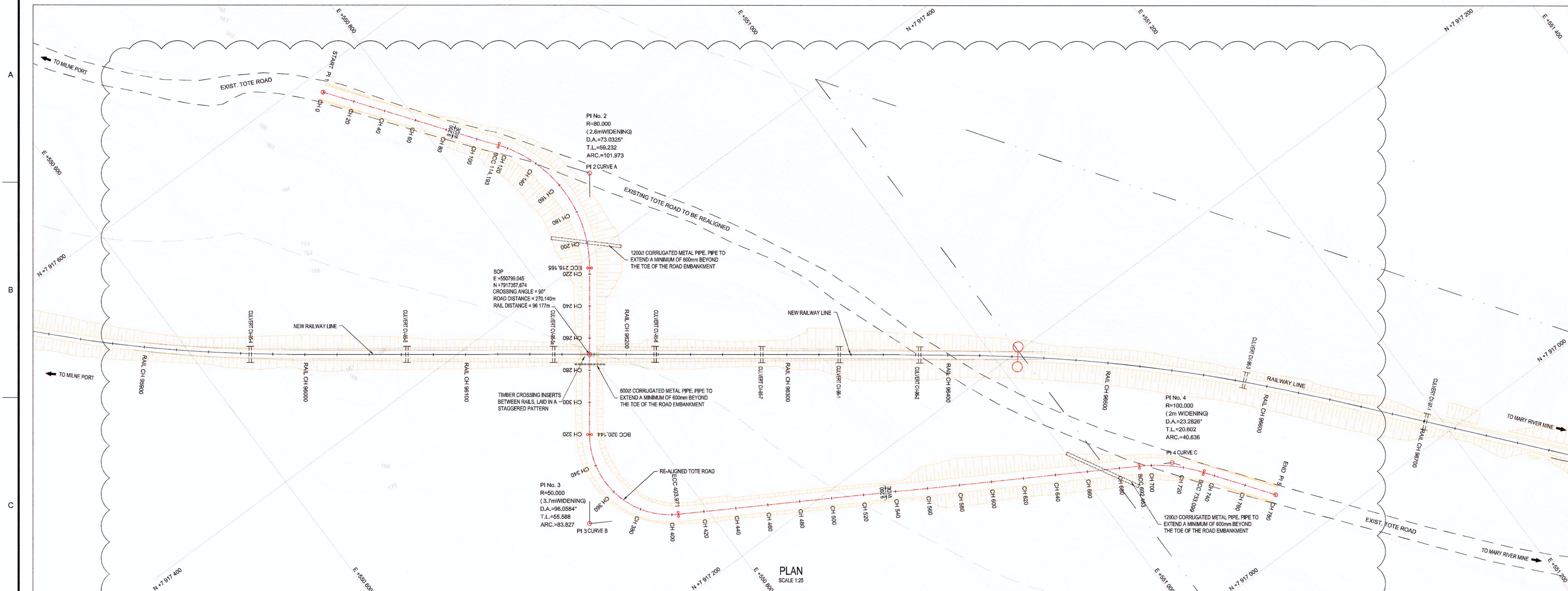
TOTE ROAD
LAYOUT AND LONGITUDINAL SECTION
GRADE CROSSING AT CH. 91+750

| DRAWING No. | DRAWING TITLE |
|----------------------------|-------------------------------------------|
| H353004-30000-224-294-0007 | ROAD SIGNAGE DETAIL |
| H353004-30000-224-294-0010 | TYPICAL HAUL ROAD CROSS SECTION |
| H353004-30000-224-294-0009 | TYPICAL LEVEL CROSSING LAYOUT |
| H353004-30000-224-273-0025 | CROSS SECTIONS CH. 0.000m TO CH. 850.000m |

| No. | DESCRIPTION | BY | CHKD | DATE |
|-----|----------------------------------------------------|------|------|------------|
| 1 | ROAD ALIGNMENT ALTERED TO SUIT NEW RAIL ALIGNMENT. | AJVN | | 2018/11/14 |
| 2 | APPROVED FOR CONSTRUCTION. | AJVN | | 2018/04/06 |

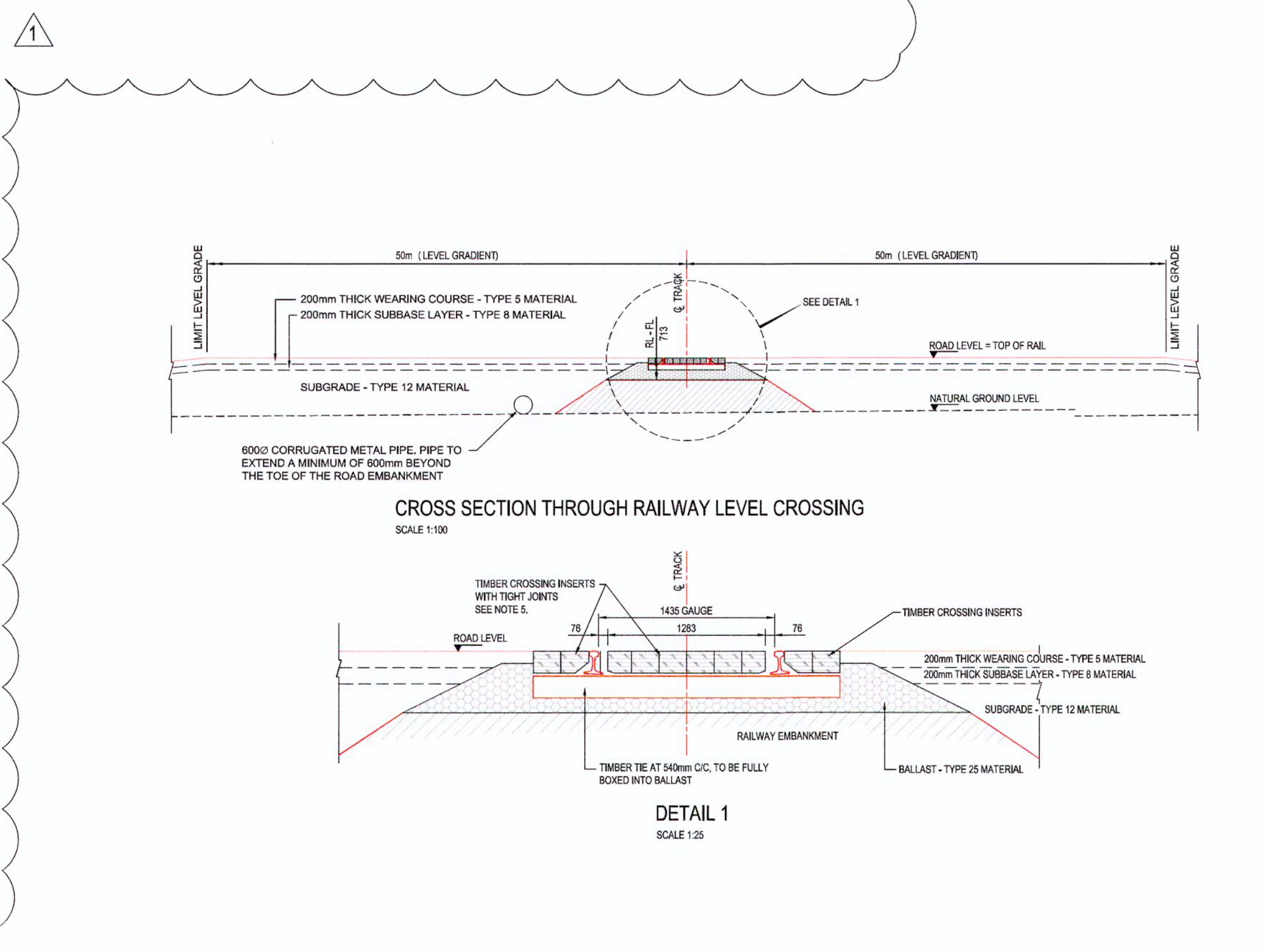
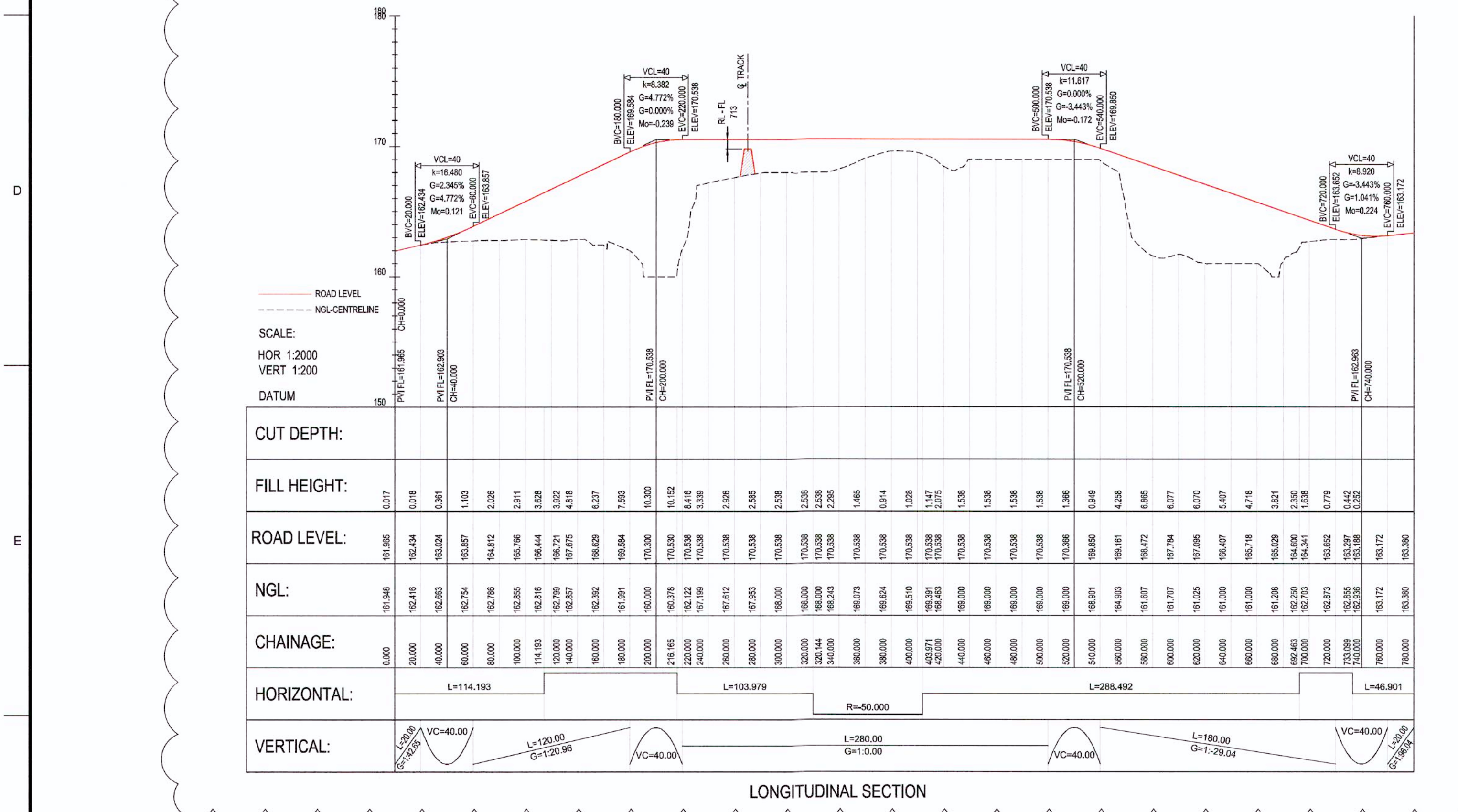
| ROLE | NAME | SIGNATURE | DATE |
|-----------------|---------------|-------------|------------|
| DRAFTSPERSON | A VAN NIEKERK | [Signature] | 2018/02/27 |
| DESIGNER | A VAN NIEKERK | [Signature] | 2018/02/27 |
| CHECKER | G JOHNSTONE | [Signature] | |
| DESIGN COORD. | G JOHNSTONE | [Signature] | |
| RESP. ENG. | D STANGER | [Signature] | |
| LEAD DISC. ENG. | F VAN BILJON | [Signature] | |
| AREA LEAD | F VAN BILJON | [Signature] | |
| AREA MANAGER | D STANGER | [Signature] | |
| PITMAN | F PITTMANN | [Signature] | 2018-11-16 |

| SCALE | DWG No. | REV |
|------------------------|---------------------------------|-----|
| 1:1,000 OR AS NOTED | H353004-30000-224-271-0037-0001 | 1 |



- GENERAL NOTES:**
- LIDAR SURVEY PROVIDED BY PHOTSAF (2016)
 - CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
 - CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 1m.
 - ALL DIMENSIONS SHOWN ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
 - TIMBER CROSSING INSERTS SHALL BE 178mm HIGH AND 223mm WIDE. INSERTS ARE TO BE FASTENED TO TIMBER TIES USING 305mm LONG LAG SCREWS. A MINIMUM DISTANCE OF 75mm SHALL BE MAINTAINED ON GAUGE SIDE THE RAIL HEAD AND THE NEAREST CROSSING INSERT.
 - THIS DRAWING WAS PREVIOUSLY ISSUED AS: H353004-0000-224-272-0036-0001
 - ALL CHANGES INDICATED FOR TOTE ROAD ARE LOCAL CHANGES.

| CO-ORDINATE LIST UTM (NAD83) ZONE 17 | | |
|--------------------------------------|------------|-------------|
| | E | N |
| PI 1 START | 550783.942 | 7917588.156 |
| BCC CURVE A | 550831.601 | 7917496.164 |
| PI 2 CURVE A | 550968.695 | 7917448.449 |
| ECC CURVE A | 550831.299 | 7917400.957 |
| LEVEL CROSSING | 550789.040 | 7917357.673 |
| BCC CURVE B | 550789.161 | 7917317.587 |
| PI 3 CURVE B | 550735.942 | 7917273.016 |
| ECC CURVE B | 550783.770 | 7917244.887 |
| BCC CURVE C | 551051.986 | 7917097.962 |
| PI CURVE C | 551048.712 | 7917087.162 |
| ECC CURVE C | 551081.244 | 7917070.511 |
| PI 5 END | 551089.454 | 7917032.695 |



| DRAWING No. | DRAWING TITLE |
|----------------------------|-------------------------------------------|
| H353004-30000-224-294-0007 | ROAD SIGNAGE DETAIL |
| H353004-30000-224-294-0010 | TYPICAL HAUL ROAD CROSS SECTION |
| H353004-30000-224-294-0009 | TYPICAL LEVEL CROSSING LAYOUT |
| H353004-30000-224-273-0026 | CROSS SECTIONS CH. 0.000m TO CH. 780.000m |

APPROVED FOR CONSTRUCTION

REG. PROFESSIONAL: [Signature]

1 ROAD ALIGNMENT ALTERED TO SUIT CHANGED RAIL ALIGNMENT. AJVN 2018/11/15

2 APPROVED FOR CONSTRUCTION. AJVN 2018/04/08

REVISIONS:

| No. | DESCRIPTION | BY | CHKD | DATE |
|-----|--------------------------------------------------------|------|------|------------|
| 1 | ROAD ALIGNMENT ALTERED TO SUIT CHANGED RAIL ALIGNMENT. | AJVN | | 2018/11/15 |
| 2 | APPROVED FOR CONSTRUCTION. | AJVN | | 2018/04/08 |

DRAFTSPERSON: A VAN NIEKERK NR 2018/02/13
 DESIGNER: A VAN NIEKERK NR 2018/02/13
 CHECKER: G JOHNSTONE
 DESIGN COORD.: G JOHNSTONE
 RESP. ENG.: D STANGER
 LEAD DISC. ENG.: F VAN BILJON
 AREA LEAD: F VAN BILJON
 ENG. MANAGER: D STANGER
 AREA MANAGER: F PITTMAN

HATCH

Baffinland

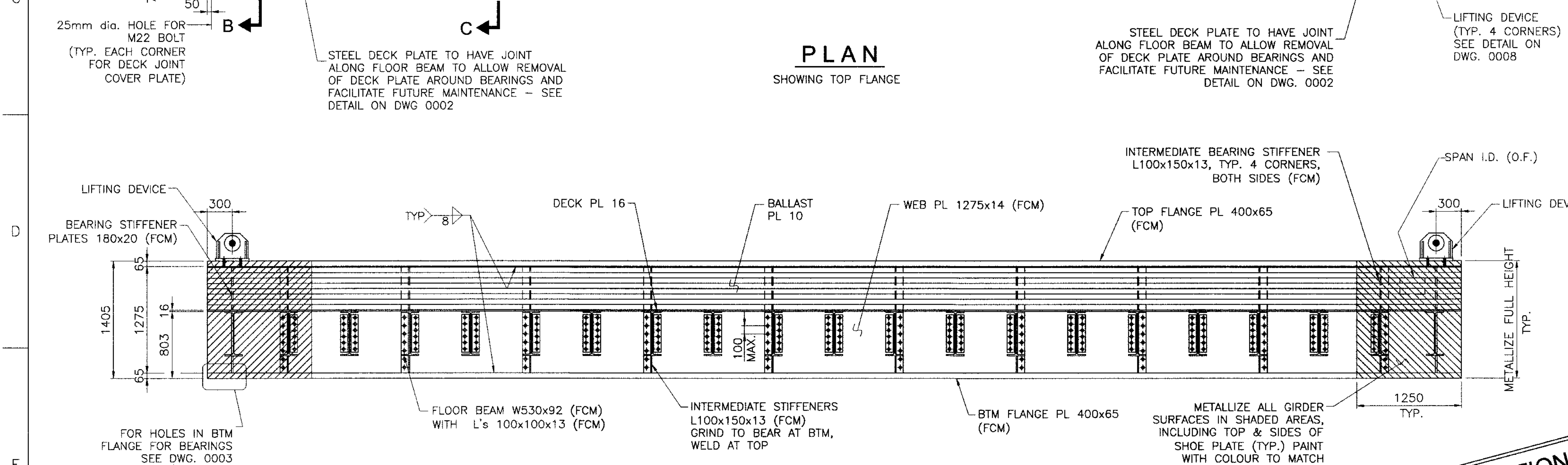
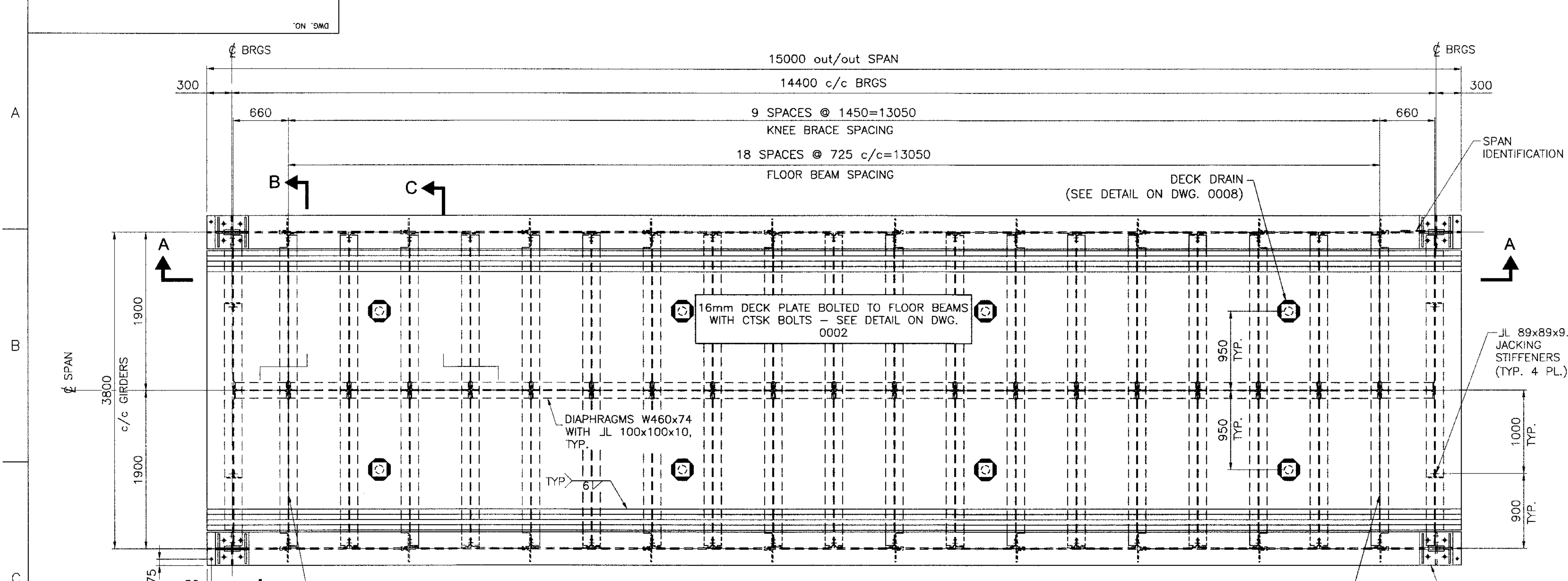
BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

TOTE ROAD
LAYOUT AND LONGITUDINAL SECTION
GRADE CROSSING AT CH. 96+177

SCALE: 1:1,000
DWG. No.: H353004-30000-224-271-0038-0001
REV: 1

PERMIT TO PRACTICE: HATCH LTD.
 Signature: [Signature]
 Date: Nov 16th, 2018
 PERMIT NUMBER: P 512
 The Association of Professional Engineers, Geologists and Geophysicists of NEWFOUNDLAND

RAILWAY BRIDGE DESIGN



- NOTES:**
- DESIGN AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH AREMA (LATEST EDITION) CHAPTER 15.
 - MATERIAL SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
 1. STRUCTURAL STEEL:
 - FRACTURE CRITICAL MEMBERS:
 - CSA G40.21 GRADE 350AT CATEGORY 4, FOR MAIN PLATE GIRDER WEBS AND FLANGES, BEARING STIFFENERS, INTERMEDIATE STIFFENERS, FLOOR BEAMS AND JACKING BEAMS (MADE FROM STEEL PLATE OR ROLLED SECTIONS), BEARING STIFFENERS AND CONNECTIONS BETWEEN FLOOR BEAMS AND MAIN GIRDERS.
 - THE IMPACT TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH AREMA CHAPTER 15 TABLE 15-1-14 ZONE 3 REQUIREMENTS FOR ASTM A709M GRADE 345 STRUCTURAL STEEL.
 - PRIMARY NON FRACTURE CRITICAL MEMBERS:
 - CSA G40.21 GRADE 350AT CATEGORY 3, FOR FLOORBEAM DIAPHRAGMS, KNEE BRACES, JACKING STIFFENERS, WALKWAY COMPONENTS (BRACKETS, ETC.) AND CONNECTIONS BETWEEN NON FRACTURE CRITICAL MEMBERS.
 - CHARPY V-NOTCH TEST REQUIREMENTS SHALL BE MADE USING THE APPROPRIATE DESIGN / SERVICE TEMPERATURE FOR THE SITE ENVIRONMENTAL CONDITIONS.
 - MISCELLANEOUS STEEL:
 - CSA G40.21 GRADE 350A, FOR DECK PLATES, BALLAST TROUGH PLATE, DECK DRAINS, DECK CLOSURE PLATES, LIFTING BRACKETS AND BEARING PLATES
 - 2. WELDING: CSA CAN3-W59-13.
 - 3. METALLIZING: CSA G189-1966 (R2003).
 - 4. GALVANIZING: CSA G164-M92 (R2003).
 - 5. H.S. BOLTS: ASTM A325, M22 (UNLESS NOTED OTHERWISE), TYPE 3 OR EQUIVALENT.
- ALL HOLES SHALL BE DRILLED.
- ALL HS BOLTS SHALL BE TIGHTENED BY THE TURN-OF-NUT METHOD.
- BOTTOM FLANGES OF TPG SPAN OVER BEARINGS SHALL BE TRUE AND SQUARE. MAXIMUM MEASURED DEVIATION AT OUTSIDE EDGE OF BEARING PLATES SHALL NOT EXCEED 1MM.
- DEVIATION FROM CAMBER (OR STRAIGHTNESS) OF MAIN GIRDERS SHALL NOT EXCEED 6MM.
- DIFFERENCE BETWEEN DEVIATIONS FROM CAMBER (OR STRAIGHTNESS) OF ADJACENT GIRDERS SHALL NOT EXCEED 6MM.
- DEVIATION RESULTING IN NEGATIVE CAMBER SHALL NOT BE PERMITTED.
- NO CAMBER REQUIRED.
- SPAN SHALL BE SHIPPED ENTIRELY SHOP ASSEMBLED.
- ZINC METALLIZING SHALL NOT BE LESS THAN 0.25MM.
- ALL NON-SLIDING SURFACES OF BEARING PLATES SHALL BE ZINC METALLIZED AS PER C.S.A. SPEC G189-1966 (R2003).
- LEGEND:**
- O.F. = OUTSIDE FACE

NOT FOR CONSTRUCTION
2018/12/05

| DRAWING NO. | DRAWING TITLE |
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| 1 | REFERENCE DRAWINGS |
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| REV. | ISSUE FOR | AUTH. BY | DATE |
|------|------------------|----------|------------|
| B | REVISED FOR BID | | DEC. 05/18 |
| A | APPROVED FOR BID | | NOV. 13/18 |

| HATCH | |
|------------------------------------------------------|-------------------------------------------------|
| DESIGNED BY A MIDDLETON DATE DEC. 05/18 | DRAWN BY J ESTRADA DATE DEC. 05/18 |
| CHECKED BY A MIDDLETON DATE DEC. 05/18 | DISCIP. ENGR. A MIDDLETON DATE DEC. 05/18 |
| PROJ. DES. COORD. F VAN BILJON DATE DEC. 05/18 | PROJ. ENGR. F VAN BILJON DATE DEC. 05/18 |
| AREA MANAGER F PITTMAN DATE DEC. 05/18 | |

Baffinland

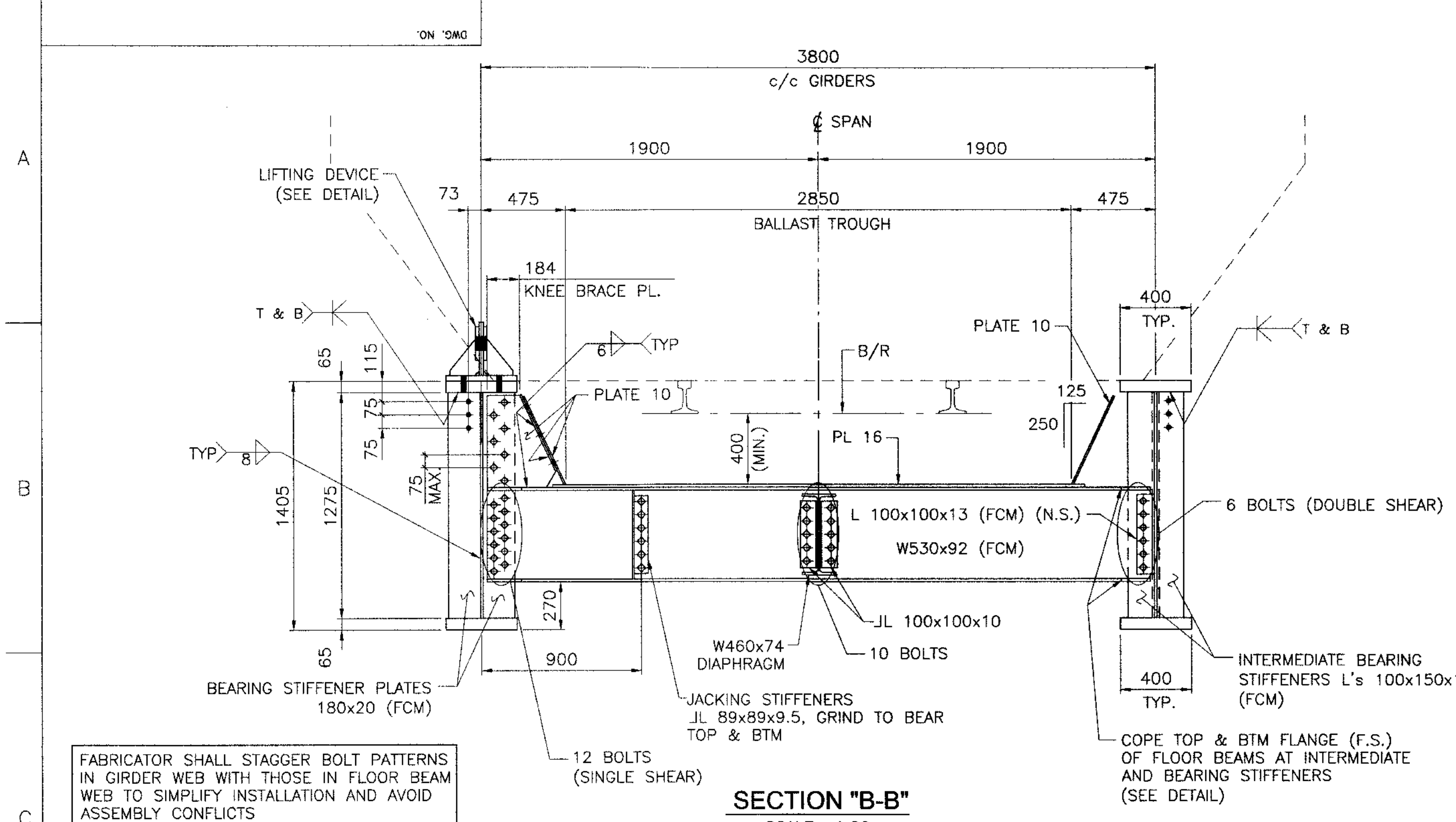
BAFFINLAND EXPANSION 12 MTPA MINE OPTION
PRE FEASIBILITY STUDY

RAILWAY
T.P.G. SPAN - 14,500 c/c
PLAN AND ELEVATION

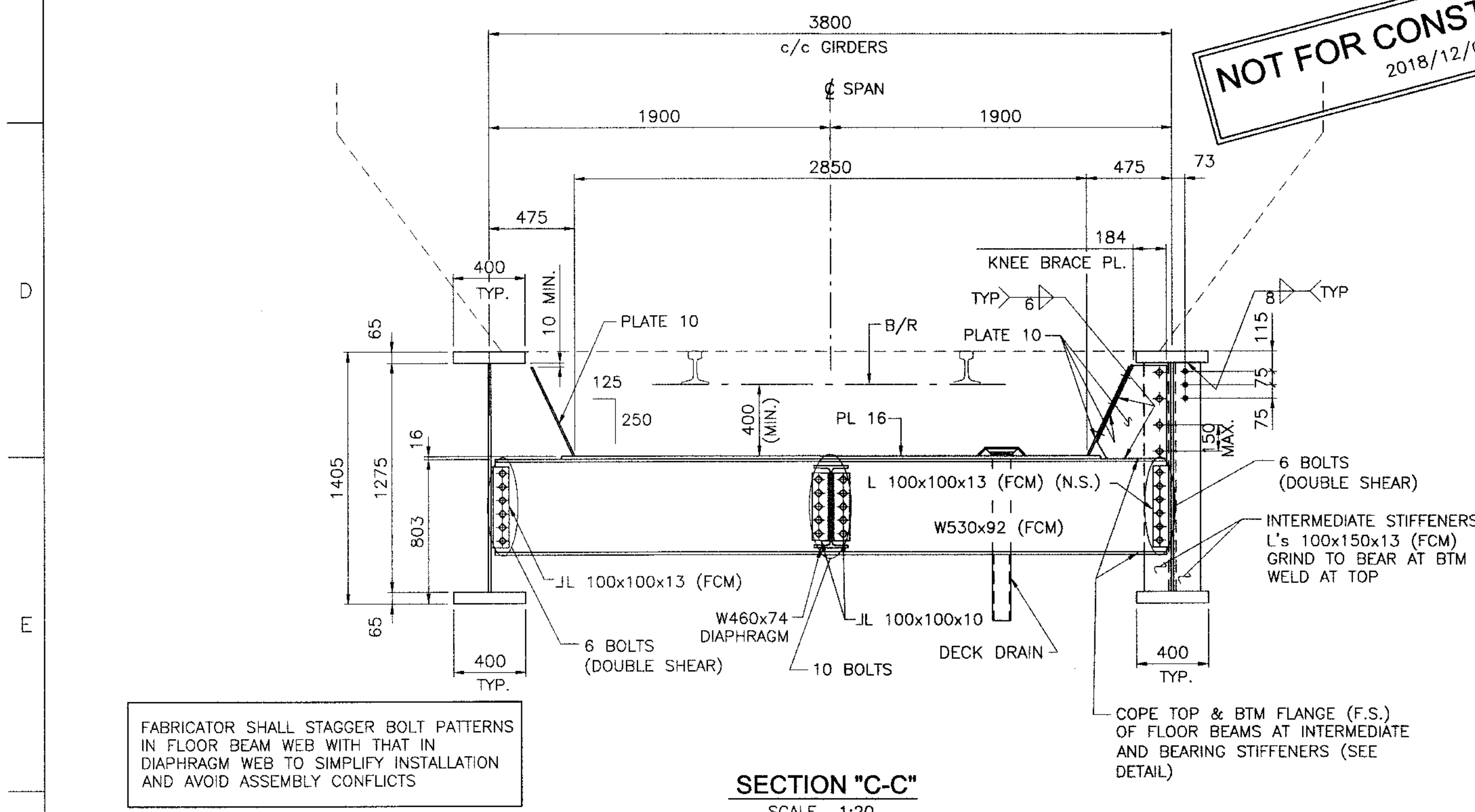
SCALE: 1:30
DWG. NO.: H353004-35000-232-260-0001-0001
REV. B

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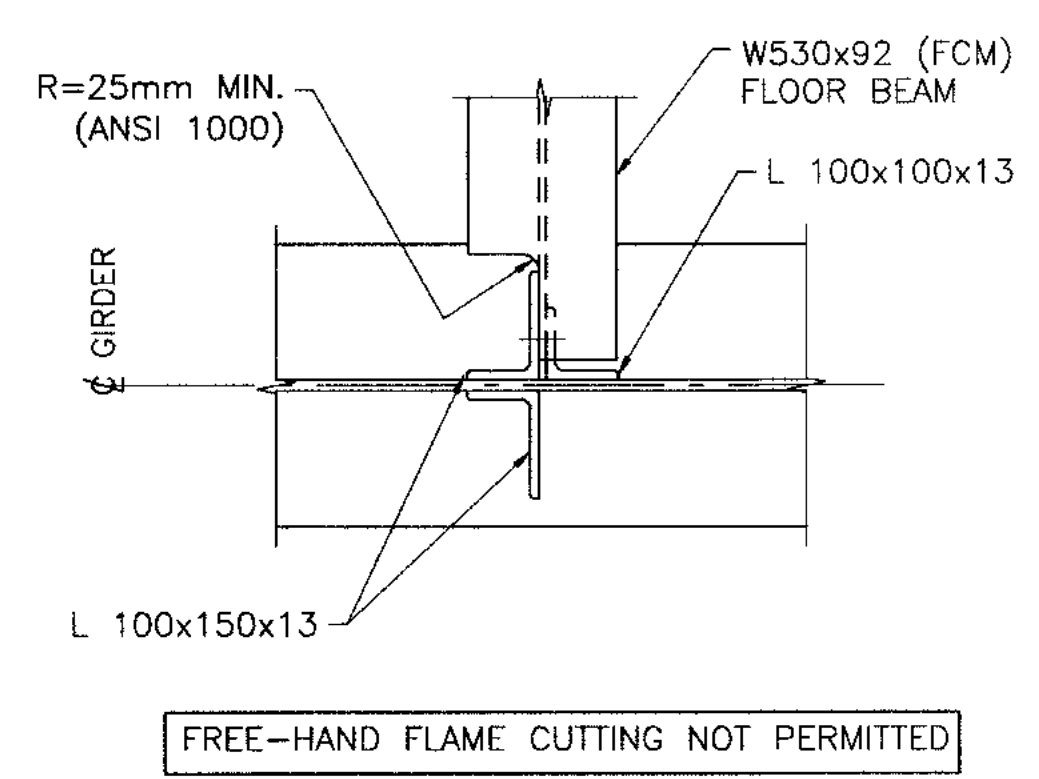
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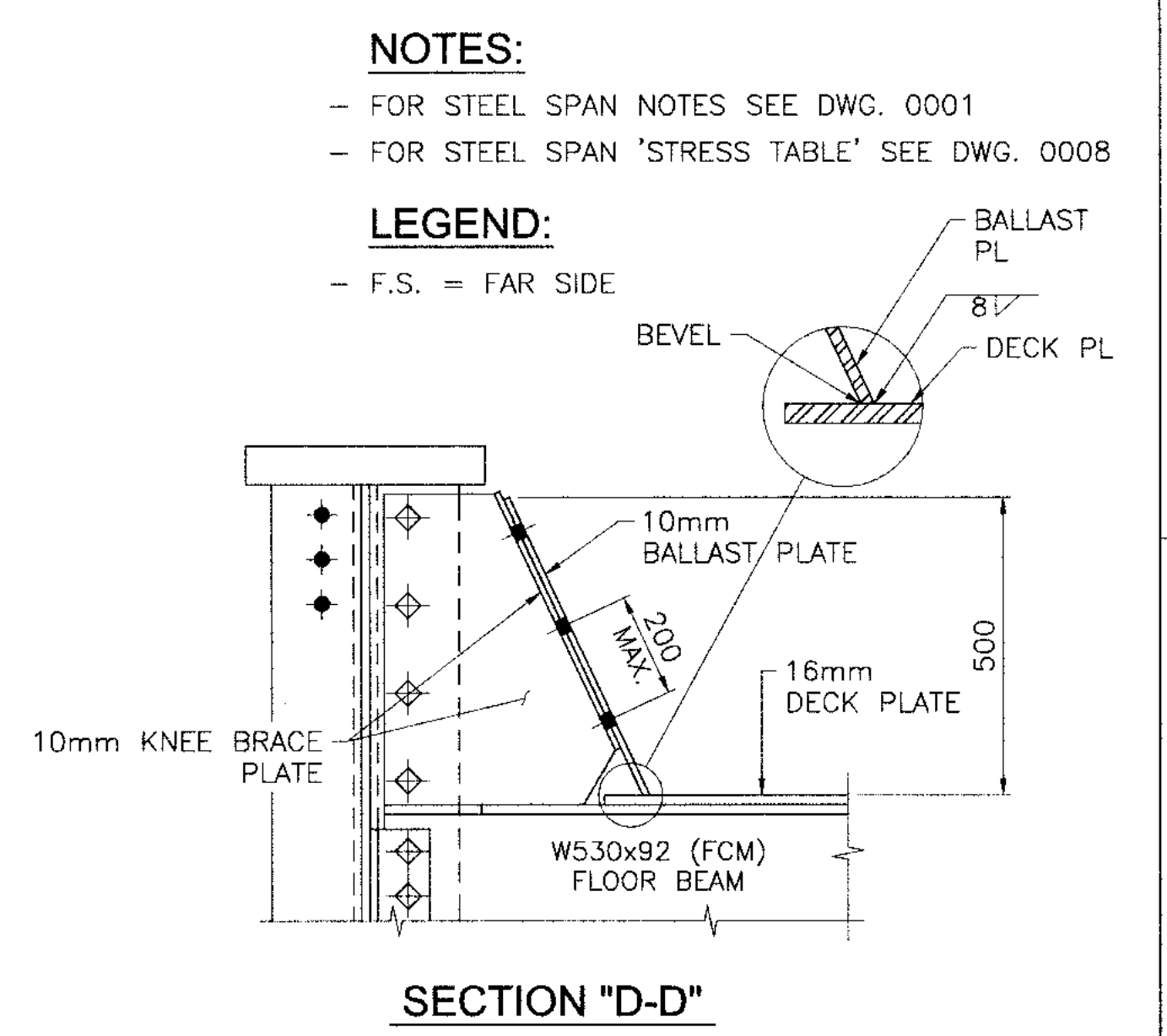
FABRICATOR SHALL STAGGER BOLT PATTERNS IN GIRDER WEB WITH THOSE IN FLOOR BEAM WEB TO SIMPLIFY INSTALLATION AND AVOID ASSEMBLY CONFLICTS



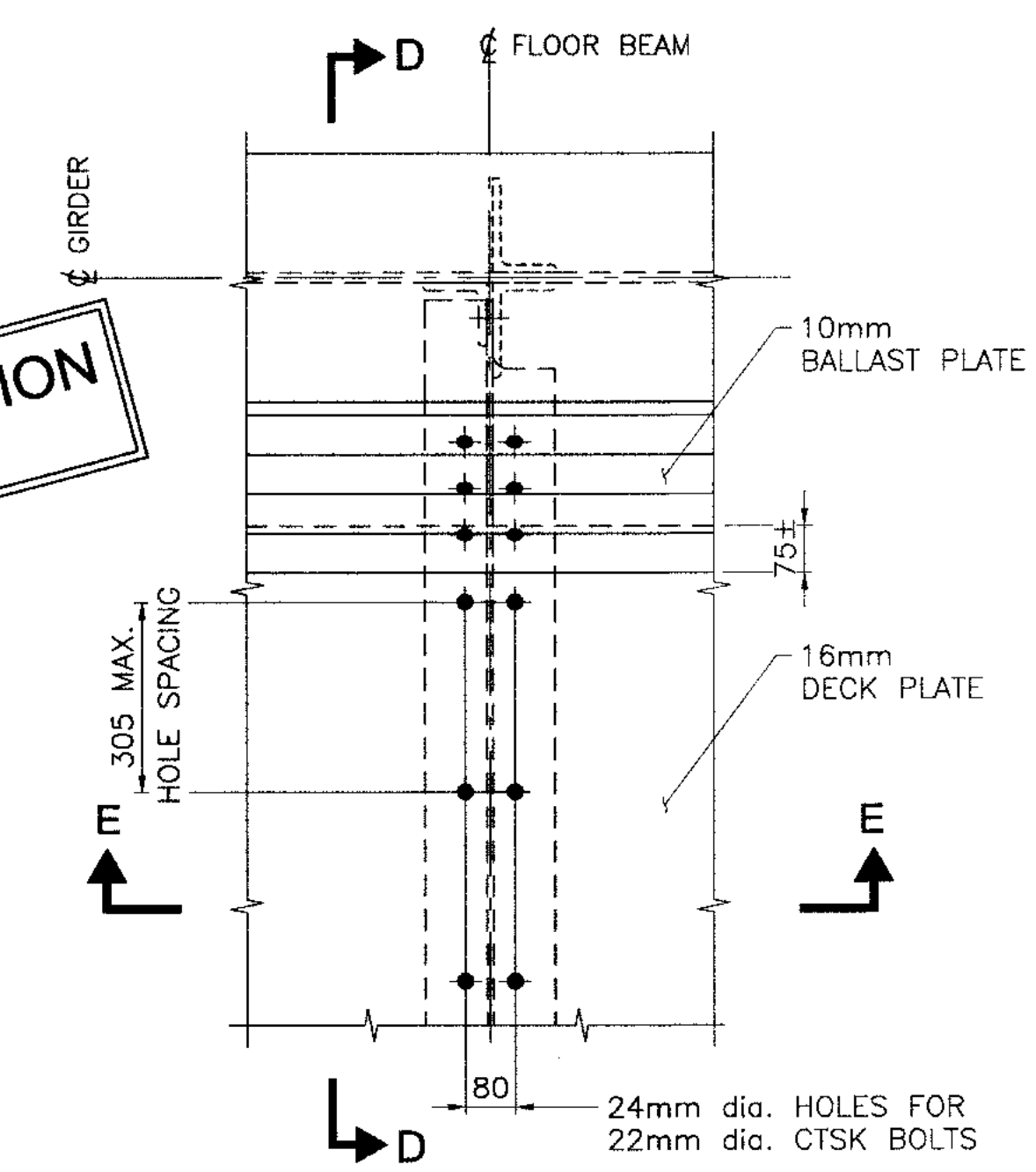
FABRICATOR SHALL STAGGER BOLT PATTERNS IN FLOOR BEAM WEB WITH THAT IN DIAPHRAGM WEB TO SIMPLIFY INSTALLATION AND AVOID ASSEMBLY CONFLICTS



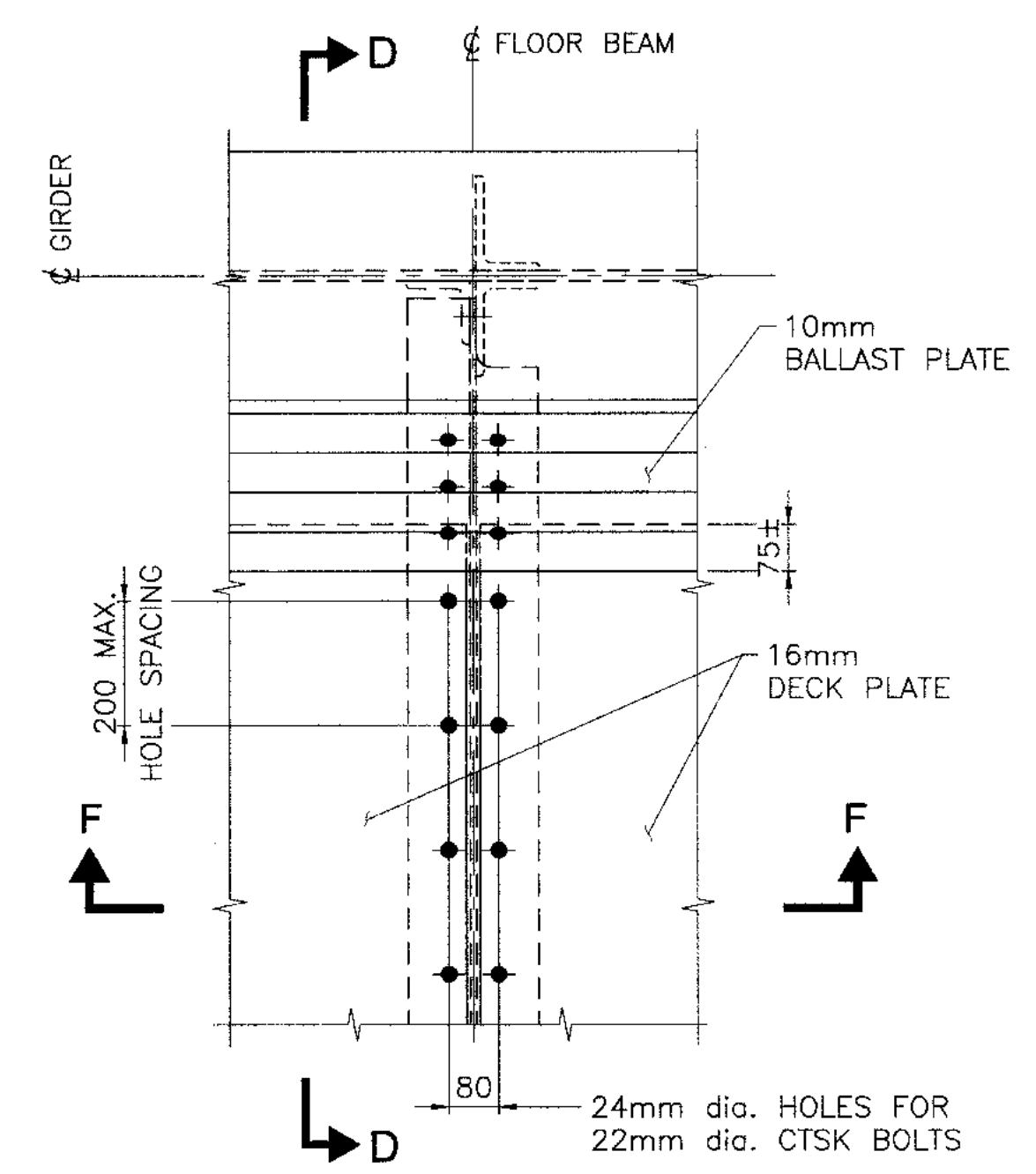
COPING DETAIL - FLOOR BEAMS



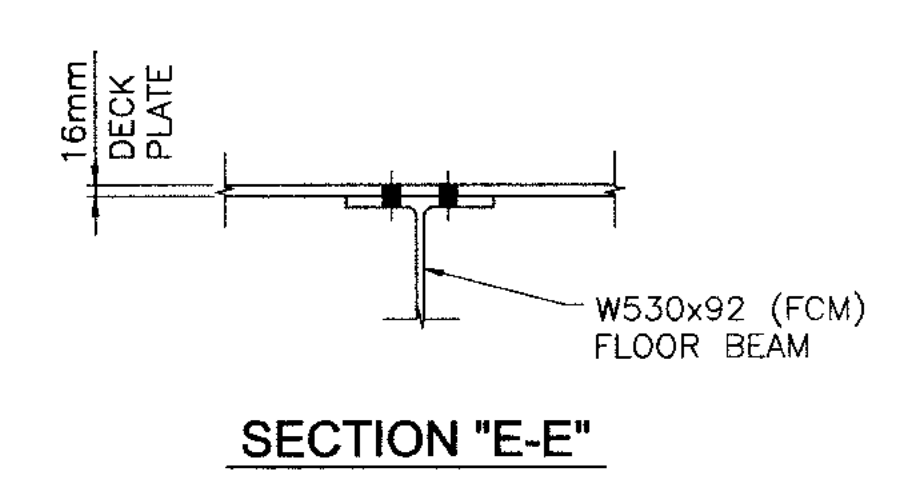
SECTION "D-D"



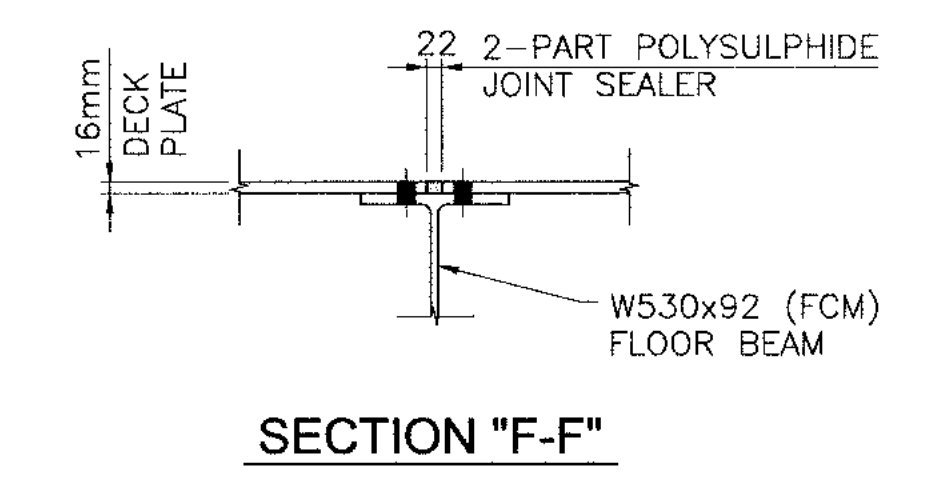
BOLTING DETAILS - DECK PLATE



JOINT DETAILS - DECK PLATE



SECTION "E-E"



SECTION "F-F"

NOT FOR CONSTRUCTION
2018/12/05

| DRAWING NO. | DRAWING TITLE |
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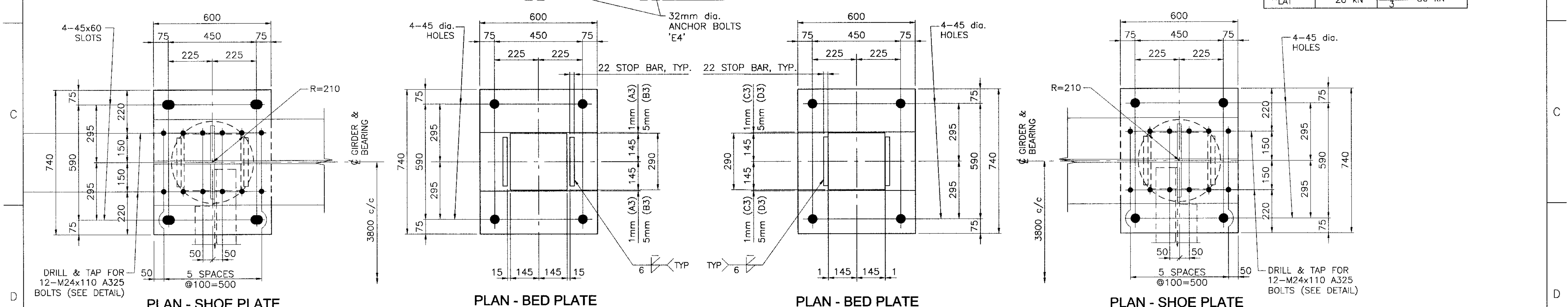
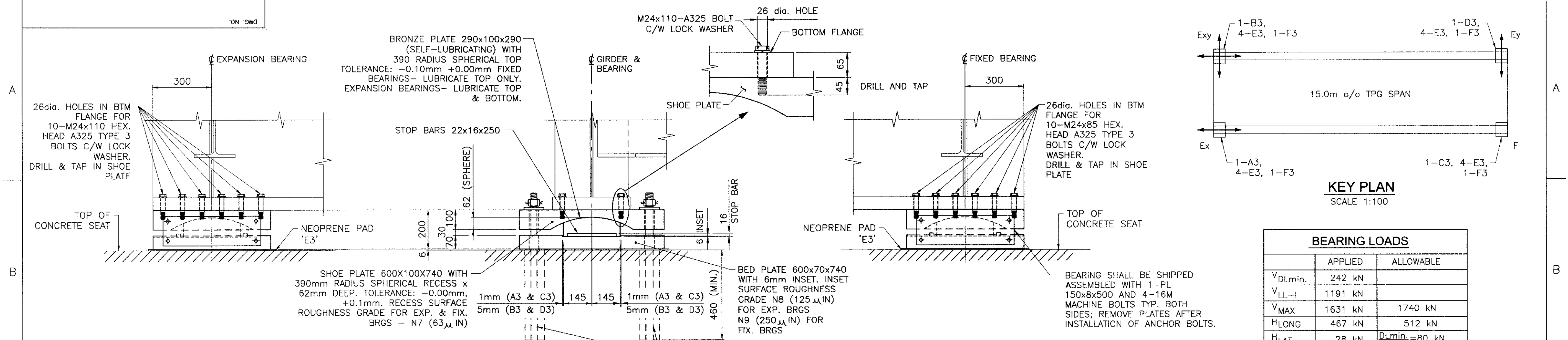
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| REV. | ISSUE FOR | DATE | AREA MANAGER |
|------|------------------|------------|--------------|
| B | REVISED FOR BID | DEC. 05/18 | |
| A | APPROVED FOR BID | NOV. 13/18 | |

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|------------------------------------------------------|------------------------------------------------|
| HATCH | |
| DESIGNED BY A MIDDLETON DATE DEC. 05/18 | DRAWN BY J ESTRADA DATE DEC. 05/18 |
| CHECKED BY A MIDDLETON DATE DEC. 05/18 | PROJ. ENGR. F VAN BILJON DATE DEC. 05/18 |
| PROJ. DES. COORD. F VAN BILJON DATE DEC. 05/18 | PROJ. ENGR. F VAN BILJON DATE DEC. 05/18 |
| DATE DEC. 05/18 | |

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|-------------------------------------------------------------------|---------------------------------------------|
| Baffinland | |
| BAFFINLAND EXPANSION 12 MTPA MINE OPTION PRE FEASIBILITY STUDY | |
| RAILWAY T.P.G. SPAN - 14.500 c/c SECTIONS AND DETAILS | |
| SCALE 1:10 OR AS NOTED | DWG. NO. H353004-35000-232-260-0001-0002 |
| REV. B | DATE DEC. 05/18 |

5 TIMES
DATE \$ FILES

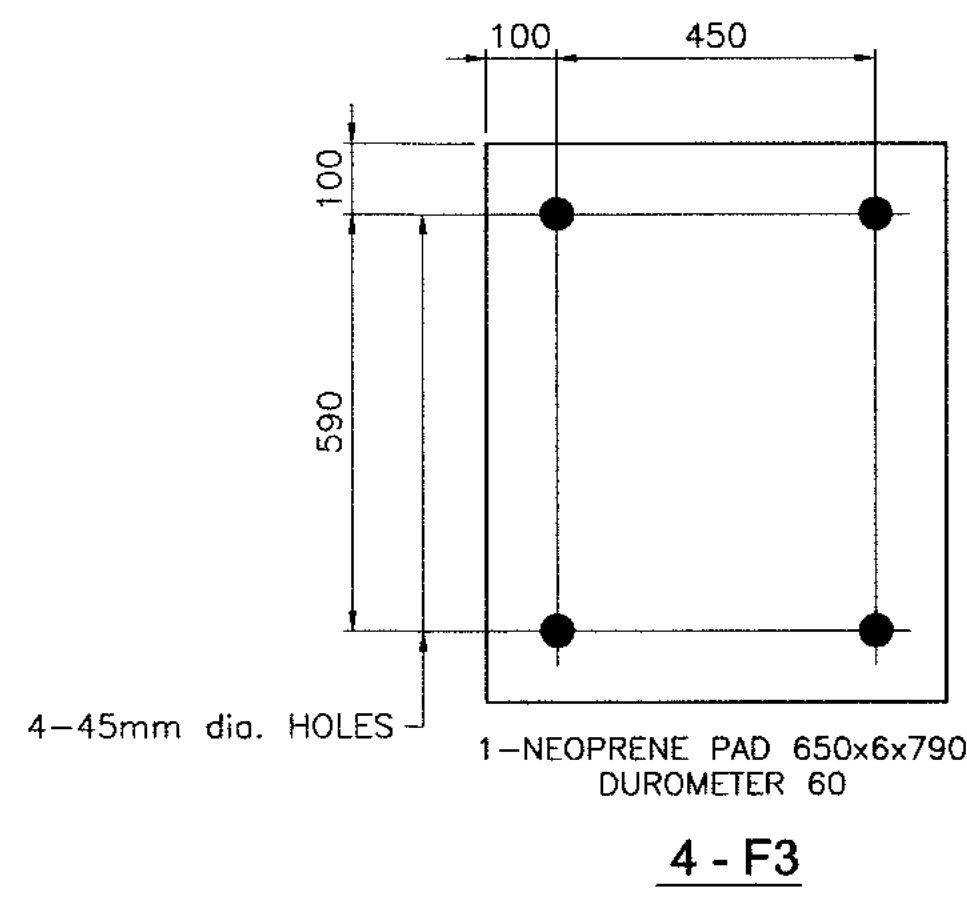
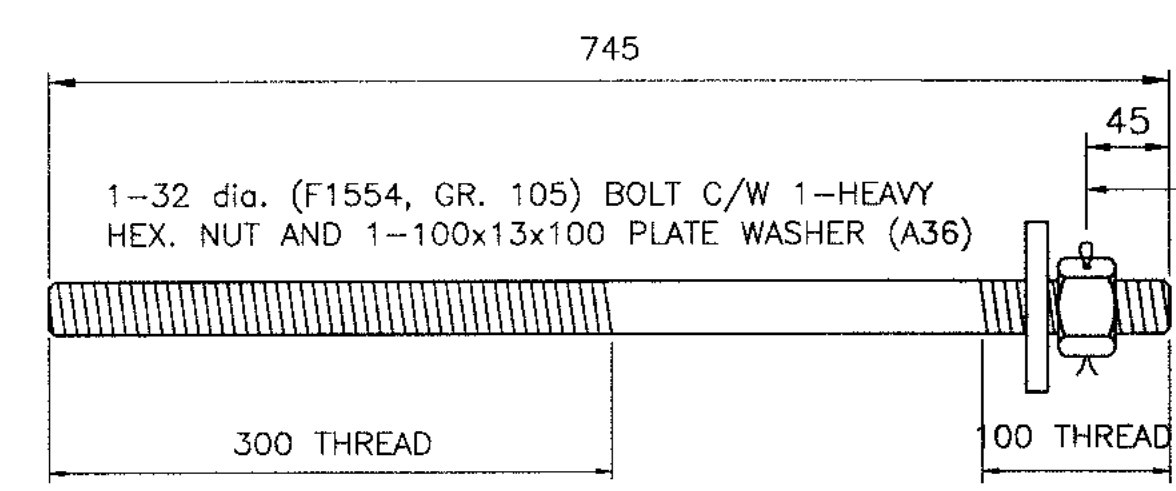


ONE - EXPANSION BEARING 'A3'
ONE - EXPANSION BEARING 'B3'

UNIT WT: 671 Kg

ONE - FIXED BEARING 'C3'
ONE - FIXED BEARING 'D3'

UNIT WT: 671 Kg



NOT FOR CONSTRUCTION
2018/12/05

SPECIFICATIONS:

- BRONZE PLATES: A.S.T.M. B22-82, COPPER ALLOY UNS No. C86300
- ALL NON-SLIDING SURFACES OF BEARINGS SHALL BE ZINC-METALLIZED IN ACCORDANCE WITH C.S.A. G189. ZINC COATING SHALL NOT BE LESS THAN 0.25mm.

ESTIMATED QUANTITIES: (ON THIS DRAWING)

- STRUCTURAL STEEL IN BEARINGS _____ 2,415 Kg
- BRONZE PLATES IN BEARINGS _____ 268 Kg
- ANCHOR BOLTS _____ 16 ea. 96 Kg.

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| DRAWING NO. | | DRAWING TITLE | | NO. | | DESCRIPTION | | BY | | CHK'D | | APP'D | | DATE | |
| 1 | | REFERENCE DRAWINGS | | 4 | | REVISIONS | | | | | | | | | |

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HATCH

DESIGNED BY
A MIDDLETON
DATE DEC. 05/18

CHECKED BY
A MIDDLETON
DATE DEC. 05/18

PROJ. DES. COORD.
F VAN BILJOY
DATE DEC. 05/18

DRAWN BY
J ESTRADA
DATE DEC. 05/18

DISCIP. ENGR.
A MIDDLETON
DATE DEC. 05/18

PROJ. ENGR.
F VAN BILJOY
DATE DEC. 05/18

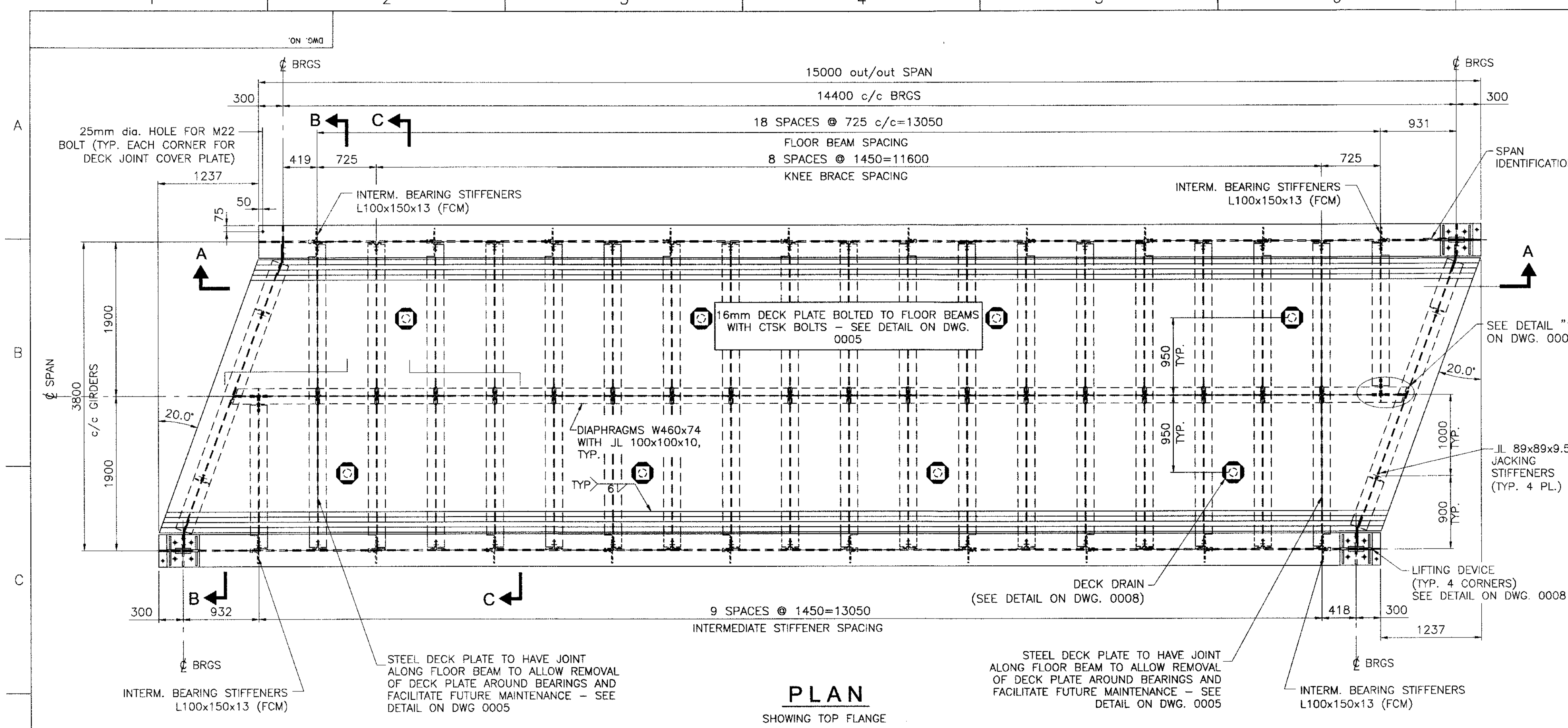
AREA MANAGER
F PITTMAN
DATE DEC. 05/18

Baffinland

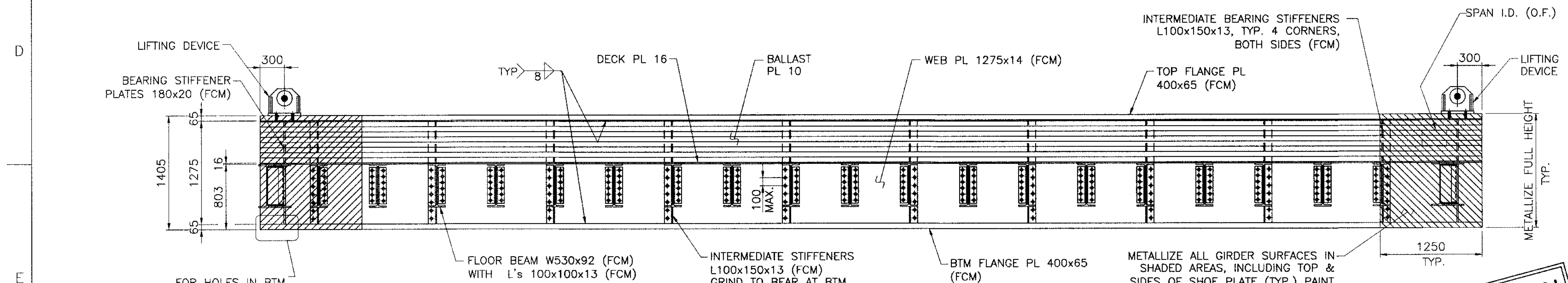
BAFFINLAND EXPANSION 12 MTPA MINE OPTION
PRE FEASIBILITY STUDY

RAILWAY
T.P.G. SPAN - 14.400 c/c
BEARINGS (SQUARED ENDS)

SCALE 1:20
DWG. NO. H353004-35000-232-260-0001-0003
OR AS NOTED
ORIGINAL SHEET SIZE: ISO A1 (841 x 594)



PLAN
SHOWING TOP FLANGE



SECTION "A-A"

- NOTES:**
- DESIGN AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH AREMA (LATEST EDITION) CHAPTER 15.
 - MATERIAL SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS;
 - 1. STRUCTURAL STEEL:
 - FRACTURE CRITICAL MEMBERS:
 - CSA G40.21 GRADE 350AT CATEGORY 4, FOR MAIN PLATE GIRDER WEBS AND FLANGES, BEARING STIFFENERS, INTERMEDIATE STIFFENERS, FLOOR BEAMS AND JACKING BEAMS (MADE FROM STEEL PLATE OR ROLLED SECTIONS), BEARING STIFFENERS AND CONNECTIONS BETWEEN FLOOR BEAMS AND MAIN GIRDERS.
 - THE IMPACT TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH AREMA CHAPTER 15 TABLE 15-1-14 ZONE 3 REQUIREMENTS FOR ASTM A709M GRADE 345 STRUCTURAL STEEL.
 - PRIMARY NON FRACTURE CRITICAL MEMBERS:
 - CSA G40.21 GRADE 350AT CATEGORY 3, FOR FLOORBEAM DIAPHRAGMS, KNEE BRACES, JACKING STIFFENERS, WALKWAY COMPONENTS (BRACKETS, ETC.) AND CONNECTIONS BETWEEN NON FRACTURE CRITICAL MEMBERS.
 - CHARPY V-NOTCH TEST REQUIREMENTS SHALL BE MADE USING THE APPROPRIATE DESIGN / SERVICE TEMPERATURE FOR THE SITE ENVIRONMENTAL CONDITIONS.
 - MISCELLANEOUS STEEL:
 - CSA G40.21 GRADE 350A, FOR DECK PLATES, BALLAST TROUGH PLATE, DECK DRAINS, DECK CLOSURE PLATES, LIFTING BRACKETS AND BEARING PLATES
 - 2. WELDING: CSA CAN3-W59-13.
 - 3. METALLIZING: CSA G189-1966 (R2003).
 - 4. GALVANIZING: CSA G164-M92 (R2003).
 - 5. H.S. BOLTS: ASTM A325, M22 (UNLESS NOTED OTHERWISE), TYPE 3 OR EQUIVALENT.

- ALL HOLES SHALL BE DRILLED.
- ALL HS BOLTS SHALL BE TIGHTENED BY THE TURN-OF-NUT METHOD.
- BOTTOM FLANGES OF TPG SPAN OVER BEARINGS SHALL BE TRUE AND SQUARE. MAXIMUM MEASURED DEVIATION AT OUTSIDE EDGE OF BEARING PLATES SHALL NOT EXCEED 1MM.
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- DEVIATION RESULTING IN NEGATIVE CAMBER SHALL NOT BE PERMITTED.
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LEGEND:
- O.F. = OUTSIDE FACE

NOT FOR CONSTRUCTION
2018/12/05

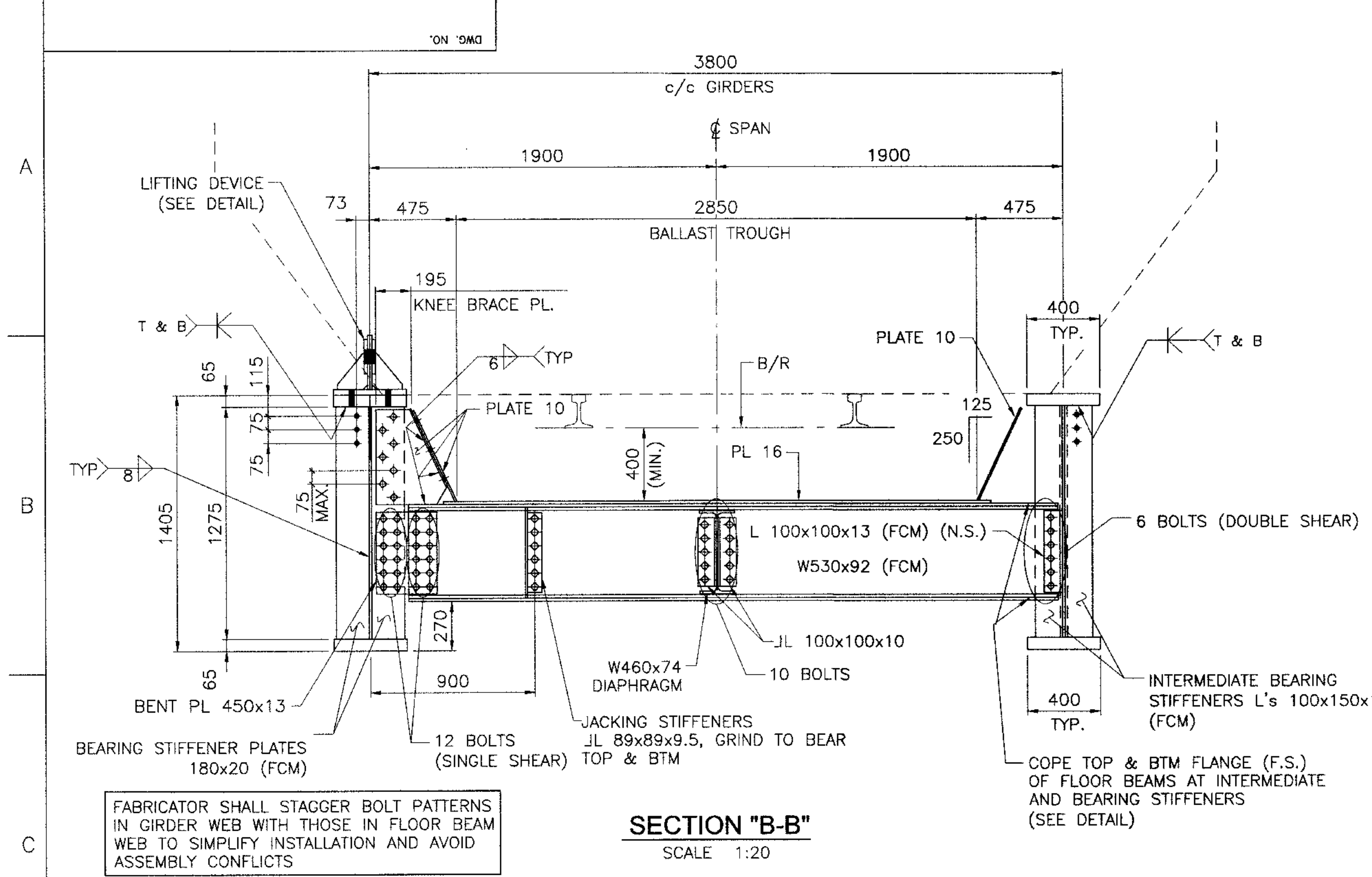
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| 1 | | REFERENCE DRAWINGS | | 4 | | REVISIONS | | | | | |

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| HATCH | |
| DESIGNED BY A MIDDLETON DATE DEC. 05/18 | DRAWN BY J ESTRADA DATE DEC. 05/18 |
| CHECKED BY A MIDDLETON DATE DEC. 05/18 | DISCIP. ENGR. A MIDDLETON DATE DEC. 05/18 |
| PROJ. DES. COORD. F VAN BILJON DATE DEC. 05/18 | PROJ. ENGR. F VAN BILJON DATE DEC. 05/18 |
| AREA MANAGER F PITTMAN DATE DEC. 05/18 | |

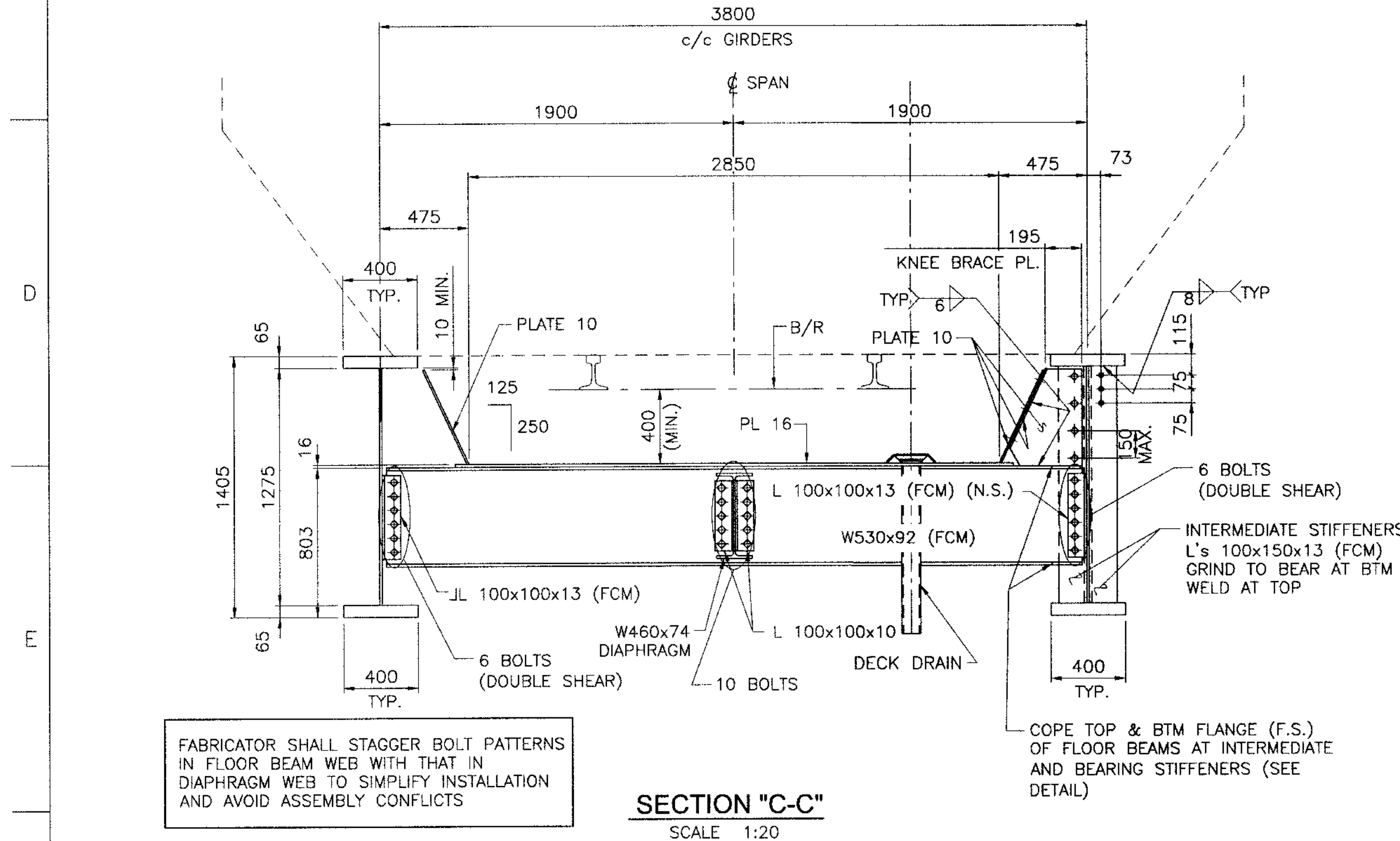
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|-------------------------------------------------------------------|---------------------------------------------|
| Baffinland | |
| BAFFINLAND EXPANSION 12 MTPA MINE OPTION PRE FEASIBILITY STUDY | |
| RAILWAY SKEWED T.P.G. SPAN - 14.400m c/c PLAN AND ELEVATION | |
| SCALE 1:30 | DWG. NO. H353004-35000-232-260-0001-0004 |
| REV. B | DATE DEC. 05/18 |

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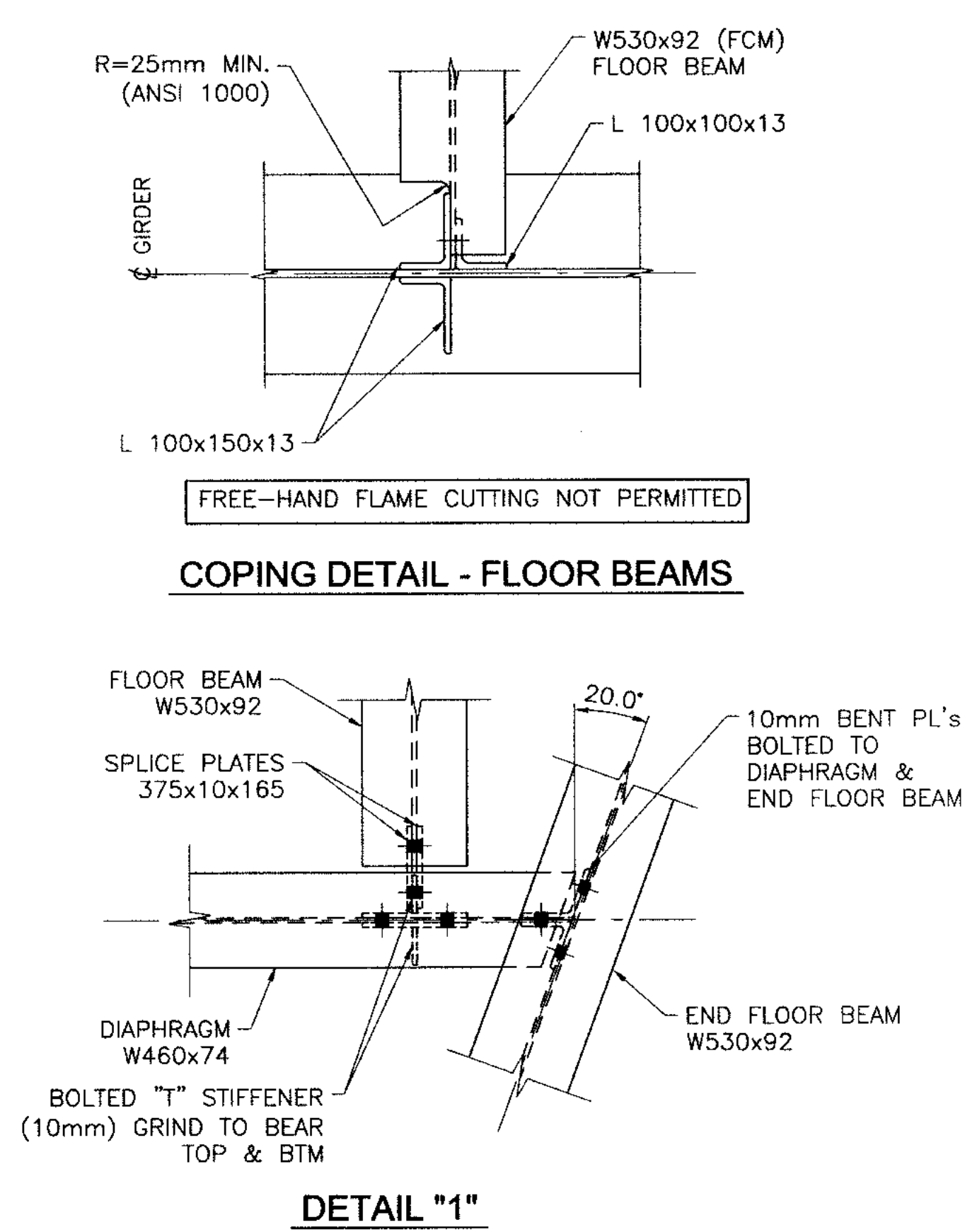
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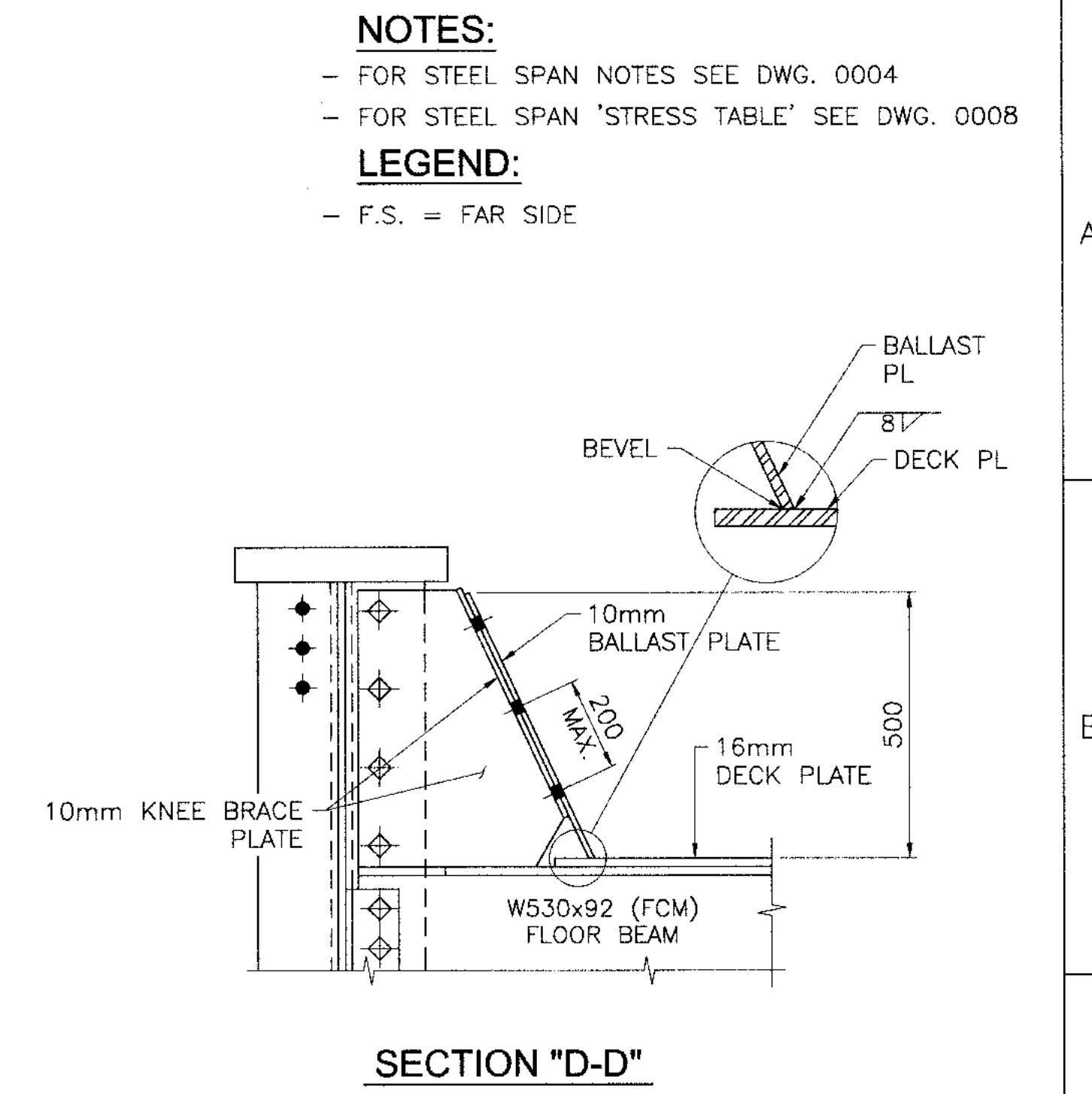
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SCALE 1:20



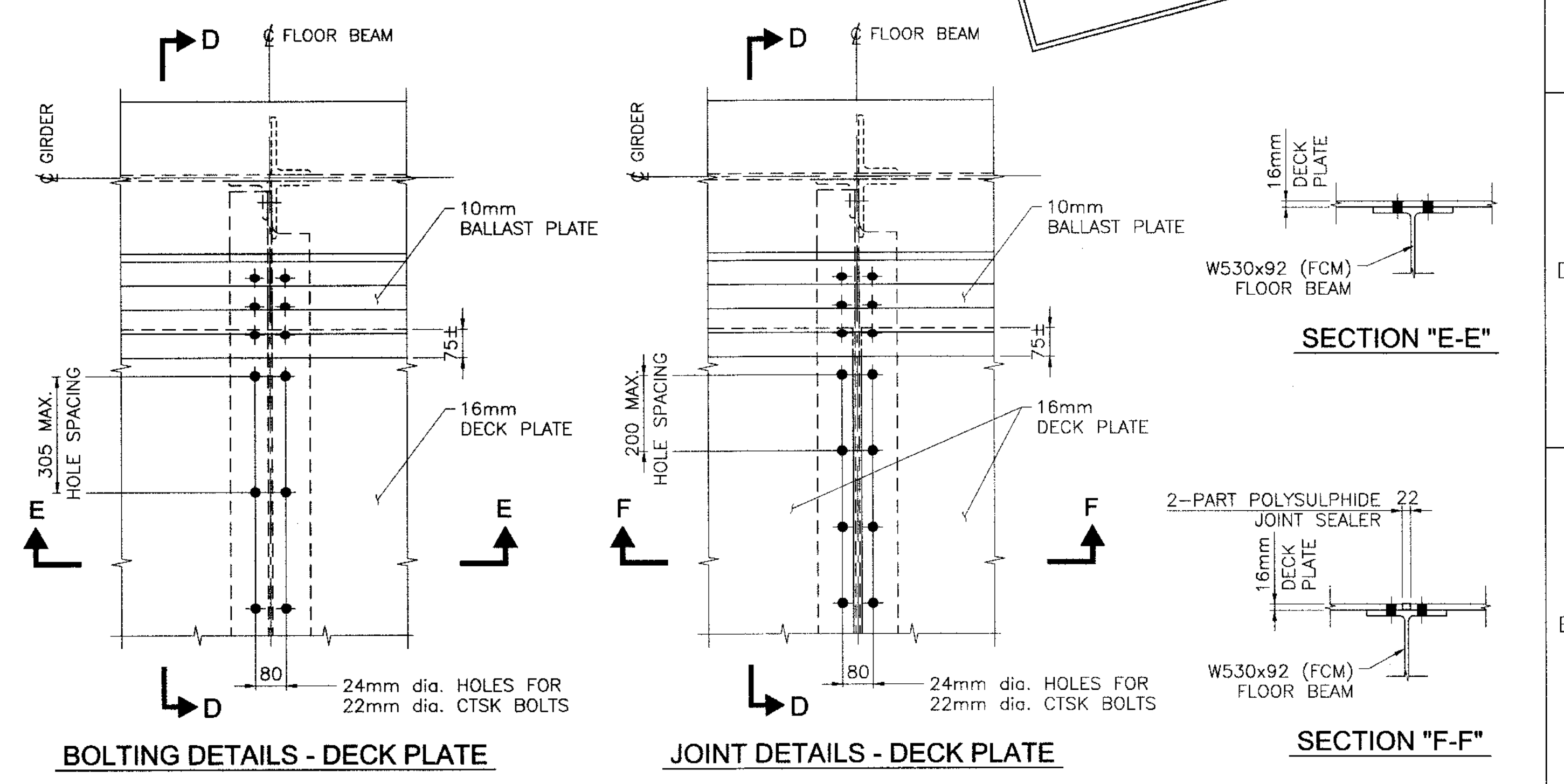
SECTION "C-C"
SCALE 1:20



DETAIL "1"



NOT FOR CONSTRUCTION
2018/12/05



BOLTING DETAILS - DECK PLATE

JOINT DETAILS - DECK PLATE

SECTION "E-E"

SECTION "F-F"

| DRAWING NO. | DRAWING TITLE |
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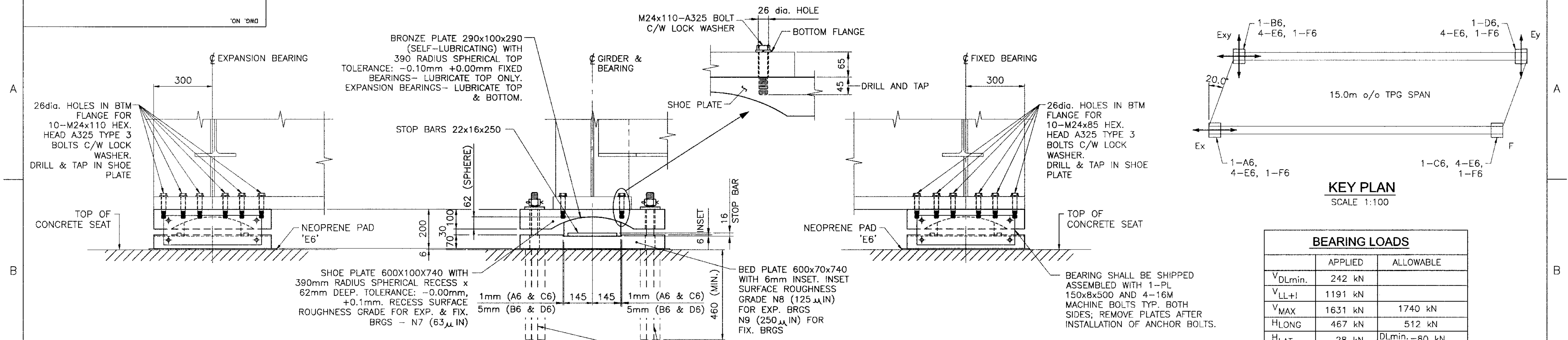
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| REV. | ISSUE FOR | DATE | AREA MANAGER |
|------|------------------|------------|--------------|
| B | REVISED FOR BID | DEC. 05/18 | |
| A | APPROVED FOR BID | NOV. 13/18 | |

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|------------------------------------------------------|-------------------------------------------------|
| HATCH | |
| DESIGNED BY A MIDDLETON DATE DEC. 05/18 | DRAWN BY J ESTRADA DATE DEC. 05/18 |
| CHECKED BY A MIDDLETON DATE DEC. 05/18 | DISCIP. ENGR. A MIDDLETON DATE DEC. 05/18 |
| PROJ. DES. COORD. F VAN BILJON DATE DEC. 05/18 | PROJ. ENGR. F VAN BILJON DATE DEC. 05/18 |
| DATE DEC. 05/18 | |

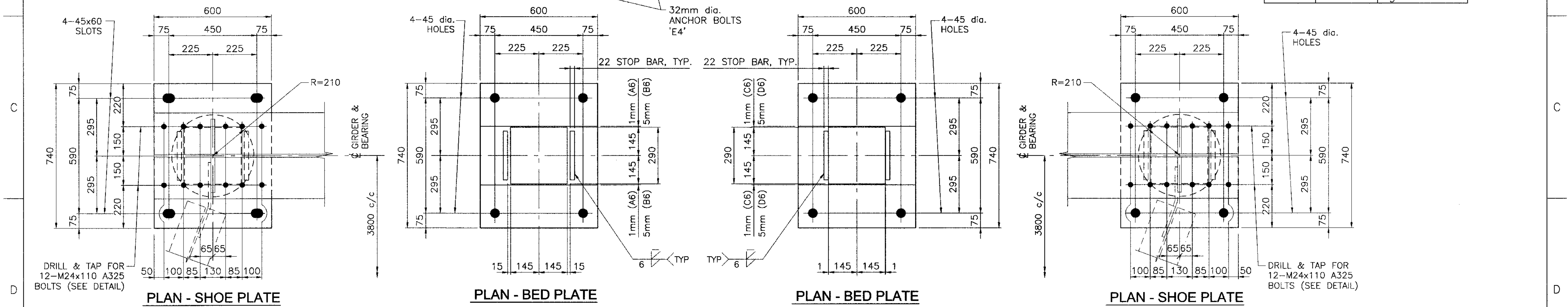
| | |
|---------------------------------------------------------------------|---------------------------------------------|
| Baffinland | |
| BAFFINLAND EXPANSION 12 MTPA MINE OPTION PRE FEASIBILITY STUDY | |
| RAILWAY SKEWED T.P.G. SPAN - 14.400m c/c SECTIONS AND DETAILS | |
| SCALE 1:10 OR AS NOTED | DWG. NO. H353004-35000-232-260-0001-0005 |
| ORIGINAL SHEET SIZE: ISO A1 (841 x 594) | REV. B |

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\$USERNAMES\$
\$DATE\$
\$FILES\$



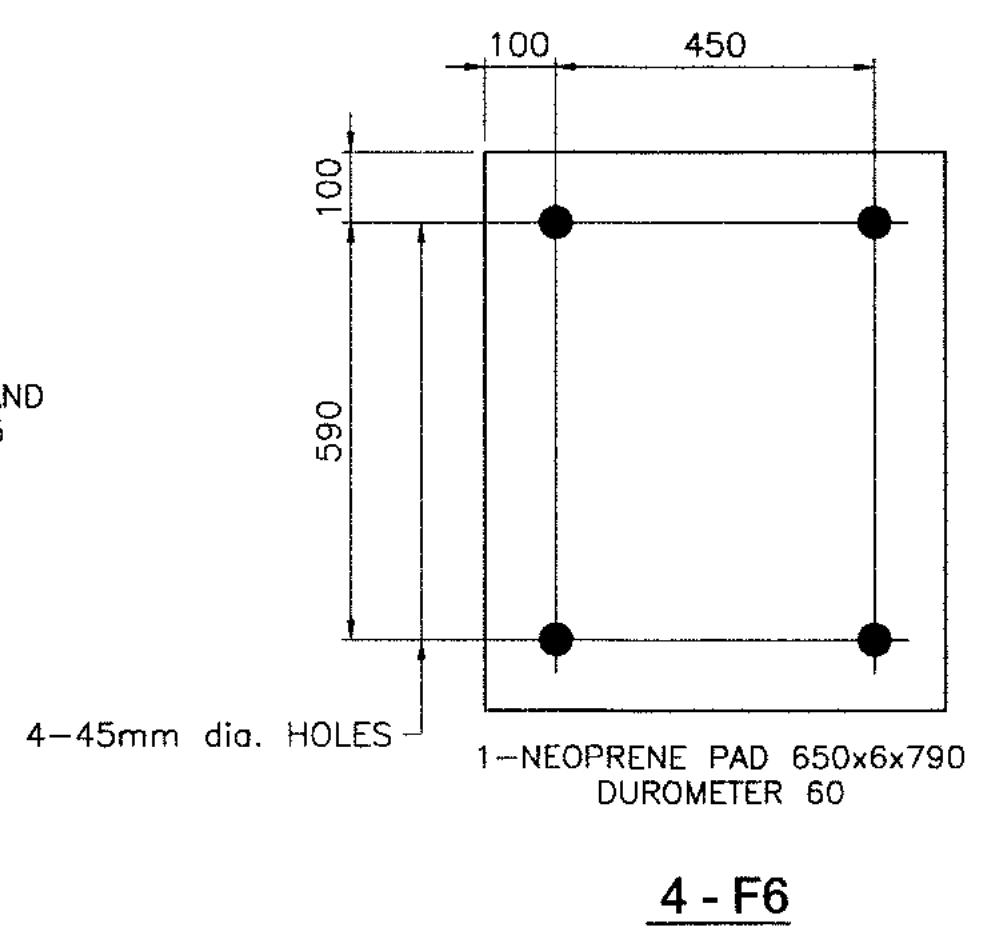
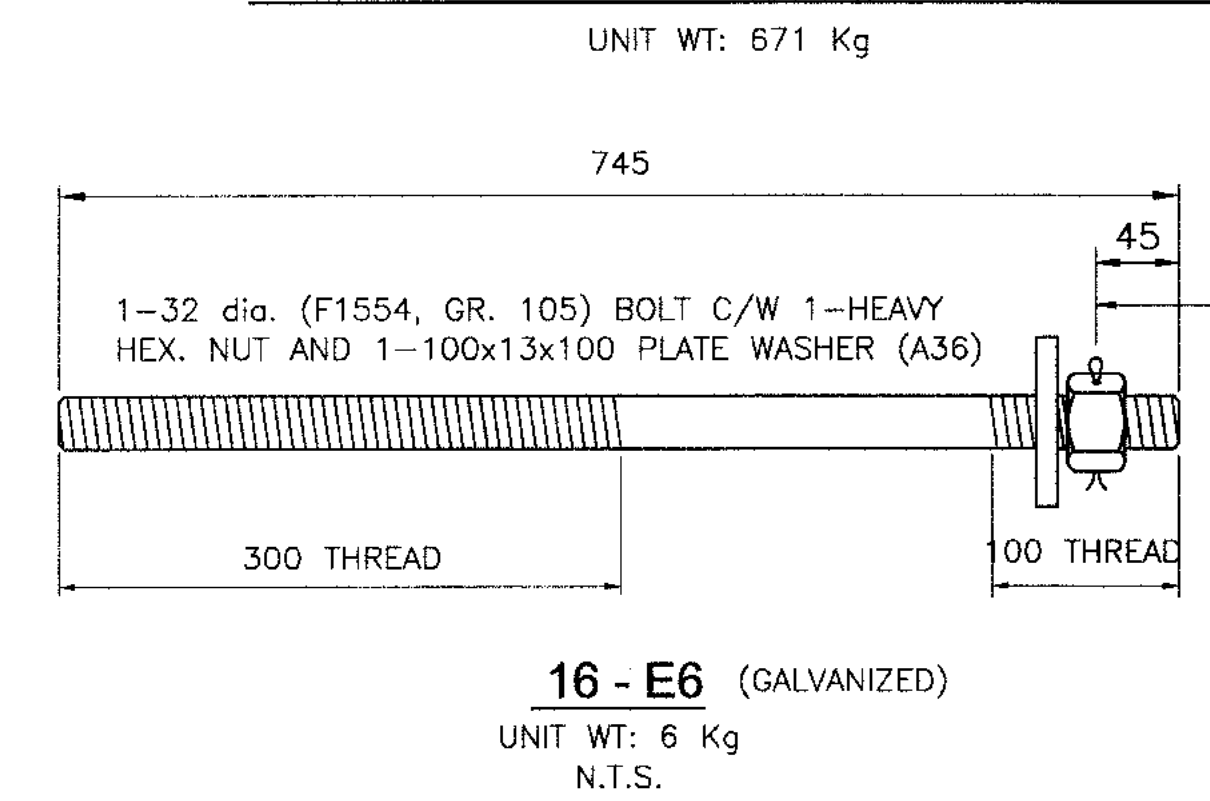
BEARING LOADS

| | APPLIED | ALLOWABLE |
|---------------------|---------|----------------------------|
| V _{DLmin.} | 242 kN | |
| V _{LL+I} | 1191 kN | |
| V _{MAX} | 1631 kN | 1740 kN |
| H _{LONG} | 467 kN | 512 kN |
| H _{LAT} | 28 kN | D _{lmin.} = 80 kN |



ONE - EXPANSION BEARING 'A6'
ONE - EXPANSION BEARING 'B6'

ONE - FIXED BEARING 'C6'
ONE - FIXED BEARING 'D6'



NOT FOR CONSTRUCTION
2018/12/05

SPECIFICATIONS:

- BRONZE PLATES: A.S.T.M. B22-82, COPPER ALLOY UNS No. C86300
- ALL NON-SLIDING SURFACES OF BEARINGS SHALL BE ZINC-METALLIZED IN ACCORDANCE WITH C.S.A. G189. ZINC COATING SHALL NOT BE LESS THAN 0.25mm.

ESTIMATED QUANTITIES: (ON THIS DRAWING)

- STRUCTURAL STEEL IN BEARINGS 2,415 Kg
- BRONZE PLATES IN BEARINGS 268 Kg
- ANCHOR BOLTS 16 ea. 96 Kg.

| | | | | | | | | | | | | | | | |
|-------------|--|--------------------|--|-----|--|-------------|--|----|--|-------|--|-------|--|------|--|
| DRAWING NO. | | DRAWING TITLE | | NO. | | DESCRIPTION | | BY | | CHK'D | | APP'D | | DATE | |
| 1 | | REFERENCE DRAWINGS | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | |

THIS DRAWING WAS PREPARED BY HATCH LTD. ("HATCH") FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE CLIENT. INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH SUBJECT TO CLIENT'S ROYALTY-FREE, IRREVOCABLE PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE AND REPRODUCE THE DRAWING FOR PURPOSES CONNECTED WITH THE PROJECT INCLUDING THE CONSTRUCTION, COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT. THIS DRAWING AND THE INFORMATION CONTAINED HEREIN SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE MODIFIED WITHOUT THE WRITTEN CONSENT OF HATCH.

HATCH

DESIGNED BY
A MIDDLETON
DATE DEC. 05/18

CHECKED BY
A MIDDLETON
DATE DEC. 05/18

PROJ. DES. COORD.
F VAN BILJON
DATE DEC. 05/18

DRAWN BY
J ESTRADA
DATE DEC. 05/18

DISCIP. ENGR.
A MIDDLETON
DATE DEC. 05/18

PROJ. ENGR.
F VAN BILJON
DATE DEC. 05/18

APPROVED FOR BID
NOV. 13/18

ISSUE FOR
DATE DEC. 05/18

AUTH. BY
F PITTMAN
DATE DEC. 05/18

Baffinland

BAFFINLAND EXPANSION 12 MTPA MINE OPTION
PRE FEASIBILITY STUDY

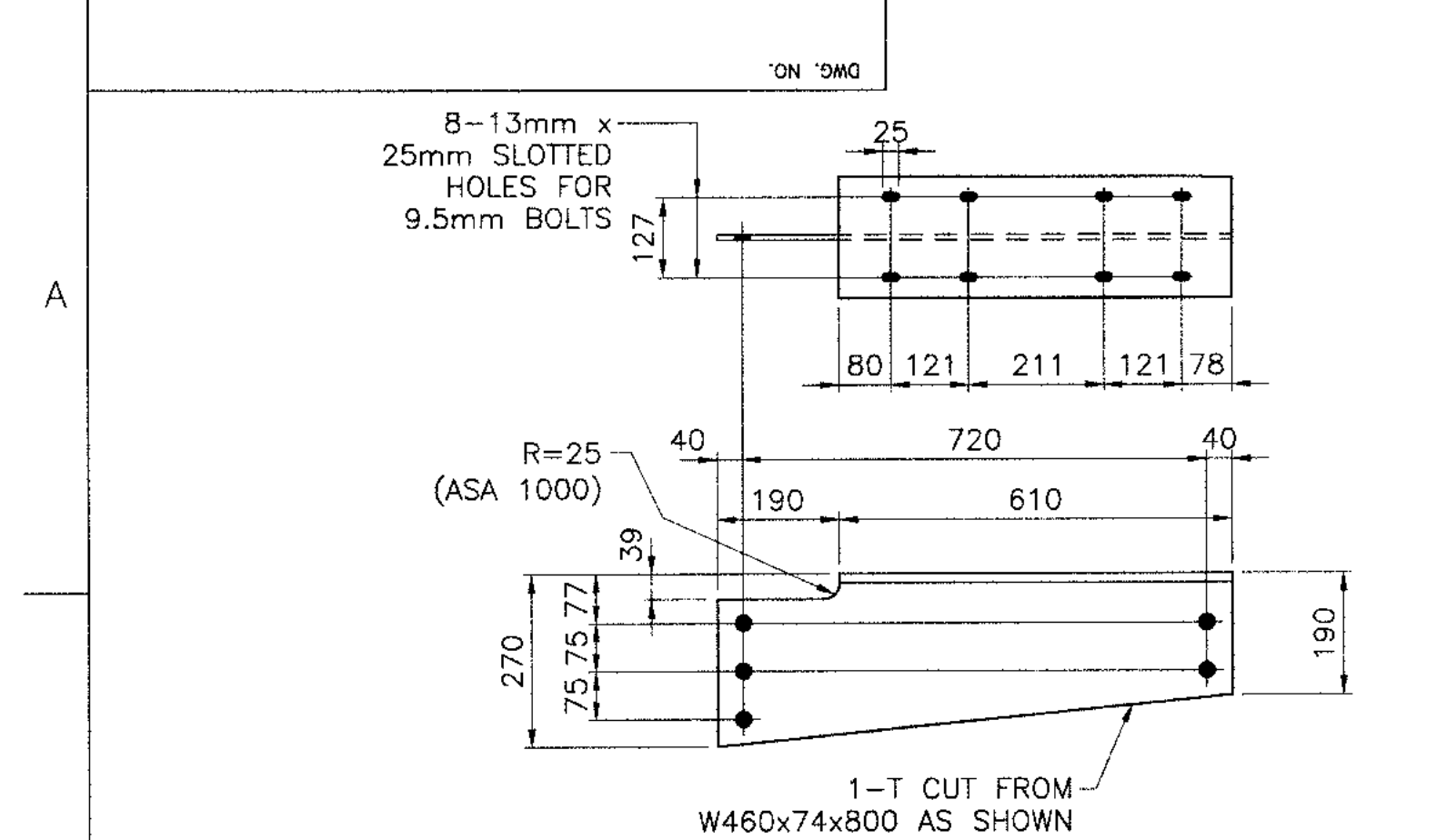
RAILWAY
SKEWED T.P.G. SPAN - 14.400m c/c
BEARINGS

SCALE
1:20
OR AS NOTED

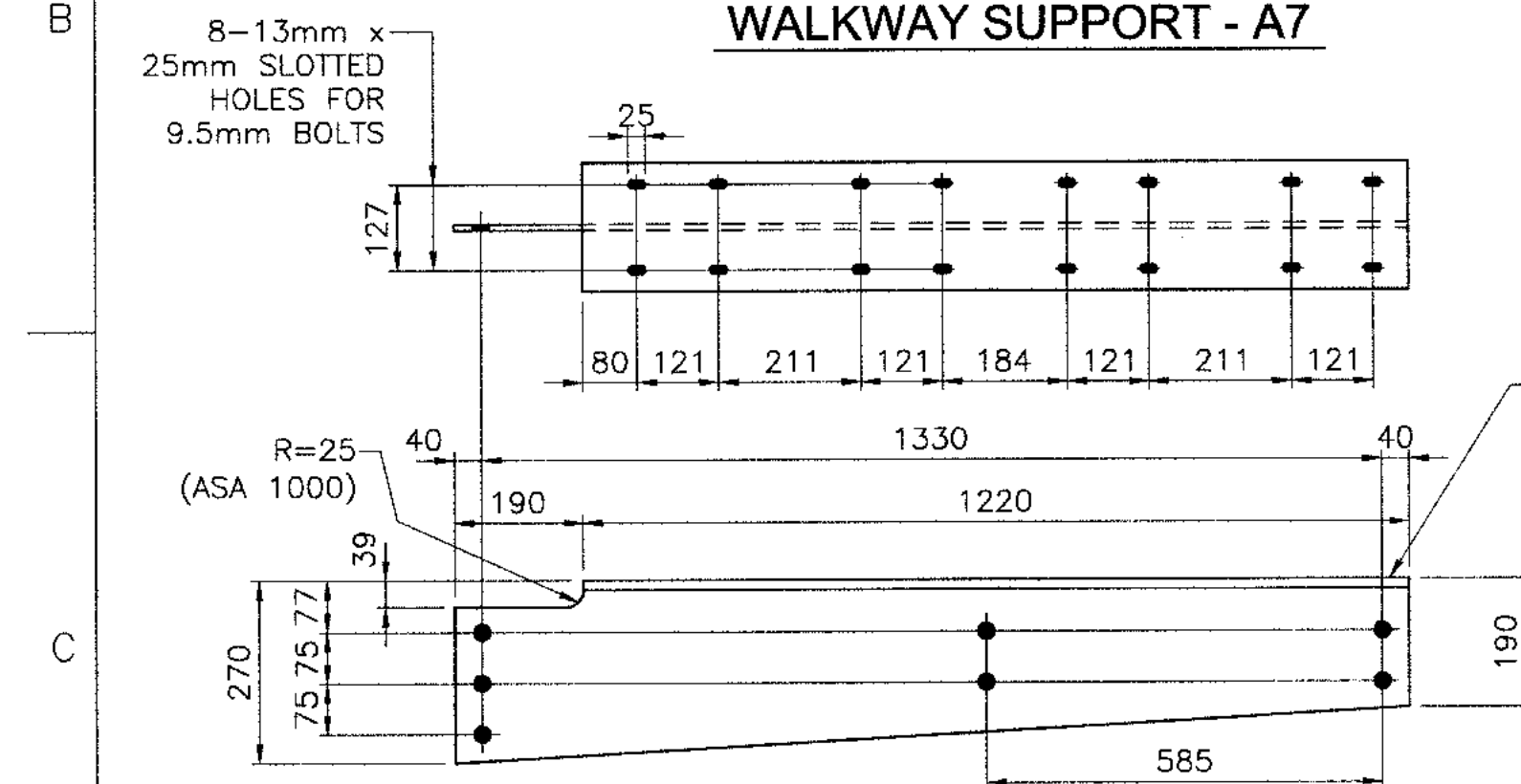
DWC. NO.
H353004-35000-232-260-0001-0006

REV. A

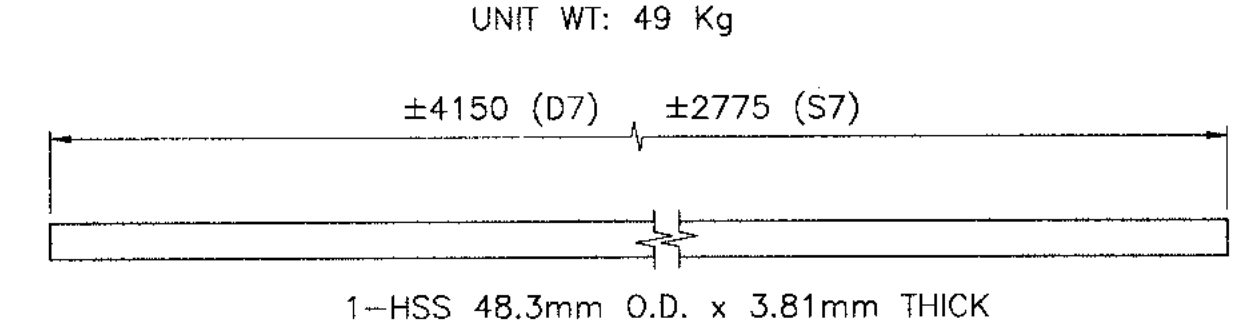
ORIGINAL SHEET SIZE: ISO A1 (841 x 594)



WALKWAY SUPPORT - A7



REFUGE SUPPORT - P7

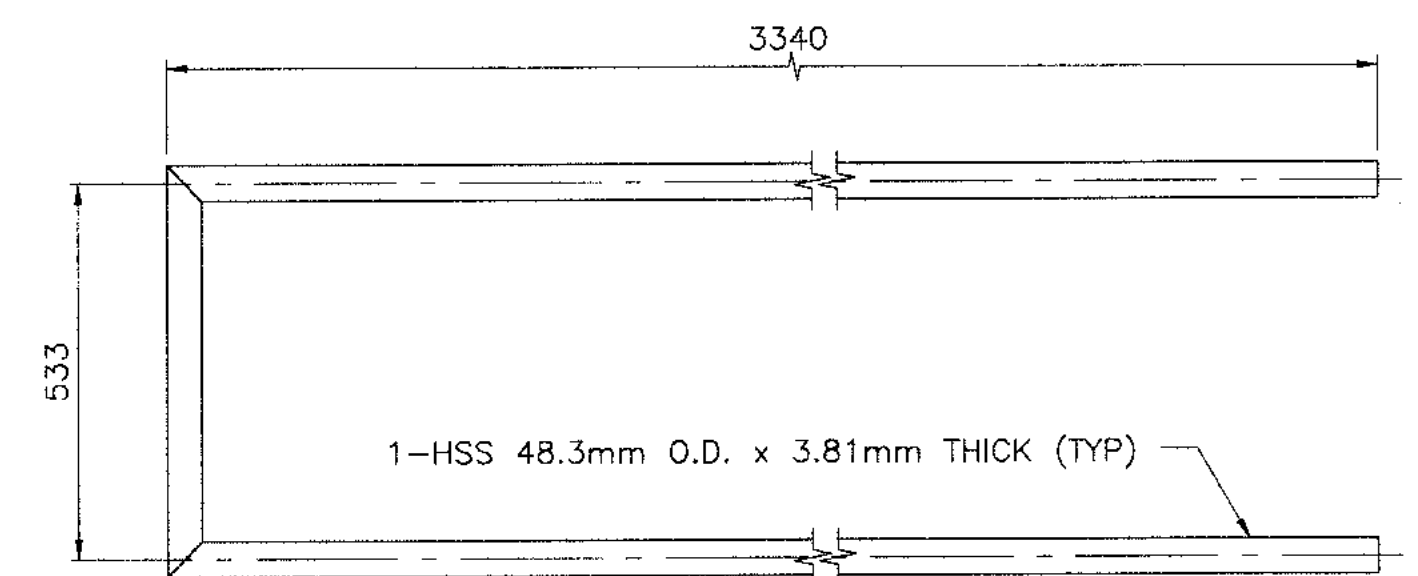


FREE RAILS - D7

QTY = 48 (BRIDGE #1) QTY = 56 (BRIDGE #2)
QTY = 24 (BRIDGE #3) QTY = 24 (BRIDGE #4)
UNIT WT: 17 Kg

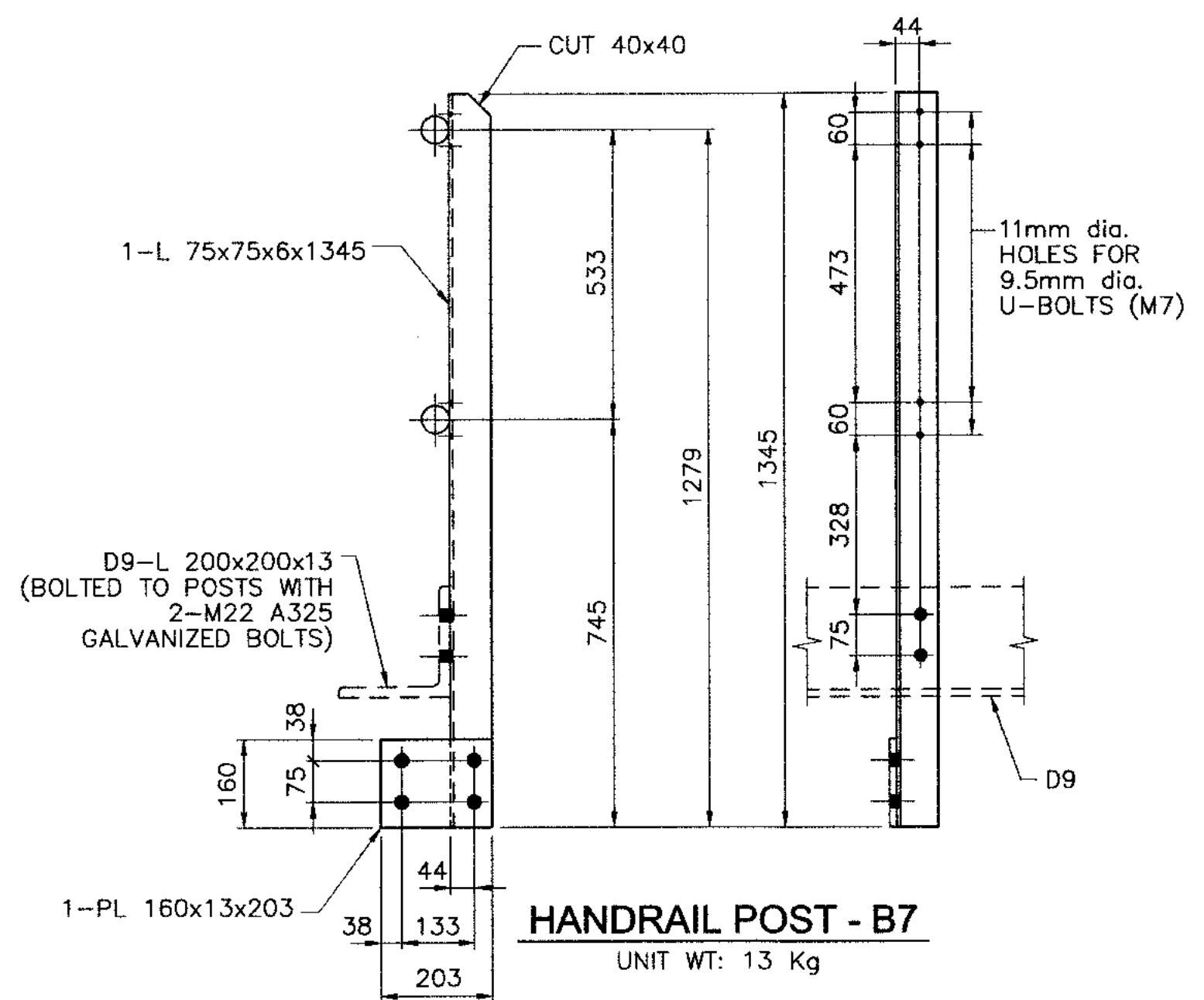
FREE RAILS - S7

QTY = 8 (BRIDGE #1) QTY = 8 (BRIDGE #2)
QTY = 8 (BRIDGE #3) QTY = 8 (BRIDGE #4)
UNIT WT: 12 Kg



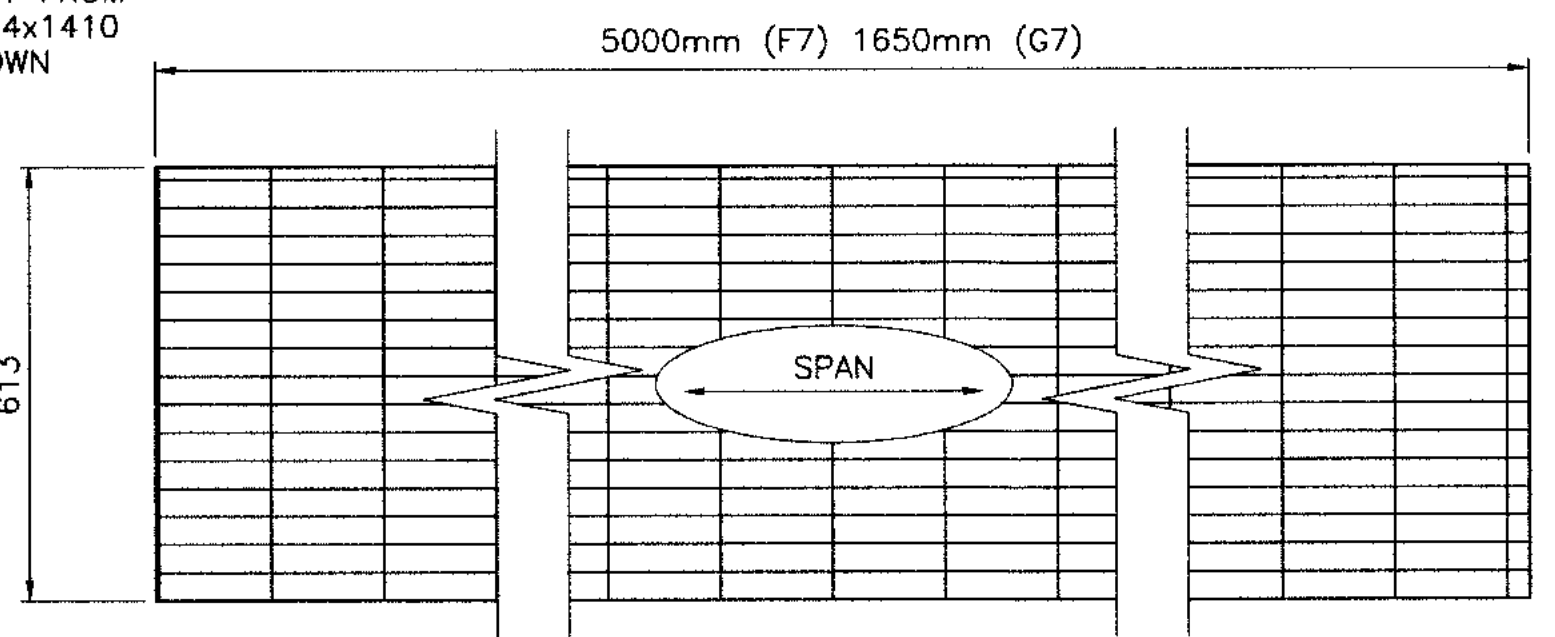
HANDRAIL LOOPS - E7

QTY = 28 (BRIDGE #1) QTY = 32 (BRIDGE #2)
QTY = 16 (BRIDGE #3) QTY = 16 (BRIDGE #4)
UNIT WT: 30 Kg



HANDRAIL POST - B7

UNIT WT: 13 Kg

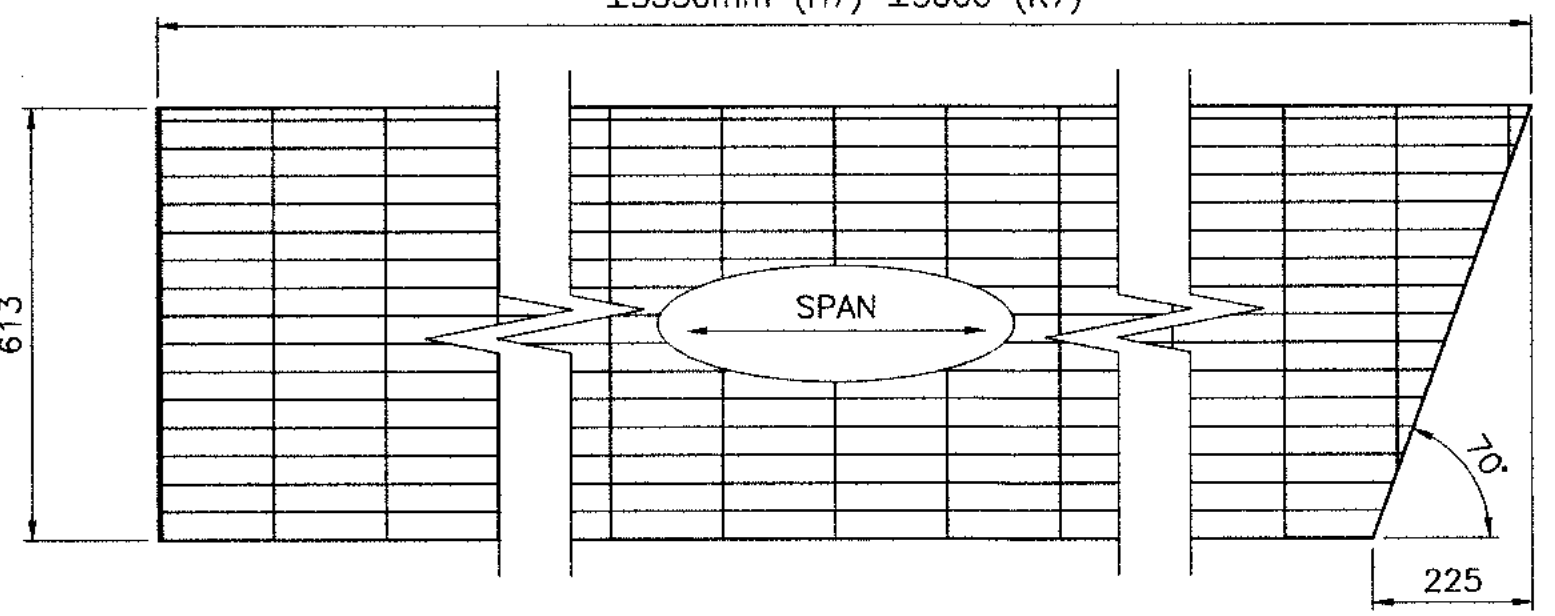


WALKWAY GRATING PANELS - F7

QTY = 38 (BRIDGE #1) QTY = 48 (BRIDGE #2)
QTY = 20 (BRIDGE #3) QTY = 24 (BRIDGE #4)

WALKWAY GRATING PANELS - G7 (REFUGE BAY)

QTY = 2 (BRIDGE #1) QTY = 2 (BRIDGE #2)
QTY = 2 (BRIDGE #3) QTY = 2 (BRIDGE #4)

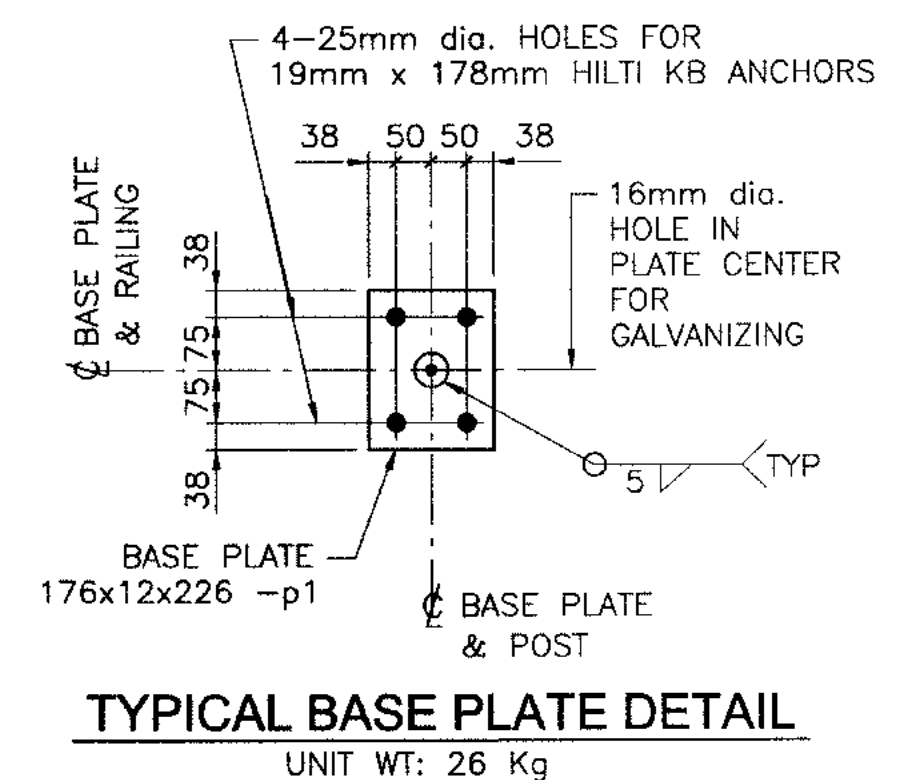


WALKWAY GRATING PANELS - H7

QTY = 2 (BRIDGE #1) QTY = 2 (BRIDGE #3)

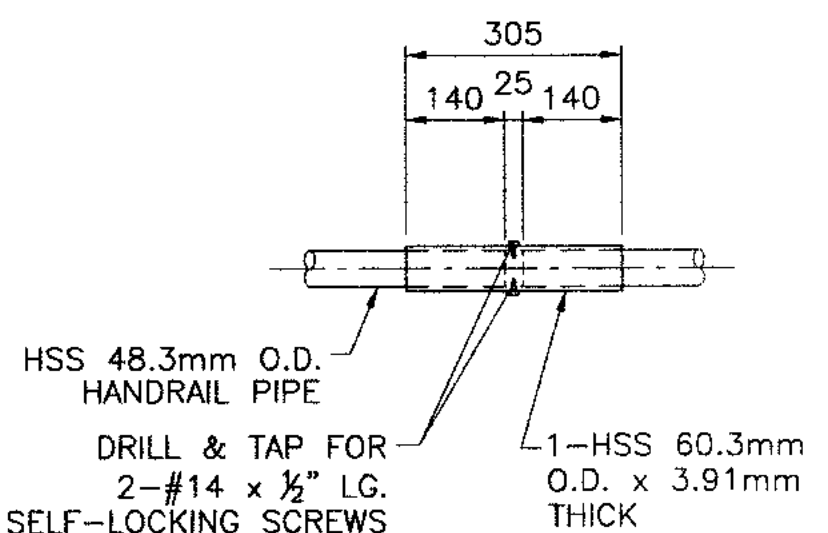
WALKWAY GRATING PANELS - K7

QTY = 2 (BRIDGE #1) QTY = 2 (BRIDGE #3)



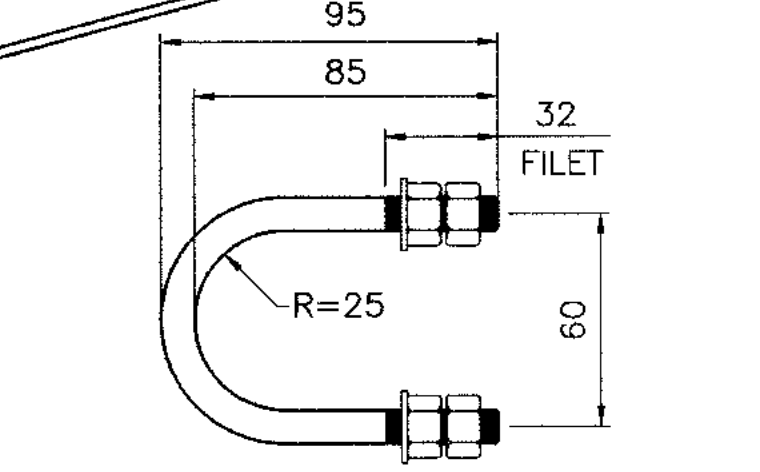
TYPICAL BASE PLATE DETAIL

UNIT WT: 26 Kg



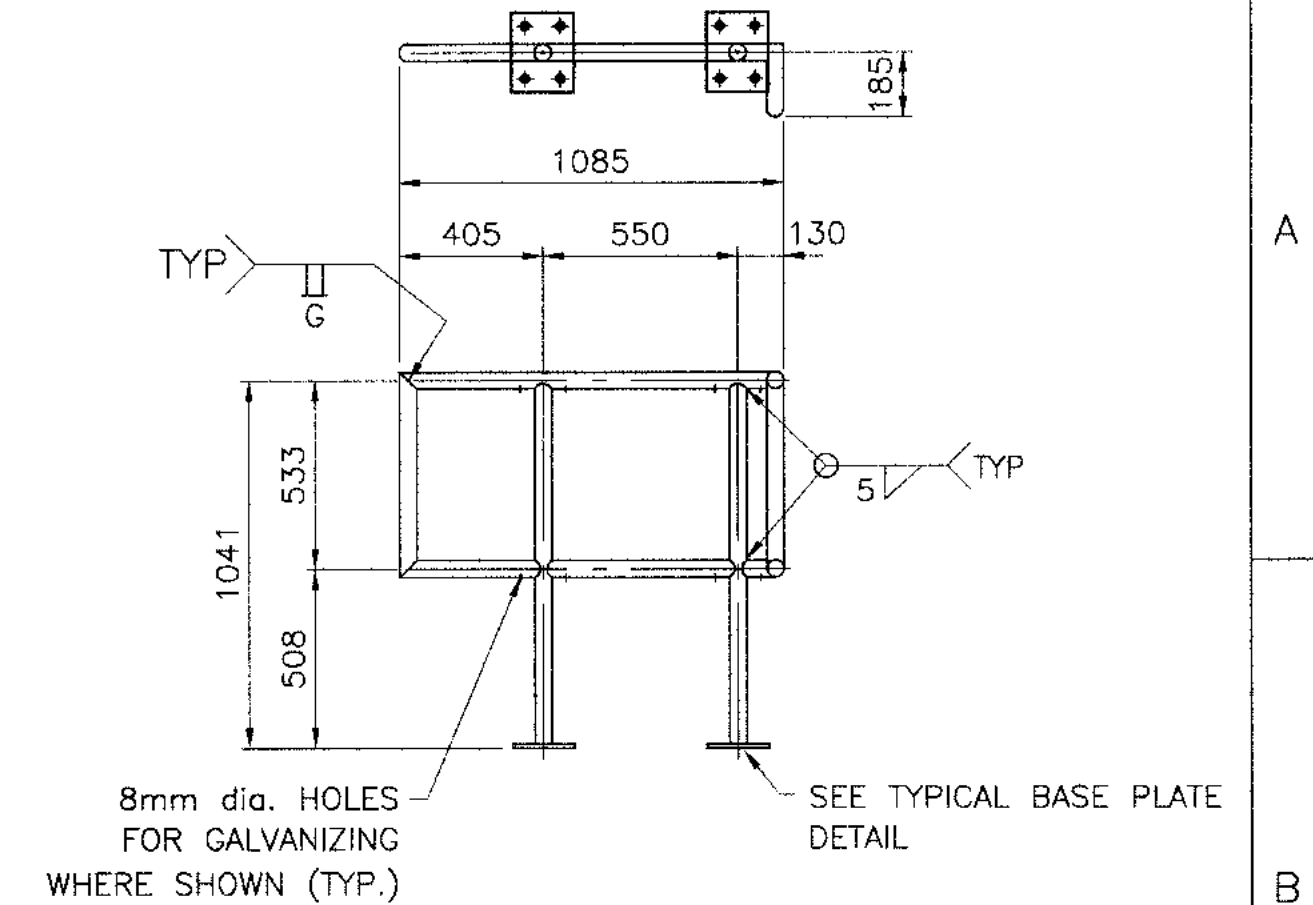
HANDRAILING SPLICE DETAIL - RS1

NOT FOR CONSTRUCTION
2018/12/05



U-BOLT FOR HANDRAIL - M7

UNIT WT: 1 Kg
SCALE = 1:2

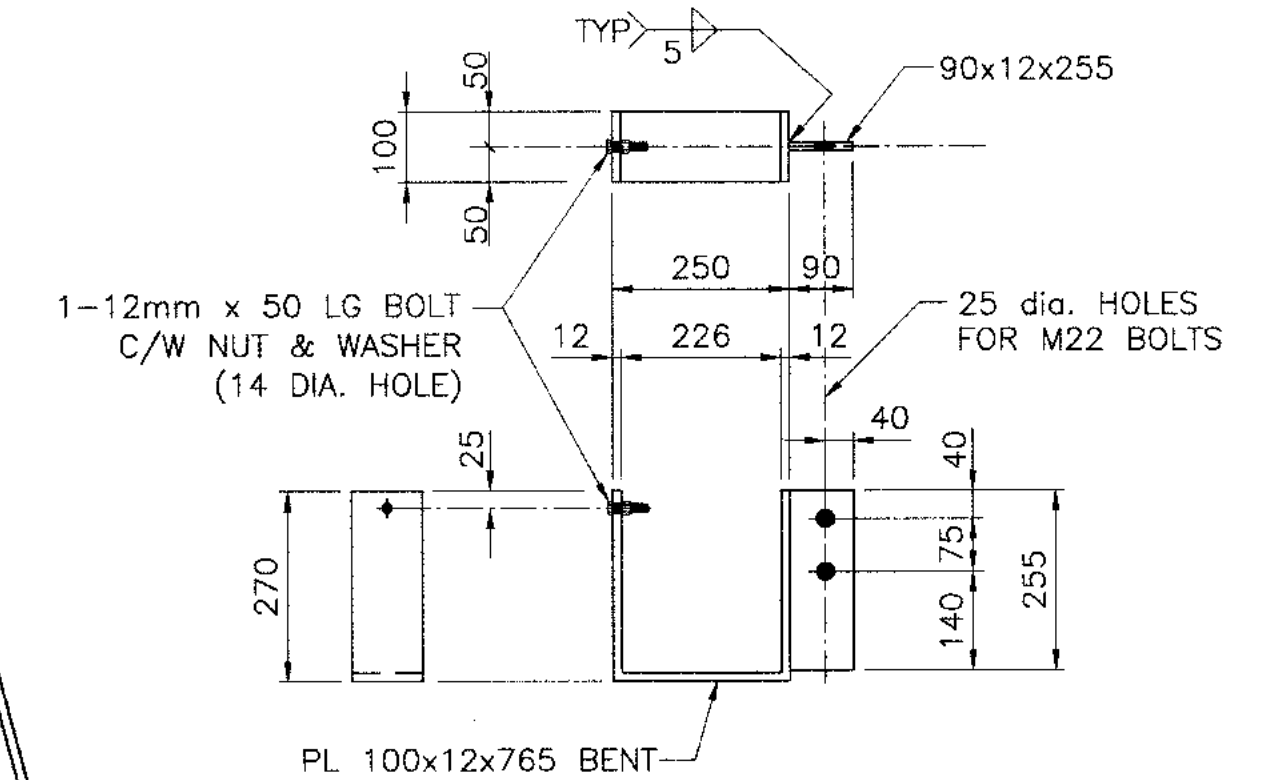


BACKWALL HANDRAIL - C7^R RIGHT (AS SHOWN)

UNIT WT: 31 Kg

BACKWALL HANDRAIL - C7^L LEFT (FROM SHOWN)

SCALE = 1:20



FIBRE-OPTIC BRACKET - N7

UNIT WT: 9 KG

WALKWAY NOTES:

- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING H3530004-35000-232-260-0001-0009.
- STRUCTURAL STEEL: CSA-CAN3-G40.21-98 GRADE 350AT CAT. 3.
- GALVANIZING: C.S.A. G164-1998.
- WELDING: C.S.A. W59-03.
- BOLTS: (UNLESS NOTED) M22 (7/8"dia.) HIGH STRENGTH A.S.T.M. A-325 WITH HEAVY HEX. NUT AND HARDENED ROUND WASHER. NUTS TO BE TIGHTENED BY USING THE TURN OF NUT METHOD.
- WALKWAY GRATING SHALL BE HEAVY DUTY STEEL GRATING HD 19-H-4 BY AMICO CAT WITH 1 1/2"x3/8" BEARING BARS AT 1 3/8" c/c OR APPROVED EQUIVALENT. PANELS SHALL BE FULLY BANDED AND HOT-DIPPED GALVANIZED. GRATING SHALL BE FASTENED TO T-BRACKETS WITH AMICO 'H-3' SADDLE CLIP c/w 3/8" HEX HEAD BOLT & NUT - 4 BOLTS/PANEL/BRACKET.
- RAILING SHALL BE HSS 48.3mm O.D. x 3.81mm CLASS C IN ACCORDANCE WITH ASTM 500, HOT-DIP GALVANIZED.
- ALL MATERIAL FOR WALKWAYS SHALL BE HOT-DIP GALVANIZED.

| DRAWING NO. | DRAWING TITLE |
|-------------|--------------------|
| 1 | REFERENCE DRAWINGS |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

THIS DRAWING WAS PREPARED BY HATCH LTD. ("HATCH") FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LTD. ("CLIENT") AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE CLIENT, INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH SUBJECT TO CLIENT'S ROYALTY-FREE, IRREVOCABLE PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE AND REPRODUCE THIS DRAWING FOR PURPOSES CONNECTED WITH THE PROJECT, INCLUDING THE CONSTRUCTION, COMPLETION, MAINTENANCE, EXTENSION, RE-STATEMENT AND REPAIR OF THE PROJECT. THIS DRAWING AND THE INFORMATION CONTAINED HEREIN SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE MODIFIED WITHOUT THE WRITTEN CONSENT OF HATCH.

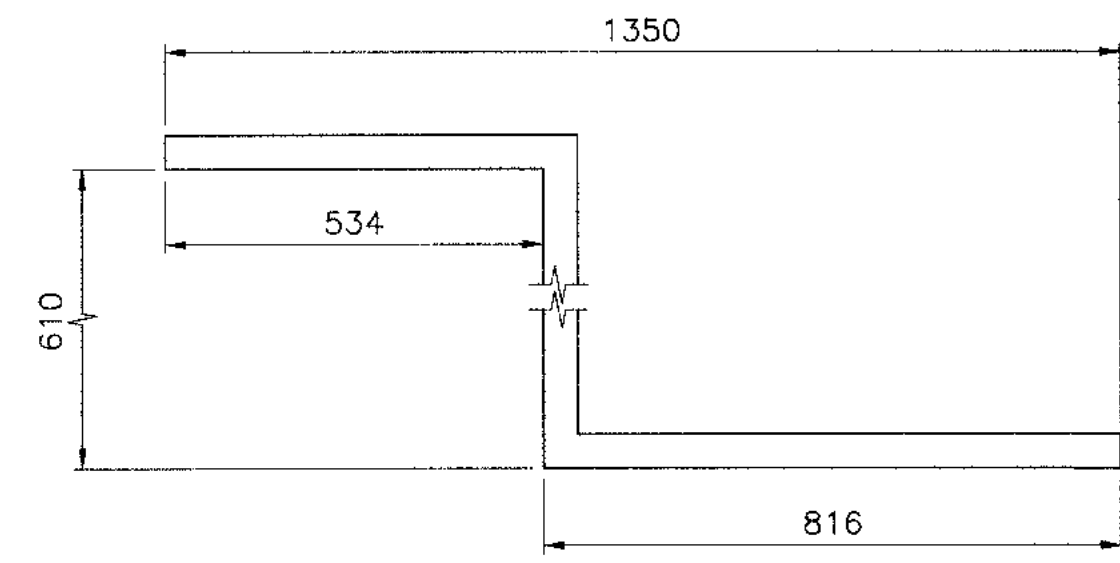
| NO. | DESCRIPTION | BY | CHK'D | APP'D | DATE |
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| REV. | ISSUE FOR | ALTH. | BY | DATE |
|------|------------------|-------|----|------------|
| B | REVISED FOR BID | | | DEC. 05/18 |
| A | APPROVED FOR BID | | | NOV. 13/18 |
| | | | | |
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| | |
|------------------------------------------------------|-------------------------------------------------|
| HATCH | |
| DESIGNED BY A MIDDLETON DATE DEC. 05/18 | DRAWN BY J ESTRADA DATE DEC. 05/18 |
| CHECKED BY A MIDDLETON DATE DEC. 05/18 | DISCIP. ENGR. A MIDDLETON DATE DEC. 05/18 |
| PROJ. DES. COORD. F VAN BILJON DATE DEC. 05/18 | PROJ. ENGR. F VAN BILJON DATE DEC. 05/18 |
| AREA MANAGER F PITTMAN DATE DEC. 05/18 | |

| | |
|-------------------------------------------------------------------|---------------------------------------------|
| Baffinland | |
| BAFFINLAND EXPANSION 12 MTPA MINE OPTION PRE FEASIBILITY STUDY | |
| RAILWAY T.P.G. SPAN WALKWAY BRACKETS/HANDRAILING | |
| SCALE | DWG. NO. H353004-35000-232-260-0001-0007 |
| OR AS NOTED | REV. B |
| ORIGINAL SHEET SIZE: ISO A1 (841 x 594) | |

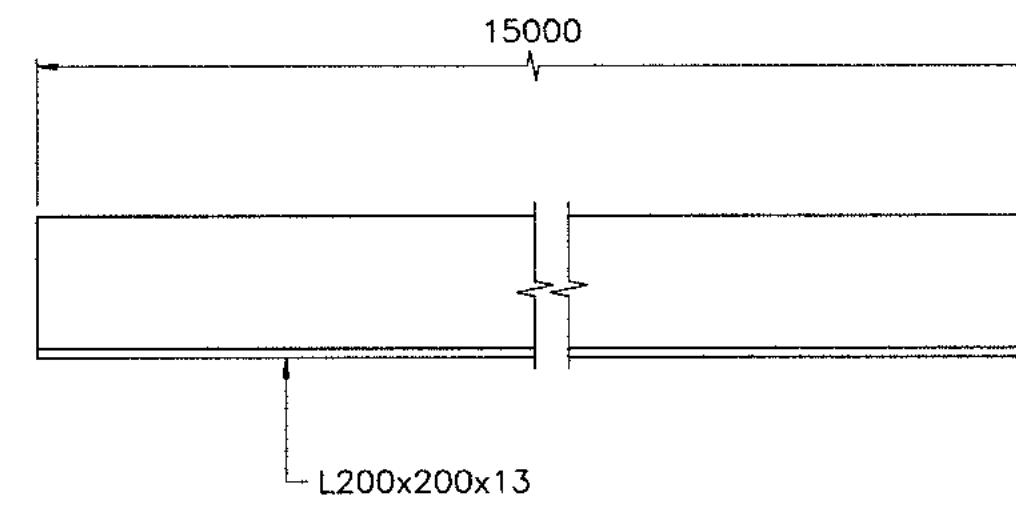
ISSUES \$TIMES \$FILES



1--HSS 48.3mm O.D. x 3.81mm THICK

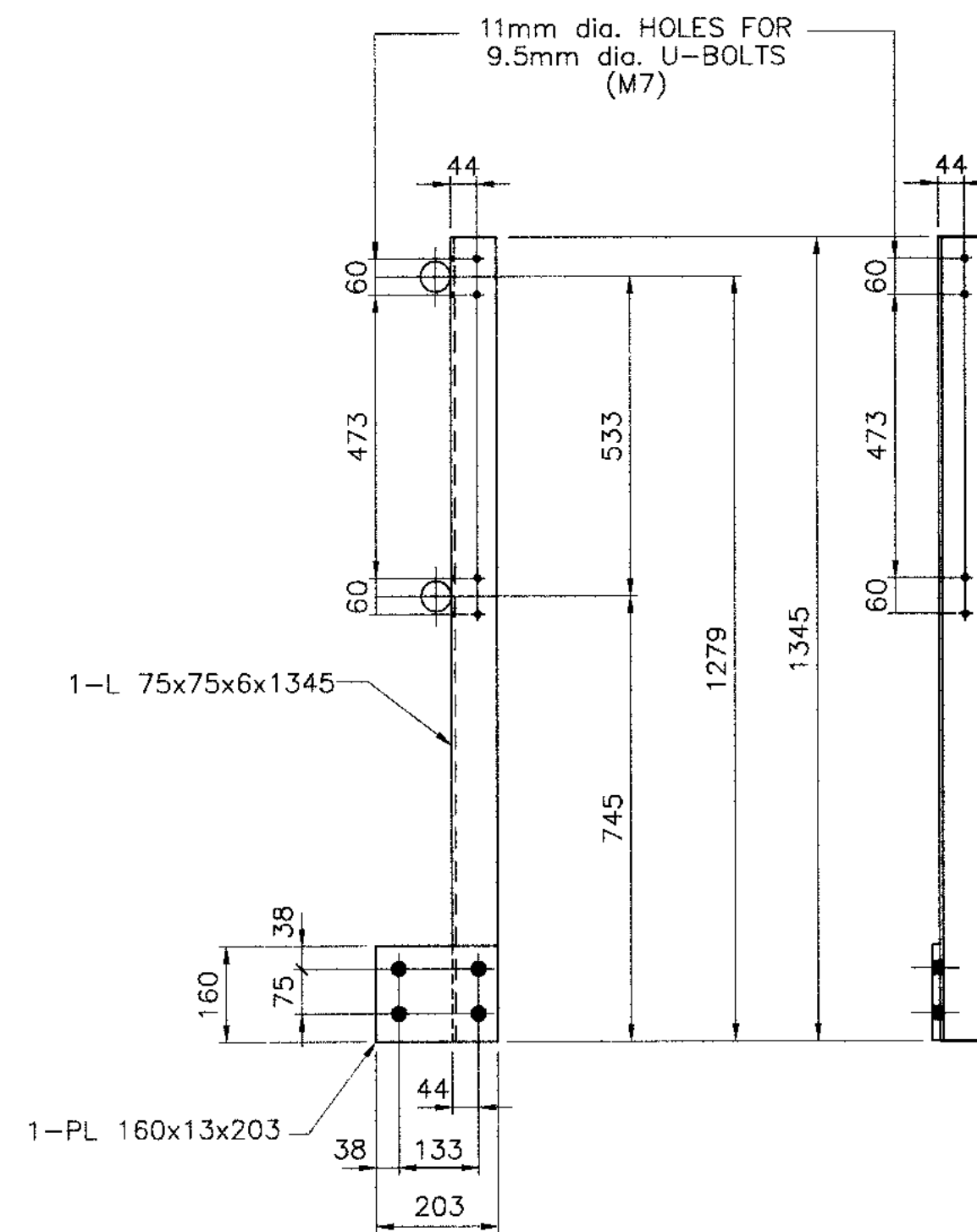
REFUGE BAY HANDRAIL - A9

QTY = 8 (BRIDGE #1) QTY = 8 (BRIDGE #2)
 QTY = 8 (BRIDGE #3) QTY = 8 (BRIDGE #4)
 UNIT WT: 8 Kg



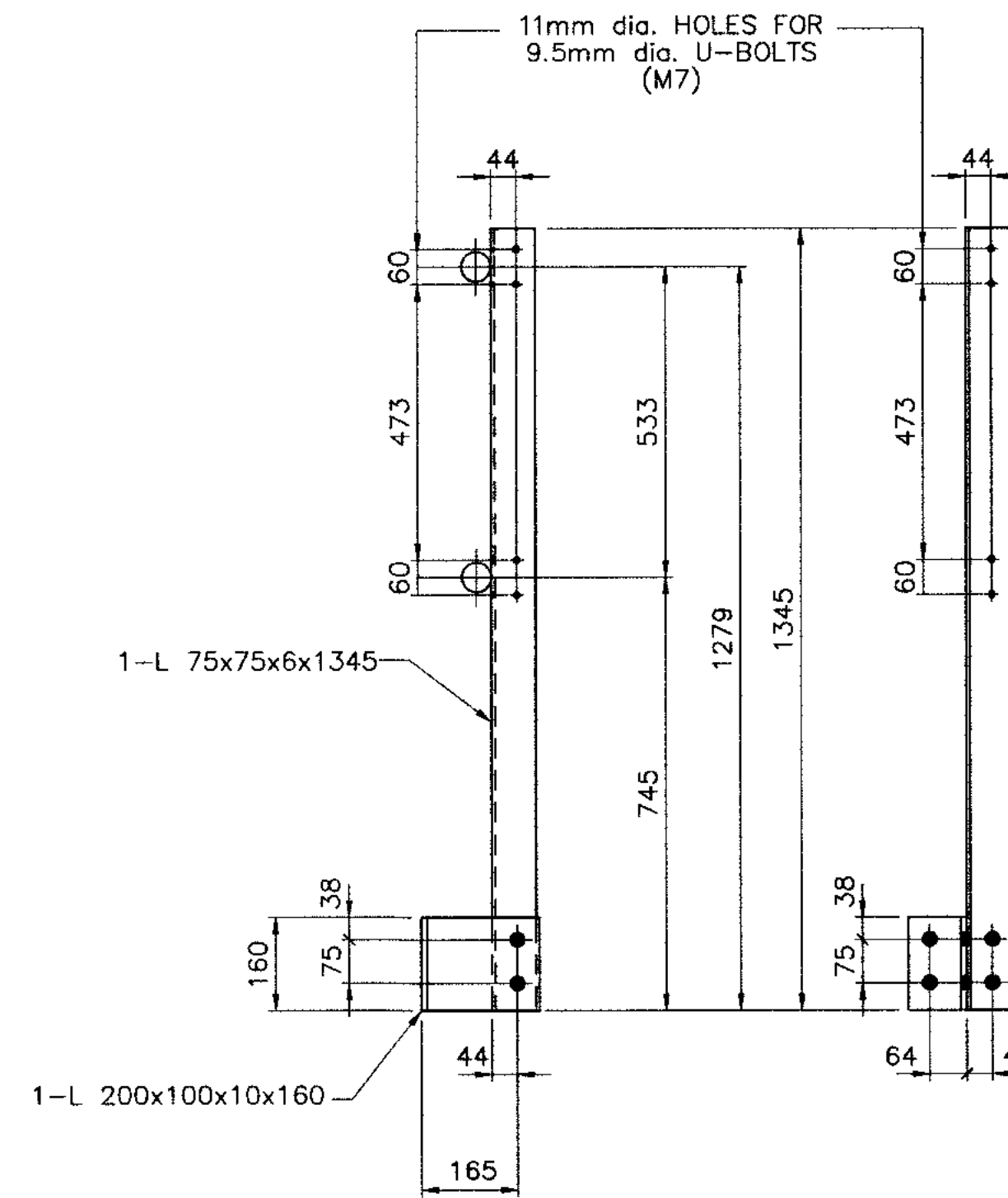
WALKWAY TOE PLATE - D9

QTY = 14 (BRIDGE #1) QTY = 16 (BRIDGE #2)
 QTY = 8 (BRIDGE #3) QTY = 8 (BRIDGE #4)
 UNIT WT: 589 Kg



REFUGE BAY POST - B9

UNIT WT: 13 Kg



REFUGE BAY POST - C9

UNIT WT: 13 Kg

NOT FOR CONSTRUCTION
 2018/12/05

NOTES:

- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING H3530004-35000-232-260-0001-0007.

| | | | | | | | | | | | |
|--------------------|---|---------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------|--|-------------------|--|
| DRAWING NO. | | DRAWING TITLE | | THIS DRAWING WAS PREPARED BY HATCH LTD. ("HATCH") FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LTD. ("CLIENT") AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE CLIENT, INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH SUBJECT TO CLIENT'S PATENT RIGHTS. HATCH GRANTS PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE AND REPRODUCE THIS DRAWING FOR PURPOSES CONNECTED WITH THE PROJECT, INCLUDING THE CONSTRUCTION, COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT. THIS DRAWING AND THE INFORMATION CONTAINED HEREIN, SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE MODIFIED WITHOUT THE WRITTEN CONSENT OF HATCH. | | NO. DESCRIPTION BY CHK'D APP'D DATE | | HATCH | | Baffinland | |
| REFERENCE DRAWINGS | | | | REVISIONS | | DESIGNED BY A MIDDLETON DATE DEC. 05/18 DRAWN BY J ESTRADA DATE DEC. 05/18 CHECKED BY A MIDDLETON DATE DEC. 05/18 DISCIP. ENGR. A MIDDLETON DATE DEC. 05/18 PROJ. DES. COORD. F VAN BILJON DATE DEC. 05/18 FROM. ENGR. F VAN BILJON DATE DEC. 05/18 | | BAFFINLAND EXPANSION 12 MTPA MINE OPTION PRE FEASIBILITY STUDY | | | |
| | | | | | | AREA MANAGER F PITTMAN DATE DEC. 05/18 | | RAILWAY T.P.G. SPAN MISC. WALKWAY DETAILS | | | |
| | | | | | | ISSUE AUTHORIZATION | | SCALE DWG. NO. H353004-35000-232-260-0001-0009 REV. A OR AS NOTED ORIGINAL SHEET SIZE: ISO A1 (841 x 594) | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | \$USER\$NAME\$ \$TIMES\$ \$FILES\$ | | | |

BILL OF MATERIALS - BR #70.69

STEEL

| ITEM | MARK | UNIT | QTY. | DRAWING No. H353004-35000-232- |
|-------------------------------------------------|-------|------|------|-----------------------------------|
| 14.500m c/c BEARINGS T.P.G. SPAN (SQUARED ENDS) | STSD1 | 1 | 8 | 260-0001-0001 |
| EXPANSION BEARING | A3 | 1 | 8 | 260-0001-0003 |
| EXPANSION BEARING | B3 | 1 | 8 | 260-0001-0003 |
| FIXED BEARING | C3 | 1 | 8 | 260-0001-0003 |
| FIXED BEARING | D3 | 1 | 8 | 260-0001-0003 |
| ANCHOR BOLTS | E3 | 1 | 128 | 260-0001-0003 |
| NEOPRENE PAD | F3 | 1 | 32 | 260-0001-0003 |
| DECK JOINT COVER PLATE (SQUARED) | A8 | 1 | 9 | 260-0001-0008 |

CONCRETE

| | | | | |
|---------------------------------------------|-------|---|---|---------------|
| ABUTMENT - PRECAST CONCRETE (SQUARED) | APC2 | 1 | 2 | 260-0003-0005 |
| 2 ROW PILE CAP - PRECAST CONCRETE (SQUARED) | 2RPC2 | 1 | 5 | 260-0003-0003 |
| 3 ROW PILE CAP - PRECAST CONCRETE (SQUARED) | 3RPC2 | 1 | 2 | 260-0003-0004 |

WALKWAY

| | | | | |
|------------------------------------------------------------------|-----------------|---|------|---------------|
| WALKWAY SUPPORT | A7 | 1 | 188 | 260-0002-0007 |
| HANDRAIL POST | B7 | 1 | 188 | 260-0002-0007 |
| REFUGE BAY POST | B9 | 1 | 4 | 260-0002-0009 |
| REFUGE BAY POST | C9 | 1 | 4 | 260-0002-0009 |
| BACKWALL HANDRAIL | C7 ^R | 1 | 2 | 260-0002-0007 |
| BACKWALL HANDRAIL | C7 ^L | 1 | 2 | 260-0002-0007 |
| REFUGE BAY HANDRAIL | A9 | 1 | 8 | 260-0002-0009 |
| FREE RAIL - 4150mm LONG | D7 | 1 | 56 | 260-0002-0007 |
| FREE RAIL - 2775mm LONG | S7 | 1 | 8 | 260-0002-0007 |
| HANDRAIL LOOP - 3340mm LONG | E7 | 1 | 32 | 260-0002-0007 |
| GRATING PANEL 613 x 5000mm | F7 | 1 | 48 | 260-0002-0007 |
| GRATING PANEL 613 x 1650mm (REFUGE) | G7 | 1 | 2 | 260-0002-0007 |
| HANDRAIL SPLICE | RS1 | 1 | 100 | 260-0002-0007 |
| 9.5mm dia. U-BOLT (C/W 4 HEX NUTS & 2 FLAT WASHERS) | M7 | 1 | 408 | 260-0002-0007 |
| FIBRE-OPTIC BRACKET (C/W 12mm dia.x50mm LG. BOLT W/NUT & WASHER) | N7 | 1 | 192 | 260-0002-0007 |
| REFUGE SUPPORT | P7 | 1 | 4 | 260-0002-0007 |
| TYPE 'H-3' SADDLE CLIP C/W M20x70 HEX BOLT & HEX NUT | | 1 | 1024 | |
| WALKWAY TOE PLATE L 200x200x13x15000 | D9 | 1 | 16 | 260-0002-0009 |

NOT FOR CONSTRUCTION
2018/12/05

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| <p><small>THIS DRAWING WAS PREPARED BY HATCH LTD. ("HATCH") FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LP ("CLIENT") AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE CLIENT, INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH SUBJECT TO CLIENT'S ROYALTY-FREE, IRREVOCABLE, PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE AND REPRODUCE THE DRAWING FOR PURPOSES CONNECTED WITH THE PROJECT, INCLUDING THE CONSTRUCTION, COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT. THIS DRAWING AND THE INFORMATION CONTAINED HEREIN, SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE MODIFIED WITHOUT THE WRITTEN CONSENT OF HATCH.</small></p> | | | <p>HATCH</p> <p>DESIGNED BY A MIDDELETON DATE DEC. 05/18 DRAWN BY J ESTRADA DATE DEC. 05/18 CHECKED BY A MIDDELETON DATE DEC. 05/18 DISCIP. ENGR. A MIDDELETON DATE DEC. 05/18 PROJ. DES. COORD. F VAN BILJON DATE DEC. 05/18 PROJ. ENGR. F VAN BILJON DATE DEC. 05/18 AREA MANAGER F PITTMAN DATE DEC. 05/18</p> | | | <p>Baffinland</p> <p>BAFFINLAND EXPANSION 12 MTPA MINE OPTION PRE FEASIBILITY STUDY</p> <p>RAILWAY BR #70.69 BILL OF MATERIAL</p> | | | <p>SCALE DWG. NO. H353004-35000-232-260-0003-0008 REV. B OR AS NOTED ORIGINAL SHEET SIZE: ISO A1 (841 x 594)</p> | | | | | | | | | | | | | | |
| DRAWING NO. | | DRAWING TITLE | | NO. | | DESCRIPTION | | BY | | CHK'D | | APP'D | | DATE | | | | | | | | | |
| <p>REFERENCE DRAWINGS</p> <table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> </table> | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | | | |

BILL OF MATERIALS - BR #85.948

STEEL

| ITEM | MARK | UNIT | QTY. | DRAWING No. H353004-35000-232-- |
|------------------------------------------------|-------|------|------|------------------------------------|
| 14.500m c/c BEARINGS T.P.G. SPAN (SKEWED ENDS) | STSD2 | 1 | 4 | 260-0001-0004 |
| EXPANSION BEARING | A6 | 1 | 4 | 260-0001-0006 |
| EXPANSION BEARING | B6 | 1 | 4 | 260-0001-0006 |
| FIXED BEARING | C6 | 1 | 4 | 260-0001-0006 |
| FIXED BEARING | D6 | 1 | 4 | 260-0001-0006 |
| ANCHOR BOLTS | E6 | 1 | 64 | 260-0001-0006 |
| NEOPRENE PAD | F6 | 1 | 16 | 260-0001-0006 |
| DECK JOINT COVER PLATE (SKEWED) | B8 | 1 | 5 | 260-0001-0008 |

CONCRETE

| | | | | |
|--------------------------------------------|-------|---|---|---------------|
| ABUTMENT - PRECAST CONCRETE (SKEWED) | APC2 | 1 | 2 | 260-0004-0005 |
| 2 ROW PILE CAP - PRECAST CONCRETE (SKEWED) | 2RPC2 | 1 | 3 | 260-0004-0003 |

WALKWAY

| | | | | |
|------------------------------------------------------------------|-----------------|---|-----|---------------|
| WALKWAY SUPPORT | A7 | 1 | 92 | 260-0002-0007 |
| HANDRAIL POST | B7 | 1 | 92 | 260-0002-0007 |
| REFUGE BAY POST | B9 | 1 | 4 | 260-0002-0009 |
| REFUGE BAY POST | C9 | 1 | 4 | 260-0002-0009 |
| BACKWALL HANDRAIL | C7 ^R | 1 | 2 | 260-0002-0007 |
| BACKWALL HANDRAIL | C7 ^L | 1 | 2 | 260-0002-0007 |
| REFUGE BAY HANDRAIL | A9 | 1 | 8 | 260-0002-0009 |
| FREE RAIL - 4150mm LONG | D7 | 1 | 24 | 260-0002-0007 |
| FREE RAIL - 2775mm LONG | S7 | 1 | 8 | 260-0002-0007 |
| HANDRAIL LOOP - 3340mm LONG | E7 | 1 | 16 | 260-0002-0007 |
| GRATING PANEL 613 x 5000mm | F7 | 1 | 20 | 260-0002-0007 |
| GRATING PANEL 613 x 1650mm (REFUGE) | G7 | 1 | 2 | 260-0002-0007 |
| GRATING PANEL 613 x 5530mm (SKEWED) | H7 | 1 | 2 | 260-0002-0007 |
| GRATING PANEL 613 x 5000mm (SKEWED) | K7 | 1 | 2 | 260-0002-0007 |
| HANDRAIL SPLICE | RS1 | 1 | 52 | 260-0002-0007 |
| 9.5mm dia. U-BOLT (C/W 4 HEX NUTS & 2 FLAT WASHERS) | M7 | 1 | 216 | 260-0002-0007 |
| FIBRE-OPTIC BRACKET (C/W 12mm dia.x50mm LG. BOLT W/NUT & WASHER) | N7 | 1 | 96 | 260-0002-0007 |
| REFUGE SUPPORT | P7 | 1 | 4 | 260-0002-0007 |
| TYPE 'H-3' SADDLE CLIP C/W M20x70 HEX BOLT & HEX NUT | | 1 | 512 | |
| WALKWAY TOE PLATE L 200x200x13x15000 | D9 | 1 | 8 | 260-0002-0009 |

NOT FOR CONSTRUCTION
2018/12/05

| | | | | | | | | | | | | | | | |
|--------------------|--|---------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------|--|----------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------|--|---------------|--|
| DRAWING NO. | | DRAWING TITLE | | <p>THIS DRAWING WAS PREPARED BY HATCH LTD. ("HATCH") FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LP (CLIENT) AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE CLIENT INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH SUBJECT TO CLIENT'S ROYALTY-FREE, IRREVOCABLE, PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE AND REPRODUCE THE DRAWING FOR PURPOSES CONNECTED WITH THE PROJECT, INCLUDING THE CONSTRUCTION, COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT. THIS DRAWING AND THE INFORMATION CONTAINED HEREIN, SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE MODIFIED WITHOUT THE WRITTEN CONSENT OF HATCH.</p> | | <p>NO. DESCRIPTION BY CHK'D APP'D DATE</p> | | <p>REV. ISSUE FOR AUTH. BY DATE</p> | | <p>DESIGNED BY A MIDDLETON DATE DEC. 05/18</p> <p>DRAWN BY J ESTRADA DATE DEC. 05/18</p> <p>CHECKED BY A MIDDLETON DATE DEC. 05/18</p> <p>PROJ. DES. COORD. F VAN BILJON DATE DEC. 05/18</p> <p>AREA MANAGER F PITTMAN DATE DEC. 05/18</p> | | <p>SCALE DWG. NO. OR AS NOTED H353004-35000-232-260-0004-0008</p> | | <p>REV. B</p> | |
| REFERENCE DRAWINGS | | | | REVISIONS | | ISSUE AUTHORIZATION | | <p>RAILWAY BR #85.948 BILL OF MATERIAL</p> | | <p>BAFFINLAND EXPANSION 12 MTPA MINE OPTION PRE FEASIBILITY STUDY</p> | | <p>ORIGINAL SHEET SIZE: ISO A1 (841 x 594)</p> | | | |

\$\$\$ TIME \$\$\$
\$\$\$ DATES \$\$\$
\$\$\$ FILES \$\$\$

BILL OF MATERIALS - BR #102.217

STEEL

Table with 5 columns: ITEM, MARK, UNIT, QTY., DRAWING No. (H353004-35000-232-). Rows include 14.500m c/c BEARINGS T.P.G. SPAN (SQUARED ENDS), EXPANSION BEARING, FIXED BEARING, ANCHOR BOLTS, NEOPRENE PAD, DECK JOINT COVER PLATE (SQUARED).

CONCRETE

Table with 5 columns: ITEM, MARK, UNIT, QTY., DRAWING No. Rows include ABUTMENT - PRECAST CONCRETE (SQUARED), 2 ROW PILE CAP - PRECAST CONCRETE (SQUARED).

WALKWAY

Table with 5 columns: ITEM, MARK, UNIT, QTY., DRAWING No. Rows include WALKWAY SUPPORT, HANDRAIL POST, REFUGE BAY POST, BACKWALL HANDRAIL, FREE RAIL - 4150mm LONG, GRATING PANEL 613 x 5000mm, HANDRAIL SPLICE, WALKWAY TOE PLATE L 200x200x13x15000.

NOT FOR CONSTRUCTION 2018/12/05

Table with 2 columns: DRAWING NO., DRAWING TITLE. Row 1: REFERENCE DRAWINGS.

THIS DRAWING WAS PREPARED BY HATCH LTD. (HATCH) FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES. IF THE CLIENT AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE CLIENT...

Table with 5 columns: NO., DESCRIPTION, BY, CHK'D, APP'D, DATE. Header: REVISIONS.

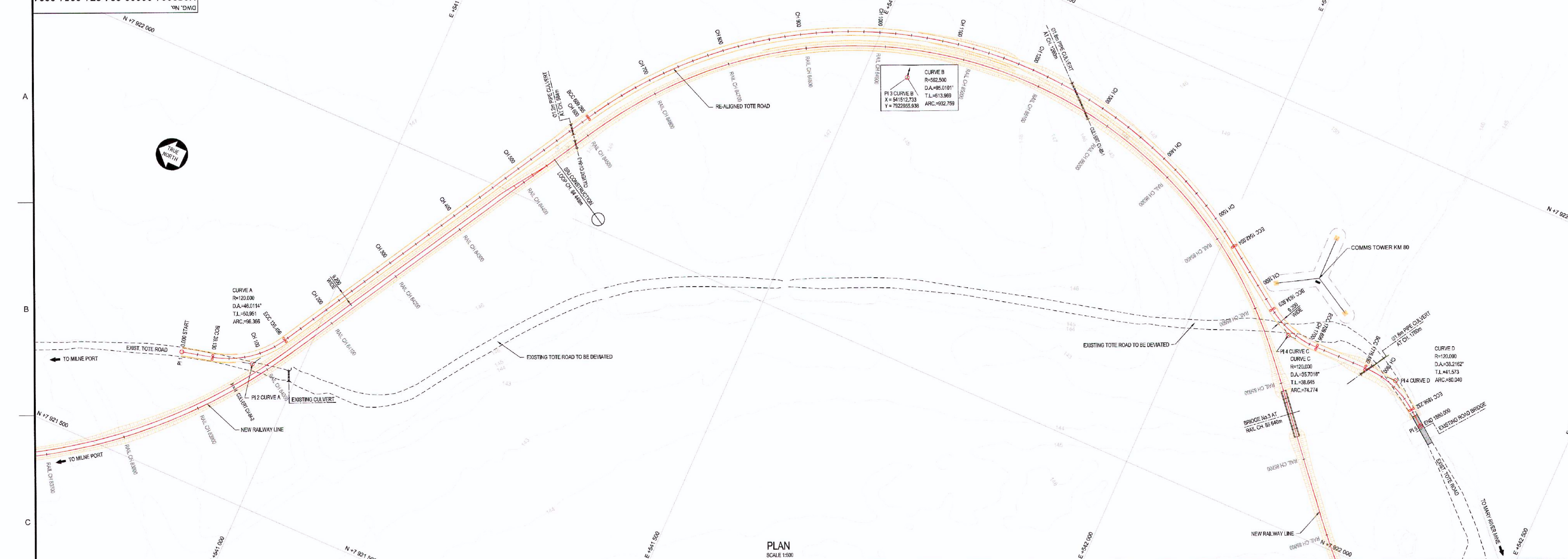
Table with 4 columns: REV., ISSUE FOR, AUTH. BY, DATE. Header: ISSUE AUTHORIZATION.

Table with 2 columns: DESIGNED BY, DRAWN BY, CHECKED BY, DISCIPL. ENGR., PROJ. DES. COORD., PROJ. ENGR., AREA MANAGER, DATE. Includes HATCH logo.

Baffinland logo and project information: BAFFINLAND EXPANSION 12 MTPA MINE OPTION PRE FEASIBILITY STUDY, RAILWAY BR #102.217 BILL OF MATERIAL, SCALE, DWG. NO. H353004-35000-232-260-0005-0008, ORIGINAL SHEET SIZE: ISO A1 (841 x 594).

DATE \$ TIME \$ FILES

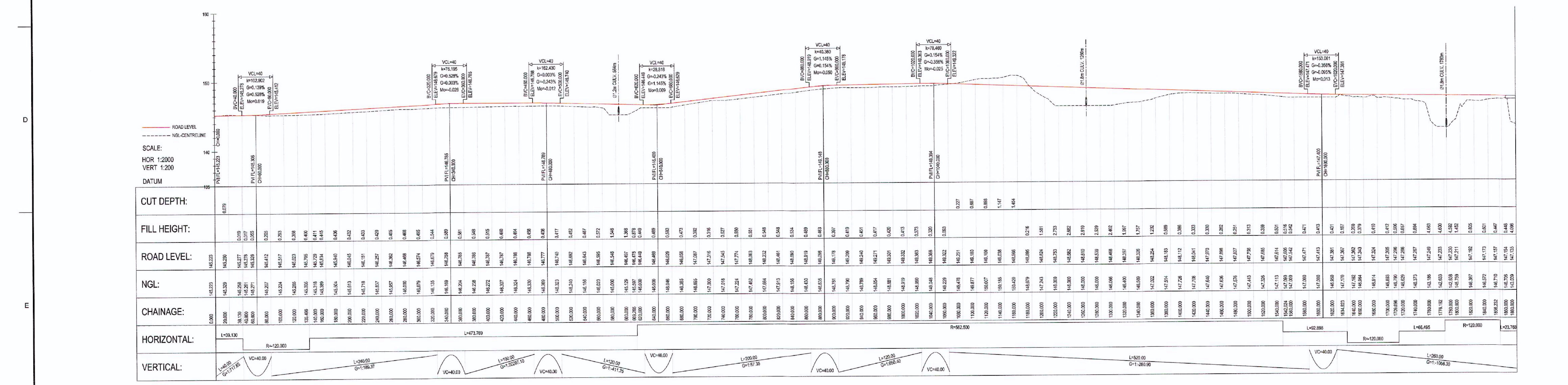
TOTE ROAD – LAYOUT AND LONG



- GENERAL NOTES:**
1. LIDAR SURVEY PROVIDED BY PHOTSAF (2016)
 2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
 3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 1m.
 4. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
 5. FOR TYPICAL ROAD CROSS SECTION SEE DRG. NO.: H353004-30000-224-294-0015-0001

| CO-ORDINATE LIST UTM (NAD83) ZONE 17 | | |
|--------------------------------------|------------|-------------|
| | E | N |
| PI 1 START | 540854.725 | 7921843.847 |
| BCC CURVE A | 540882.706 | 7921858.250 |
| PI CURVE A | 540942.492 | 7921870.513 |
| ECC CURVE A | 540967.682 | 7921874.800 |
| CULVERT AT 684m | 541182.427 | 7922102.143 |
| BCC CURVE B | 541205.087 | 7922124.807 |
| PI CURVE B | 541512.733 | 7922655.938 |
| CULVERT AT 1280m | 541874.607 | 7922404.887 |
| ECC CURVE B | 542015.166 | 7922303.686 |
| ECC CURVE C | 542091.189 | 7922246.874 |
| PI CURVE C | 542122.814 | 792227.463 |
| ECC CURVE C | 542181.457 | 792227.882 |
| BCC CURVE D | 542227.948 | 792228.612 |
| CULVERT AT 1780m | 542231.758 | 792228.582 |
| PI CURVE D | 542289.518 | 7922229.632 |
| ECC CURVE D | 542302.458 | 7922203.689 |
| PI 5 END | 542321.290 | 7922189.188 |

PLAN SCALE 1:500



LONGITUDINAL SECTION

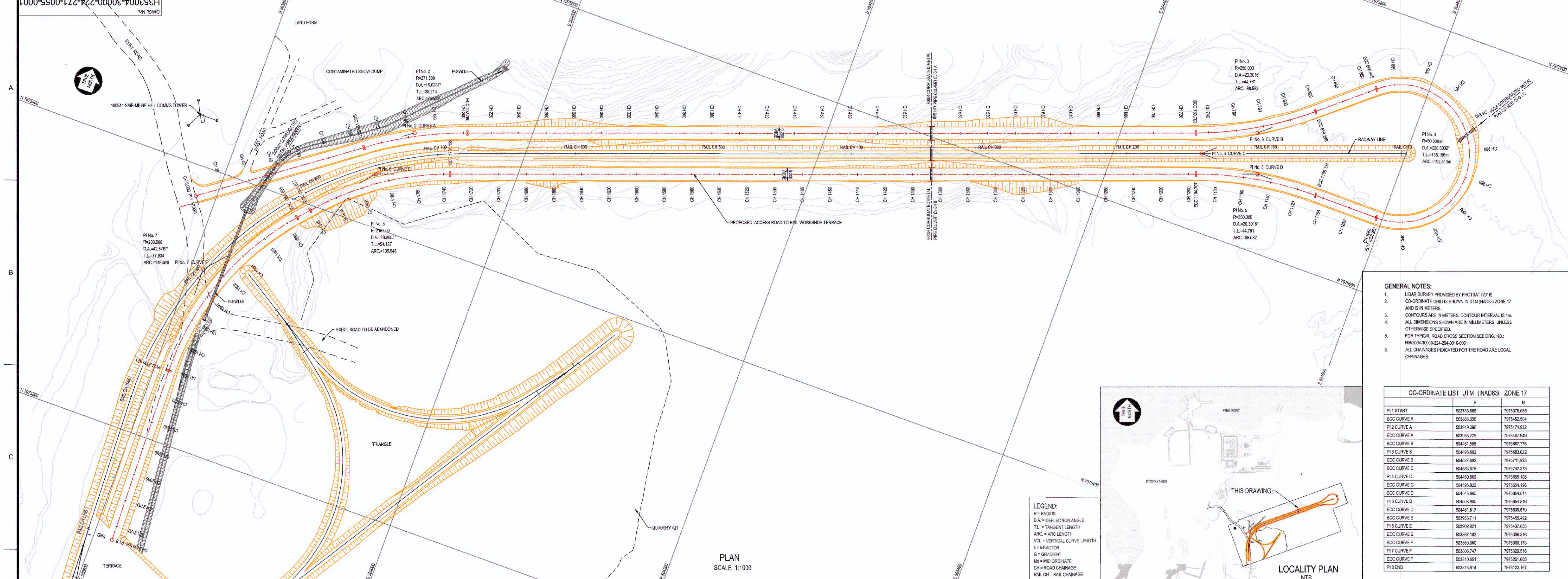
| | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>H353004-30000-224-271-0054-0001 TYPICAL HAUL ROAD CROSS SECTION</p> <p>H353004-30000-224-271-0054-0001 CROSS SECTIONS CH. 1+200 TO CH. 1+880</p> <p>H353004-30000-224-271-0054-0001 CROSS SECTIONS CH. 0+000 TO CH. 1+180</p> <p>DRAWING No. _____ DRAWING TITLE _____</p> | | <p>PERMIT TO PRACTICE</p> <p>Signature: _____</p> <p>Date: _____</p> <p>PERMIT NUMBER: P 512</p> <p>The Association of Professional Engineers, Geoscientists and Geophysicists of Newfoundland and Labrador</p> | |
| <p>APPROVED FOR CONSTRUCTION</p> <p>1 TOTE ROAD ALTERED TO SUIT REALIGNED RAILWAY LINE</p> <p>0 APPROVED FOR CONSTRUCTION</p> | | <p>HATCH</p> <p>DRAFTSPERSON: A VAN NEKERK NR 2018/0327</p> <p>DESIGNER: A VAN NEKERK NR 2018/0327</p> <p>CHECKER: G JOHNSTONE</p> <p>DESIGN COORD.: G JOHNSTONE</p> <p>RESP. ENG.: D STANGER</p> <p>LEAD DISC. ENG.: F VAN BILJON</p> <p>AREA LEAD: F VAN BILJON</p> <p>ENG. MANAGER: D STANGER</p> <p>DATE: 2018-12-13</p> | |
| <p>REG. PROFESSIONAL</p> <p>5</p> | | <p>REG. PROFESSIONAL</p> <p>6</p> | |
| <p>REG. PROFESSIONAL</p> <p>7</p> | | <p>REG. PROFESSIONAL</p> <p>8</p> | |

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

TOTE ROAD
ROAD RELOCATION RAIL CH. 83+900 - 85+700
LAYOUT AND LONGITUDINAL SECTION

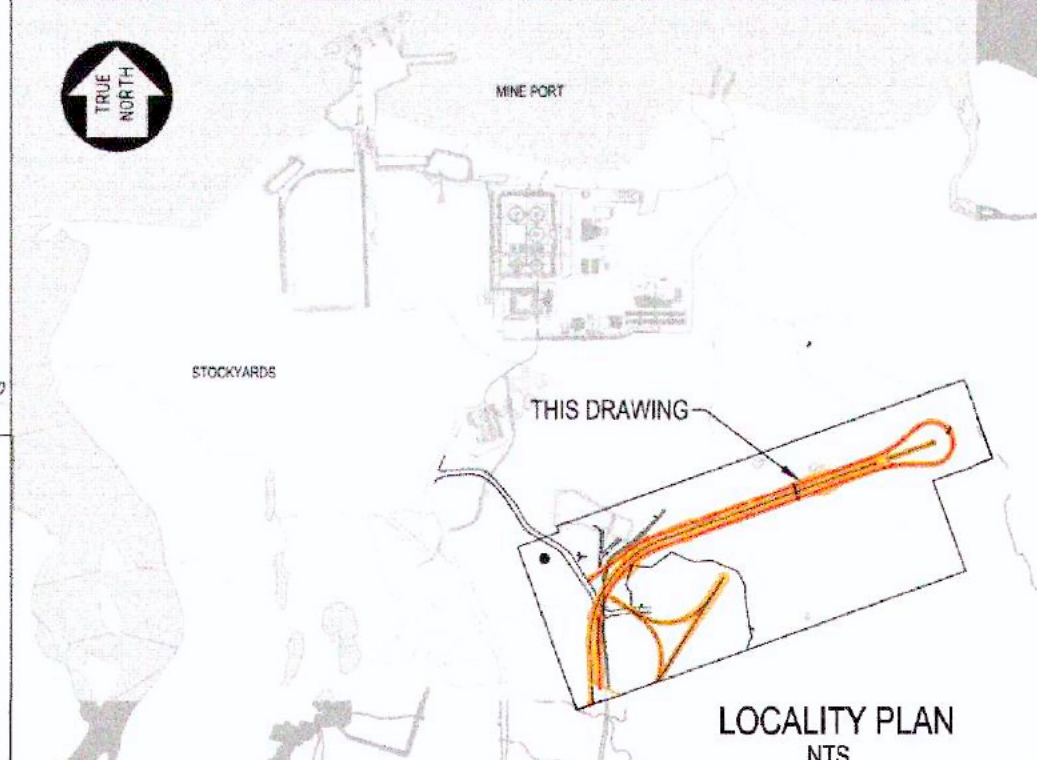
SCALE: 1:2000
DWG. No.: H353004-30000-224-271-0054-0001
REV: 1



- GENERAL NOTES:**
1. LEAS SURVEY PROVIDED BY PHOTASAT (2016)
 2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
 3. CONTOURS ARE IN METERS, CONTOUR INTERVAL IS 1m.
 4. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
 5. FOR TYPICAL ROAD CROSS SECTION SEE DRG. NO. H353004-30000-224-294-001(0001)
 6. ALL CHANGES INDICATED FOR THE ROAD ARE LOCAL CHANGES.

CO-ORDINATE LIST UTM (NAD83) ZONE 17

| PI No. | E | N |
|--------------|------------|-------------|
| PI 1 START | 533780.600 | 7975739.050 |
| BCC CURVE A | 533888.350 | 7975482.504 |
| PI 2 CURVE A | 533919.290 | 7975174.932 |
| ECC CURVE A | 533956.225 | 7975487.840 |
| BCC CURVE B | 534051.590 | 7975667.776 |
| PI 3 CURVE B | 534083.882 | 7975883.622 |
| ECC CURVE B | 534027.882 | 7975711.923 |
| BCC CURVE C | 534063.876 | 7975742.375 |
| PI 4 CURVE C | 534080.060 | 7975655.108 |
| ECC CURVE C | 534096.822 | 7975554.196 |
| BCC CURVE D | 534046.890 | 7975654.614 |
| PI 5 CURVE D | 534030.900 | 7975594.616 |
| ECC CURVE D | 534067.817 | 7975599.670 |
| BCC CURVE E | 533963.714 | 7975545.482 |
| PI 6 CURVE E | 533922.821 | 7975437.605 |
| ECC CURVE E | 533887.183 | 7975396.316 |
| BCC CURVE F | 533880.040 | 7975383.173 |
| PI 7 CURVE F | 533808.716 | 7975329.616 |
| ECC CURVE F | 533810.651 | 7975351.805 |
| PI 8 END | 533813.814 | 7975321.187 |



LEGEND:
 R = RADIUS
 D.A. = DEFLECTION ANGLE
 T.L. = TANGENT LENGTH
 M.L. = MIDPOINT
 V.C.L. = VERTICAL CURVE LENGTH
 G = GRADE
 CH = ROAD CHANGE
 RAIL CH = RAIL CHANGE

PLAN SCALE 1:1000

LONGITUDINAL SECTION

PERMIT TO PRACTICE
 HATCH LTD.
 Signature: [Signature]
 Date: [Date]
 PERMIT NUMBER: P-152
 The Association of Professional Engineers, Geologists and Geophysicists of NWT (A.P.E.G.G.N.W.T.)

FOR CONSTRUCTION

HATCH

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

PORT RAIL SITE
LAYOUT AND LONGITUDINAL SECTION
ACCESS ROAD TO RAIL WORKSHOP

DRAFTSPERSON: A VAN MEKERK
 DESIGNER: A VAN MEKERK
 CHECKER: A AQUIL
 DESIGN COORD: A AQUIL
 RESP. ENG: R HANIM
 LEAD DISC. ENG: F VAN BILJON
 AREA LEAD: F VAN BILJON
 ENGR. MANAGER: D STANGER
 AREA MANAGER: F FITTMAN

DATE: 2018/05/21
 DATE: 2018/05/21
 DATE: 2018/05/21
 DATE: 2018/05/21
 DATE: 2018/05/21
 DATE: 2018/05/21
 DATE: 2018/05/21

APPROVED FOR CONSTRUCTION
 BY: [Signature] DATE: 2018/09/04

REG. PROFESSIONAL

REVISIONS

DRAWING APPROVAL STATUS: APPROVED FOR CONSTRUCTION

SCALE: 1:1000 (ON AS NOTED)

DWG. No. H353004-30000-224-271-0055-0001

REV 0

SHEET SIZE: A0

| NO. | DESCRIPTION | DATE | BY | CHKD |
|-----|-----------------------------------------|------|----|------|
| 1 | TYPICAL HALL ROAD CROSS SECTION | | | |
| 2 | CROSS SECTIONS CAL. 0+100 TO 0+241.320m | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |

REFERENCE DRAWINGS

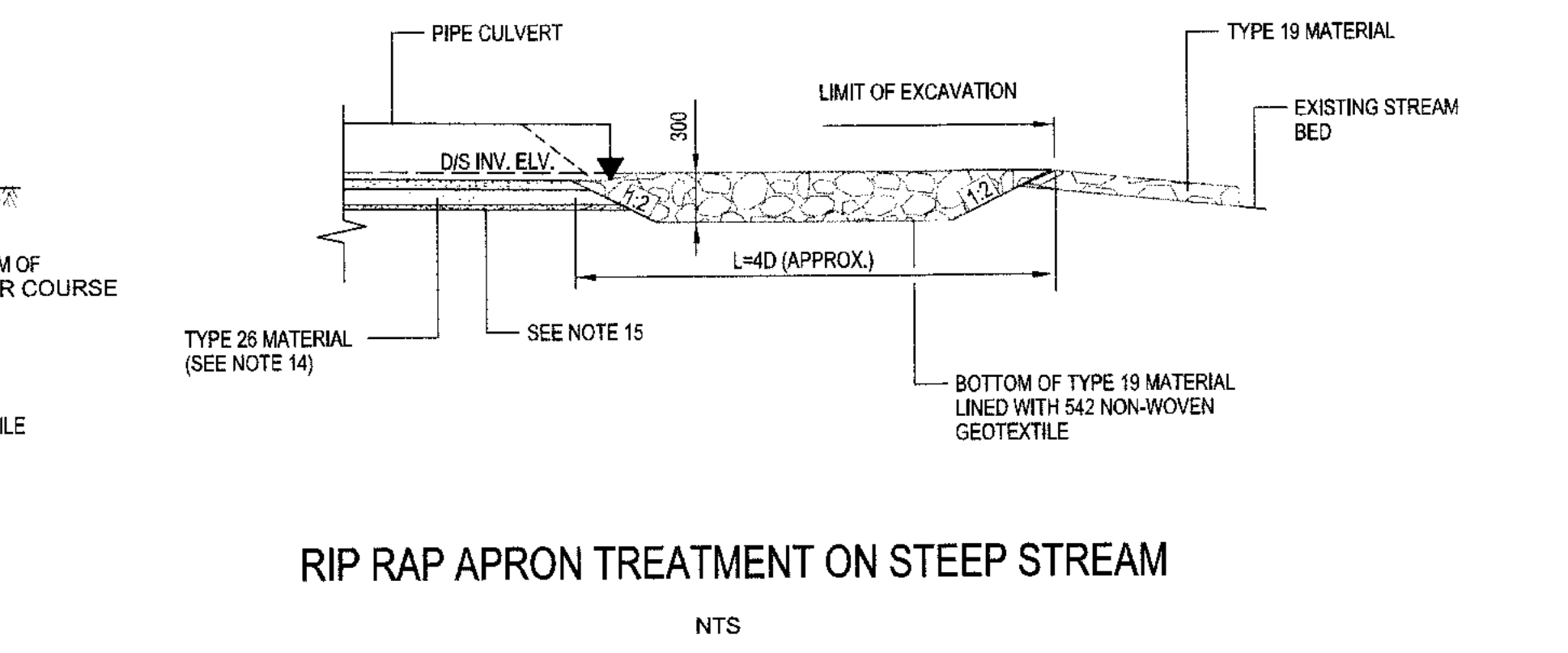
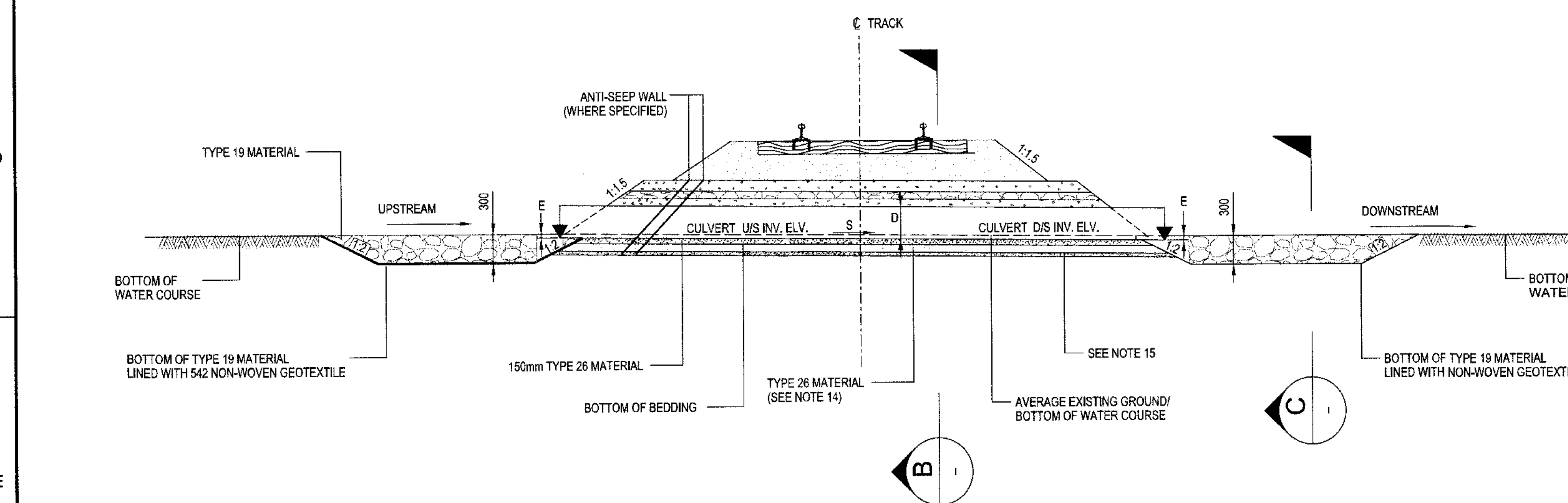
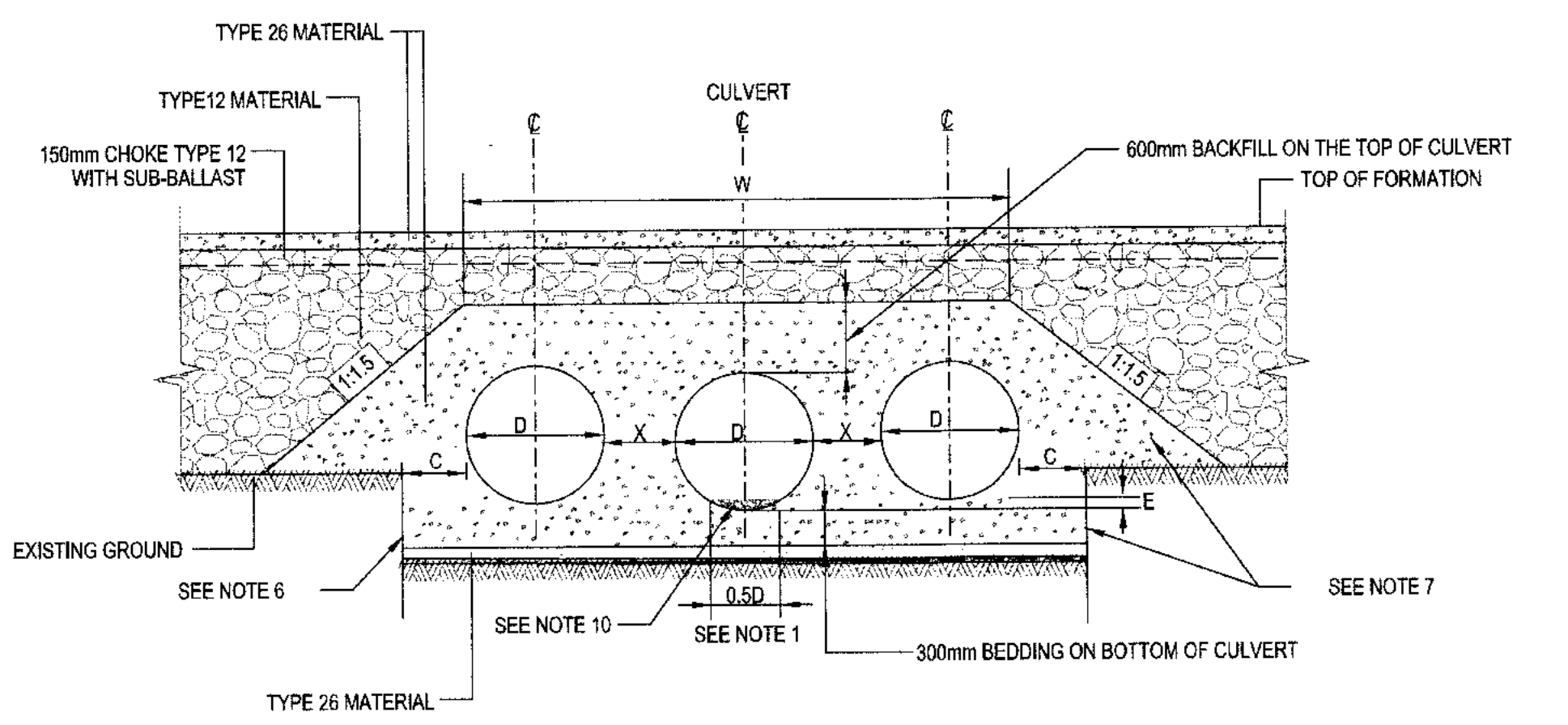
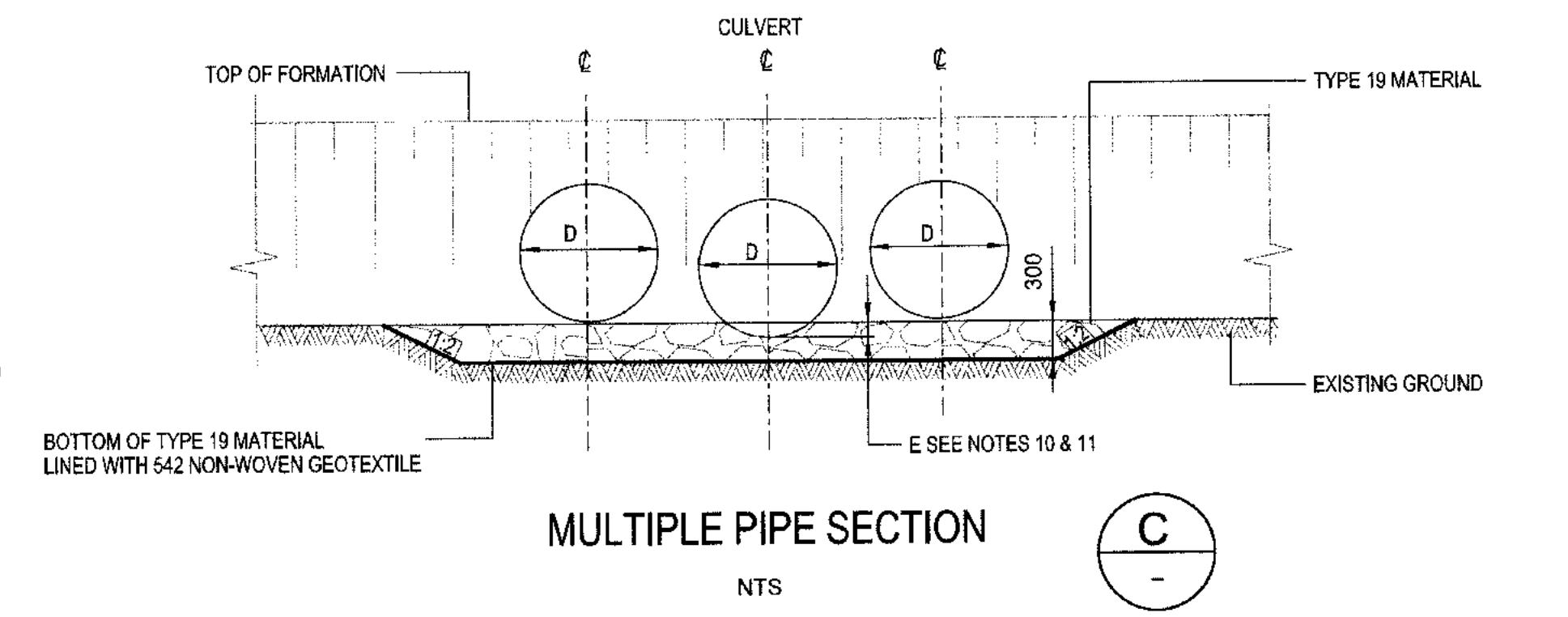
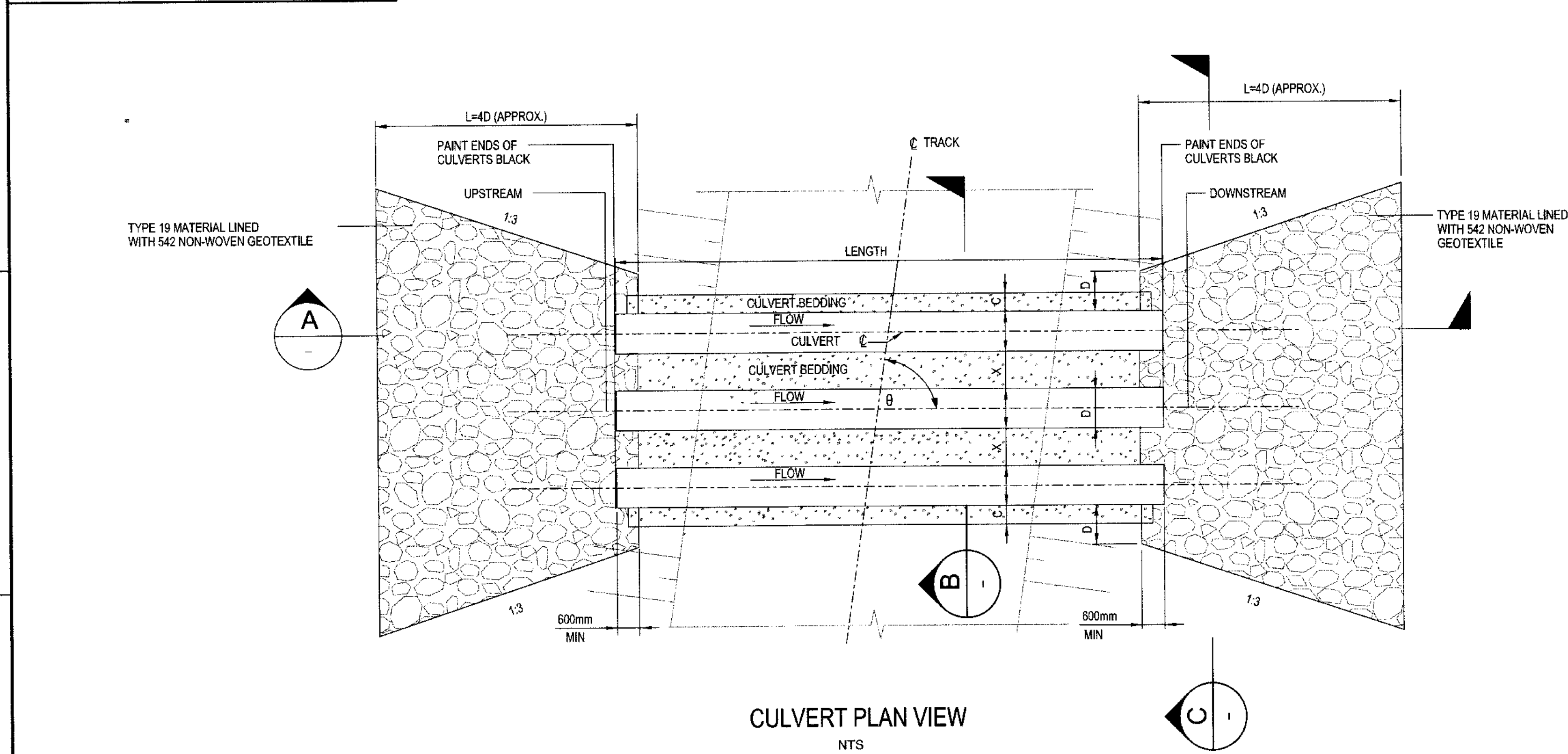
TYPICAL CROSS SECTIONS

H353004-30000-224-294-001-0001
 W.G. No. 001

LEGEND

| | |
|---------------|---------------------------------------------------------------------------------------|
| D | CULVERT DIAMETER |
| E | EMBEDMENT DEPTH |
| C | CULVERT SPACING AND BEDDING CLEARANCE C=500 WHILE D<=900mm C=300 WHILE D<=900mm |
| W | CULVERT BACKFILL TOP WIDTH W=n'D (n=1)'C |
| U/S INV. ELV. | CULVERT UPSTREAM INVERT ELEVATION |
| D/S INV. ELV. | CULVERT DOWNSTREAM INVERT ELEVATION |
| L | RIPRAP APRON LENGTH L=4'D (APPROX.) |
| S | CULVERT SLOPE |
| LENGTH | CULVERT LENGTH |
| INV | INVERT |
| θ | ANGLE OF SKEW |
| X | DISTANCE BETWEEN CULVERTS |
| n | NUMBER OF CULVERTS |

- NOTES:**
- THE PIPE BED SHALL BE SHAPED TO RECEIVE THE BOTTOM OF THE PIPE.
 - GRANULAR MATERIAL PLACED UNDER THE HAUNCH MUST BE COMPACTED.
 - BEDDING AND BACKFILL MATERIAL SHALL BE HOMOGENEOUS GRANULAR MATERIAL AND SHALL BE PLACED AND COMPACTED UNIFORMLY AROUND THE PIPE.
 - ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE
 - ALL ELEVATIONS ARE IN METERS UNLESS NOTED OTHERWISE.
 - WHERE VERTICAL EXCAVATION IS NOT POSSIBLE, MODIFY EXCAVATION SLOPE TO MIN. 1V:1.5H
 - PROVIDE 300mm TYPE 8 (150mm MINUS) AROUND BEDDING AND BACK FILL MATERIAL ONLY WHEN ROCK/FILL IS PRESENT.
 - ADJUST CULVERT START AND END COORDINATES AND INVERT ELEVATIONS IN THE FIELD AS APPROVED BY COMPANY'S REPRESENTATIVE.
 - PROVIDE AVERAGE STREAM SLOPE ALONG THE CULVERT AS CULVERT SLOPE BASED ON ACTUAL FIELD CONDITION.
 - FOR FISH BEARING CULVERT, E=0.1D TO 0.25D FOR NON-FISH BEARING CULVERT, E=0 TYPE 19 MATERIAL IN BASE OF LOWERED CULVERT.
 - FOR FISH BEARING CULVERT WITH MULTIPLE PIPES, ONLY ONE PIPE SHALL BE EMBEDDED BY 'E' (APPROXIMATELY 0.1D TO 0.25D) ALL OTHER PIPES SHALL BE PLACED ON GROUND/BOTTOM OF WATER COURSE.
 - COMPACTED ROCK-FILL (TYPE 8) MATERIAL TO BE PLACED ON THE NATURAL GROUND OR RAISED GRADE. DEPTH OF ROCK-FILL VARIES BETWEEN 1m AND 1.5m.
 - ADDITIONAL FILL OF RUN OF QUARRY (TYPE 12) OR ROCK-FILL (TYPE 8) MAY BE REQUIRED TO RAISE GRADE OF EMBANKMENT TO MATCH VERTICAL PROFILE OF RAILROAD OR WHERE A WEAK FOUNDATION SOIL IS PRESENT.
 - THE DEPTH OF THE EXCAVATION UNDER THE CULVERT AND THE REQUIREMENT OF THE INSULATION LAYER IS TO BE DEFINED BY CULVERT LOCATION.
 - 100mm OF DRY SAND, TYPE 9 FILL-CRUSHER FINES/LINER BEDDING OR A FILTER CLOTH PLACED ABOVE AND BELOW INSULATION LAYER FOR PROTECTION.
 - PREFABRICATED CONCRETE WINGWALLS WILL BE ALLOWED FOR. FLAG WILL BE PLANTED TO INDICATE BEGINNING/END OF PIPE.
 - DESIGN FOR 1:200 RETURN PERIOD.
 - MATERIAL TYPE DEFINITION:
TYPE 12: RUN OF QUARRY/ROCK FILL LAYER
TYPE 19: RIP RAP LAYER
TYPE 25: BALLAST LAYER
TYPE 26: SUB-BALLAST LAYER
 - THIS DRAWING WAS PREVIOUSLY ISSUED AS H353004-00000-220-294-0001-0001.



PERMIT TO PRACTICE
HATCH LTD.
 Signature: _____
 Date: 2018-11-08
PERMIT NUMBER: P 512
 The Association of Professional Engineers,
 Geologists and Geophysicists of NWT/NU

| | |
|---------------------------------|---------------------------------------------------|
| H353004-30000-224-294-0002-0001 | TYPICAL CROSS SECTION- SINGLE BARREL PIPE CULVERT |
| DRAWING No. | DRAWING TITLE |
| REFERENCE DRAWINGS | |

APPROVED FOR CONSTRUCTION

2018-11-08

| | | | | |
|-----|---------------------------|-------|-------|------------|
| No. | DESCRIPTION | BY | CHK'D | DATE |
| 0 | APPROVED FOR CONSTRUCTION | S.P.A | G.J | 2018/10/19 |

REG. PROFESSIONAL

HATCH

| | | | |
|-----------------|---------------------|-----------------|--------------------------|
| DRAFTSPERSON | S. PINKNEY-ATKINSON | NR | 2018/09/26 |
| DESIGNER | S. PINKNEY-ATKINSON | NR | |
| CHECKER | GLEN JOHNSTONE | Johnstone, Glen | |
| DESIGN COORD. | GLEN JOHNSTONE | Johnstone, Glen | |
| RESP. ENG. | FANUS VAN BILJON | | 2018-10-30 |
| LEAD DISC. ENG. | FANUS VAN BILJON | | 2018-11-08 10:11:08 |
| AREA LEAD | FANUS VAN BILJON | | 2018-11-08 10:12:25-4030 |
| ENG. MANAGER | DANIEL STANGER | | 2018-10-30 |
| AREA MANAGER | FAY PITTMAN | | 2018-11-08 |

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

RAIL SITE
STANDARD DRAWING
TYPICAL CROSS SECTION- MULTIPLE BARREL PIPE CULVERT

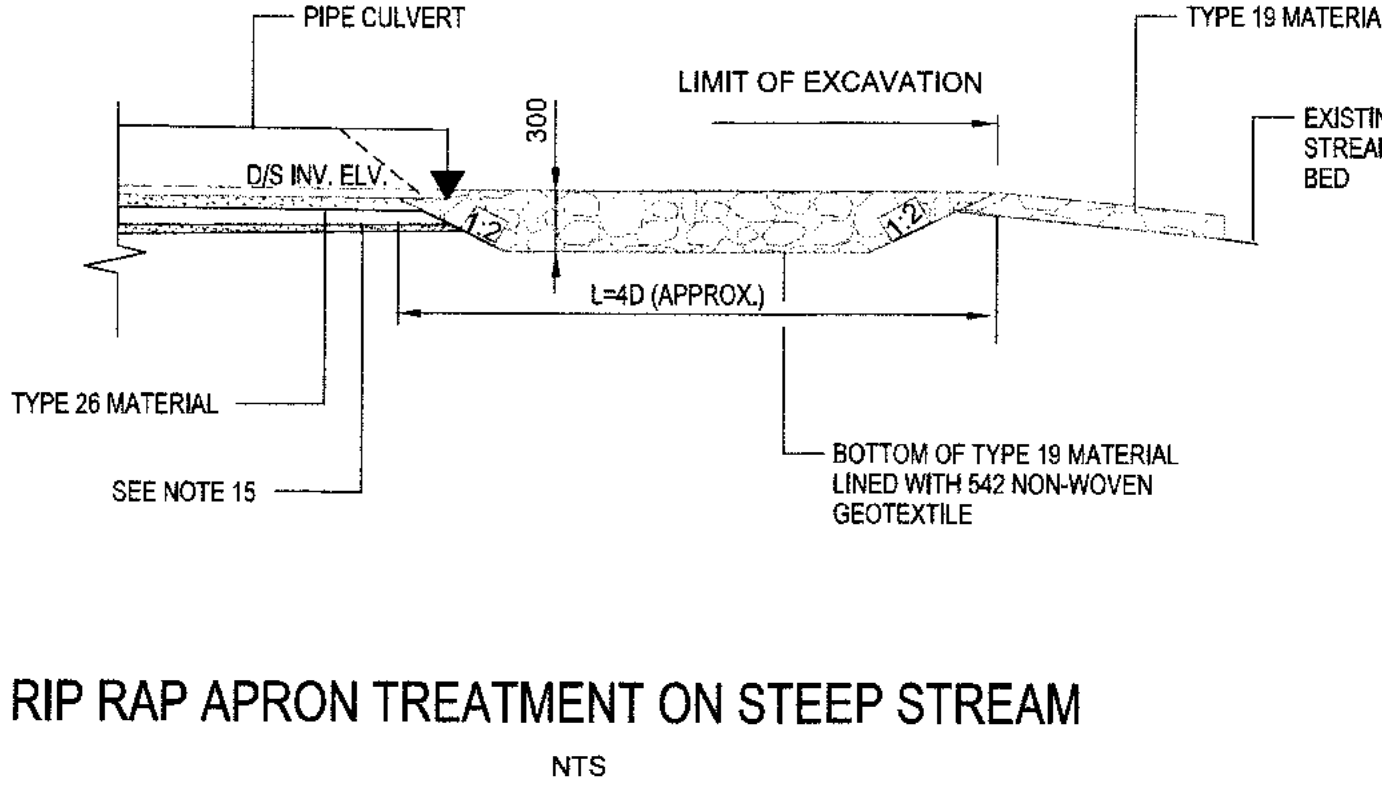
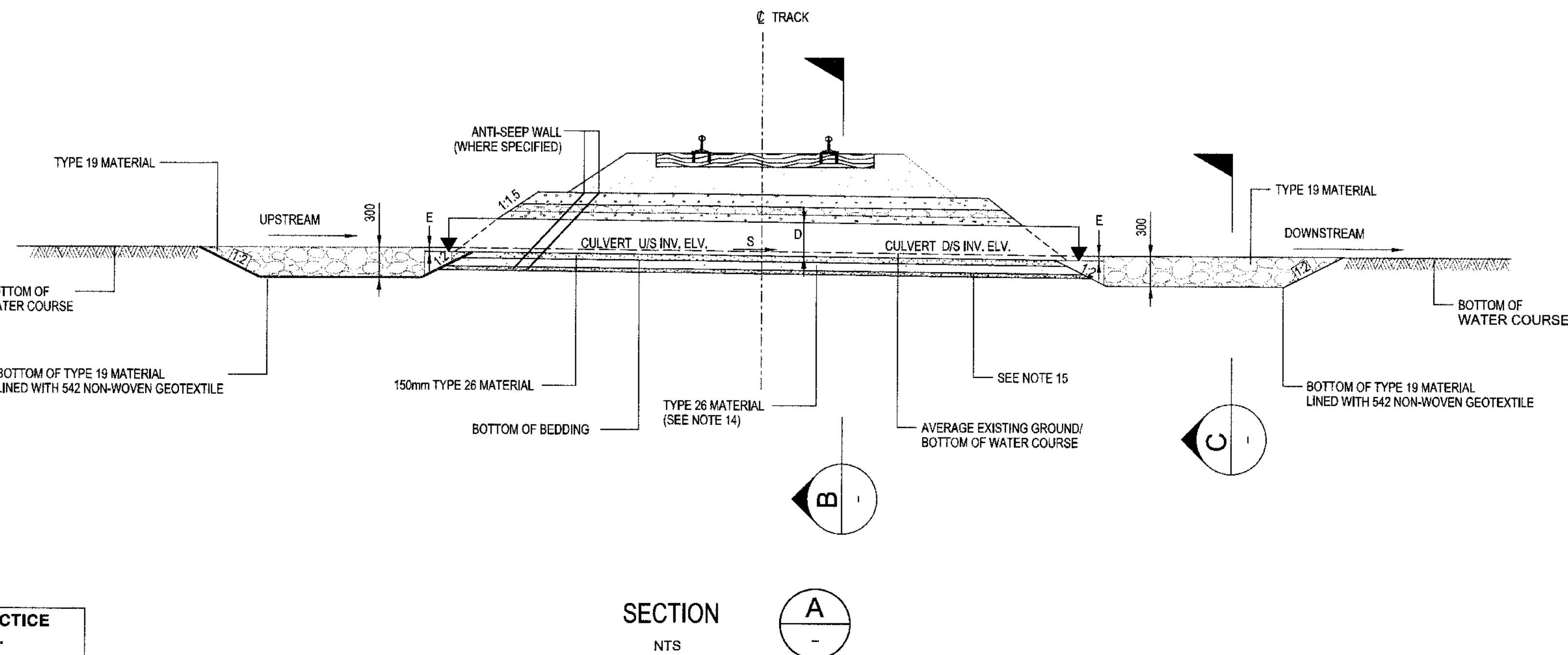
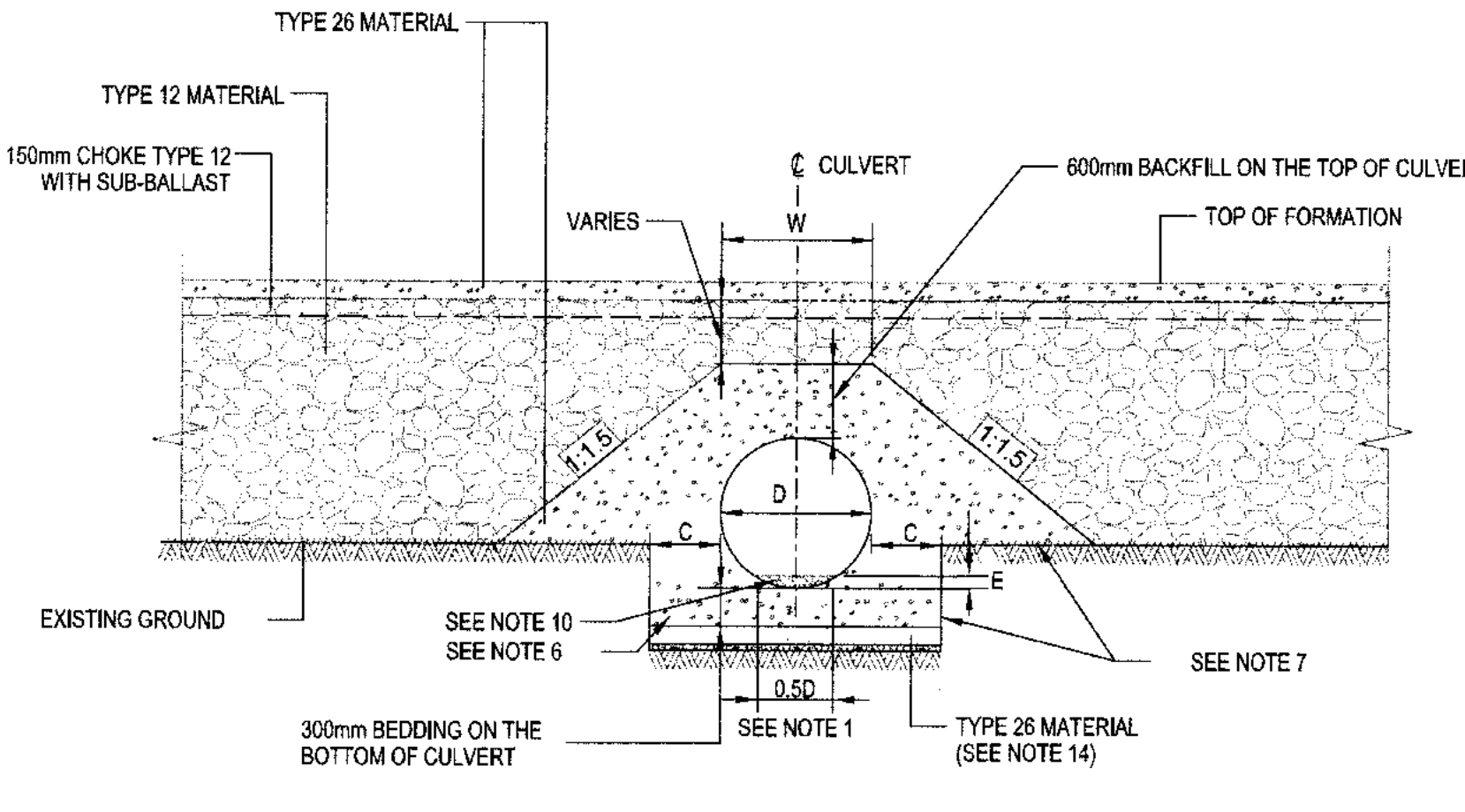
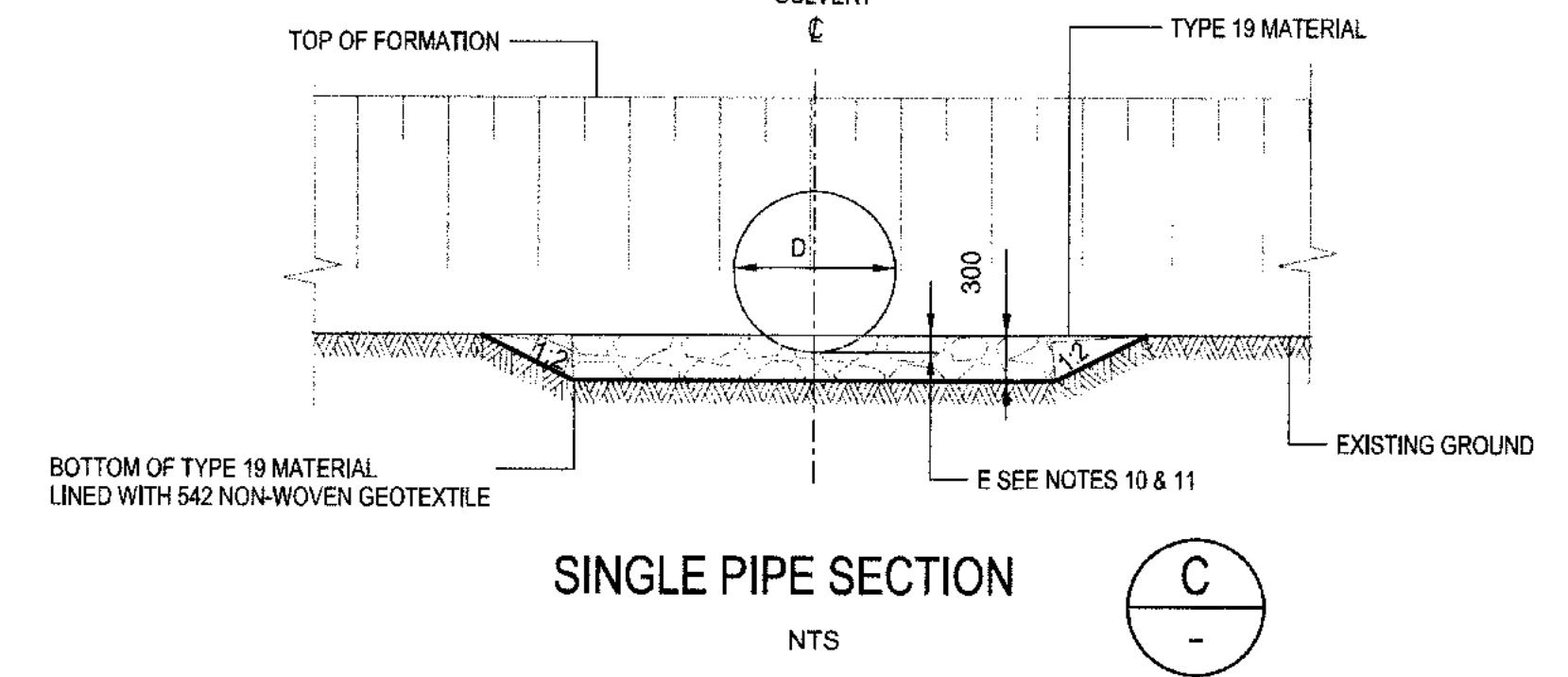
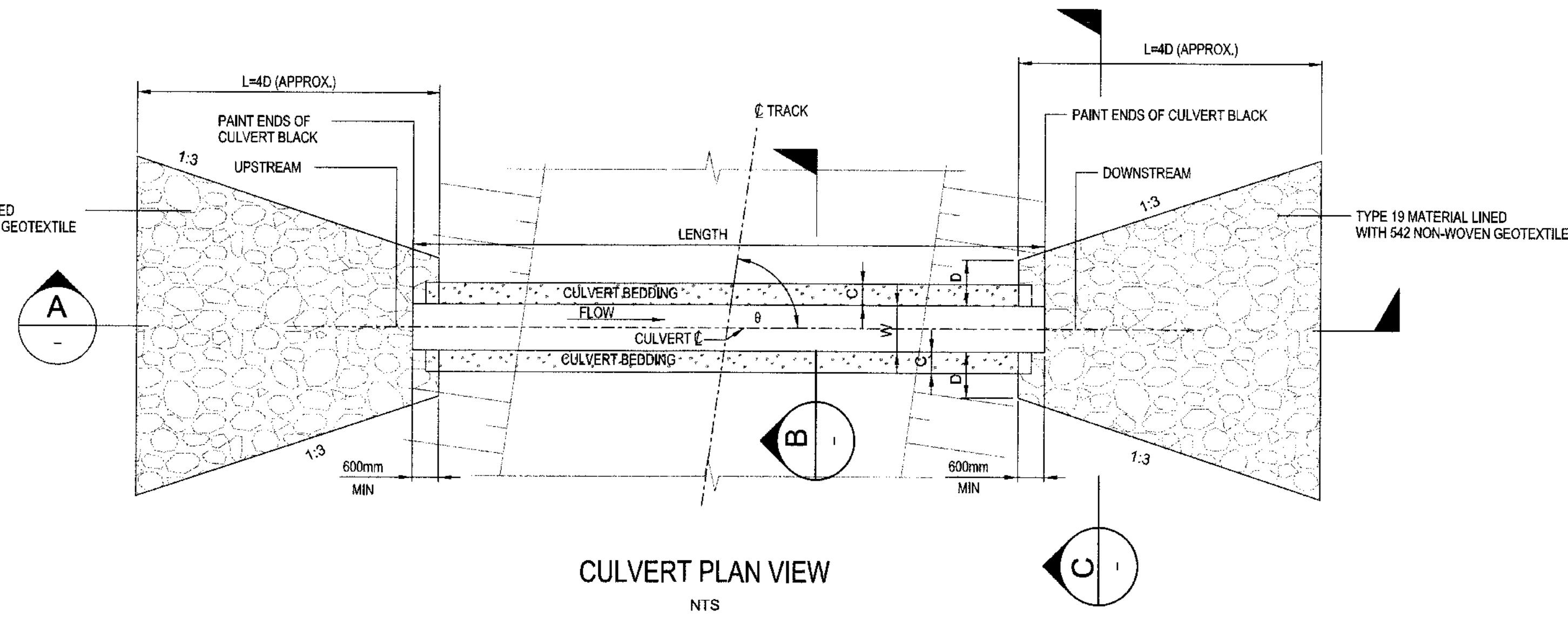
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|-------------|---------------------------------|-----|
| SCALE | DWG. No. | REV |
| NTS | H353004-30000-224-294-0001-0001 | 0 |
| OR AS NOTED | | |

SHEET SIZE: 0

LEGEND

| | |
|---------------|-------------------------------------------------------------------------------------|
| D | CULVERT DIAMETER |
| E | EMBEDMENT DEPTH |
| C | CULVERT SPACING AND BEDDING CLEARANCE C=500 WHILE D=900mm C=900 WHILE D=900mm |
| W | CULVERT BACKFILL TOP WIDTH $W=n'D+(n-1)C$ |
| U/S INV. ELV. | CULVERT UPSTREAM INVERT ELEVATION |
| D/S INV. ELV. | CULVERT DOWNSTREAM INVERT ELEVATION |
| L | RIPRAP APRON LENGTH L=4'D (APPROX.) |
| S | CULVERT SLOPE |
| LENGTH | CULVERT LENGTH |
| INV | INVERT |
| θ | ANGLE OF SKEW |
| X | DISTANCE BETWEEN CULVERTS |
| n | NUMBER OF CULVERTS |

- NOTES:**
- THE PIPE BED SHALL BE SHAPED TO RECEIVE THE BOTTOM OF THE PIPE.
 - GRANULAR MATERIAL PLACED UNDER THE HAUNCH MUST BE COMPACTED.
 - BEDDING AND BACKFILL MATERIAL SHALL BE HOMOGENEOUS GRANULAR MATERIAL AND SHALL BE PLACED AND COMPACTED UNIFORMLY AROUND THE PIPE.
 - ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - ALL ELEVATIONS ARE IN METERS UNLESS NOTED OTHERWISE.
 - WHERE VERTICAL EXCAVATION IS NOT POSSIBLE, MODIFY EXCAVATION SLOPE TO MIN. 1.5H:1V.
 - PROVIDE 300mm TYPE 8 (150mm MINUS) AROUND BEDDING AND BACK FILL MATERIAL ONLY WHEN ROCKFILL IS PRESENT.
 - ADJUST CULVERT START AND END COORDINATES AND INVERT ELEVATIONS IN THE FIELD AS APPROVED BY COMPANY'S REPRESENTATIVE.
 - FLOW DIRECTION MUST BE FROM UPSTREAM TO DOWNSTREAM. PROVIDE AVERAGE STREAM SLOPE ALONG THE CULVERT AS CULVERT SLOPE BASED ON ACTUAL FIELD CONDITION.
 - FOR FISH BEARING CULVERT, E=0.1D TO 0.25D
FOR NON-FISH BEARING CULVERT, E=0
TYPE 19 MATERIAL IN BASE OF LOWERED CULVERT.
 - FOR FISH BEARING CULVERT WITH MULTIPLE PIPES, ONLY ONE PIPE SHALL BE EMBEDDED BY "E" (APPROXIMATELY 0.1D TO 0.25D) ALL OTHER PIPES SHALL BE PLACED ON GROUND/BOTTOM OF WATER COURSE.
 - COMPACTED ROCK-FILL (TYPE 8) MATERIAL TO BE PLACED ON THE NATURAL GROUND OR RAISED GRADE. DEPTH OF ROCK-FILL VARIES BETWEEN 1m AND 1.5m
 - ADDITIONAL FILL OF RUN OF QUARRY (TYPE 12) OR ROCK-FILL (TYPE 8) MAY BE REQUIRED TO RAISE GRADE OF EMBANKMENT TO MATCH VERTICAL PROFILE OF RAILROAD OR WHERE A WEAK FOUNDATION SOIL IS PRESENT.
 - THE DEPTH OF THE EXCAVATION UNDER THE CULVERT AND THE REQUIREMENT OF THE INSULATION LAYER IS TO BE DEFINED BY CULVERT LOCATION.
 - 100mm OF DRY SAND, TYPE 9 FILL-CRUSHER FINES/ LINER BEDDING OR A FILTER CLOTH PLACED ABOVE AND BELOW INSULATION LAYER FOR PROTECTION.
 - PREFABRICATED CONCRETE WINGWALLS WILL BE ALLOWED FOR. FLAG WILL BE PLANTED TO INDICATE BEGINNING/END OF PIPE.
 - DESIGN FOR 1:200 RETURN PERIOD.
 - MATERIAL TYPE DEFINITION:
TYPE 12: RUN OF QUARRY/ ROCK FILL LAYER
TYPE 19: RIP RAP LAYER
TYPE 25: BALLAST LAYER
TYPE 26: SUB-BALLAST LAYER
 - THIS DRAWING WAS PREVIOUSLY ISSUED AS H353004-00000-220-294-0002-0001.



**PERMIT TO PRACTICE
HATCH LTD.**
Signature _____
Date 2018-11-08
PERMIT NUMBER: P 512
The Association of Professional Engineers,
Geologists and Geophysicists of NWT/NU

APPROVED FOR CONSTRUCTION

THIS DRAWING WAS PREPARED BY HATCH LTD. (HATCH) FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LP (CLIENT) AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE CLIENT. INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH. SUBJECT TO CLIENT'S ROYALTY-FREE, IRREVOCABLE, PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE AND REPRODUCE THIS DRAWING FOR PURPOSES CONNECTED WITH THIS PROJECT, INCLUDING THE CONSTRUCTION, COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT, THIS DRAWING, AND THE INFORMATION CONTAINED HEREIN, SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE MODIFIED WITHOUT THE WRITTEN CONSENT OF HATCH.

HATCH

Baffinland

| | | | |
|-----------------|--------------------|-----------------|---------------------|
| DRAFTSPERSON | S PINKNEY-ATKINSON | NR | 2018/03/19 |
| DESIGNER | S PINKNEY-ATKINSON | NR | |
| CHECKER | GLEN JOHNSTONE | Johnstone, Glen | |
| DESIGN COORD. | GLEN JOHNSTONE | Johnstone, Glen | |
| RESP. ENG. | FANUS VAN BILJON | | 2018-10-30 |
| LEAD DISC. ENG. | FANUS VAN BILJON | | 2018-10-16 10:25:00 |
| AREA LEAD | FANUS VAN BILJON | | 2018-10-30 |
| ENG. MANAGER | DANIEL STANGER | | |
| AREA MANAGER | FAY PITTMAN | | 2018-11-08 |

**BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT**

**RAIL SITE
STANDARD DRAWING
TYPICAL CROSS SECTION- SINGLE BARREL PIPE CULVERT**

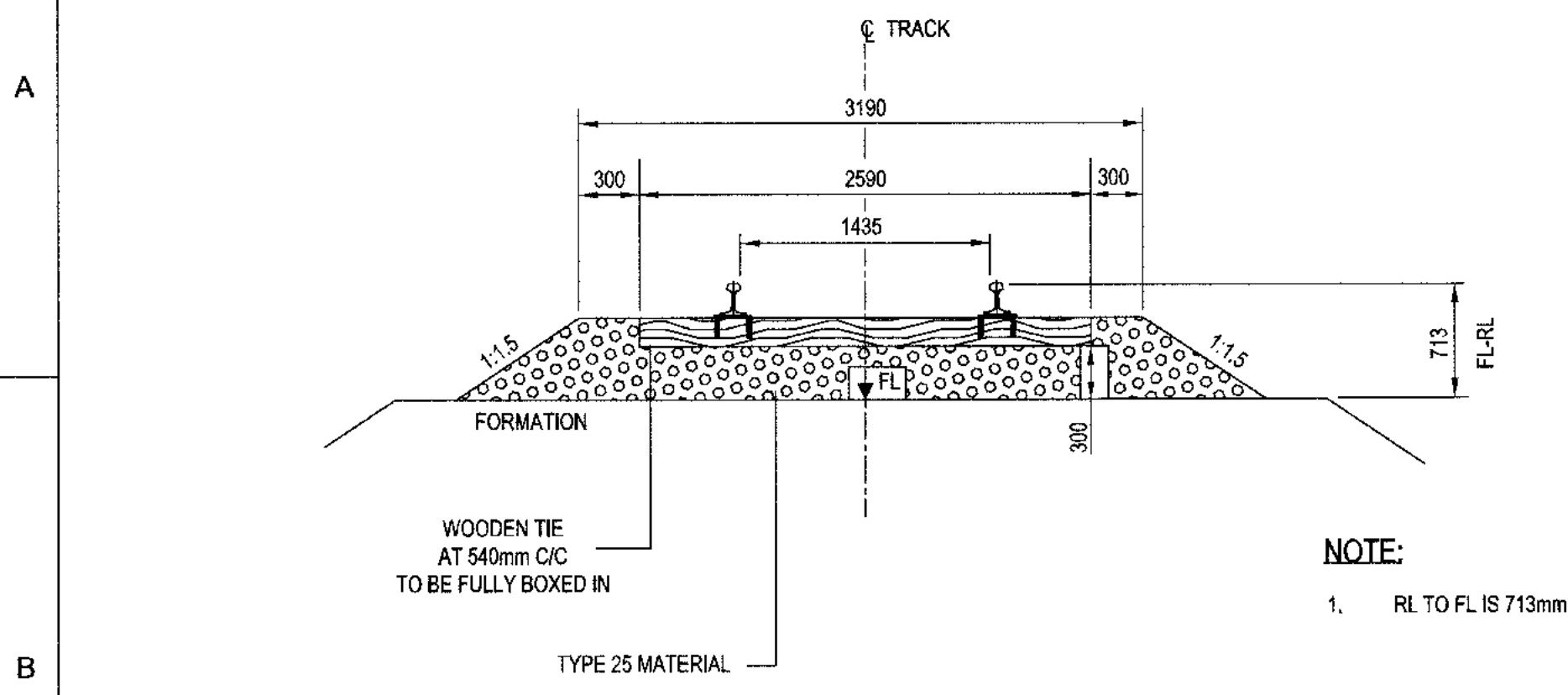
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| H353004-30000-224-294-0001-0001 | TYPICAL CROSS SECTION - MULTIPLE BARREL PIPE CULVERT | REG. PROFESSIONAL |
| DRAWING No. | DRAWING TITLE | |
| REFERENCE DRAWINGS | | |
| REG. PROFESSIONAL | | |

| | | | | |
|-----------|---------------------------|-------|-------|------------|
| 0 | APPROVED FOR CONSTRUCTION | S.P.A | G.J | 2018/10/19 |
| No. | DESCRIPTION | BY | CHK'D | DATE |
| REVISIONS | | | | |

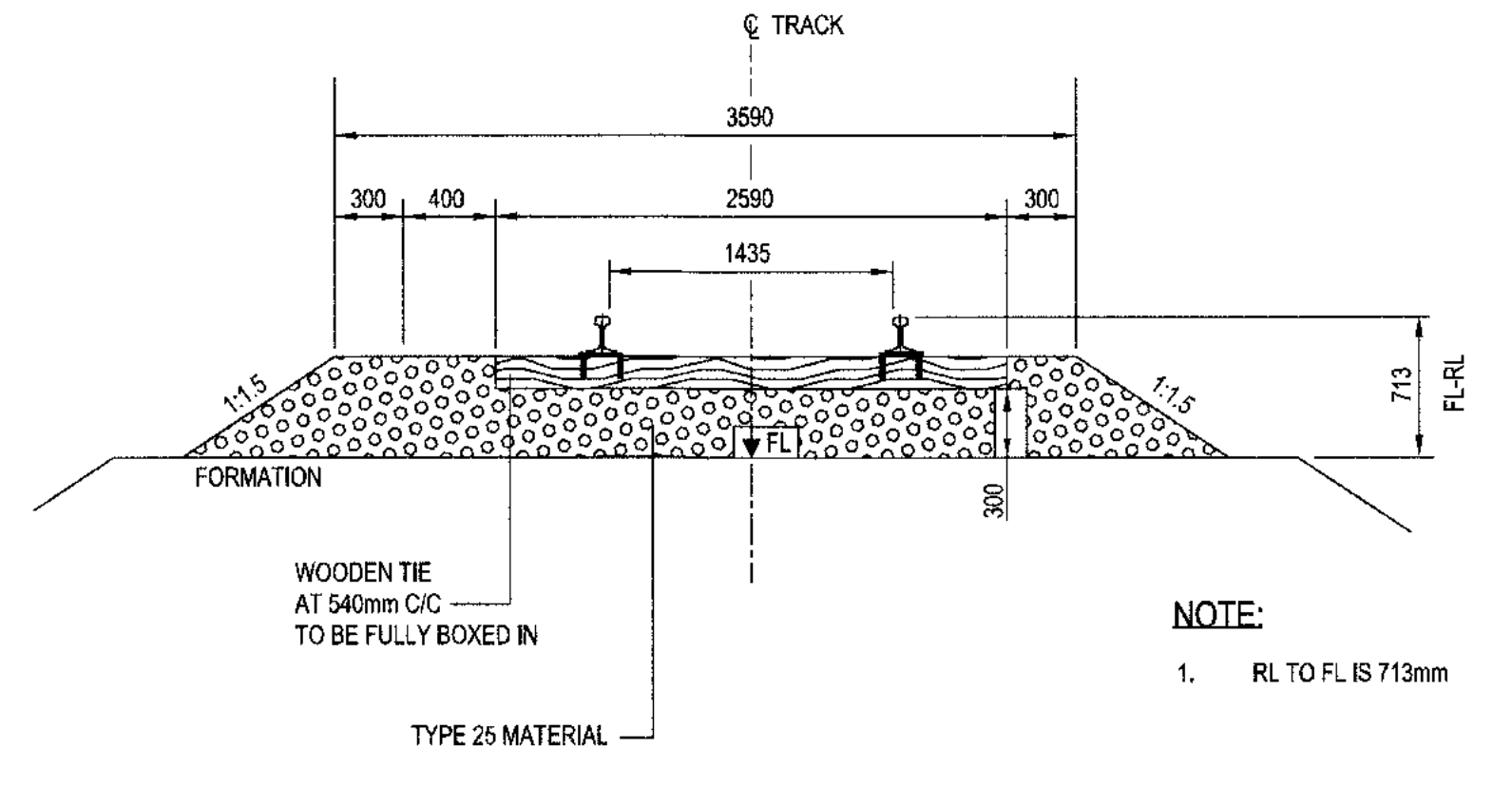
DRAWING APPROVAL STATUS: Approved for Construction

SCALE: NTS
DWG. No.: H353004-30000-224-294-0002-0001
REV: 0

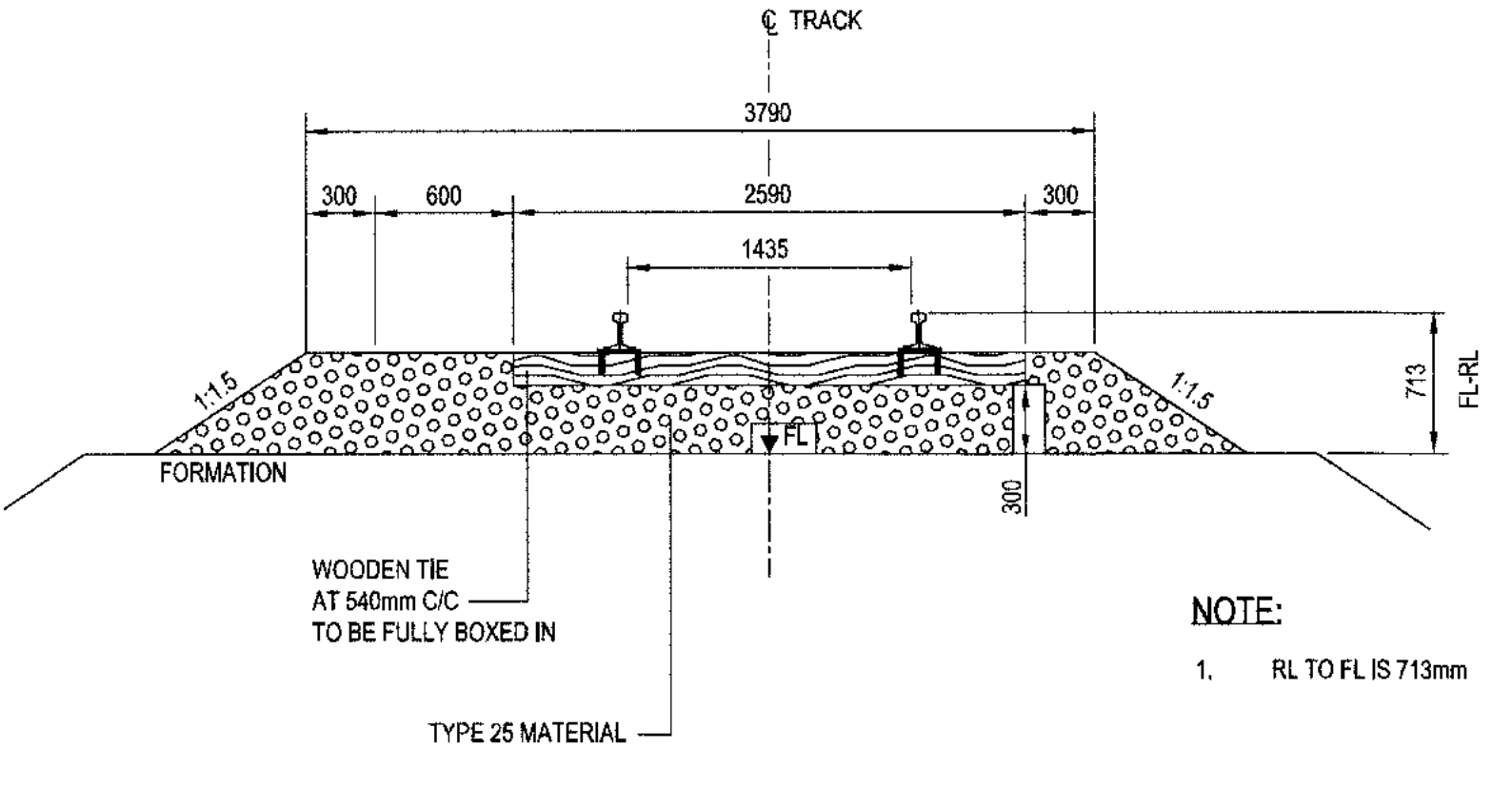
SUSANAMES \$TIMES \$FILES



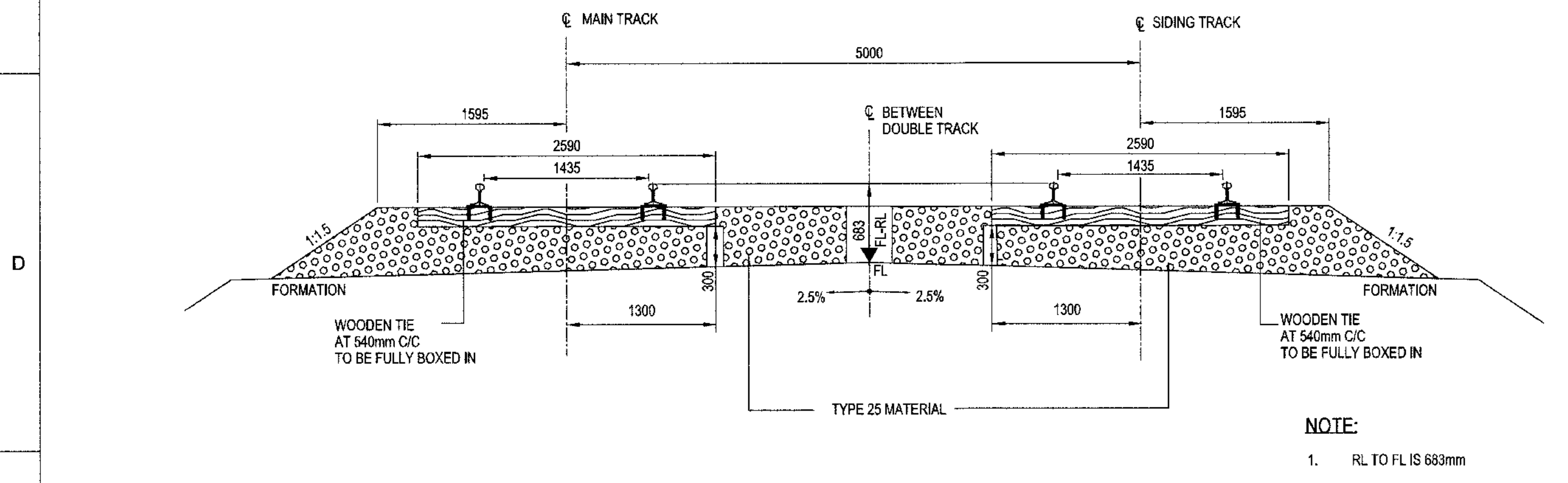
TYPICAL CROSS SECTION- SUPERSTRUCTURE
HARDWOOD TIES
R > 800m AND TANGENT TRACK
NTS



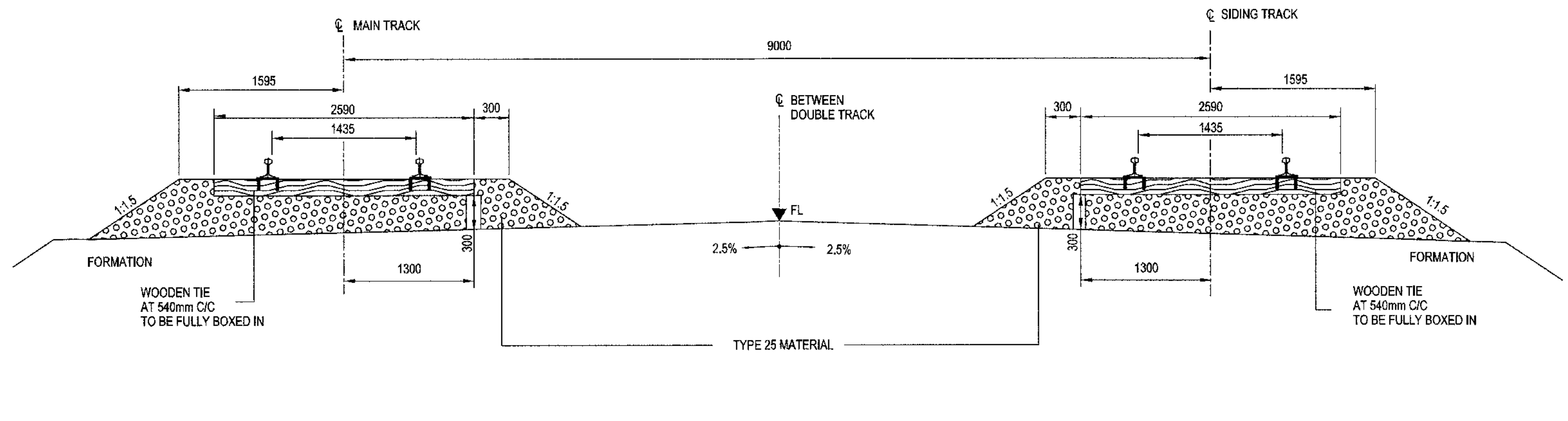
TYPICAL CROSS SECTION- SUPERSTRUCTURE
HARDWOOD TIES
400m < R <= 800m
NTS



TYPICAL CROSS SECTION- SUPERSTRUCTURE
HARDWOOD TIES
R <= 400m
NTS



TYPICAL CROSS SECTION AT PASSING LOOP LOCATION-SUPERSTRUCTURE
HARDWOOD TIES
NTS



TYPICAL CROSS SECTION AT PASSING LOOP LOCATION- SUPERSTRUCTURE
IN YARD
HARDWOOD TIES
NTS

NOTE:
1. THIS DRAWING WAS PREVIOUSLY ISSUED AS H353004-00000-220-294-0003-0001.

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HATCH LTD.
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Date: 2018-11-08
PERMIT NUMBER: P 512
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| DRAWING No. | DRAWING TITLE |
|---------------------------------|-------------------------------------|
| H353004-30000-224-294-0006-0001 | TYPICAL CROSS SECTION- SHEET 6 OF 6 |
| H353004-30000-224-294-0005-0002 | TYPICAL CROSS SECTION- SHEET 5 OF 6 |
| H353004-30000-224-294-0005-0001 | TYPICAL CROSS SECTION- SHEET 4 OF 6 |
| H353004-30000-224-294-0004-0002 | TYPICAL CROSS SECTION- SHEET 3 OF 6 |
| H353004-30000-224-294-0004-0001 | TYPICAL CROSS SECTION- SHEET 2 OF 6 |

REG. PROFESSIONAL
2018-11-8

APPROVED FOR CONSTRUCTION

| No. | DESCRIPTION | BY | CHK'D | DATE |
|-----|---------------------------|-------|-------|------------|
| 0 | APPROVED FOR CONSTRUCTION | S-P-A | G-J | 2018/10/19 |

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| AREA MANAGER | ROLE | NAME | SIGNATURE | DATE |
|--------------|--------------|-------------|-------------|------------|
| FAY PITTMAN | AREA MANAGER | FAY PITTMAN | [Signature] | 2018-11-08 |

HATCH

Baffinland

MARY RIVER EXPANSION STAGE 3
BAFFINLAND IRON ORE MINES

RAIL SITE
STANDARD DRAWING
TYPICAL CROSS SECTION- SHEET 1 OF 6

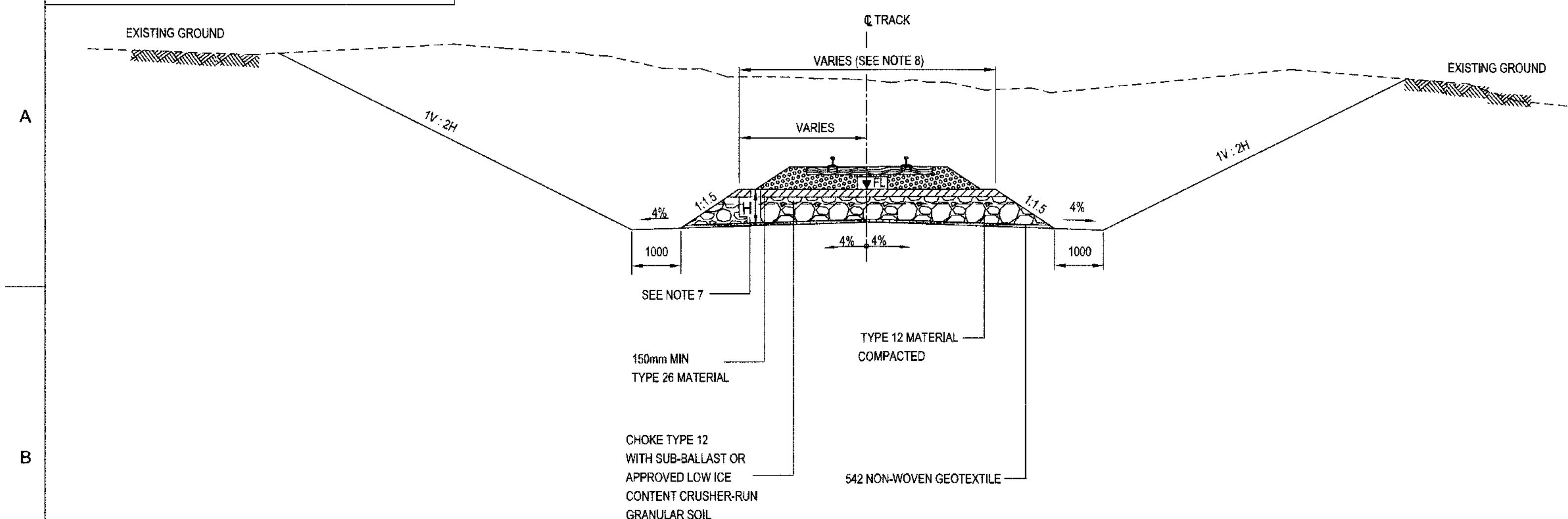
SCALE: NTS
OR AS NOTED

DWG. No. H353004-30000-224-294-0003-0001

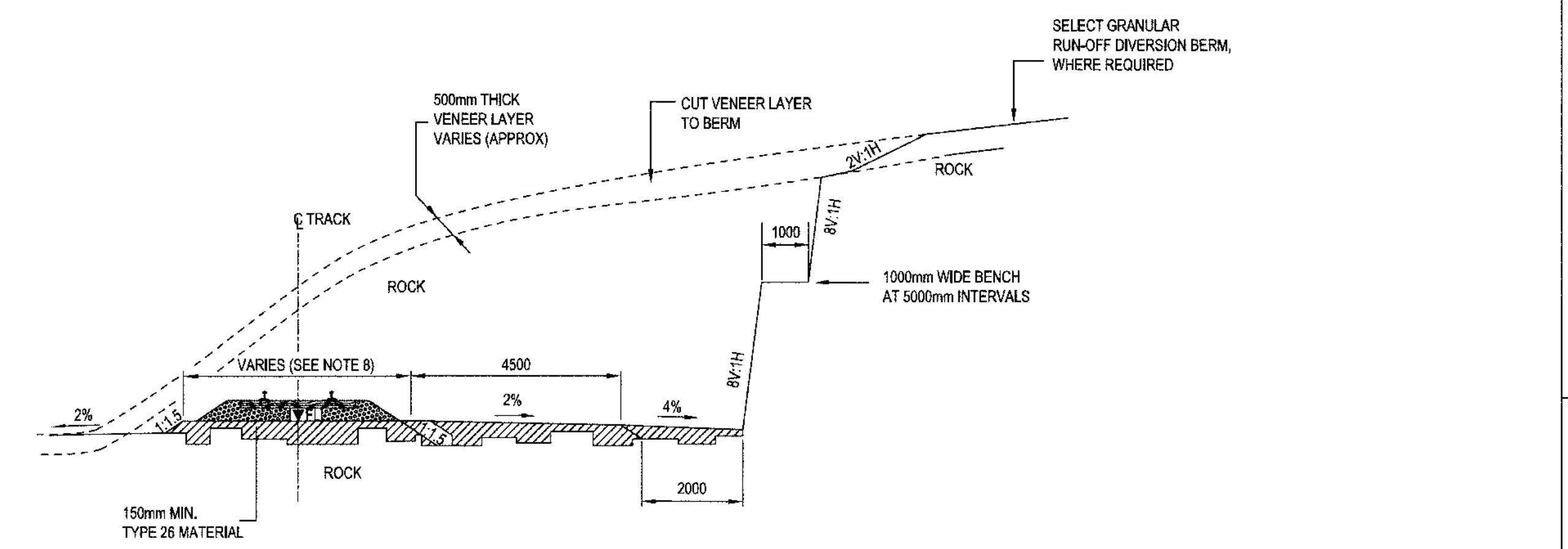
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SHEET SIZE: D

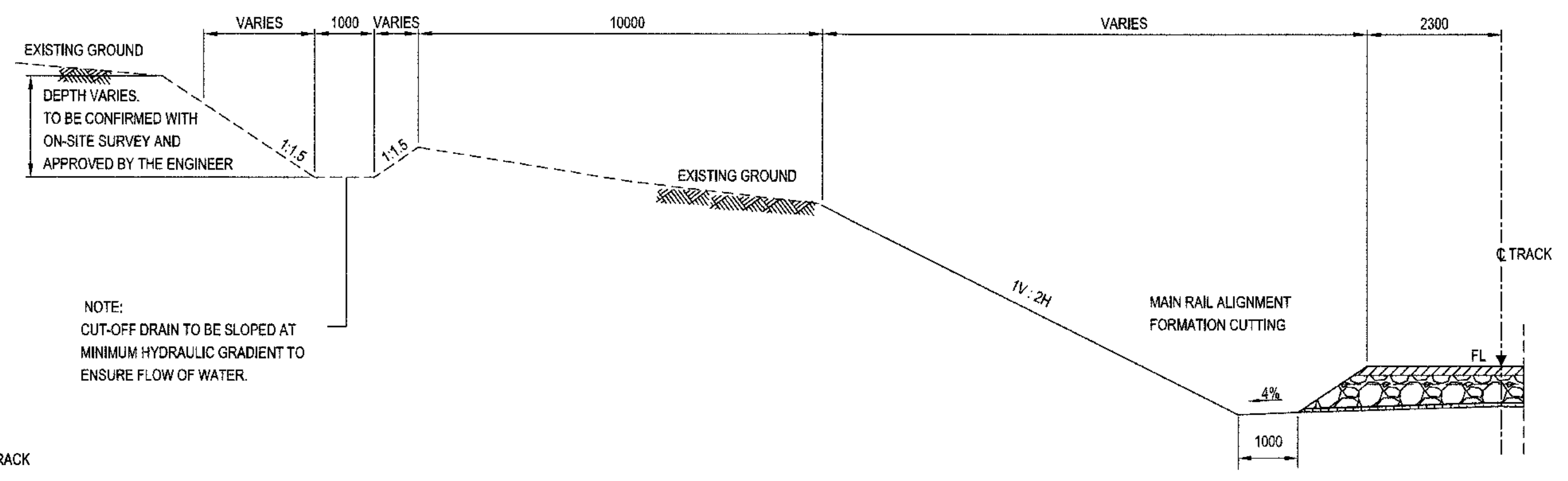
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STIMES



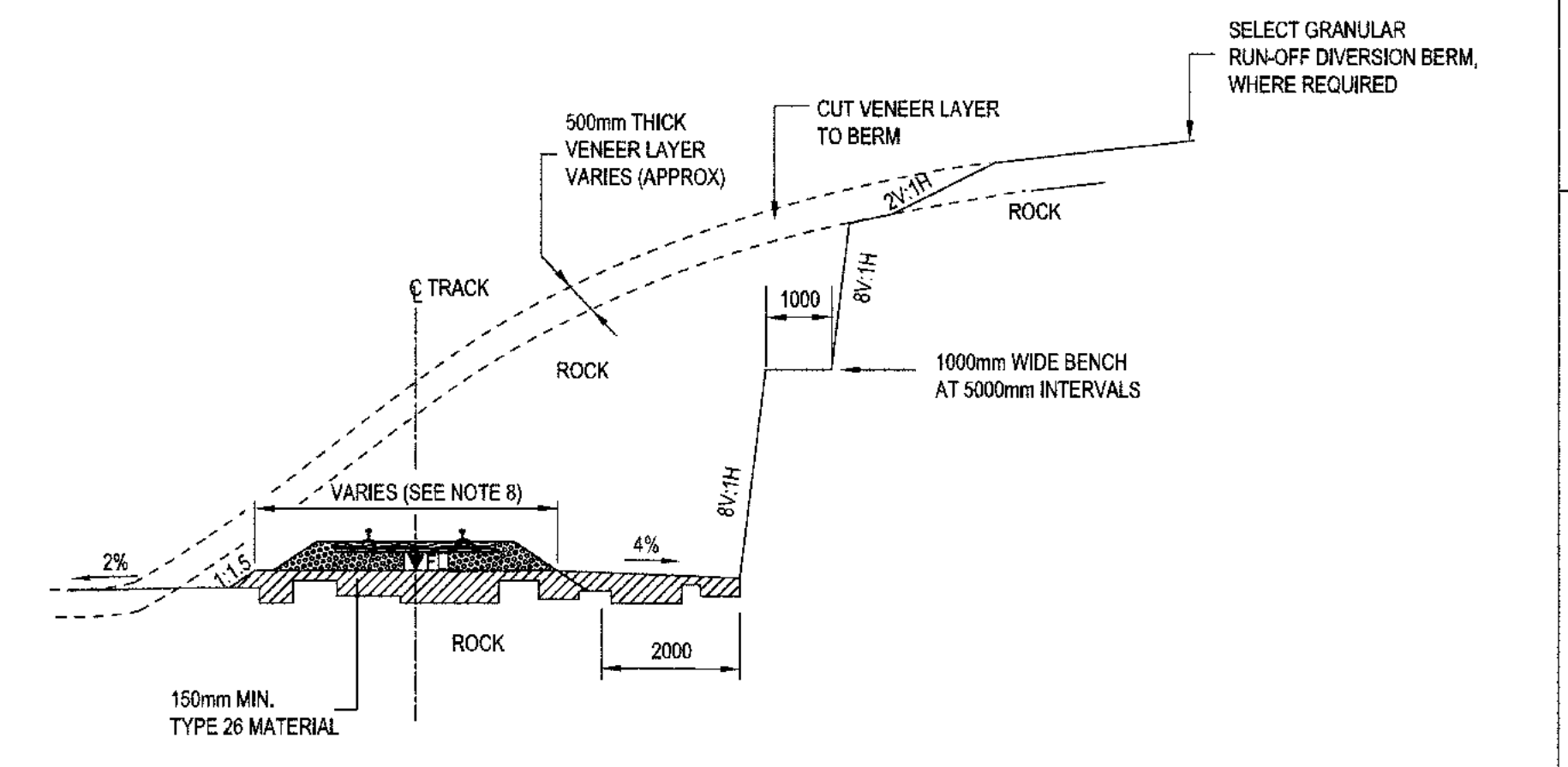
TYPICAL CROSS SECTION (CUT IN ICE POOR PERMAFROST)
NTS



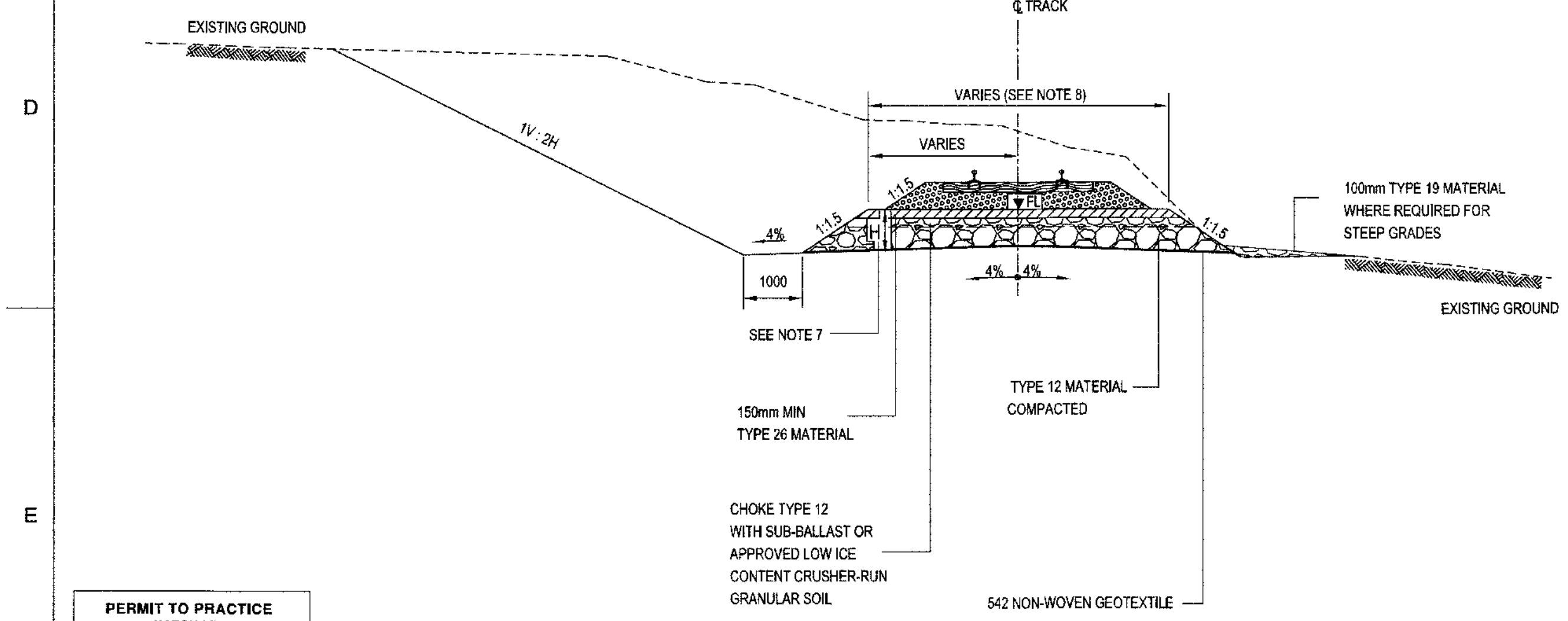
TYPICAL CROSS SECTION (CUT IN GRANITIC ROCK) WITH SERVICE ROAD
NTS



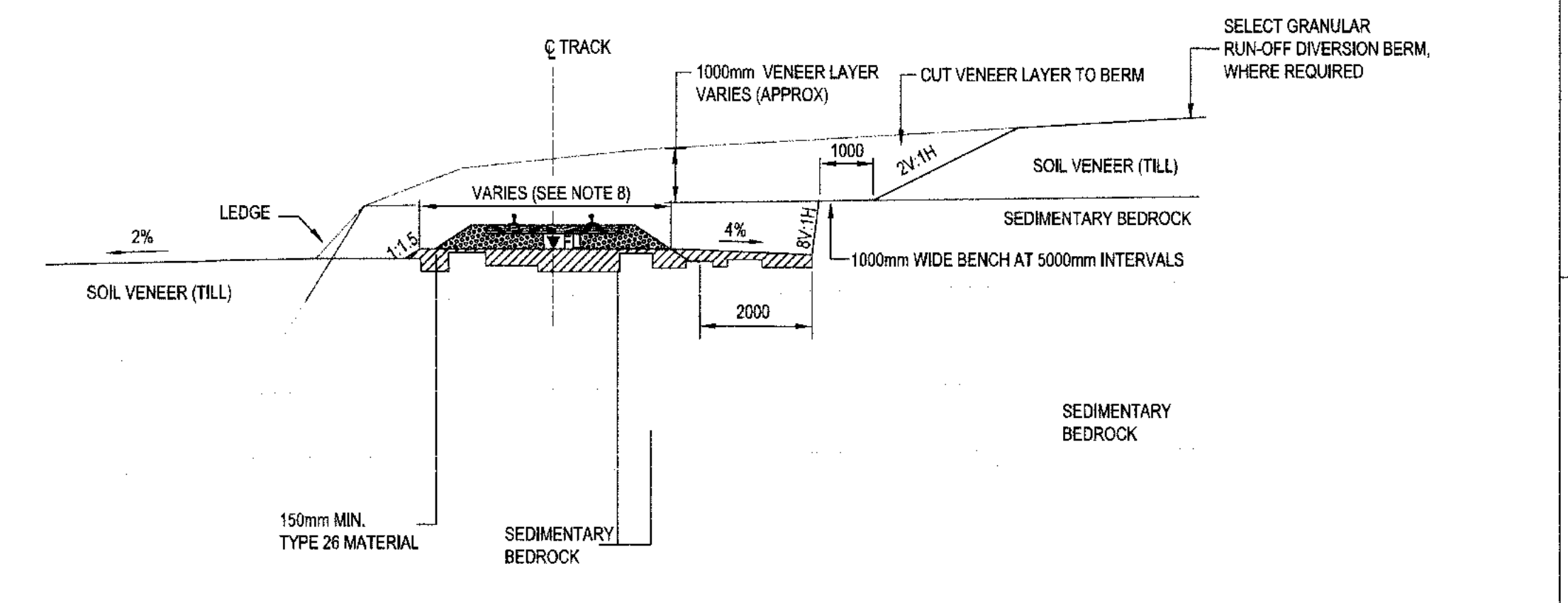
TYPICAL CROSS SECTION (CUT-OFF DRAIN ICE POOR PERMAFROST)
NTS



TYPICAL CROSS SECTION (CUT IN GRANITIC ROCK)
NTS



TYPICAL CROSS SECTION (CUT IN ICE POOR PERMAFROST WITH DAYLIGHTING)
NTS



TYPICAL CROSS SECTION (CUT IN SEDIMENTARY BEDROCK LEDGES)
NTS

- NOTE:**
- MATERIAL TYPE DEFINITION:
TYPE 12: RUN OF QUARRY/ ROCK FILL LAYER
TYPE 19: RIP RAP LAYER
TYPE 26: SUB-BALLAST LAYER
VENEER LAYER: INSITU SAND AND GRAVEL LAYER
 - PROPOSED EMBANKMENT DOES NOT HAVE SUITABLY WIDE SUB-BALLAST SHOULDERS. EMPLOYER SHALL DEVELOP SAFE OPERATING PROCEDURES FOR ACCESS TO INSPECT AND REPAIR TRAIN EQUIPMENT IN THE CASE OF A BREAKDOWN ON A HIGH EMBANKMENT.
 - FOR SUPERSTRUCTURE DETAILS REFER TO DRAWING H353004-30000-224-294-0003-0001.
 - LONGITUDINAL SLOPE ON RUNOFF AREA TO BE 2% WHERE PRACTICAL.
 - THIS DRAWING WAS PREVIOUSLY ISSUED AS H353004-00000-220-294-0004-0001.
 - THESE TYPICAL SECTIONS ARE APPLICABLE TO ICE POOR AND ROCK EXCAVATIONS.
 - H = 800mm TO TOP OF GEOTEXTILE.
 - FORMATION WIDTH VARIES:
R > 800m AND TANGENT TRACK : 5212mm
400m < R ≤ 800m : 5612mm
R ≤ 400m : 5812mm
WHERE R : RADIUS (HORIZONTAL ALIGNMENT)
 - FL : FORMATION LEVEL.

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HATCH LTD.
Signature: [Signature]
Date: 2018-11-08
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

APPROVED FOR CONSTRUCTION

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HATCH

Baffinland

| | | | |
|-----------------|--------------------|-----------------|------------|
| DRAFTSPERSON | S PINKNEY-ATKINSON | NR | 2018/09/27 |
| DESIGNER | S PINKNEY-ATKINSON | NR | |
| CHECKER | GLEN JOHNSTONE | Johnstone, Glen | |
| DESIGN COORD. | GLEN JOHNSTONE | Johnstone, Glen | |
| RESP. ENG. | FANUS VAN BILJON | | |
| LEAD DISC. ENG. | FANUS VAN BILJON | | |
| AREA LEAD | FANUS VAN BILJON | | |
| ENG. MANAGER | DANIEL STANGER | | |
| AREA MANAGER | FAY PITTMAN | | |
| ROLE | NAME | SIGNATURE | DATE |

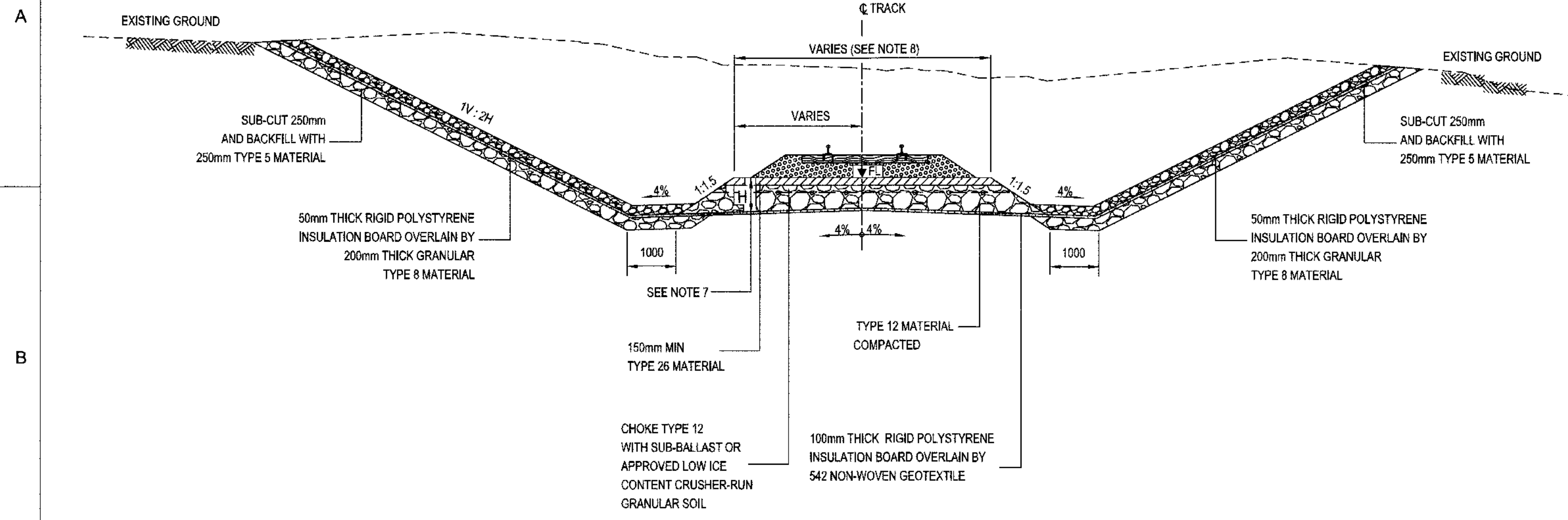
**BAFFINLAND IRON ORE MINES LP
MARY RIVER EXPANSION PROJECT**

**RAIL SITE
STANDARD DRAWING
TYPICAL CROSS SECTION- SHEET 2 OF 6**

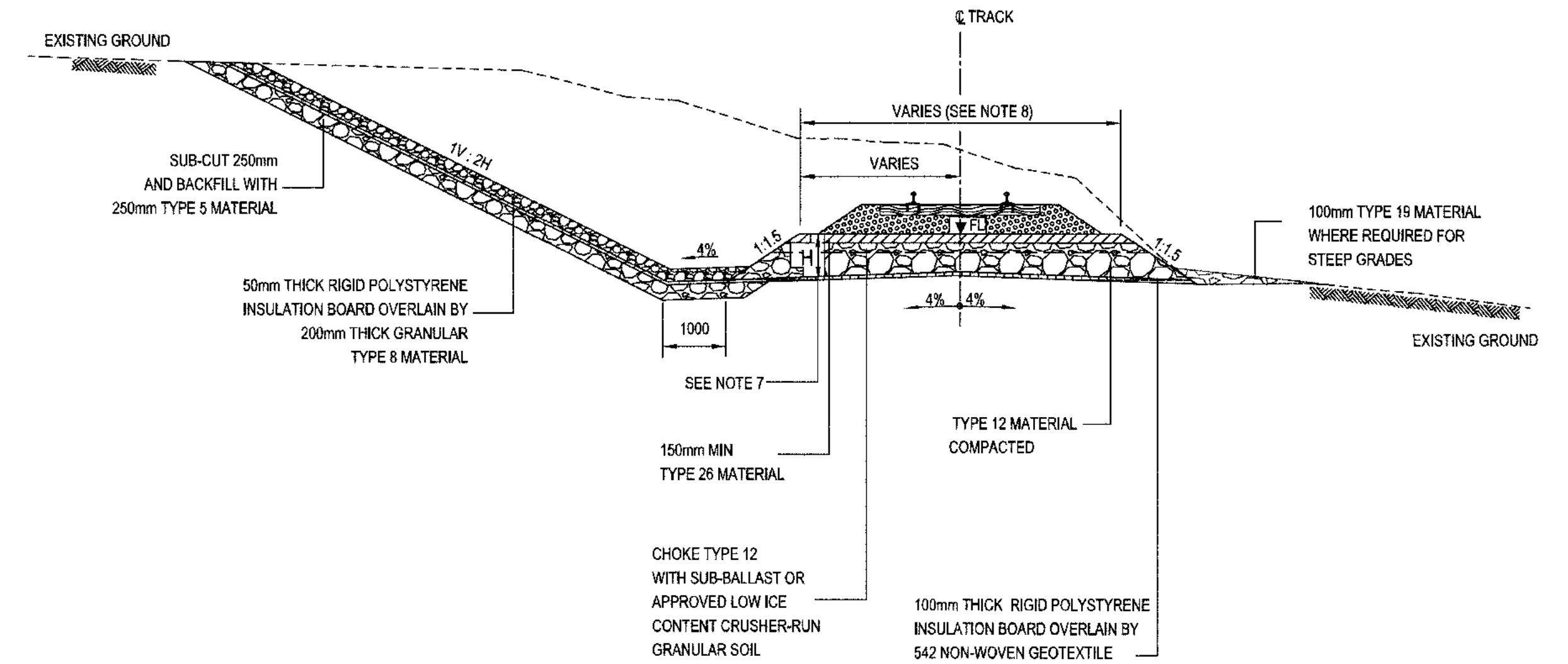
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| H353004-30000-224-294-0003-0001 | TYPICAL CROSS SECTION: SHEET 1 OF 6 | REG. PROFESSIONAL |
| DRAWING No. | DRAWING TITLE | |
| REFERENCE DRAWINGS | | |
| No. | DESCRIPTION | |
| REVISIONS | | |

SCALE: NTS OR AS NOTED
DWG. No.: H353004-30000-224-294-0004-0001
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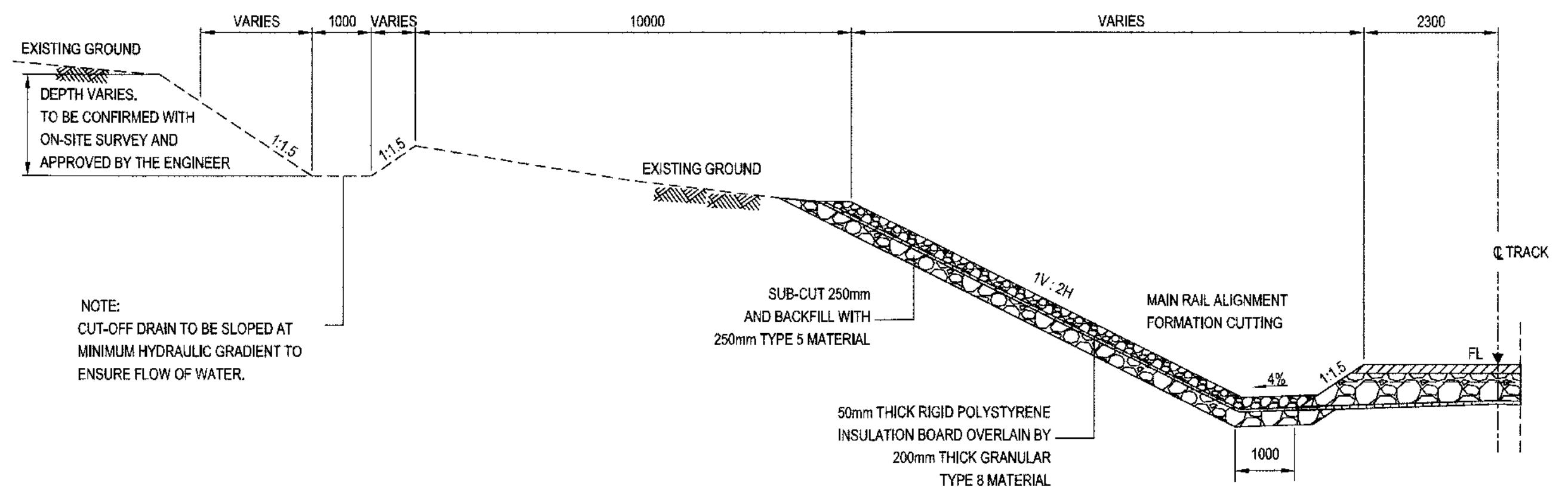
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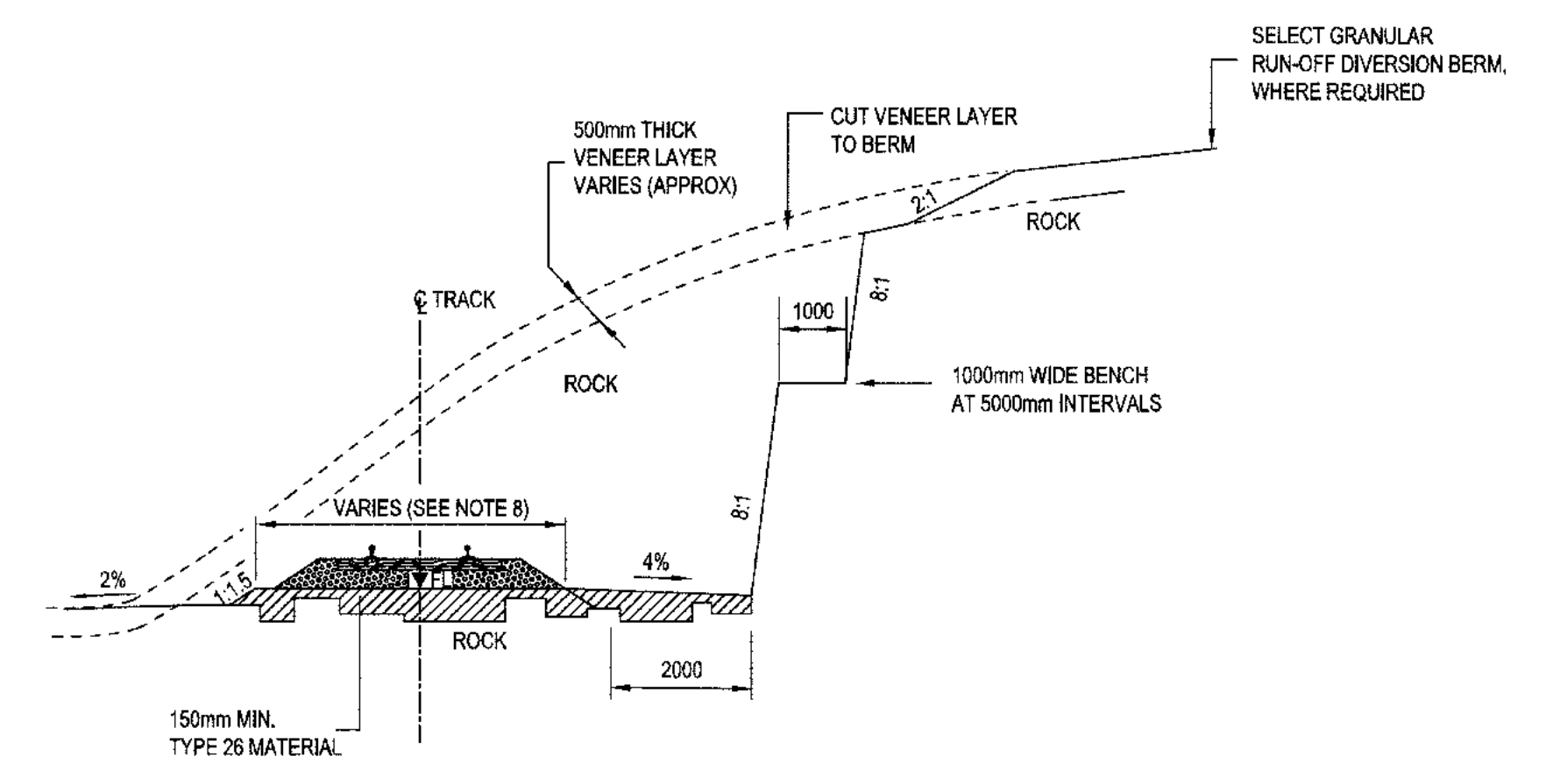
TYPICAL CROSS SECTION (CUT IN ICE RICH PERMAFROST)
NTS



TYPICAL CROSS SECTION (CUT IN ICE RICH PERMAFROST WITH DAYLIGHTING)
NTS



TYPICAL CROSS SECTION (CUT-OFF DRAIN ICE RICH PERMAFROST)
NTS



TYPICAL CROSS SECTION (CUT IN GRANITIC ROCK)
NTS

- NOTE:**
- MATERIAL TYPE DEFINITION:
TYPE 12: RUN OF QUARRY/ ROCK FILL LAYER
TYPE 18: RIP RAP LAYER
TYPE 25: BALLAST LAYER
TYPE 26: SUB-BALLAST LAYER
VENEER LAYER: INSITU SAND AND GRAVEL LAYER
 - PROPOSED EMBANKMENT DOES NOT HAVE SUITABLY WIDE SUB-BALLAST SHOULDERS. EMPLOYER SHALL DEVELOP SAFE OPERATING PROCEDURES FOR ACCESS TO INSPECT AND REPAIR TRAIN EQUIPMENT IN THE CASE OF A BREAKDOWN ON A HIGH EMBANKMENT.
 - FOR SUPERSTRUCTURE DETAILS REFER TO DRAWING H353004-30000-224-294-0003-0001.
 - LONGITUDINAL SLOPE ON RUNOFF AREA TO BE 2% WHERE PRACTICAL.
 - THIS DRAWING WAS PREVIOUSLY ISSUED AS H353004-00000-220-294-0004-0001.
 - THESE TYPICAL SECTIONS ARE APPLICABLE TO ICE RICH PERMAFROST SOILS.
 - H = 800mm TO UNDERSIDE OF POLYSTYRENE INSULATION
 - FORMATION WIDTH VARIES:
R > 800m AND TANGENT TRACK : 5212mm
400m < R ≤ 800m : 5612mm
R ≤ 400m : 5812mm
WHERE R: RADIUS (HORIZONTAL ALIGNMENT)
 - FL : FORMATION LEVEL.

Signature
Date

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HATCH LTD.
2018-11-08
PERMIT NUMBER: P 512
The Association of Professional Engineers
Geologists and Geophysicists of NWT/NU

APPROVED FOR CONSTRUCTION

HATCH

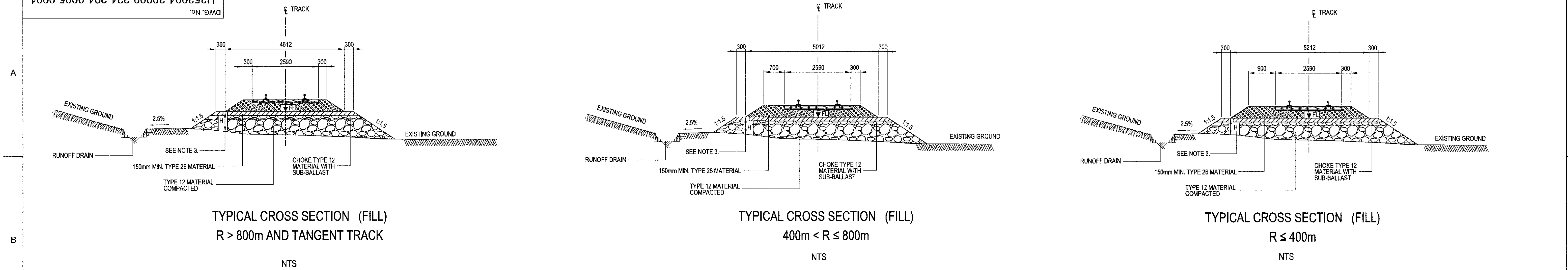
Baffinland

BAFFINLAND IRON ORE MINES LP
MARY RIVER EXPANSION PROJECT

RAIL SITE
STANDARD DRAWING
TYPICAL CROSS SECTION- SHEET 3 OF 6

| | | | | | | | | | | | | | | | | | | | | | | | | | |
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| H353004-30000-224-294-0003-0001 | | TYPICAL CROSS SECTION: SHEET 3 OF 8 | | REG. PROFESSIONAL | | APPROVED FOR CONSTRUCTION | | NO. | | DESCRIPTION | | BY | | CHK'D | | DATE | | DRAWING APPROVAL STATUS: Approved for Construction | | SCALE: NTS OR AS NOTED | | DWG. No. H353004-30000-224-294-0004-0002 | | REV 0 | |
| DRAWING No. | | DRAWING TITLE | | REG. PROFESSIONAL | | DESCRIPTION | | BY | | CHK'D | | DATE | | DRAWING APPROVAL STATUS: Approved for Construction | | SCALE: NTS OR AS NOTED | | DWG. No. H353004-30000-224-294-0004-0002 | | REV 0 | | SHEET SIZE: D | | | |

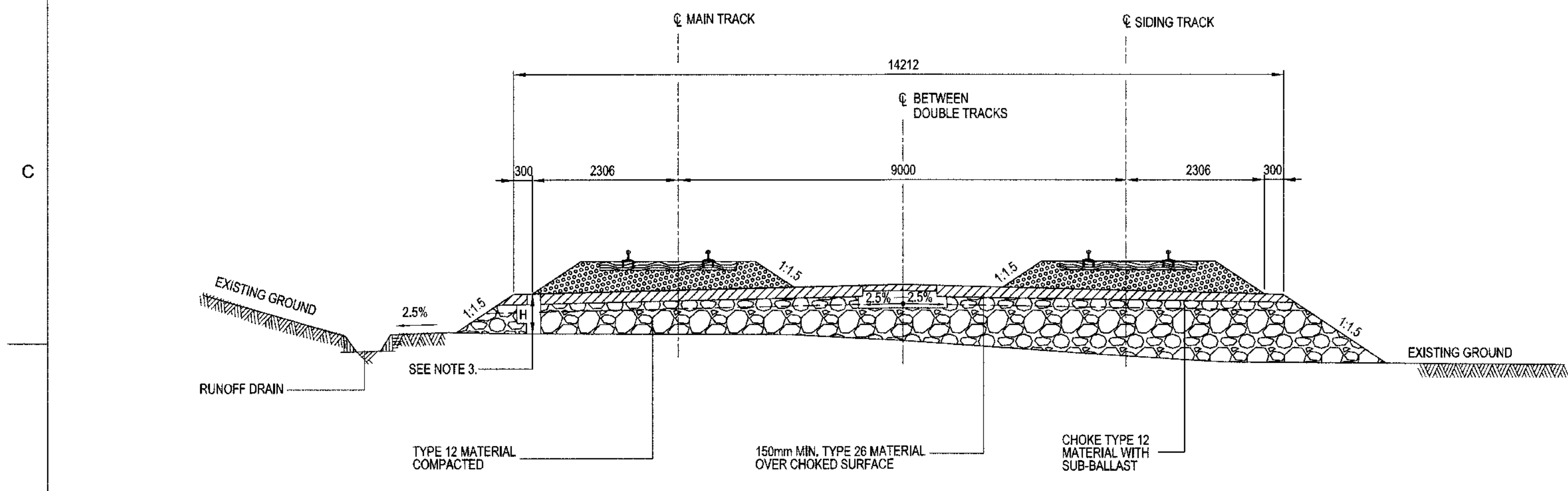
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SDATES
SFILES



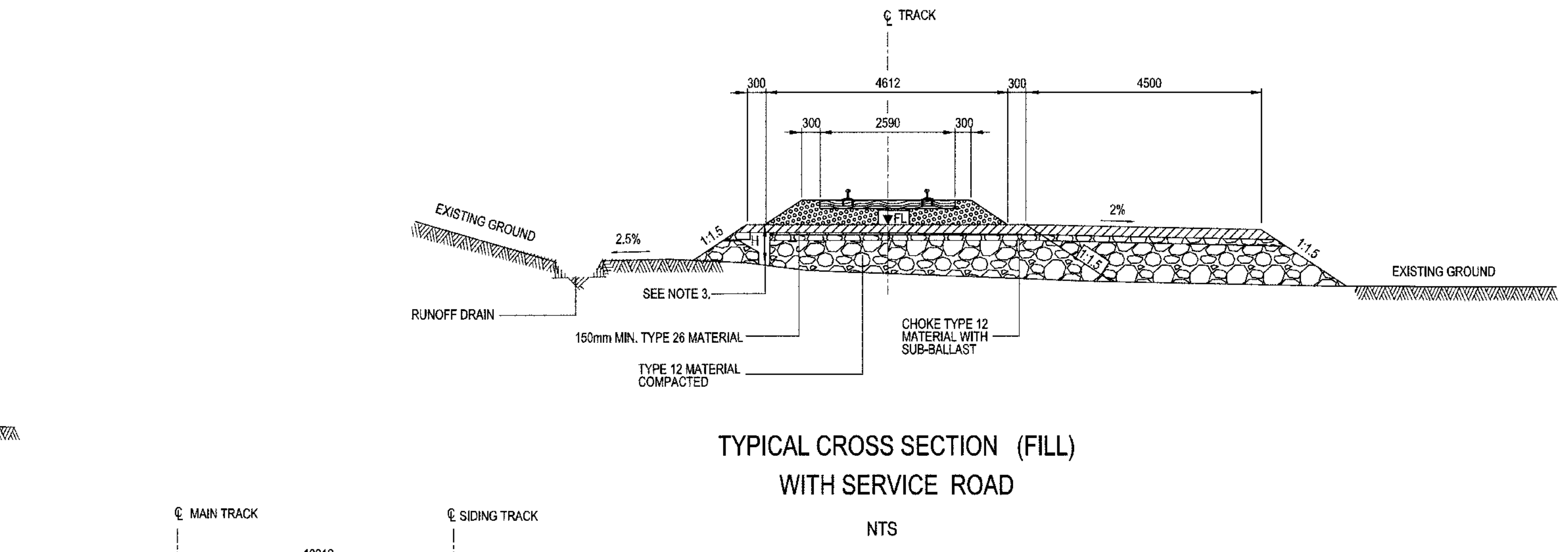
TYPICAL CROSS SECTION (FILL)
R > 800m AND TANGENT TRACK

TYPICAL CROSS SECTION (FILL)
400m < R ≤ 800m

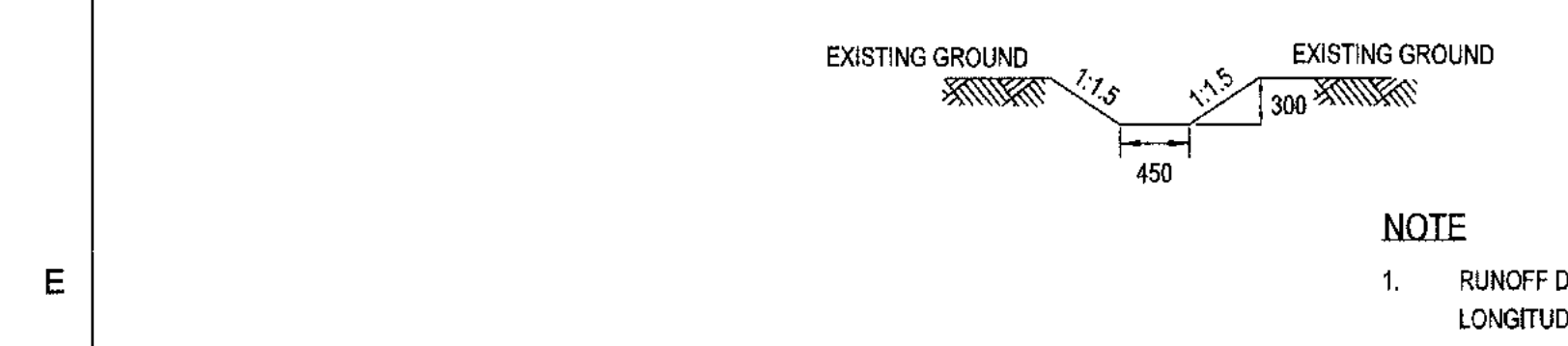
TYPICAL CROSS SECTION (FILL)
R ≤ 400m



TYPICAL CROSS SECTION AT PASSING LOOP LOCATION (FILL)
IN YARD

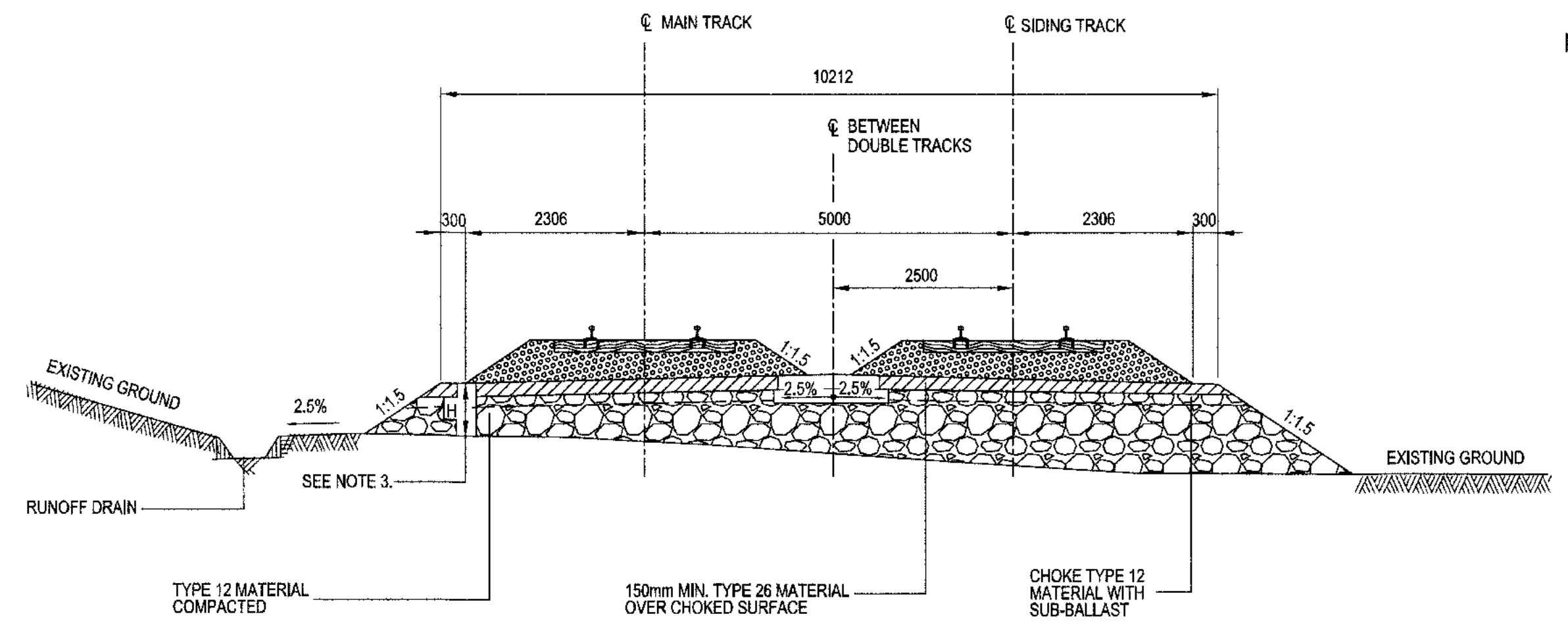


TYPICAL CROSS SECTION (FILL)
WITH SERVICE ROAD



TYPICAL RUNOFF DRAIN DIMENSIONS

NOTE
1. RUNOFF DRAINS WILL BE SLOPED AT 2% LONGITUDINAL WHERE PRACTICAL



TYPICAL CROSS SECTION AT PASSING LOOP LOCATION (FILL)

- NOTES:
- MATERIAL TYPE DEFINITION:
TYPE 12: RUN OF QUARRY/ROCK FILL LAYER
TYPE 26: BALLAST LAYER
TYPE 28: SUB-BALLAST LAYER
 - PROPOSED EMBANKMENT DOES NOT HAVE SUITABLY WIDE SUB-BALLAST SHOULDERS. EMPLOYER SHALL DEVELOP SAFE OPERATING PROCEDURES FOR ACCESS TO INSPECT AND REPAIR TRAIN EQUIPMENT IN THE CASE OF A BREAKDOWN ON A HIGH EMBANKMENT.
 - MINIMUM EMBANKMENT (TYPE 12 PLUS SUB-BALLAST) THICKNESS VARIES DEPENDING ON SUB-GRADE CONDITION
H= 700mm STANDARD DIMENSION
 - FOR RUNOFF DRAIN DETAILS REFER TO TYPICAL RUNOFF DRAIN DIMENSIONS.
 - FOR SUPERSTRUCTURE DETAILS REFER TO DRAWING H353004-30000-224-294-0003-0001.
 - THIS DRAWING WAS PREVIOUSLY ISSUED AS H353004-30000-224-294-0005-0001.
 - THESE TYPICAL SECTIONS ARE APPLICABLE TO ICE POOR PERMAFROST FILL AREAS.

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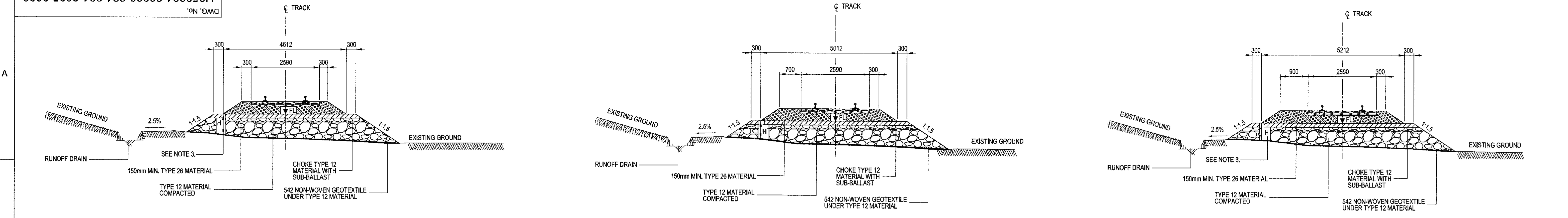
BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

RAIL SITE
STANDARD DRAWING
TYPICAL CROSS SECTION- SHEET 4 OF 6

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--|-------------------------------------|--|-------------------|--|---------------------------|--|-------|--|------------|--|-----------------------------------------------|--|--------------------------------|--|-----------------------------------|--|-----------------------------------------|--|----------------------------------------|--|----------------------------------------------------|--|---------------------------------------|--|------------------------------------------|--|-------------------------------------|--|---------------|--|------------------------------------------|--|-------|--|
| H353004-30000-224-294-0003-0001 | | TYPICAL CROSS SECTION- SHEET 1 OF 6 | | REG. PROFESSIONAL | | APPROVED FOR CONSTRUCTION | | S.P.A | | 2018/03/19 | | DRAFTSPERSON S PINKNEY-ATKINSON NR 2018/12/09 | | DESIGNER S PINKNEY-ATKINSON NR | | CHECKER GLEN JOHNSTONE 2018-11-07 | | DESIGN COORD. GLEN JOHNSTONE 2018-11-07 | | RESP. ENG. FANUS VAN BILJON 2018-11-07 | | LEAD DISC. ENG. FANUS VAN BILJON 2018-11-07 | | AREA LEAD FANUS VAN BILJON 2018-11-07 | | ENG. MANAGER DANIEL STANGER 2018-11-07 | | AREA MANAGER FAY PITTMAN 2018-11-08 | | SCALE NTS | | DWG. No. H353004-30000-224-294-0005-0001 | | REV 0 | |
| DRAWING No. | | DRAWING TITLE | | REG. PROFESSIONAL | | DESCRIPTION | | BY | | CHK'D | | DATE | | ROLE | | NAME | | SIGNATURE | | DATE | | DRAWING APPROVAL STATUS: Approved for Construction | | SCALE NTS OR AS NOTED | | DWG. No. H353004-30000-224-294-0005-0001 | | REV 0 | | SHEET SIZE: D | | | | | |

SUBSERIALS STIMES \$FILES

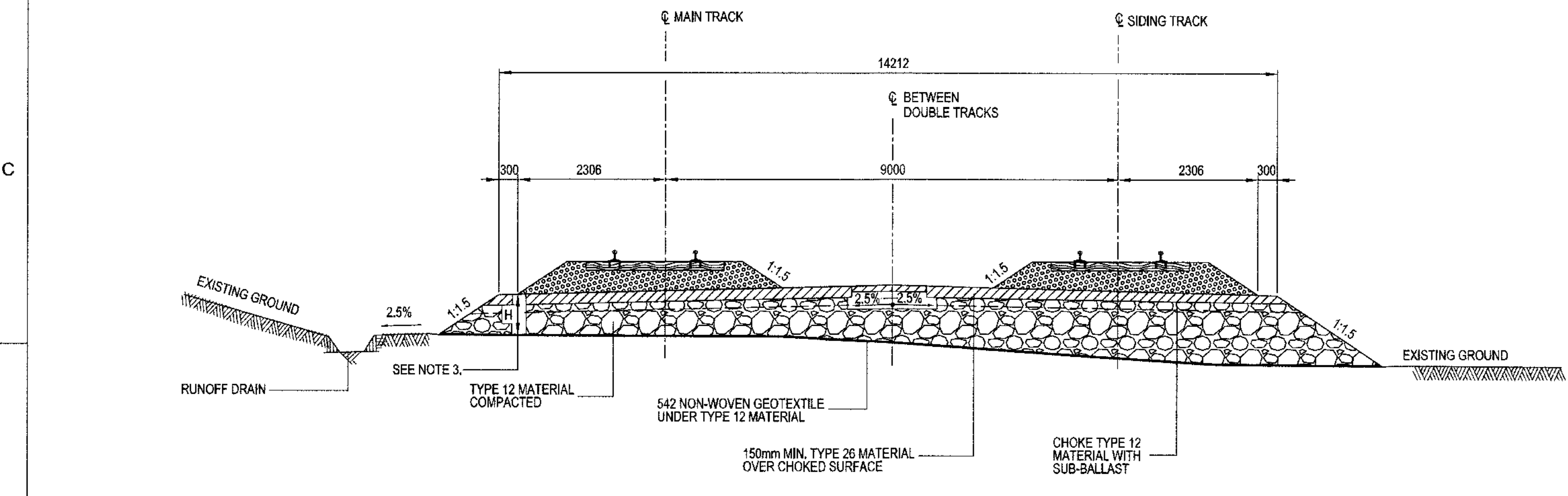
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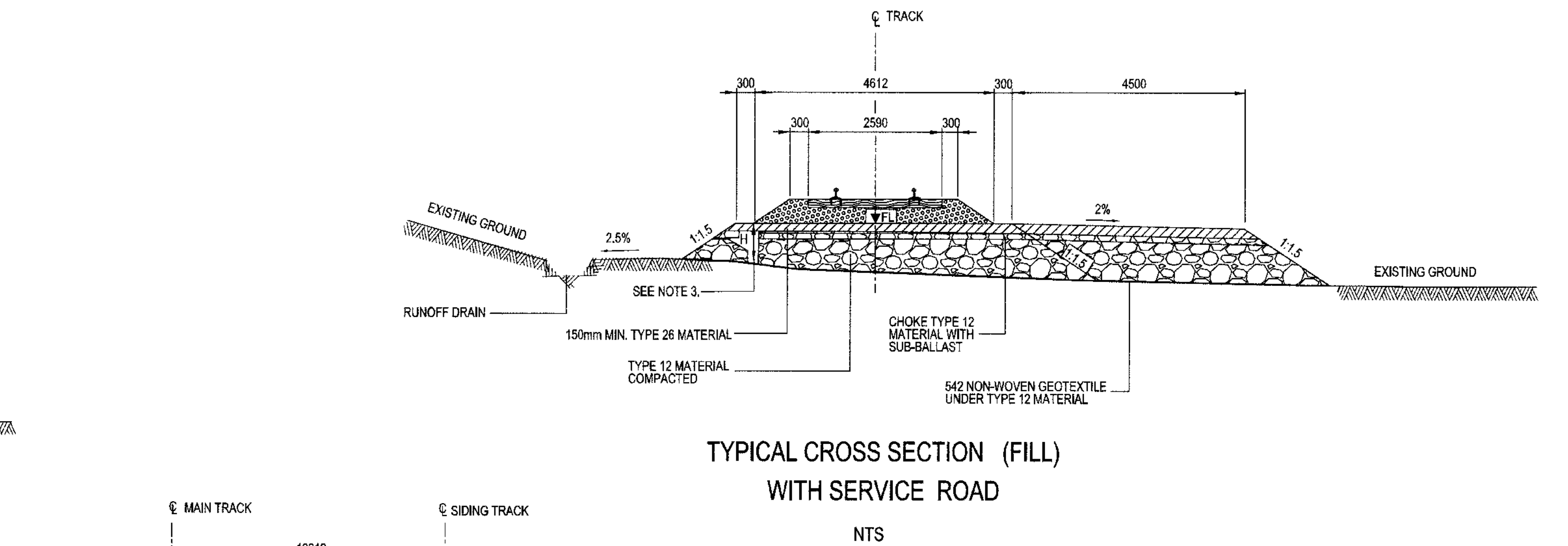
TYPICAL CROSS SECTION (FILL)
R > 800m AND TANGENT TRACK

TYPICAL CROSS SECTION (FILL)
400m < R ≤ 800m

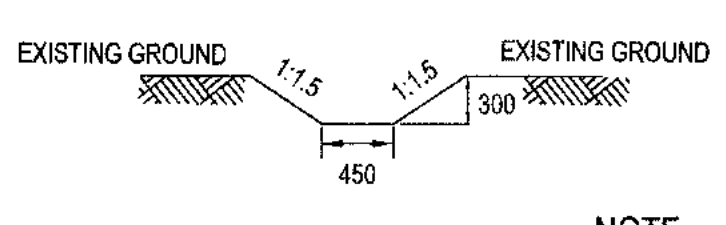
TYPICAL CROSS SECTION (FILL)
R ≤ 400m



TYPICAL CROSS SECTION AT PASSING LOOP LOCATION (FILL)
IN YARD



TYPICAL CROSS SECTION (FILL)
WITH SERVICE ROAD



TYPICAL RUNOFF DRAIN DIMENSIONS

NOTE
1. RUNOFF DRAINS WILL BE SLOPED AT 2% LONGITUDINAL WHERE PRACTICAL

- NOTE:
- MATERIAL TYPE DEFINITION:
TYPE 12: RUN OF QUARRY/ROCK FILL LAYER
TYPE 25: BALLAST LAYER
TYPE 26: SUB-BALLAST LAYER
 - PROPOSED EMBANKMENT DOES NOT HAVE SUITABLY WIDE SUB-BALLAST SHOULDERS. EMPLOYER SHALL DEVELOP SAFE OPERATING PROCEDURES FOR ACCESS TO INSPECT AND REPAIR TRAIN EQUIPMENT IN THE CASE OF A BREAKDOWN ON A HIGH EMBANKMENT.
 - MINIMUM EMBANKMENT (TYPE 12 PLUS SUB-BALLAST) THICKNESS VARIES DEPENDING ON SUB-GRADE CONDITION
H = 1500mm STANDARD DIMENSION FOR ICE RICH PERMAFROST
 - 542 NON-WOVEN GEOTEXTILE UNDER TYPE 12 MATERIAL ON ICE RICH SILT.
 - FOR RUNOFF DRAIN DETAILS REFER TO TYPICAL RUNOFF DRAIN DIMENSIONS.
 - FOR SUPERSTRUCTURE DETAILS REFER TO DRAWING H353004-30000-224-294-0005-0001.
 - THIS DRAWING WAS PREVIOUSLY ISSUED AS H353004-00000-224-294-0005-0001.
 - THESE TYPICAL SECTIONS ARE APPLICABLE TO ICE RICH PERMAFROST FILL AREAS.

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HATCH LTD.
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Date: 2018-11-08
PERMIT NUMBER: P 512
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Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

RAIL SITE
STANDARD DRAWING
TYPICAL CROSS SECTION- SHEET 5 OF 6

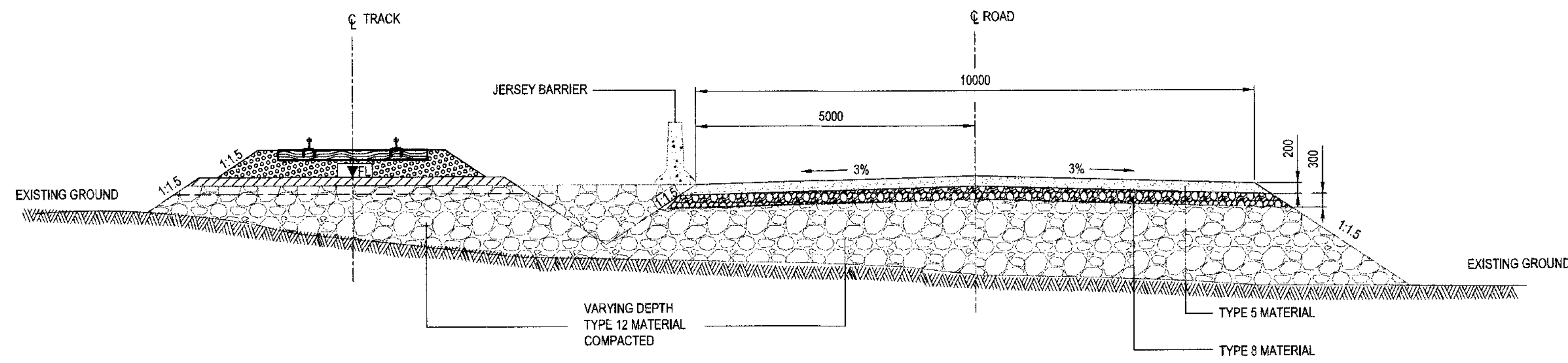
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| H353004-30000-224-294-0005-0001 | TYPICAL CROSS SECTION- SHEET 1 OF 6 |
| DRAWING No. | DRAWING TITLE |
| REFERENCE DRAWINGS | REG. PROFESSIONAL |

| | | | | | |
|---------------------------|---------------------------|----|-------|------|------------|
| APPROVED FOR CONSTRUCTION | | | | SP-A | 2018/10/19 |
| No. | DESCRIPTION | BY | CHK'D | DATE | |
| 0 | APPROVED FOR CONSTRUCTION | | | | |
| REVISIONS | | | | | |

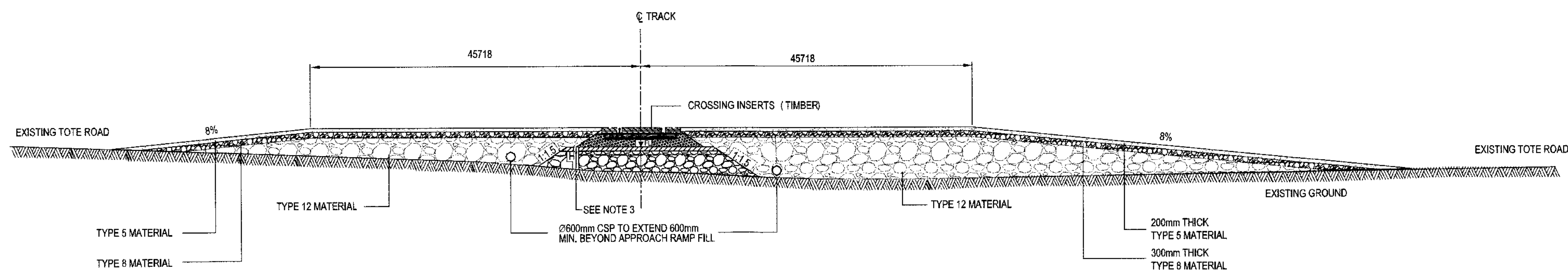
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| DRAFTSPERSON | S PINKNEY-ATKINSON | NR | 2018/12/09 |
| DESIGNER | S PINKNEY-ATKINSON | NR | |
| CHECKER | GLEN JOHNSTONE | Johnstone, Glen | 2018-11-08 |
| DESIGN COORD. | GLEN JOHNSTONE | Johnstone, Glen | 2018-11-08 |
| RESP. ENG. | FANUS VAN BILJON | | 2018-11-08 |
| LEAD DISC. ENG. | FANUS VAN BILJON | | 2018-11-08 |
| AREA LEAD | FANUS VAN BILJON | | 2018-11-08 |
| ENG. MANAGER | DANIEL STANGER | | 2018-11-08 |
| AREA MANAGER | FAY PITTMAN | | 2018-11-08 |
| ROLE | NAME | SIGNATURE | DATE |
| DRAWING APPROVAL STATUS: Approved for Construction | | | |

| | | | | | |
|-------------|-----|----------|---------------------------------|---------------|---|
| SCALE | NTS | DWG. No. | H353004-30000-224-294-0005-0002 | REV | 0 |
| OR AS NOTED | | | | SHEET SIZE: D | |

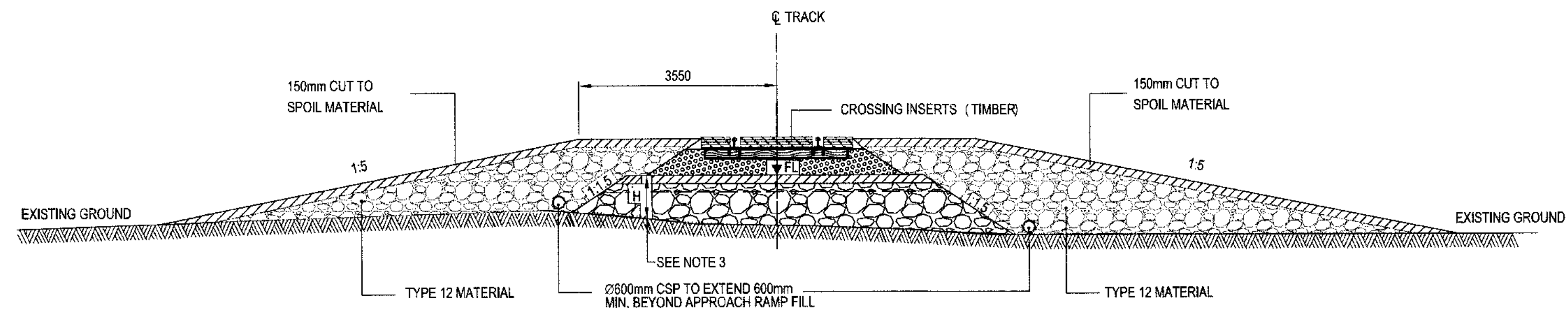
SUSSEX STIMES FILES



TYPICAL CROSS SECTION FOR TOTE ROAD AND RAIL INTERFACE
NTS



TYPICAL CROSS SECTION FOR LEVEL CROSSING
NTS



TYPICAL CROSS SECTION FOR CARIBOU AND SNOW MOBILE CROSSING
NTS

NOTES:

- MATERIAL TYPE DEFINITION:
TYPE 5: 32mm MINUS
TYPE 8: 150mm MINUS
TYPE 12: RUN OF QUARRY/ROCK FILL LAYER
TYPE 25: BALLAST LAYER
TYPE 26: SUB-BALLAST LAYER
- PROPOSED EMBANKMENT DOES NOT HAVE SUB-BALLAST SHOULDERS. EMPLOYER SHALL DEVELOP SAFE OPERATING PROCEDURES FOR ACCESS TO INSPECT AND REPAIR TRAIN EQUIPMENT IN THE CASE OF A BREAKDOWN ON A HIGH EMBANKMENT.
- MINIMUM EMBANKMENT (TYPE 12 PLUS SUB-BALLAST) THICKNESS VARIES DEPENDING ON SUB-GRADE CONDITION
H= 700mm STANDARD DIMENSION
H= 1500mm FOR ICE RICH PERMAFROST.
- 542 NON-WOVEN GEOTEXTILE UNDER TYPE 12 MATERIAL ON ICE RICH SILT.
- FOR JERSEY BARRIER DETAILS REFER TO TYPICAL JERSEY BARRIER DIMENSIONS.
- FOR SUPERSTRUCTURE DETAILS REFER TO DRAWING H353004-30000-224-294-0003-0001.
- THIS DRAWING WAS PREVIOUSLY ISSUED AS H353004-00000-220-294-0006-0001.
- TIMBER CROSSING INSERTS SHALL BE 178mm HIGH AND 229mm WIDE INSERTS TO BE FASTENED TO TIMBER TIES USING 305mm LAG SCREWS. MINIMUM OF 76mm SHALL BE MAINTAINED BETWEEN GAUGE FACE OF THE RAIL AND NEAREST CROSSING INSERT.
- WHERE REQUIRED, JERSEY BARRIER LOCATED ON RAIL SIDE.

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Date: 2018-11-08
PERMIT NUMBER: P 512
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Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

RAIL SITE
STANDARD DRAWING
TYPICAL CROSS SECTION- SHEET 6 OF 6

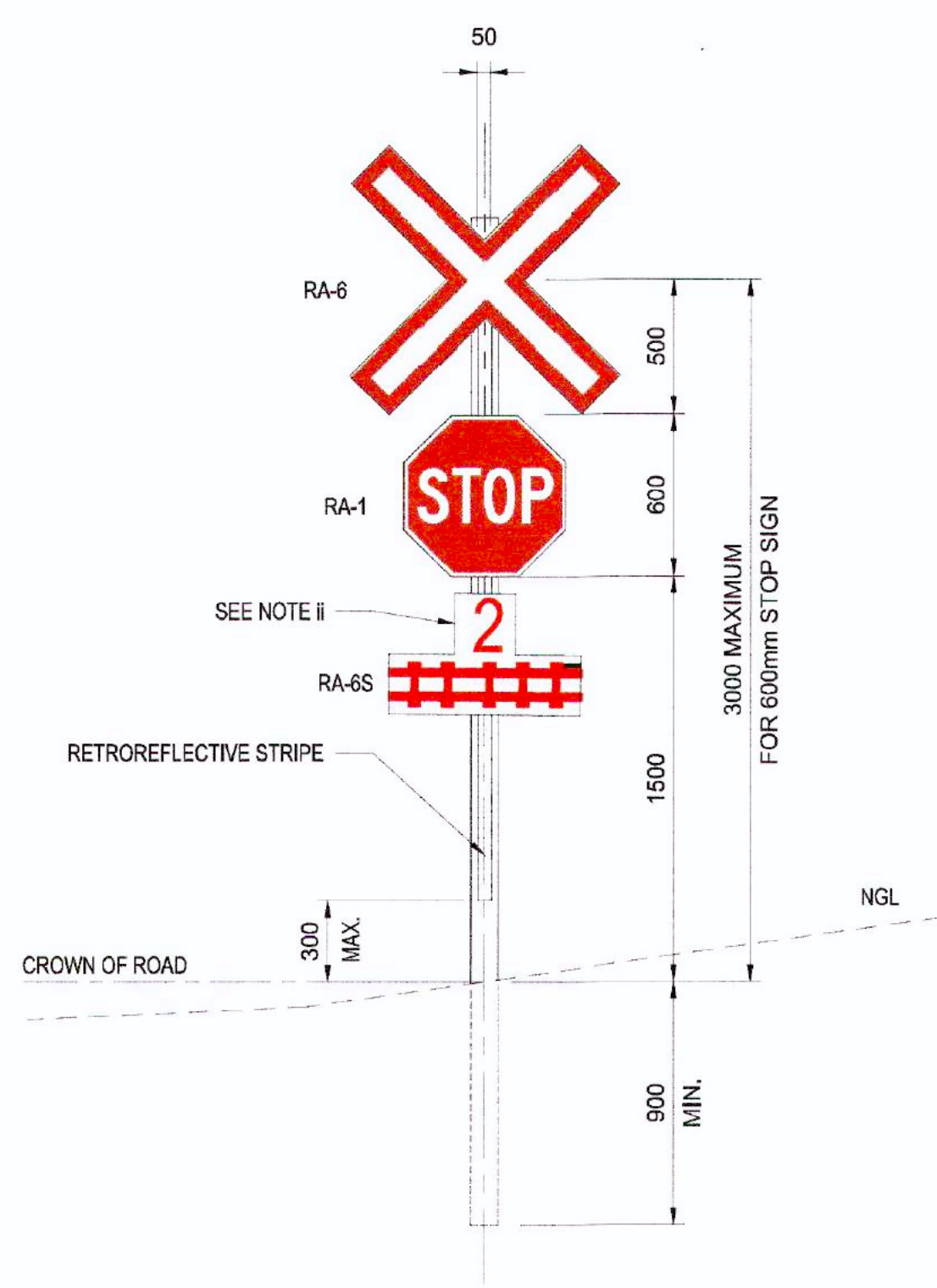
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| H353004-30000-224-294-0003-0001 | TYPICAL CROSS SECTION- SHEET 1 OF 6 |
| DRAWING No. | DRAWING TITLE |
| REFERENCE DRAWINGS | REG. PROFESSIONAL |

| | | | | | |
|---------------------------|---------------------------|-----|-------|------------|------------|
| APPROVED FOR CONSTRUCTION | | | | DATE | 2018/10/19 |
| No. | DESCRIPTION | BY | CHK'D | DATE | |
| 0 | APPROVED FOR CONSTRUCTION | SPA | | 2018/10/19 | |
| REVISIONS | | | | | |

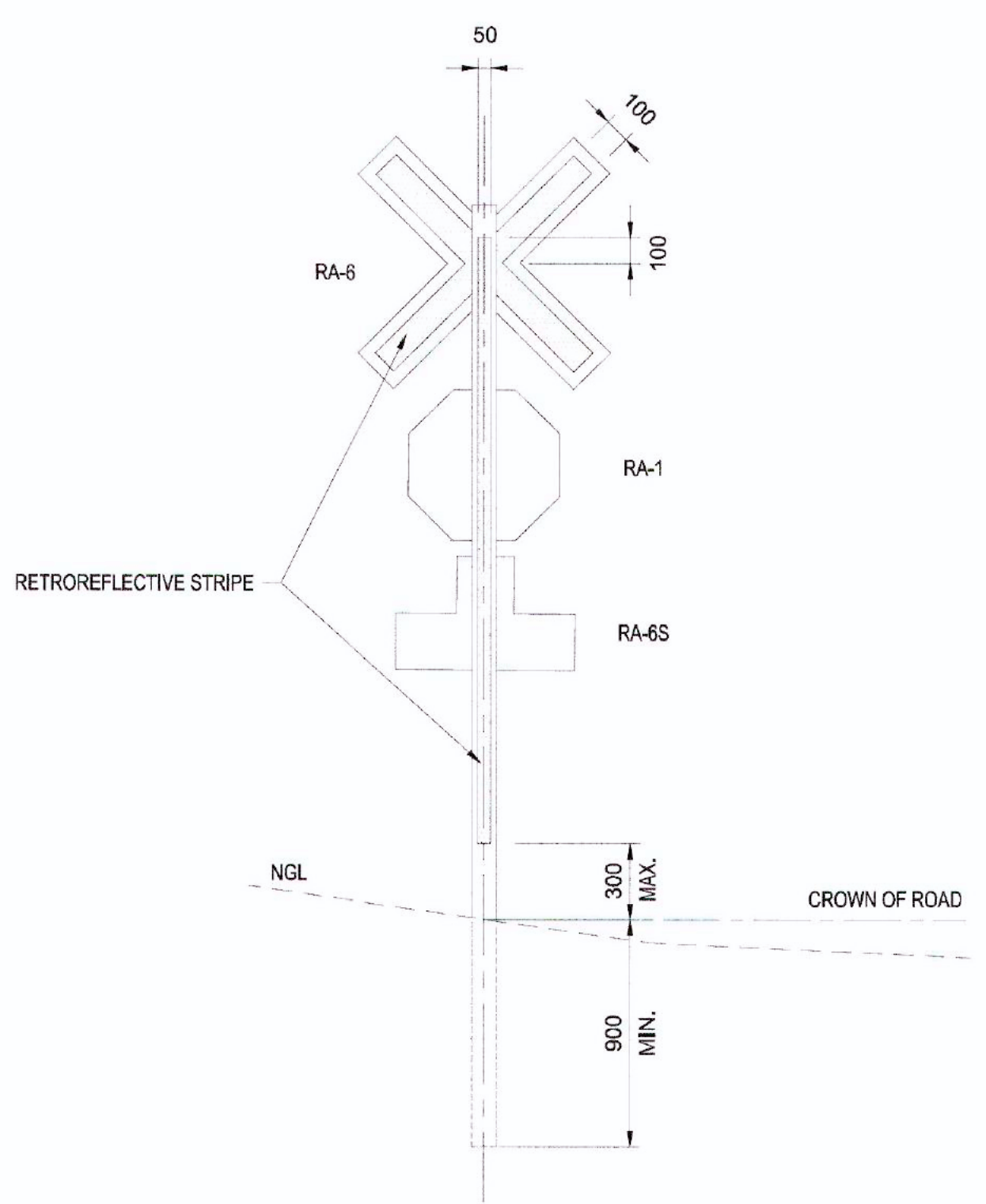
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| DRAFTSPERSON | S PINKNEY-ATKINSON | NR | 2016-12-12 |
| DESIGNER | S PINKNEY-ATKINSON | NR | |
| CHECKER | GLEN JOHNSTONE | | 2018-11-07 |
| DESIGN COORD. | GLEN JOHNSTONE | | 2018-11-07 |
| RESP. ENG. | FANUS VAN BILJON | | 2018-11-07 |
| LEAD DISC. ENG. | FANUS VAN BILJON | | 2018-11-07 |
| AREA LEAD | FANUS VAN BILJON | | 2018-11-07 |
| ENG. MANAGER | DANIEL STANGER | | 2018-11-07 |
| AREA MANAGER | FAY PITTMAN | | 2018-11-08 |

| | | |
|-------------|---------------------------------|-----|
| SCALE | DWG. No. | REV |
| NTS | H353004-30000-224-294-0006-0001 | 0 |
| OR AS NOTED | | |

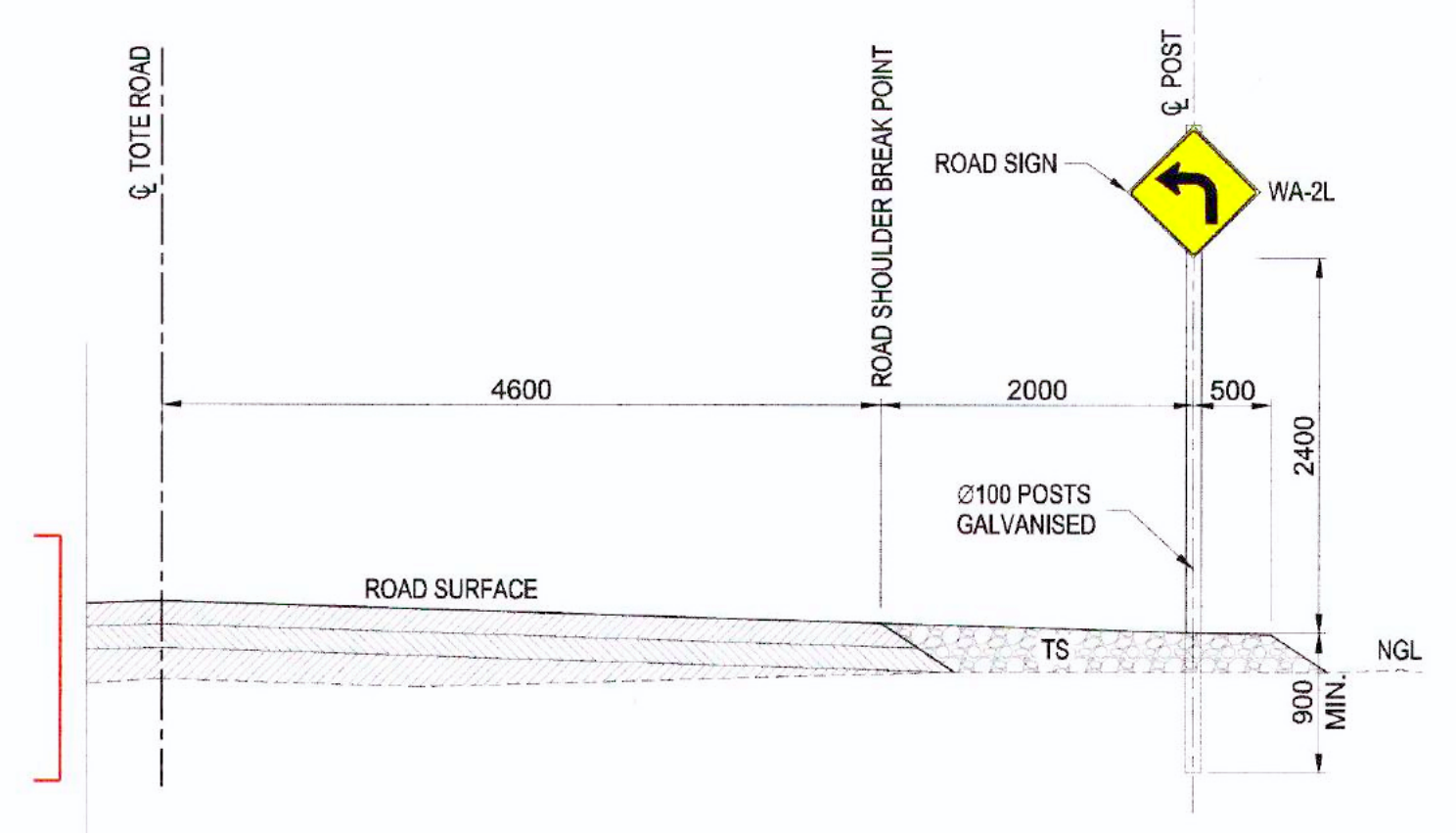
SUSANAMES \$TIMES
SHEET SIZE: D



STOP SIGN
FRONT VIEW
SCALE 1:50



STOP SIGN
BACK VIEW
SCALE 1:50



SIGN POST LOCATION
TYPICAL CROSS SECTION
SCALE 1:50

| CODE | SIGN | SIZE | NO. OFF |
|-------|------|------------|---------|
| RA-1 | | (600x600) | 2 |
| RA-6 | | (1200x200) | 2 |
| RA-6S | | (750x450) | 2 |
| Wc-4 | | (750x750) | 2 |
| WA-2R | | (600x600) | 4 |
| WA-2L | | (600x600) | 4 |
| RB-1 | | (600x750) | 2 |
| RB-1 | | (600x750) | 2 |

- NOTES:
- (i) TRAFFIC CONTROL SIGNAGE CONFORM TO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA (MUTCD), FIFTH EDITION.
 - (ii) WHEN ROAD CROSSES TWO OR MORE TRACKS, SIGNAGE RA-6S MUST BE ADDED BELOW STOP SIGN RA-1.
 - (iii) THIS DRAWING WAS PREVIOUSLY ISSUED AS: H353004-00000-220-294-0008-0001.

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Date: _____
PERMIT NUMBER: P 512
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BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

TOTE ROAD
STANDARD DRAWING
ROAD SIGNS AND SIGN POST DETAIL

| | |
|----------------------------|-------------------------------|
| H353004-30000-224-294-0009 | TYPICAL GRADE CROSSING LAYOUT |
| DRAWING No. | DRAWING TITLE |
| 1 | 2 |
| REFERENCE DRAWINGS | REG. PROFESSIONAL |



| | | | | |
|-----|---------------------------|------|-------|------------|
| 0 | APPROVED FOR CONSTRUCTION | AJVN | 6 | 2018/04/09 |
| No. | DESCRIPTION | BY | CHK'D | DATE |
| | REVISIONS | | | |

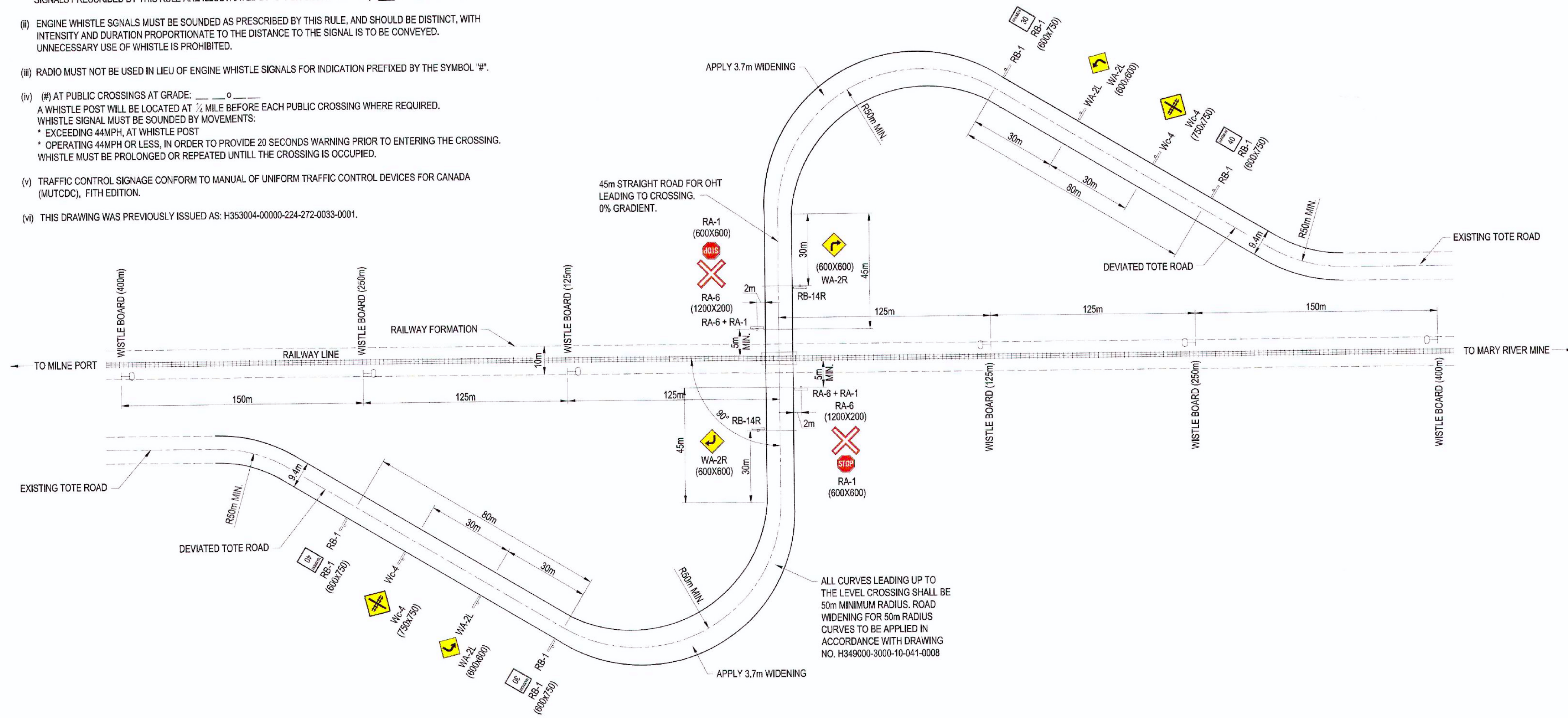
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|----------------------------------------------------|---------------|-----------|------------|
| DRAFTSPERSON | A VAN NIEKERK | NR | 10/01/18 |
| DESIGNER | A VAN NIEKERK | NR | 10/01/18 |
| CHECKER | G JOHNSTONE | | |
| DESIGN COORD. | G JOHNSTONE | | |
| RESP. ENG. | D STANGER | | |
| LEAD DISC. ENG. | F VAN BILJON | | 2018-12-19 |
| AREA LEAD | F VAN BILJON | | 2018-12-19 |
| ENG. MANAGER | D STANGER | | 2018-12-20 |
| AREA MANAGER | F PITTMAN | | 2018-12-20 |
| ROLE | NAME | SIGNATURE | DATE |
| DRAWING APPROVAL STATUS: Approved for Construction | | | |

SCALE NTS OR AS NOTED
DWG. No. H353004-30000-224-294-0007-0001
REV 0

SUSSEX/AMES
SDATES
\$FILES
\$TIMES

NOTES:

- (i) WHEREVER THE WORDS 'ENGINE WHISTLE' APPEAR IN THESE RULES THEY ALSO REFER TO 'ENGINE HORN'. SIGNALS PRESCRIBED BY THIS RULE ARE ILLUSTRATED BY "o" FOR SHORT SOUNDS, "—" FOR LONGER SOUNDS.
- (ii) ENGINE WHISTLE SIGNALS MUST BE SOUNDED AS PRESCRIBED BY THIS RULE, AND SHOULD BE DISTINCT, WITH INTENSITY AND DURATION PROPORTIONATE TO THE DISTANCE TO THE SIGNAL IS TO BE CONVEYED. UNNECESSARY USE OF WHISTLE IS PROHIBITED.
- (iii) RADIO MUST NOT BE USED IN LIEU OF ENGINE WHISTLE SIGNALS FOR INDICATION PREFIXED BY THE SYMBOL "R".
- (iv) (#) AT PUBLIC CROSSINGS AT GRADE: — o —
A WHISTLE POST WILL BE LOCATED AT 1/4 MILE BEFORE EACH PUBLIC CROSSING WHERE REQUIRED. WHISTLE SIGNAL MUST BE SOUNDED BY MOVEMENTS:
* EXCEEDING 44MPH, AT WHISTLE POST
* OPERATING 44MPH OR LESS, IN ORDER TO PROVIDE 20 SECONDS WARNING PRIOR TO ENTERING THE CROSSING. WHISTLE MUST BE PROLONGED OR REPEATED UNTILL THE CROSSING IS OCCUPIED.
- (v) TRAFFIC CONTROL SIGNAGE CONFORM TO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA (MUTCD), FIFTH EDITION.
- (vi) THIS DRAWING WAS PREVIOUSLY ISSUED AS: H353004-00000-224-272-0033-0001.



TYPICAL LEVEL CROSSING LAYOUT
NTS

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Date: _____
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BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

TOTE ROAD
STANDARD DRAWING
TYPICAL GRADE CROSSING LAYOUT

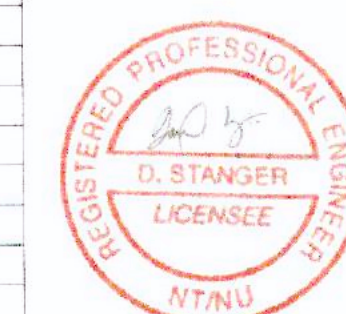
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| DRAFTSPERSON | A VAN NIEKERK | NR | 13/12/17 |
| DESIGNER | A VAN NIEKERK | NR | 13/12/17 |
| CHECKER | G JOHNSTONE | | |
| DESIGN COORD. | G JOHNSTONE | | |
| RESP. ENG. | D STANGER | | 2018-12-18 |
| LEAD DISC. ENG. | F VAN BILJON | | 20 18-12-18 |
| AREA LEAD | F VAN BILJON | | 2018-12-18 |
| ENG. MANAGER | D STANGER | | 2018-12-18 |
| AREA MANAGER | F PITTMAN | | 2018-12-20 |

| BY | CHKD | DATE | ROLE | NAME | SIGNATURE | DATE |
|------|------|------------|------|------|-----------|------|
| AJVN | | 2018/04/09 | | | | |

DRAWING APPROVAL STATUS: Approved for Construction

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| SCALE | DWG. No. | REV |
| 1:100 OR AS NOTED | H353004-30000-224-294-0009-0001 | 0 |

| | |
|----------------------------|---------------------------------|
| H353004-30000-224-294-0007 | ROAD SIGNS AND SIGN POST DETAIL |
| DRAWING No. | DRAWING TITLE |

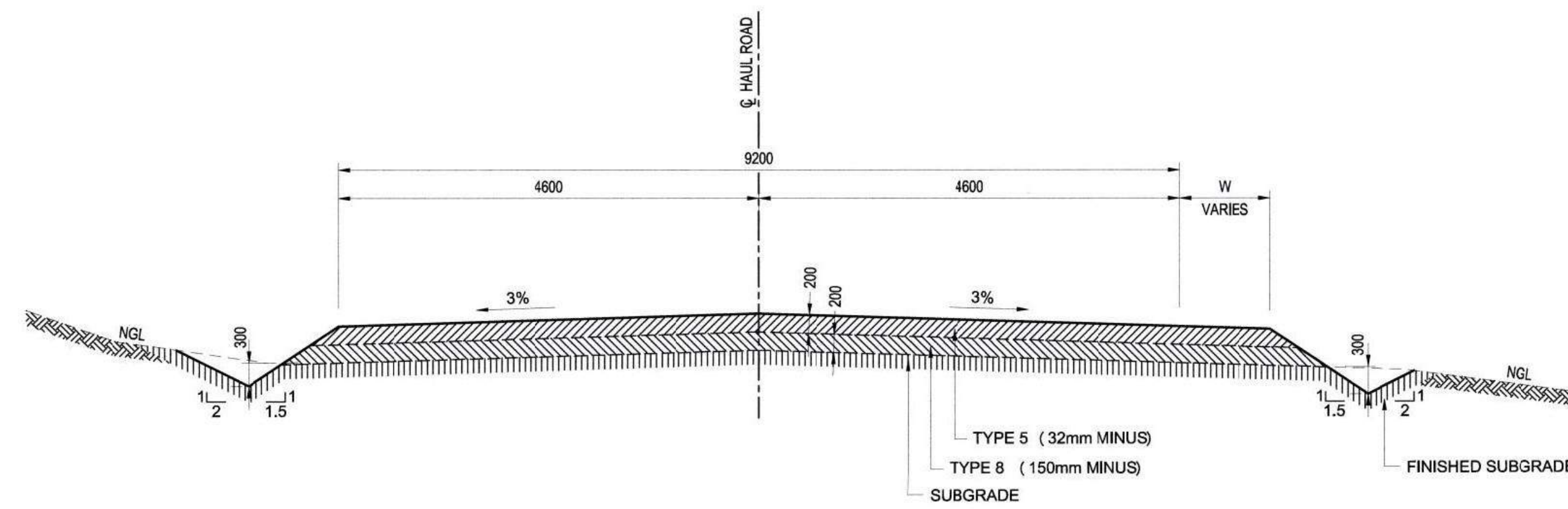


REG. PROFESSIONAL

| No. | DESCRIPTION | REVISIONS |
|-----|---------------------------|-----------|
| 0 | APPROVED FOR CONSTRUCTION | |

H353004-30000-224-294-0010-0001
DWG. No.

| ROAD PAVEMENT STRUCTURE BY SOIL TYPE | | |
|--------------------------------------|-------------------|-------------------|
| SOIL TYPE BY FROST SUSCEPTIBILITY | TYPE 8 DEPTH (mm) | TYPE 5 DEPTH (mm) |
| HIGHLY SUSCEPTIBLE (HS) | 150 | 150 |
| MODERATELY SUSCEPTIBLE (MS) | 150 | 150 |
| POTENTIALLY SUSCEPTIBLE (PS) | - | 150 |
| NON SUSCEPTIBLE | - | 150 |



TYPICAL HAUL ROAD CROSS SECTION
SCALE 1:50

| WIDENING TABLE | | | | | |
|-----------------------|----------|-----------------------|----------|-----------------------|----------|
| DESIGN SPEED: 65 km/h | | DESIGN SPEED: 65 km/h | | DESIGN SPEED: 65 km/h | |
| RADIUS | WIDENING | RADIUS | WIDENING | RADIUS | WIDENING |
| 10000 | 0 | 475 | 0.3 | 190 | 1 |
| 5000 | 0 | 390 | 0.4 | 180 | 1.1 |
| 3000 | 0 | 380 | 0.5 | 170 | 1.2 |
| 2000 | 0 | 370 | 0.5 | 160 | 1.3 |
| 1500 | 0 | 360 | 0.5 | 150 | 1.4 |
| 1200 | 0 | 350 | 0.5 | 140 | 1.5 |
| 1000 | 0 | 340 | 0.5 | 130 | 1.6 |
| 950 | 0 | 330 | 0.5 | 120 | 1.7 |
| 900 | 0 | 320 | 0.6 | 110 | 1.9 |
| 850 | 0.1 | 310 | 0.6 | 100 | 2 |
| 800 | 0.1 | 300 | 0.6 | 90 | 2.3 |
| 750 | 0.1 | 290 | 0.6 | 80 | 2.6 |
| 700 | 0.1 | 280 | 0.7 | 70 | 2.9 |
| 650 | 0.2 | 270 | 0.7 | 60 | 3.3 |
| 600 | 0.2 | 260 | 0.7 | 55 | 3.5 |
| 575 | 0.2 | 250 | 0.8 | 50 | 3.7 |
| 550 | 0.2 | 240 | 0.8 | | |
| 525 | 0.2 | 200 | 1 | | |

- NOTE:
 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
 2. 'W' - REFER TO WIDENING TABLE FOR WIDTH OF WIDENING.
 3. THIS DRAWING WAS PREVIOUSLY ISSUED: H353004-00000-224-272-0034-0001

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 Date: 2018-11-24
 PERMIT NUMBER: P 512
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BAFFINLAND IRON MINES LP
 MARY RIVER EXPANSION PROJECT

TOTE ROAD
 STANDARD DRAWING
 TYPICAL HAUL ROAD CROSS SECTION



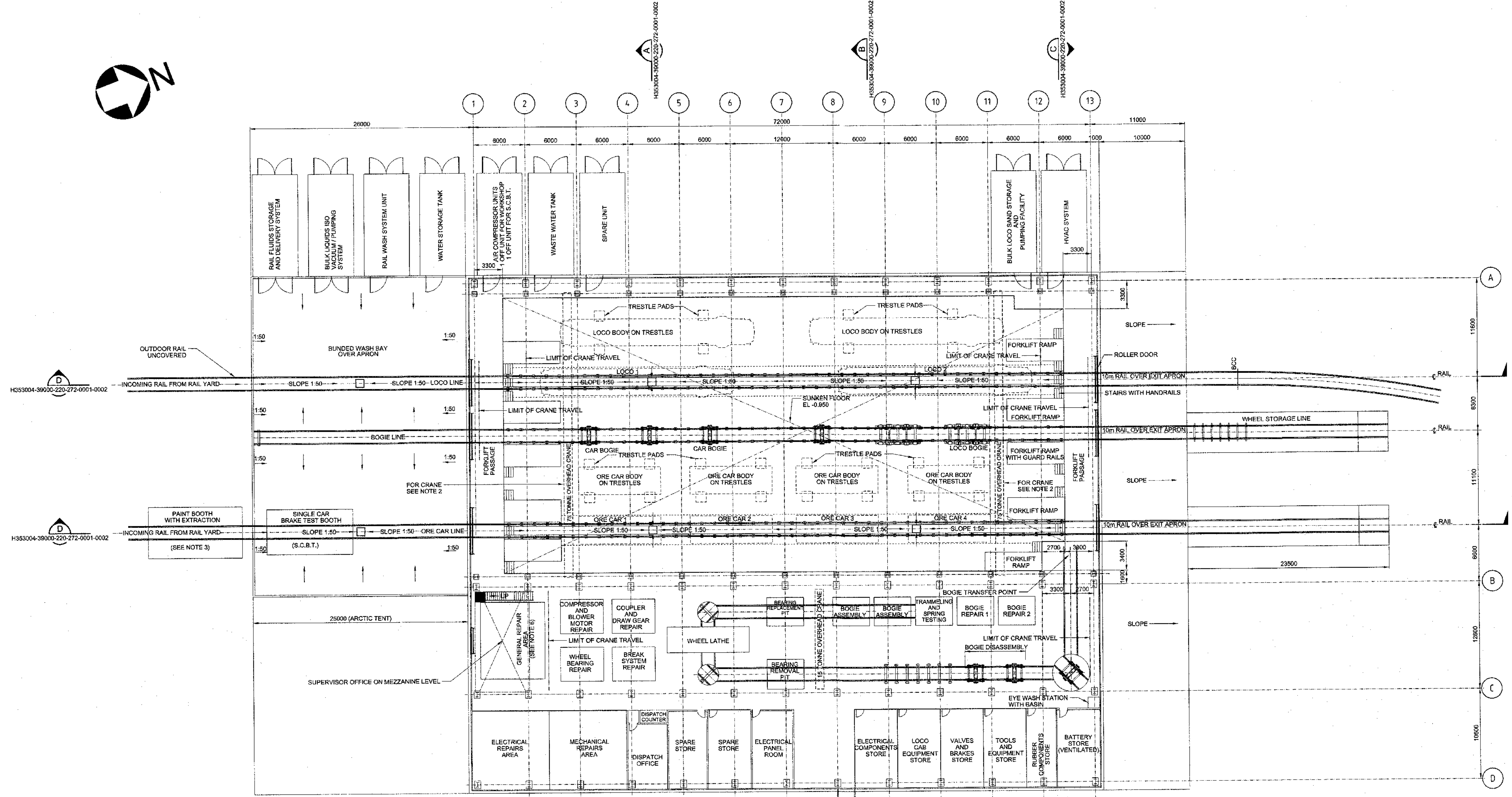
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|-----------------|---------------|--------------------|------------|
| DRAFTSPERSON | A VAN NIEKERK | NR | 22/11/17 |
| DESIGNER | A VAN NIEKERK | NR | 22/11/17 |
| CHECKER | A AQUIL | <i>[Signature]</i> | 2018/04/23 |
| DESIGN COORD. | A AQUIL | <i>[Signature]</i> | 2018/04/23 |
| RESP. ENG. | D STANGER | <i>[Signature]</i> | 2018/04/23 |
| LEAD DISC. ENG. | F VAN BILJON | <i>[Signature]</i> | 2018/04/23 |
| AREA LEAD | F VAN BILJON | <i>[Signature]</i> | 2018/04/23 |
| ENG. MANAGER | D STANGER | <i>[Signature]</i> | 2018/04/23 |
| AREA MANAGER | F PITTMAN | <i>[Signature]</i> | 2018/11/25 |

| No. | DESCRIPTION | BY | CHKD | DATE |
|-----|---------------------------|-----|------|------------|
| 0 | APPROVED FOR CONSTRUCTION | AVN | AD | 2018/11/25 |

DRAWING APPROVAL STATUS: APPROVED FOR CONSTRUCTION

SCALE 1:100 OR AS NOTED
 DWG. No. H353004-30000-224-294-0010-0001
 REV 0

WORKSHOPS



RAIL WORKSHOP FLOOR PLAN
SCALE 1:200

- NOTES:**
1. ALL STAIRS AND FORKLIIFT RAMPS TO BE FITTED WITH HANDRAILS AND GUARD RAILS.
 2. OVERHEAD CRANE CAPACITY TO BE VALIDATED BY CONTRACTOR. CAPACITY WILL BE BASED ON LOCOMOTIVE WET WEIGHT FOR LOCOMOTIVE BODY WITHOUT BOGIES. SPECIFICATION SHEET WILL BE PROVIDED.
 3. PAINT BOOTH ON ORE CAR LINE IS OPTIONAL. IF NOT REQUIRED BY CLIENT, STENCILING OF ORE CAR MAINTENANCE CYCLES SHALL BE DONE INSIDE WORKSHOP ON ORE CAR LINE. LOCOMOTIVE BODY SPRAY CAN ALSO BE DONE IN THIS BOOTH.
 4. LOCOMOTIVE BOGIE REPAIR AND TRACTION MOTOR CHANGE TO BE CONDUCTED ON EITHER BOGIE LINE OR ON LOCO LINE.
 5. FOR EARTHWORKS, LAYER WORKS AND INSULATION REFER TO DRG H353004-39000-220-272-0001-0002.
 6. PROVIDE EXTRACTION FAN FOR WELDING FUMES.
 7. PROVIDE FOR WELDING RECEIPTALS AND POWER HYDRANTS FOR 347V AND 600V HOOKUPS IN DETAILED DESIGN.
 8. TRESTLE PAD POSITIONS ARE INDICATED ON THE LOCOMOTIVE AND ORE CAR SPECIFICATION SHEETS, SUPPLIED WITH SCOPE OF WORK SPECIFICATION.
 9. EXACT POSITION TO BE DEFINED BY CONTRACTOR TX004 FOR FIBRE OPTIC CABLE CONNECTION. CONTRACTOR MUST LEAVE 50M COILED FIBRE OPTIC CABLE AT THE POWER CENTRE UNIT FOR TX004 TO TERMINATE.
 10. EXACT POSITION FOR POWER CENTRE UNIT TO BE DETERMINED BY TX004 CONTRACTOR.

NOT FOR CONSTRUCTION

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MARY RIVER EXPANSION PROJECT
MILNE PORT

RAIL WORKSHOP
GENERAL ARRANGEMENT
FLOOR LAYOUT

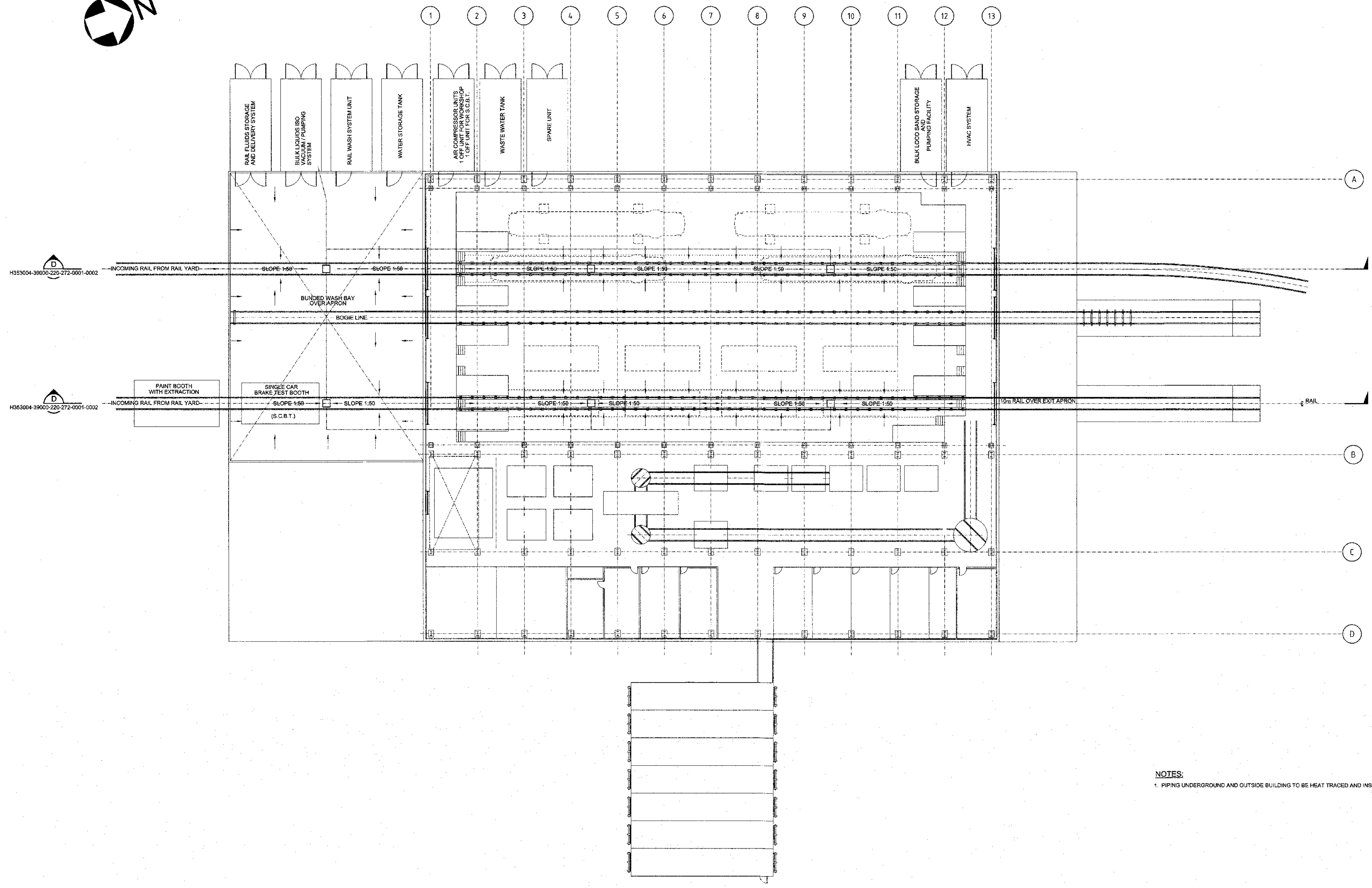
| | |
|---------------------------------|-----------------------------------------------------------------|
| H353004-39000-220-272-0001-0005 | RAIL WORKSHOP - COMPRESSED AIR AND LOCO SAND - PIPING LAYOUT |
| H353004-39000-220-272-0001-0006 | RAIL WORKSHOP - DISTILLED WATER, OIL AND GREASE - PIPING LAYOUT |
| H353004-39000-220-272-0001-0008 | RAIL WORKSHOP - DRAINAGE AND PIPING |
| H353004-39000-220-272-0001-0002 | RAIL WORKSHOP - SECTIONS AND DETAILS |

| No. | DESCRIPTION | BY | CHKD | DATE | ROLE | NAME | SIGNATURE | DATE |
|-----|------------------|-----|------|------------|-----------------|---------------|-----------|------|
| 2 | APPROVED FOR BID | GPM | CG | 2018/11/05 | LEAD D/SC. ENG. | P. BHULLA | | |
| 1A | CLIENT REVIEW | GPM | CG | 2018/10/29 | AREA LEAD | F. VAN BILJON | | |
| 1 | APPROVED FOR BID | EB | RG | 2017/11/23 | ENG. MANAGER | D. STANER | | |
| 0 | APPROVED FOR BID | PS | CS | 2017/02/11 | AREA MANAGER | F. PITTMAN | | |

| | | | |
|---------------|------------|------------|------------|
| DRAFTSPERSON | GP MEADES | NR | 28/03/2018 |
| DESIGNER | GP MEADES | NR | |
| CHECKER | C. GOMBA | 01/10/2018 | |
| DESIGN COORD. | S. VORSTER | 09/11/2018 | |
| RESP. ENG. | C. GOMBA | 07/11/2018 | |
| | | 07/11/2018 | |
| | | 11/11/18 | |
| | | 09/11/2018 | |

SCALE 1:200
DWG. No. H353004-39000-220-272-0001-0001
REV 2

STAGES
SUBMITTALS
REVISED



NOTES:
 1. PIPING UNDERGROUND AND OUTSIDE BUILDING TO BE HEAT TRACED AND INSULATED.

RAIL WORKSHOP FLOOR PLAN
 SCALE 1:200

| DRAWING No. | DRAWING TITLE |
|--------------------------------|-----------------------------------------------------------------|
| H353004-39000-220-272-001-0005 | RAIL WORKSHOP - COMPRESSED AIR AND LOOSE SAND - PIPING LAYOUT |
| H353004-39000-220-272-001-0004 | RAIL WORKSHOP - DISTILLED WATER, OIL AND GREASE - PIPING LAYOUT |
| H353004-39000-220-272-001-0002 | RAIL WORKSHOP - SECTIONS AND DETAILS |
| H353004-39000-220-272-001-0001 | RAIL WORKSHOP - FLOOR LAYOUT |

NOT FOR CONSTRUCTION

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HATCH

| | | | |
|----------------|--------------|------------|------------|
| DRAFTSPERSON | G MEADES | NR | 22/10/2018 |
| DESIGNER | G MEADES | NR | |
| CHECKER | C GOMBA | 07/11/2018 | |
| DESIGN COORD. | B VORSTER | 07/11/2018 | |
| RESP. ENG. | C GOMBA | 07/11/2018 | |
| LEAD DES. ENG. | L GRESSE | 27/10/18 | |
| AREA LEAD | F VAN BILJON | 27/10/18 | |
| ENG. MANAGER | D STANGER | 12/11/17 | |
| AREA MANAGER | F FITTMAN | 07/11/2018 | |

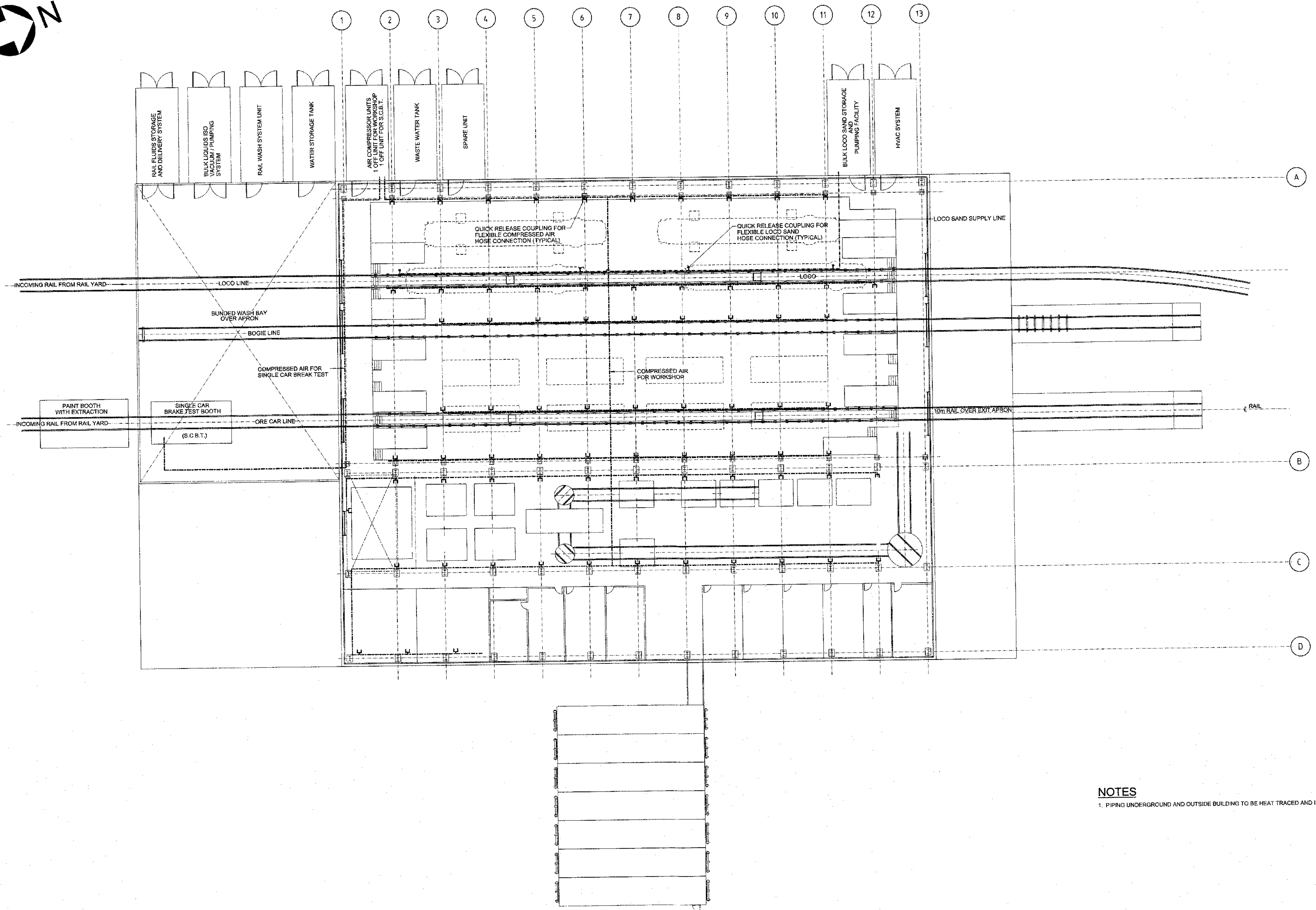
Baffinland
 MARY RIVER EXPANSION PROJECT
 MILNE PORT

**RAIL WORKSHOP
 GENERAL ARRANGEMENT
 DRAINAGE AND PIPING**

| NO. | DESCRIPTION | BY | CHK'D | DATE |
|-----|------------------|-----|-------|------------|
| 0 | APPROVED FOR BID | GPM | CG | 2018/11/05 |
| A | CLIENT REVIEW | GPM | CG | 2018/10/29 |

SCALE: 1:200
 OR AS NOTED
 DWS No: H353004-39000-220-272-001-0003
 SHEET SIZE: E

SUBMITTALS
 SHEET 5 OF 5



RAIL WORKSHOP FLOOR PLAN

NOTES
 1. PIPING UNDERGROUND AND OUTSIDE BUILDING TO BE HEAT TRACED AND INSULATED.

| DRAWING No. | DRAWING TITLE |
|----------------------------------|-----------------------------------------------------------------|
| H3530004-39000-220-272-0001-0004 | RAIL WORKSHOP - DISTILLED WATER, OIL AND GREASE - PIPING LAYOUT |
| H3530004-39000-220-272-0001-0003 | RAIL WORKSHOP - DRAINAGE AND PIPING |
| H3530004-39000-220-272-0001-0002 | RAIL WORKSHOP - SECTIONS AND DETAILS |
| H3530004-39000-220-272-0001-0001 | RAIL WORKSHOP - FLOOR LAYOUT |

NOT FOR CONSTRUCTION

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HATCH

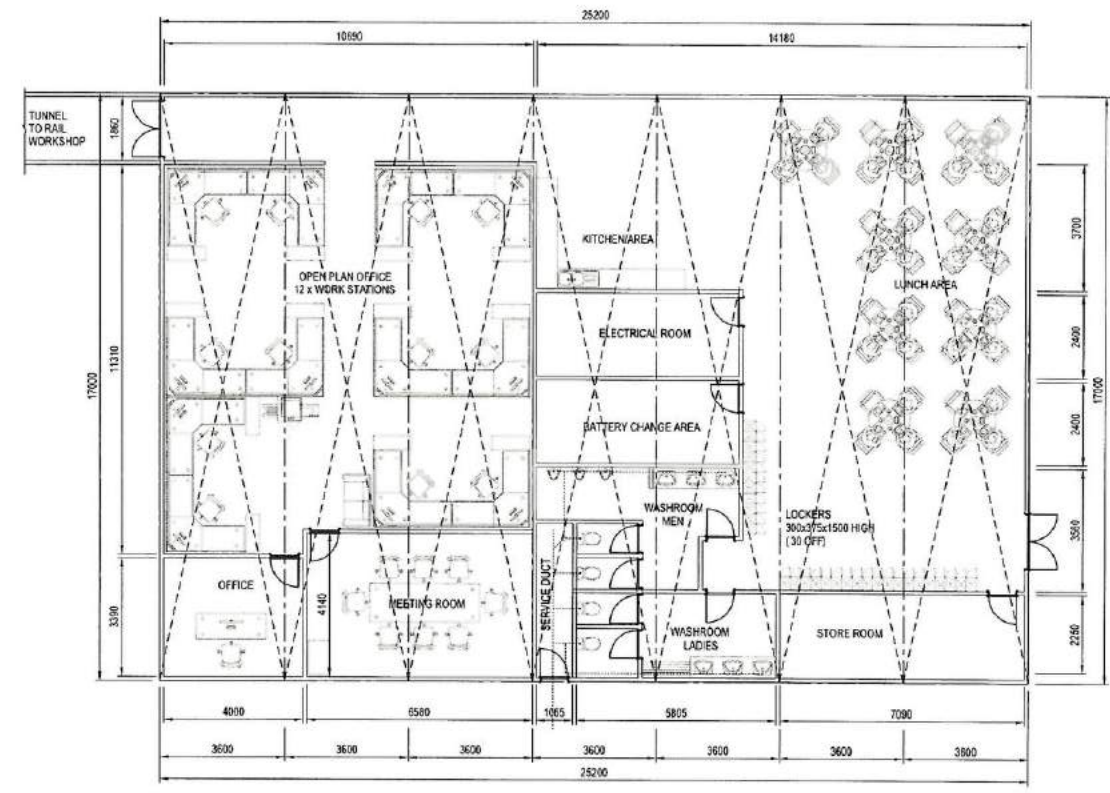
Baffinland

| No. | DESCRIPTION | BY | CHKD | DATE |
|-----|------------------|-----|------|------------|
| 0 | APPROVED FOR BID | GPM | CG | 2018/10/29 |
| 1 | CLIENT REVIEW | GPM | CG | 2018/10/29 |

| ROLE | NAME | SIGNATURE | DATE |
|-----------------|--------------|--------------------|------------|
| DRAFTSPERSON | GP MEADES | <i>[Signature]</i> | 23/08/2018 |
| DESIGNER | GP MEADES | <i>[Signature]</i> | 23/08/2018 |
| CHECKER | C GOMBA | <i>[Signature]</i> | 07/11/2018 |
| DESIGN COORD. | B VORSTER | <i>[Signature]</i> | 07/11/2018 |
| RESP. ENG. | C GOMBA | <i>[Signature]</i> | 07/11/2018 |
| LEAD DISC. ENG. | L GRESSE | <i>[Signature]</i> | 07/11/2018 |
| AREA LEAD | F VAN BILJON | <i>[Signature]</i> | 07/11/2018 |
| ENG. MANAGER | D STANGER | <i>[Signature]</i> | 07/11/2018 |
| AREA MANAGER | F PITTMAN | <i>[Signature]</i> | 07/11/2018 |

| | |
|----------------------------------------------------------------|-----------------------------------------|
| MARY RIVER EXPANSION PROJECT MILNE PORT | |
| RAIL WORKSHOP COMPRESSED AIR AND LOCO SAND PIPING LAYOUT | |
| SCALE: 1:200 OR AS NOTED | DWG No: H353004-39000-220-272-0001-0005 |
| REV 0 | SHEET SIZE: E |

DWG No. H353004-39000-220-272-0002-0001



PLAN
SCALE 1:100

| | |
|----------------|---------------------------------|
| NAME | |
| SIGNATURE | |
| ENG REG NUMBER | |
| REVISION DATE | |
| ORIGINAL DATE | |
| DRAWING No. | H353004-00000-224-272-0031-0001 |
| DRAWING TITLE | PORT YARD LINES AND TRIANGLE |

| | | | |
|-------------------|------|------------|-------------------|
| REG. PROFESSIONAL | No. | 0 | APPROVED FOR BID. |
| REVISIONS | No. | | |
| DESCRIPTION | | | |
| BY | CHKD | DATE | |
| AN | AA | 20/11/2017 | |

| | | | |
|-----------------|---------------|----|------------|
| HATCH | | | |
| DRAFTSPERSON | A VAN NIEKERK | NR | 18/11/17 |
| DESIGNER | | NR | |
| CHECKER | A AQUIL | | 20/11/2017 |
| DESIGN COORD. | R Goosen | | 20/11/2017 |
| RESP. ENG. | | | |
| LEAD DISC. ENG. | | | |
| AREA MANAGER | F VAN BILJON | | 20/11/2017 |
| PROJ. MANAGER | | | |
| CLIENT | FAN PITTMAN | | 20/11/10 |

| | |
|---------------------------------------------------------------------------|---------------------------------|
| Baffinland | |
| BAFFINLAND IRON MINES LP MARY RIVER PROJECT | |
| MILNE PORT RAIL MAINTENANCE WORKSHOP RAIL OFFICE TX003 FLOOR LAYOUT | |
| SCALE | DWG. No. |
| 1:100 OR AS NOTED | H353004-39000-220-272-0002-0001 |
| REV | 0 |
| SHEET SIZE: D | |

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