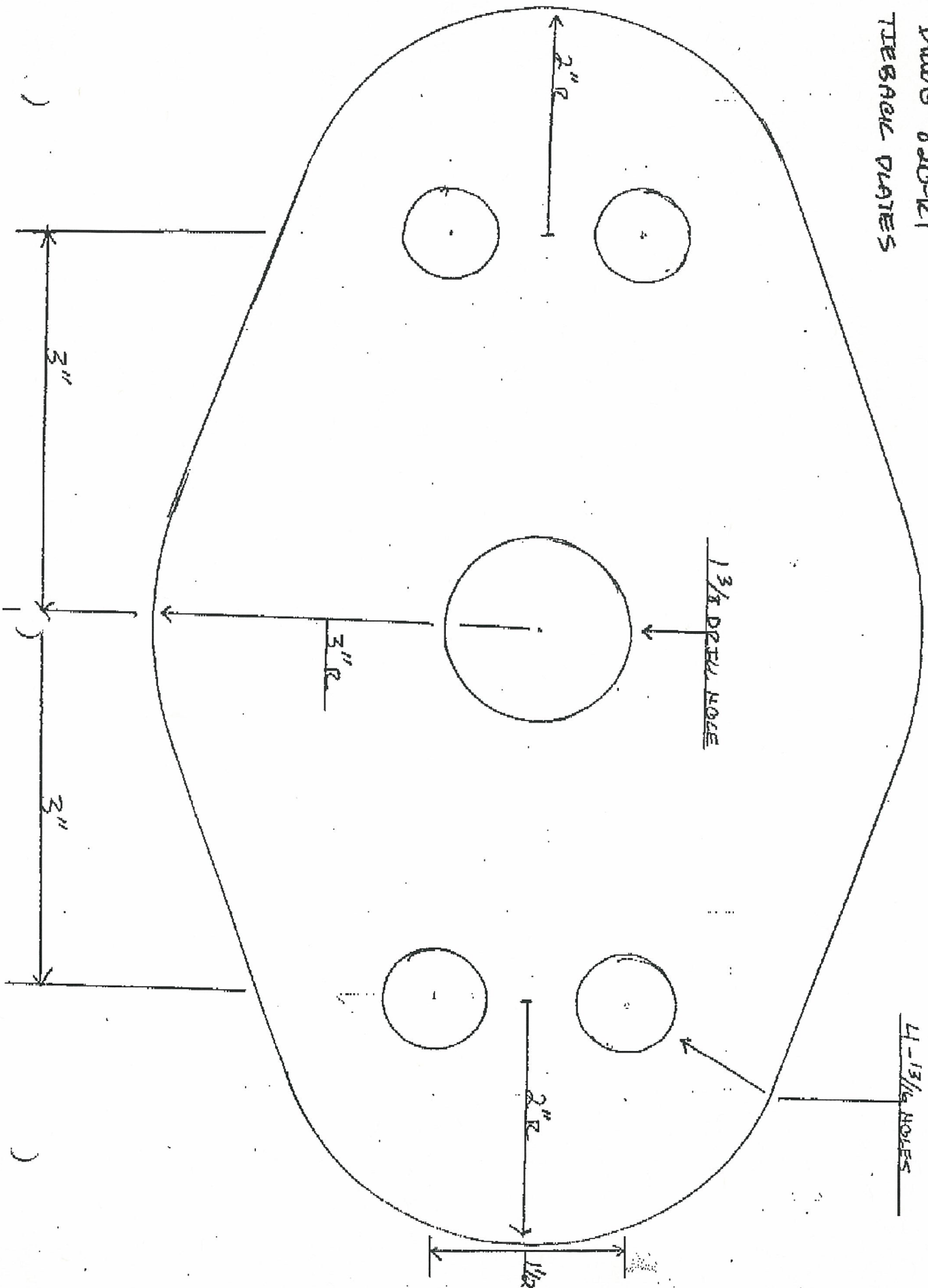


N.T.S.  
ENVIRONMENT CANADA

Draw 820-R1  
TIEBACK PLATES

5/8 THICK



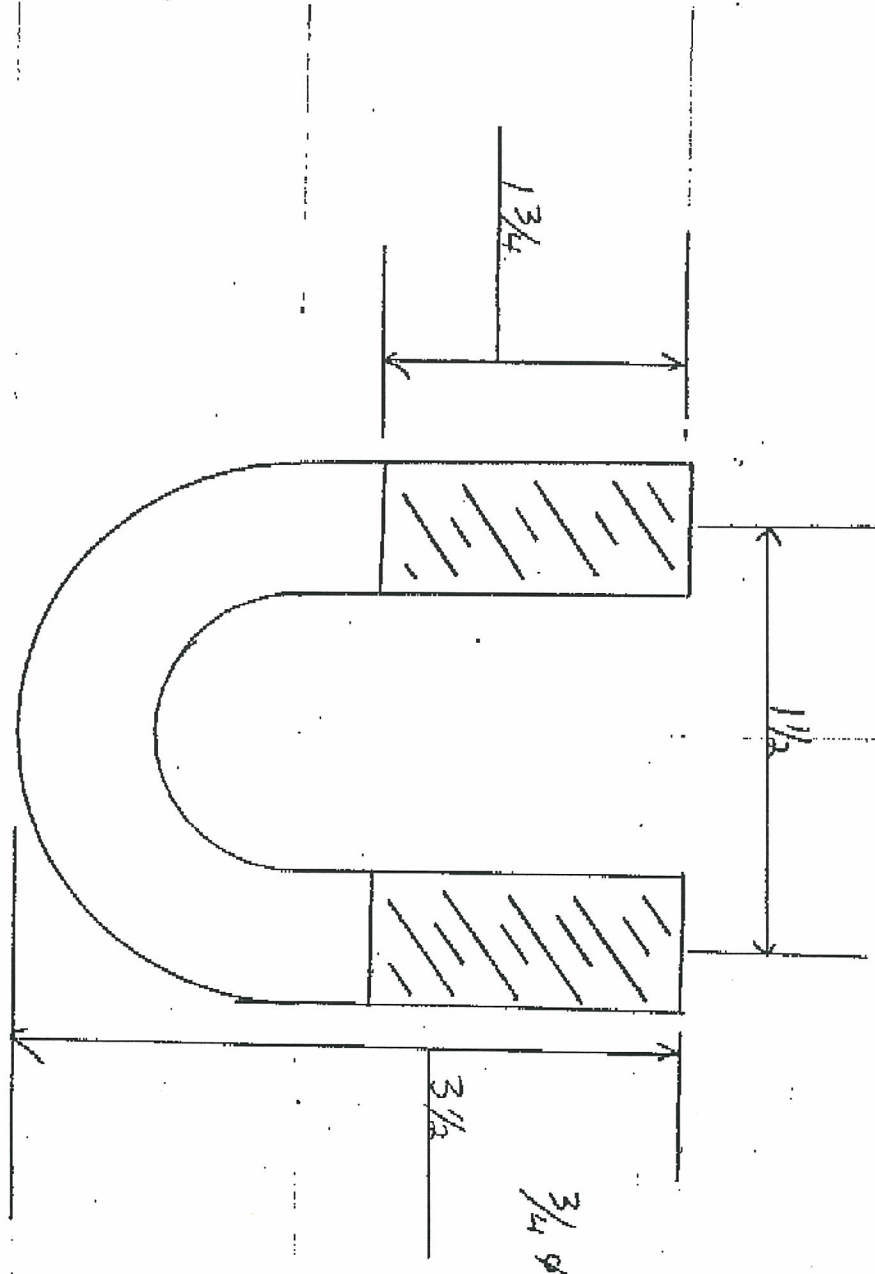
FROM :

PHONE NO. : 6045803605 +

AUG. 22 2002 02:45PM P3

ENVIRONMENT CHAOS  
0206 820-121

TIEBACK PLATE U-BOLTS



## NOTES :

1. ALL STEEL SHALL CONFIRM TO C.S.A. G40.21M  
GRADE 350W
2. FABRICATOR SHALL SUPPLY 8 NUTS FOR U-BOLTS
3. FABRICATOR SHALL SUPPLY 2 U-BOLTS
4. ALL PARTS TO BE HOT-DIPPED GALVANIZED AS  
PER C.S.A. G164  
(INCLUDING NUTS & U-BOLTS)

BILLS OF MATERIAL

A COMPLETE 2 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 2 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.1 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 2   | LADDER BRACKET ASSEMBLY             | 3136-13 | CONTRACTOR |
| 1   | 3m LADDER                           | 3136-11 | CONTRACTOR |

A COMPLETE 3 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 3 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.5 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 3   | LADDER BRACKET ASSEMBLY             | 3136-13 | CONTRACTOR |
| 1   | 4m LADDER                           | 3136-11 | CONTRACTOR |

A COMPLETE 4 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                   | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 3   | LADDER BRACKET ASSEMBLY             | 3136-13 | CONTRACTOR |
| 1   | 5m LADDER                           | 3136-12 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY             | 3136-17 | CONTRACTOR |

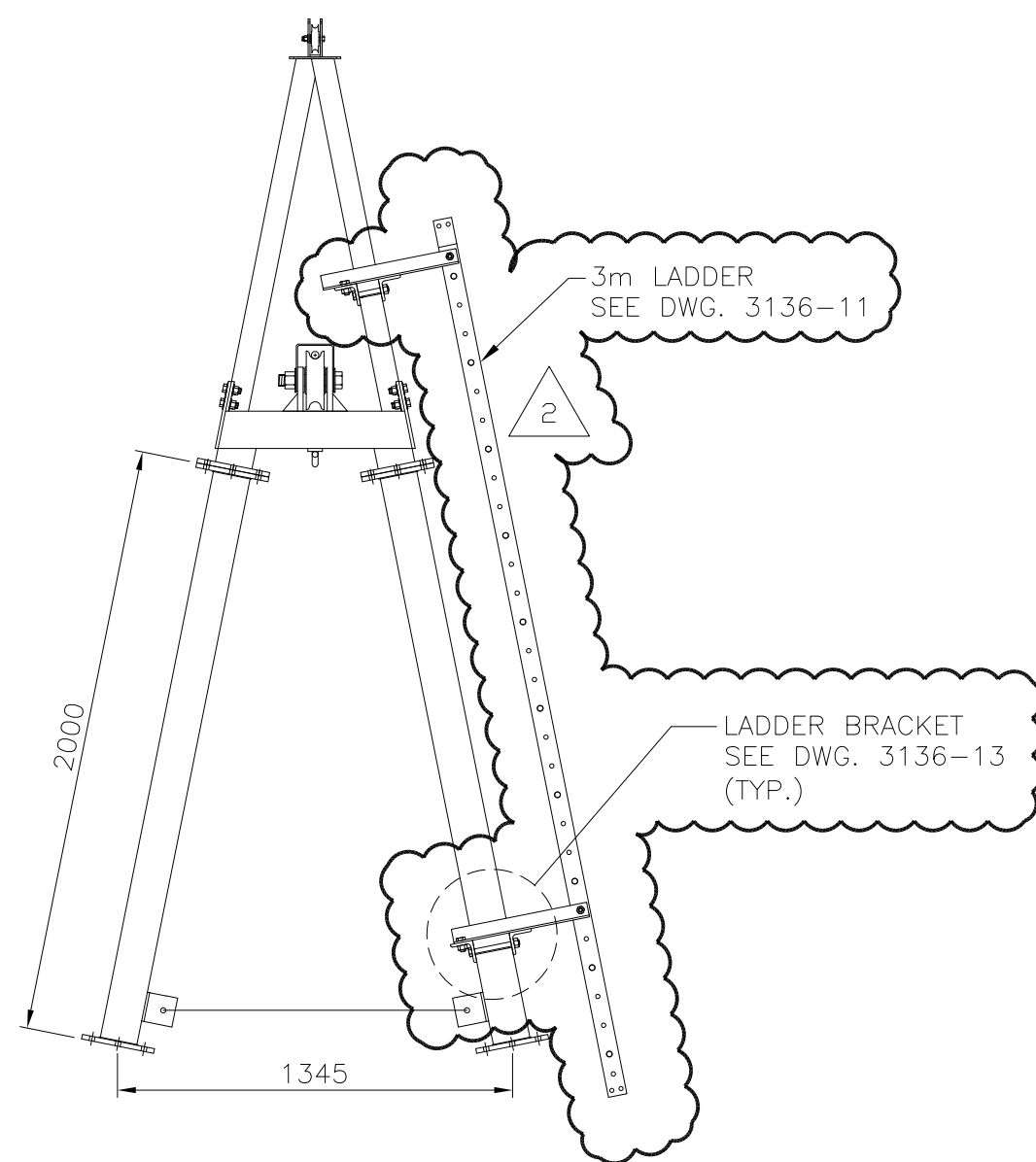
A COMPLETE 5 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                   | DWG No. | SUPPLIER   |
|-----|---|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                          | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                          | 3136-5  | CONTRACTOR |
| 1   | 1 METRE LEG ASSEMBLY                          | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY           | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                             | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                         | 3136-10 | CONTRACTOR |
| 4   | LADDER BRACKET ASSEMBLY                       | 3136-13 | CONTRACTOR |
| 2   | 3m LADDER                                     | 3136-11 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                       | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"L.G. ASTM A325M GALV. HEX BOLTS | —       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS             | —       | CONTRACTOR |

A COMPLETE 1 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

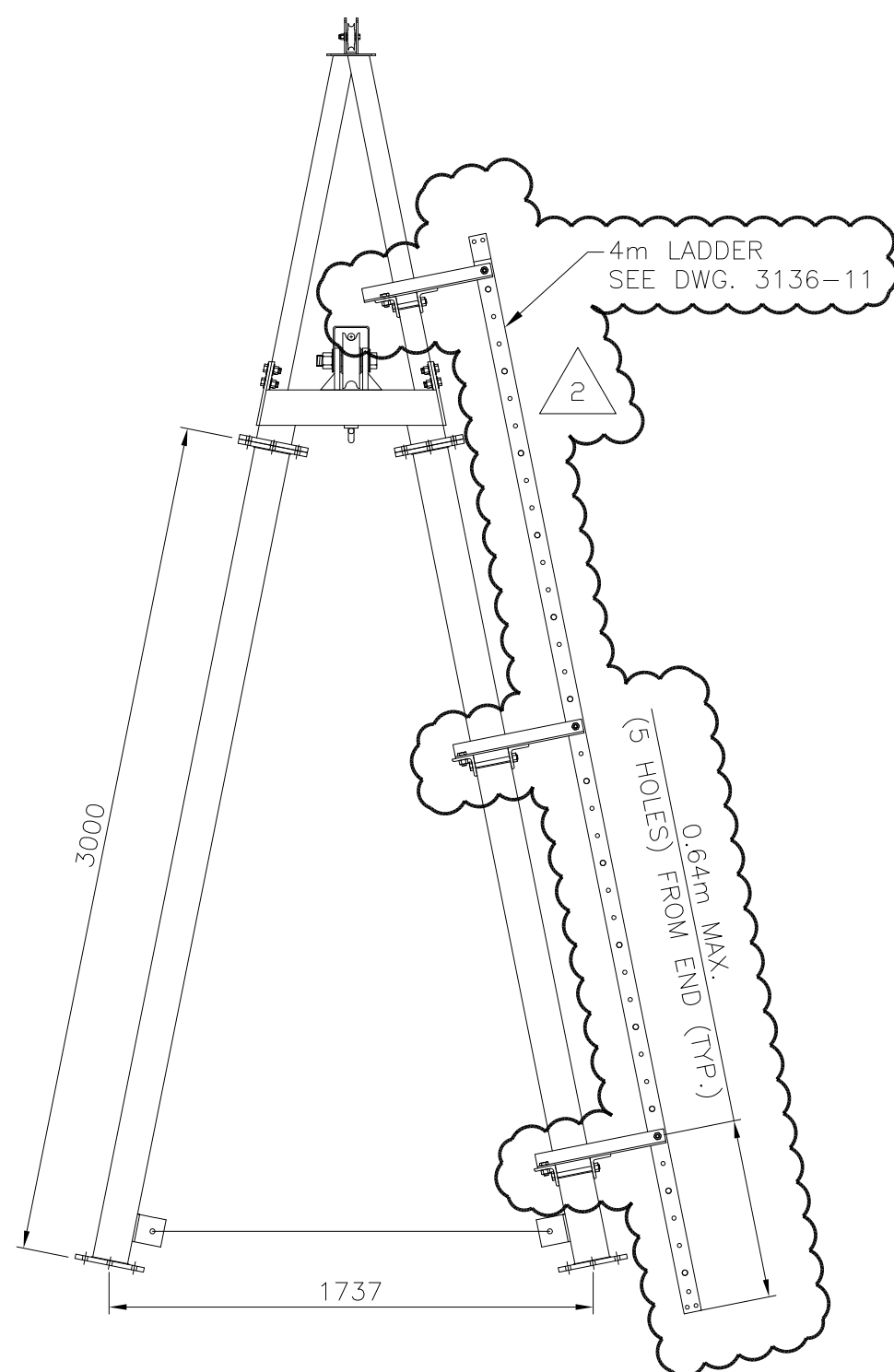
| QTY | DESCRIPTION          | DWG No. | SUPPLIER   |
|-----|----------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY | 3136-4  | CONTRACTOR |
| 1   | 1 METRE LEG ASSEMBLY | 3136-5  | CONTRACTOR |

EST. W.T. 173.4 kg



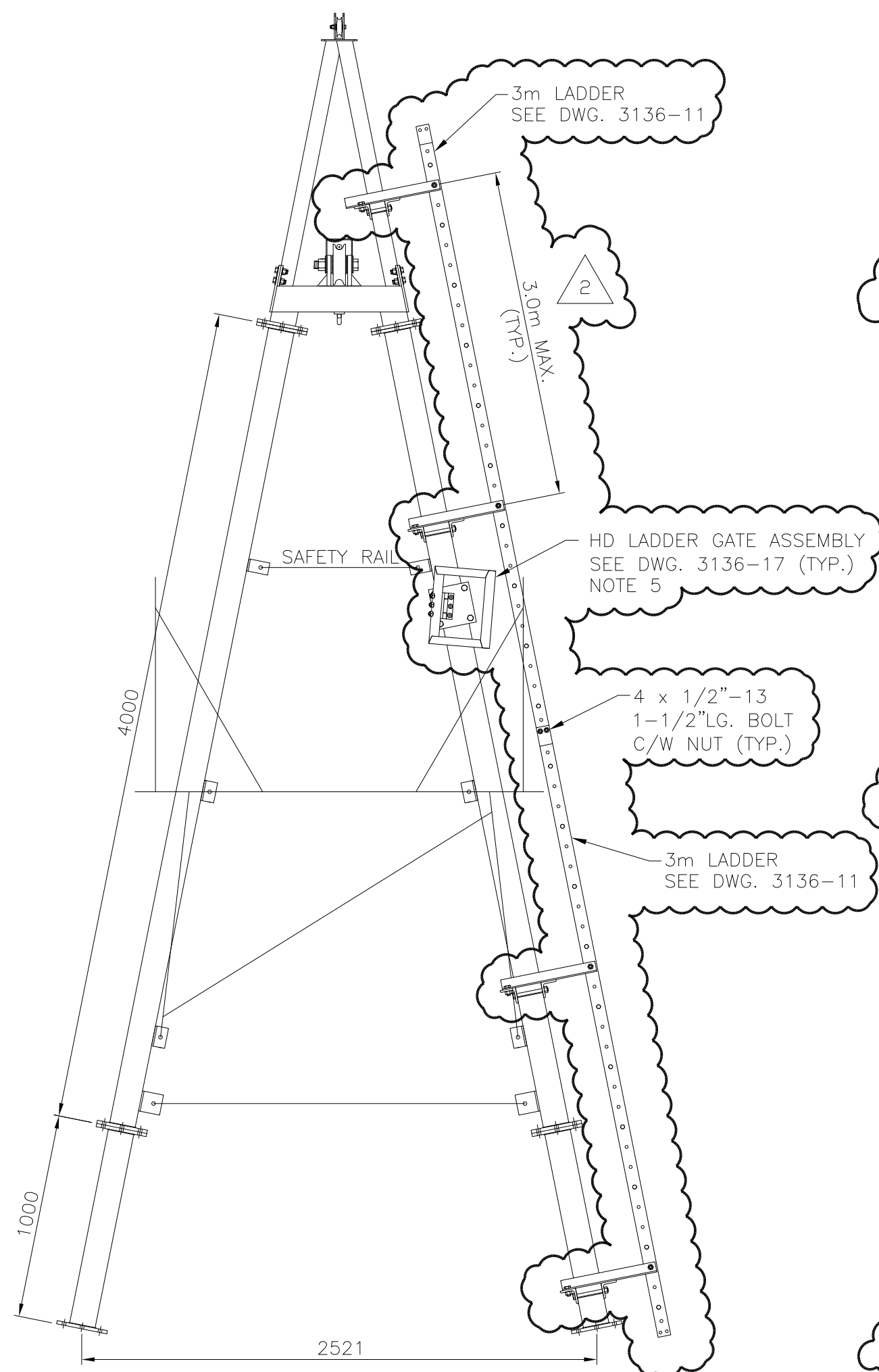
2 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 2.352 METRES (WITHOUT FOOT PIECE)



3 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 3.332 METRES (WITHOUT FOOT PIECE)



5 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 5.294 METRES (WITHOUT FOOT PIECE)

DESIGN LOAD

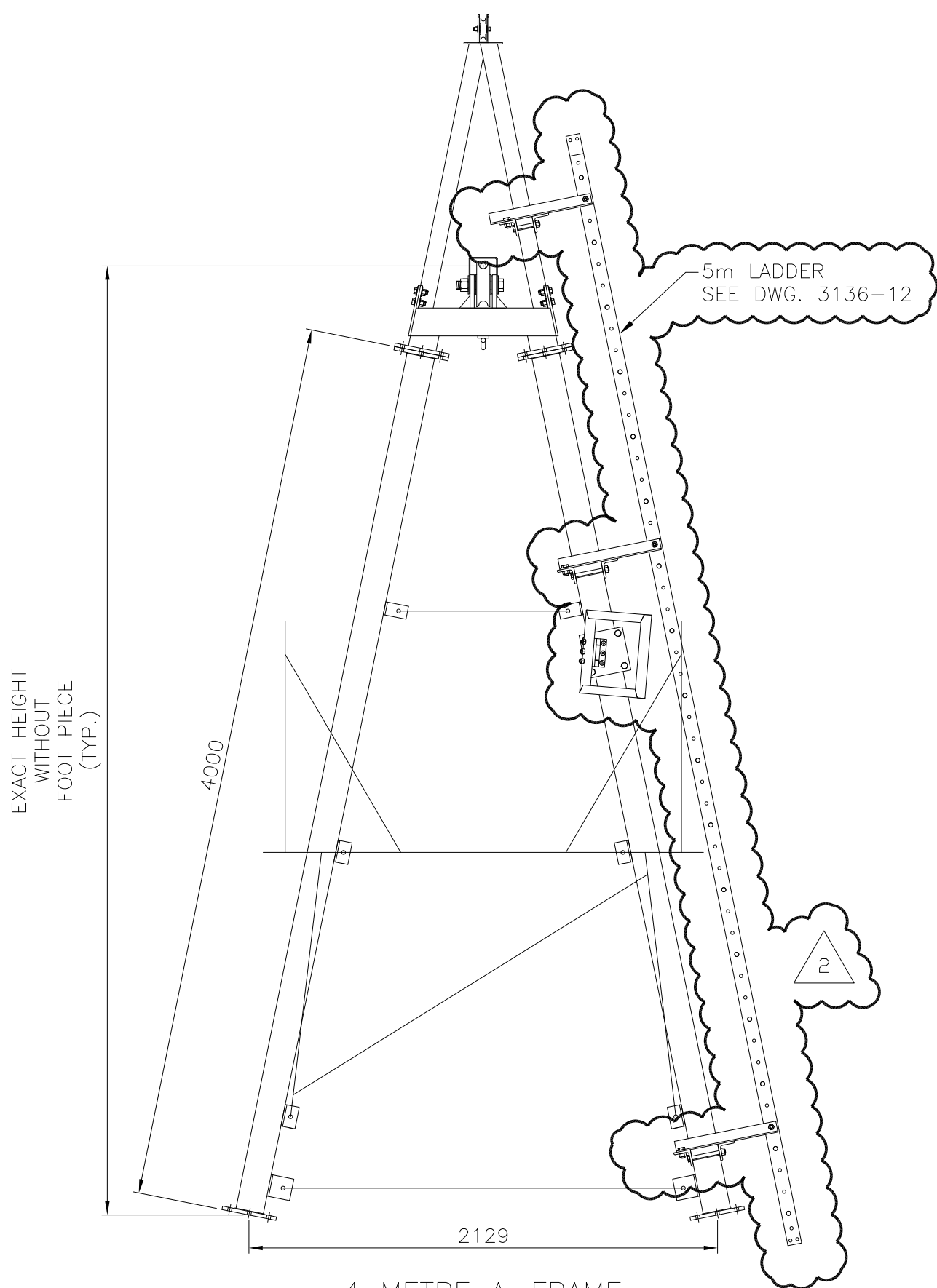
|       |          |
|-------|----------|
| CAR   | 200      |
| 2 MEN | 400      |
| REEL  | 50       |
|       | 650 lbs. |

PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY  
ANGLE = 1600 lbs. BREAKING STRENGTH.

NOTES:

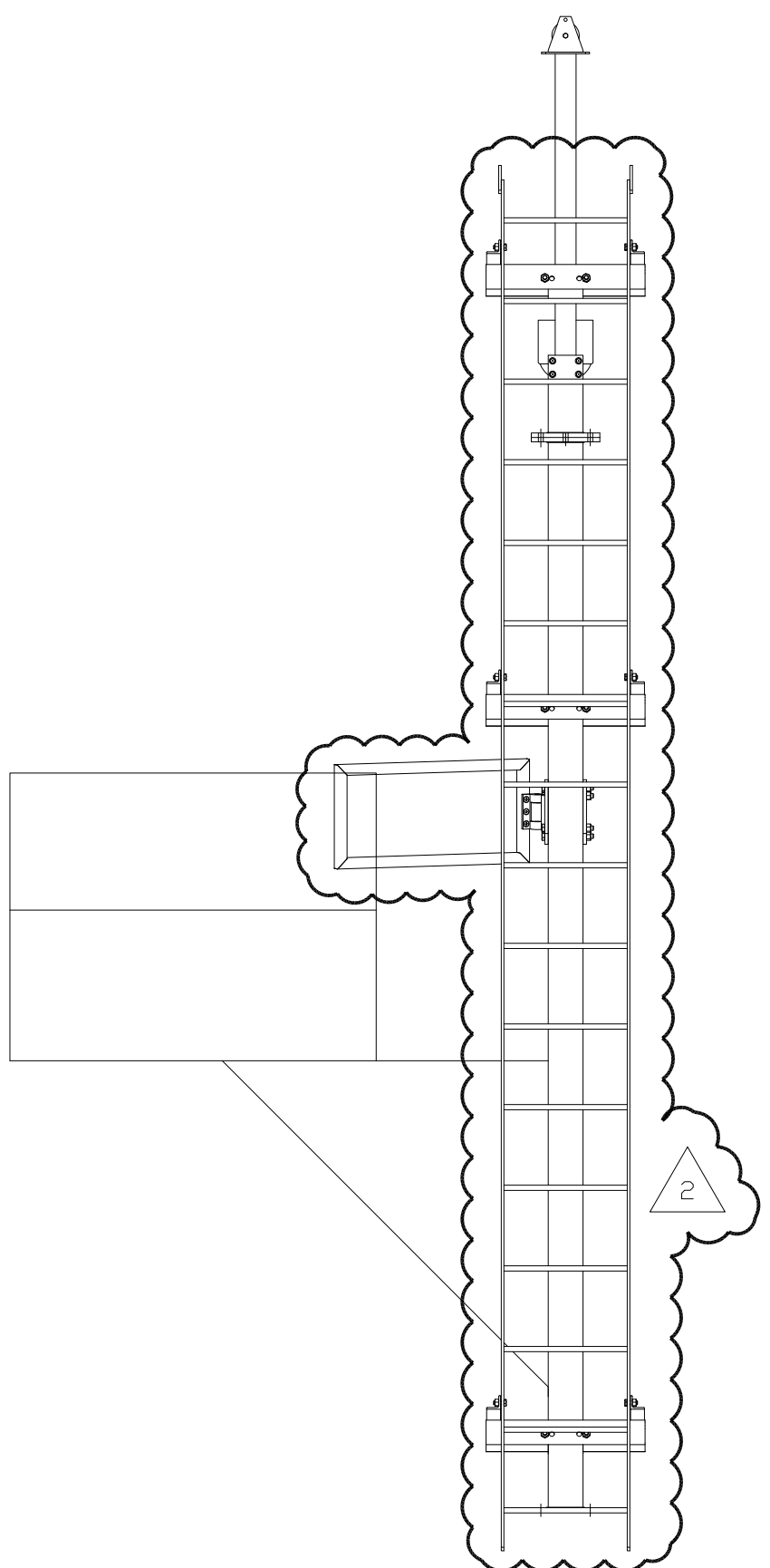
- ALL PARTS TO BE HOT-DIPPED GALVANIZED AS PER ASTM A123/A123M.
- ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED, UNLESS OTHERWISE NOTED.
- ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED, UNLESS OTHERWISE NOTED.
- LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
- HD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.
- LADDERS ARE DESIGNED TO MEET ANSI14.3-2008 REQUIREMENTS.
- LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED

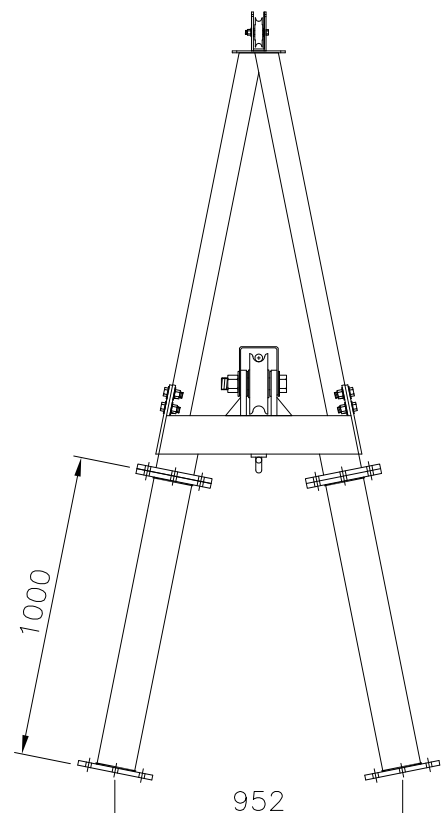


4 METRE A-FRAME

(THIS SECTION IS TYPICAL OF ALL FRAMES OVER 4 METRES)  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 4.313 METRES (WITHOUT FOOT PIECE)



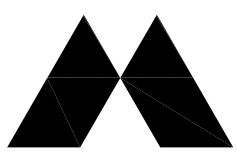
4 METRE A-FRAME SECTION



1 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 1.371 METRES (WITHOUT FOOT PIECE)

| No. | Date    | Revision                     | Dr  | Ch  |
|-----|---------|------------------------------|-----|-----|
| 2   | MAR/19  | ISSUED FOR CONSTRUCTION      | WC  | BB  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |



McElhanney

McElhanney Consulting Services Ltd.

203-502 Bow Valley Trail, Canmore, AB, Canada T1W 1N9 Telephone 403-609-3992

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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
1, 2, 3, 4, & 5 METRE HEIGHTS

VANCOUVER, B.C.

Designed D.O.E.

Job No. 2111-01745-1

Drawing No.

Drawn K.D.W.

Scale 1:25

Checked A.A.W.

Date APRIL 2002

Approved

Revision 2

3136-1

of 18

Destroy all prints bearing previous number

BILLS OF MATERIAL

A COMPLETE 6 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                  | DWG No. | SUPPLIER   |
|-----|--|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 2 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | 2.7 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 4   | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 1   | 3m LADDER                                    | 3136-11 | CONTRACTOR |
| 1   | 4m LADDER                                    | 3136-11 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | -       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS            | -       | CONTRACTOR |

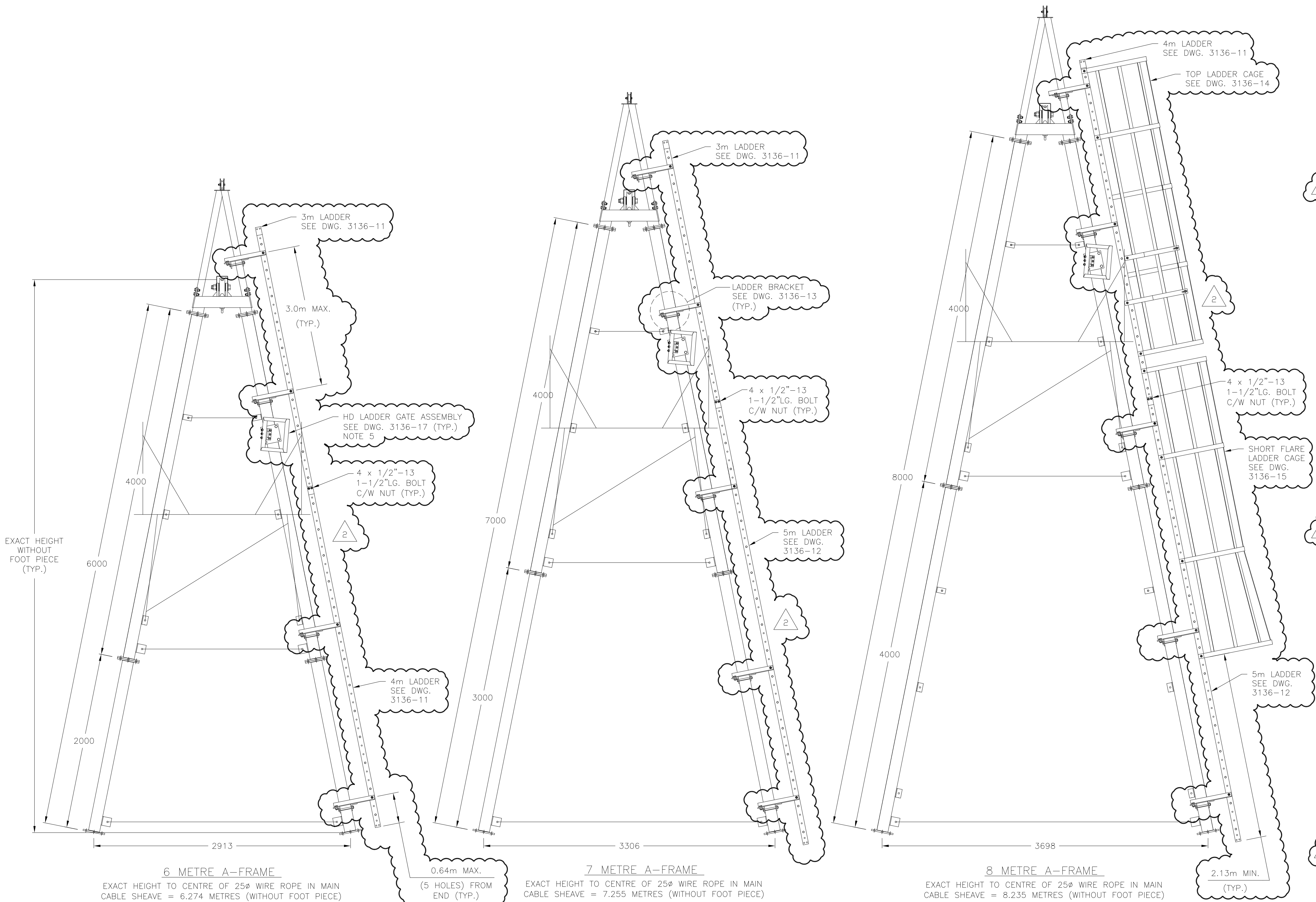
A COMPLETE 7 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                  | DWG No. | SUPPLIER   |
|-----|--|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 3 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | 3.1 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 5   | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 1   | 5m LADDER                                    | 3136-12 | CONTRACTOR |
| 1   | 3m LADDER                                    | 3136-11 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | -       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS            | -       | CONTRACTOR |

A COMPLETE 8 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                  | DWG No. | SUPPLIER   |
|-----|--|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 2   | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | 3.5 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 5   | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 1   | 4m LADDER                                    | 3136-11 | CONTRACTOR |
| 1   | 5m LADDER                                    | 3136-12 | CONTRACTOR |
| 1   | TOP LADDER CAGE                              | 3136-14 | CONTRACTOR |
| 1   | SHORT FLARE LADDER CAGE                      | 3136-15 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | -       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS            | -       | CONTRACTOR |

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED



6 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 6.274 METRES (WITHOUT FOOT PIECE)

7 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 7.255 METRES (WITHOUT FOOT PIECE)

8 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 8.235 METRES (WITHOUT FOOT PIECE)

NOTES:

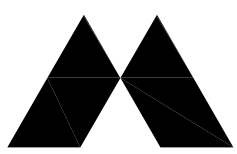
1. ALL PARTS TO BE HOT-DIPPED GALVANIZED AS PER ASTM A123/A123M.
2. ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED, UNLESS OTHERWISE NOTED.
3. ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED, UNLESS OTHERWISE NOTED.
4. LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
5. HD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.
6. LADDERS ARE DESIGNED TO MEET ANSI14.3-2008 REQUIREMENTS.
7. LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.

DESIGN LOAD

|       |          |
|-------|----------|
| CAR   | 200      |
| 2 MEN | 400      |
| REEL  | 50       |
|       | 650 lbs. |

PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY  
ANGLE = 1600 lbs. BREAKING STRENGTH.

|     |         |                              |     |     |
|-----|---------|------------------------------|-----|-----|
| No. | Date    | Revision                     | Dr  | Ch  |
| 2   | MAR/19  | ISSUED FOR CONSTRUCTION      | WC  | BB  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |



**McElhanney**

McElhanney Consulting Services Ltd.

203-502 Bow Valley Trail, Canmore, AB, Canada T1W 1N9 Telephone 403-609-3992

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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
6, 7, & 8 METRES

VANCOUVER, B.C.

Designed D.O.E.

Job No. 2111-01745-1

Drawing No.

Drawn K.D.W.

Scale 1:25

Checked A.A.W.

Date APRIL 2002

Approved

Revision 2

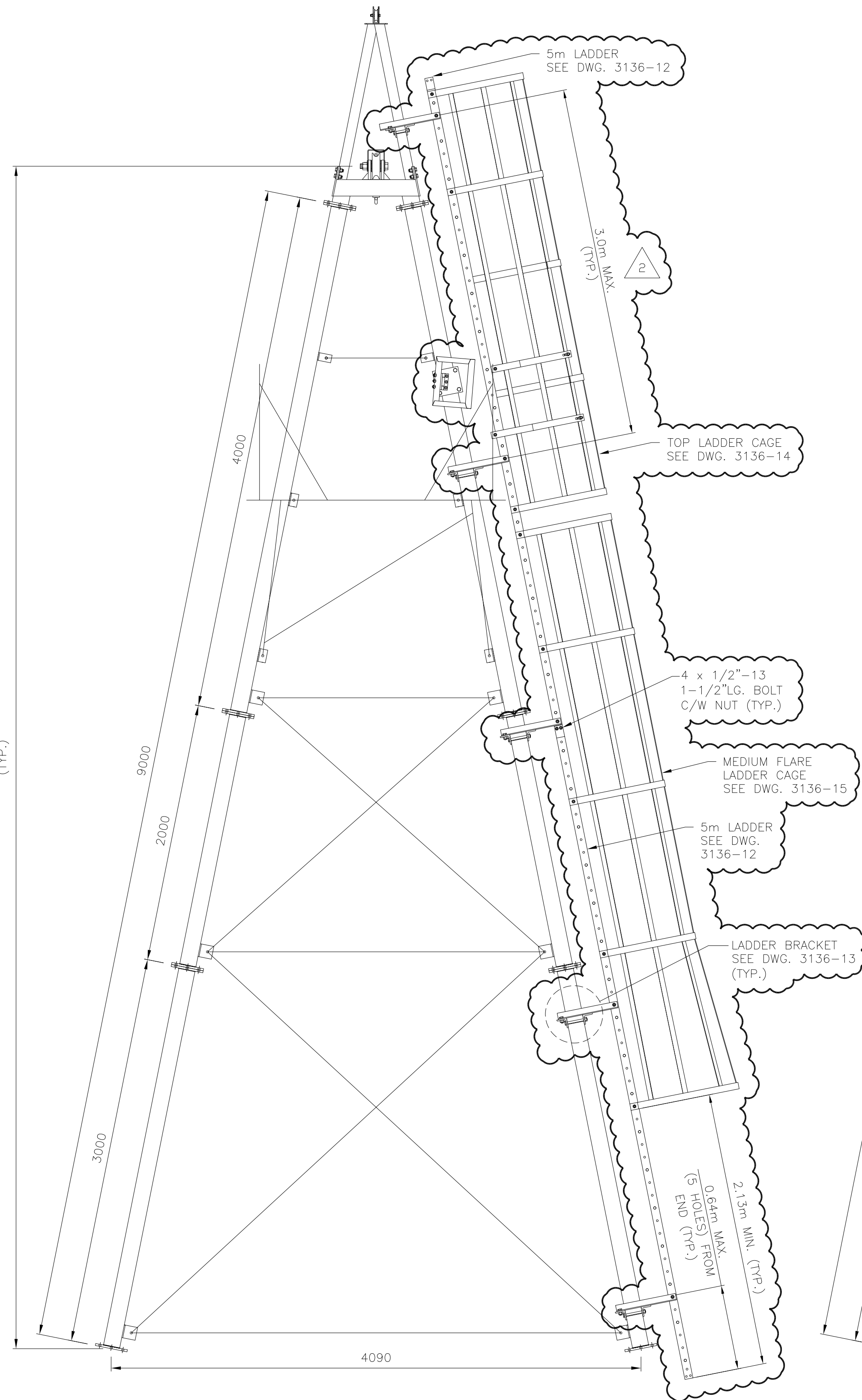
3136-2

of 18

Destroy all prints bearing previous number.

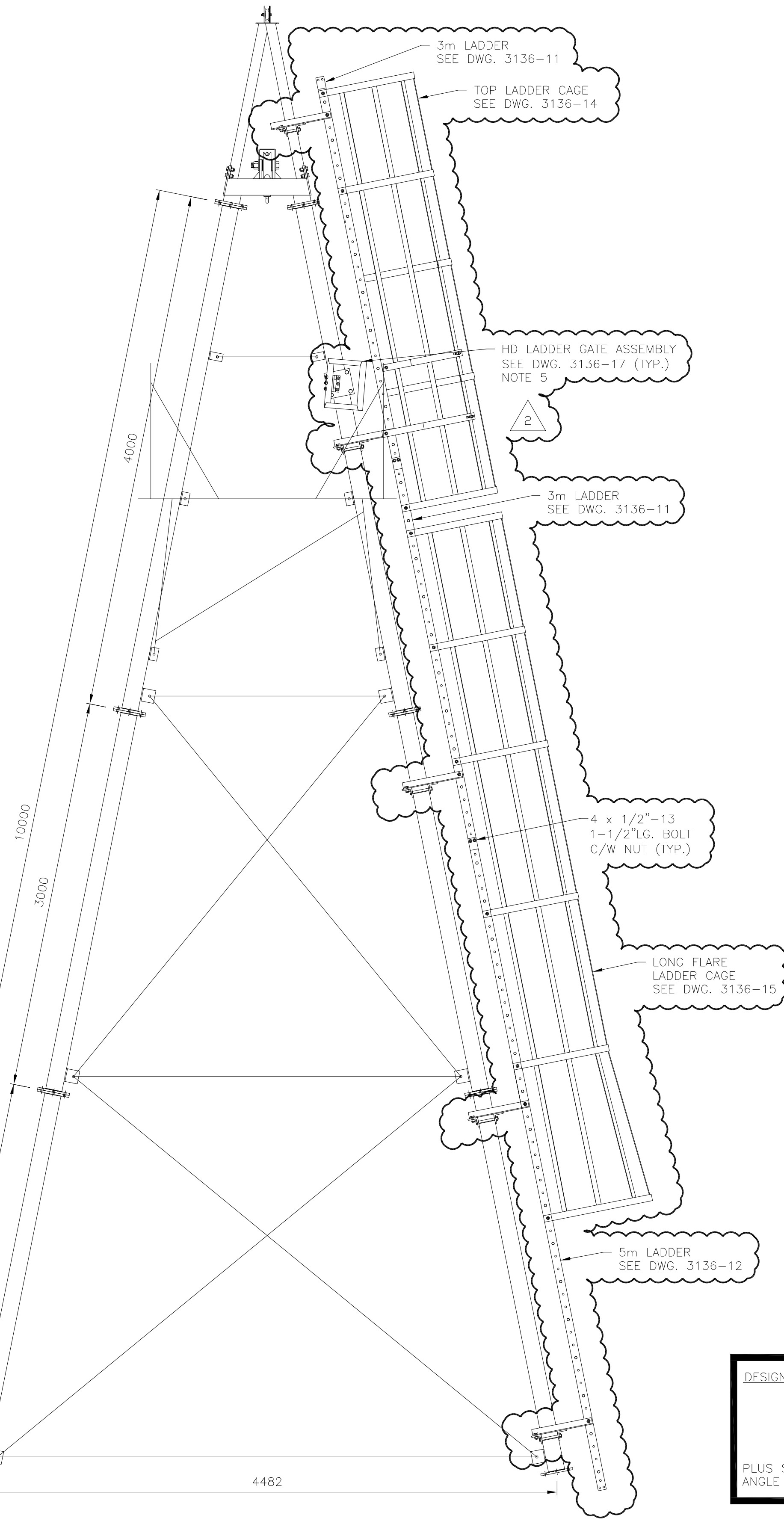


EXACT HEIGHT  
WITHOUT  
FOOT PIECE  
(TYP.)



#### 9 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 9.216 METRES (WITHOUT FOOT PIECE)



#### 10 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 10.197 METRES (WITHOUT FOOT PIECE)

#### DESIGN LOAD

|       |          |
|-------|----------|
| CAR   | 200      |
| 2 MEN | 400      |
| REEL  | 50       |
|       | 650 lbs. |

PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY  
ANGLE = 1600 lbs. BREAKING STRENGTH.

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED

## BILLS OF MATERIAL

A COMPLETE 9 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                     | DWG No. | SUPPLIER   |
|-----|---|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                            | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR |
| 1   | 2 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR |
| 1   | 3 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY             | 3136-6  | CONTRACTOR |
| 1   | 2.7 METRE HORIZONTAL BRACE ASSEMBLY             | 3136-6  | CONTRACTOR |
| 1   | 3.9 METRE HORIZONTAL BRACE ASSEMBLY             | 3136-6  | CONTRACTOR |
| 1   | LATERAL BRACING ASSEMBLY FOR 9<br>METRE A-FRAME | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                               | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                           | 3136-10 | CONTRACTOR |
| 5   | LADDER BRACKET ASSEMBLY                         | 3136-13 | CONTRACTOR |
| 2   | 5m LADDER                                       | 3136-12 | CONTRACTOR |
| 1   | TOP LADDER CAGE                                 | 3136-14 | CONTRACTOR |
| 1   | MEDIUM FLARE LADDER CAGE                        | 3136-15 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                         | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS    | -       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS               | -       | CONTRACTOR |

A COMPLETE 10 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                      | DWG No. | SUPPLIER   |
|-----|--|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                             | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                             | 3136-5  | CONTRACTOR |
| 2   | 3 METRE LEG ASSEMBLY                             | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY              | 3136-6  | CONTRACTOR |
| 1   | 3.1 METRE HORIZONTAL BRACE ASSEMBLY              | 3136-6  | CONTRACTOR |
| 1   | 4.2 METRE HORIZONTAL BRACE ASSEMBLY              | 3136-6  | CONTRACTOR |
| 1   | LATERAL BRACING ASSEMBLY FOR 10<br>METRE A-FRAME | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                                | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                            | 3136-10 | CONTRACTOR |
| 5   | LADDER BRACKET ASSEMBLY                          | 3136-13 | CONTRACTOR |
| 1   | 5m LADDER  | 3136-12 | CONTRACTOR |
| 2   | 3m LADDER  | 3136-11 | CONTRACTOR |
| 1   | TOP LADDER CAGE                                  | 3136-14 | CONTRACTOR |
| 1   | LONG FLARE LADDER CAGE                           | 3136-15 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                          | 3136-17 | CONTRACTOR |
| 8   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS     | -       | CONTRACTOR |
| 8   | 1/2"-13 ASTM A325M GALV. HEX NUTS                | -       | CONTRACTOR |

#### NOTES:

- ALL PARTS TO BE HOT-DIPPED GALVANIZED AS PER ASTM A123/A123M.
- ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED, UNLESS OTHERWISE NOTED.
- ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED, UNLESS OTHERWISE NOTED.
- LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
- HD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.
- LADDERS ARE DESIGNED TO MEET ANSI14.3-2008 REQUIREMENTS.
- LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.

DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
9 & 10 METRES

VANCOUVER, B.C.

Designed D.O.E.

Job No. 2111-01745-1

Drawing No.

Drawn K.D.W.

Scale 1:25

Checked A.A.W.

Date APRIL 2002

Approved

Revision 2

3136-3

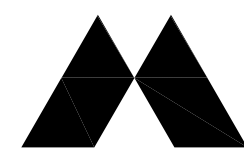
of 18

Destroy all prints bearing previous number.

MA 2111-01745-1 (DRAWING) 1745-01.DWG

APRIL 25, 2002

|     |         |                              |     |     |
|-----|---------|------------------------------|-----|-----|
| No. | Date    | Revision                     | Dr  | Ch  |
| 2   | MAR/19  | ISSUED FOR CONSTRUCTION      | WC  | BB  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |



**McElhanney**

McElhanney Consulting Services Ltd.

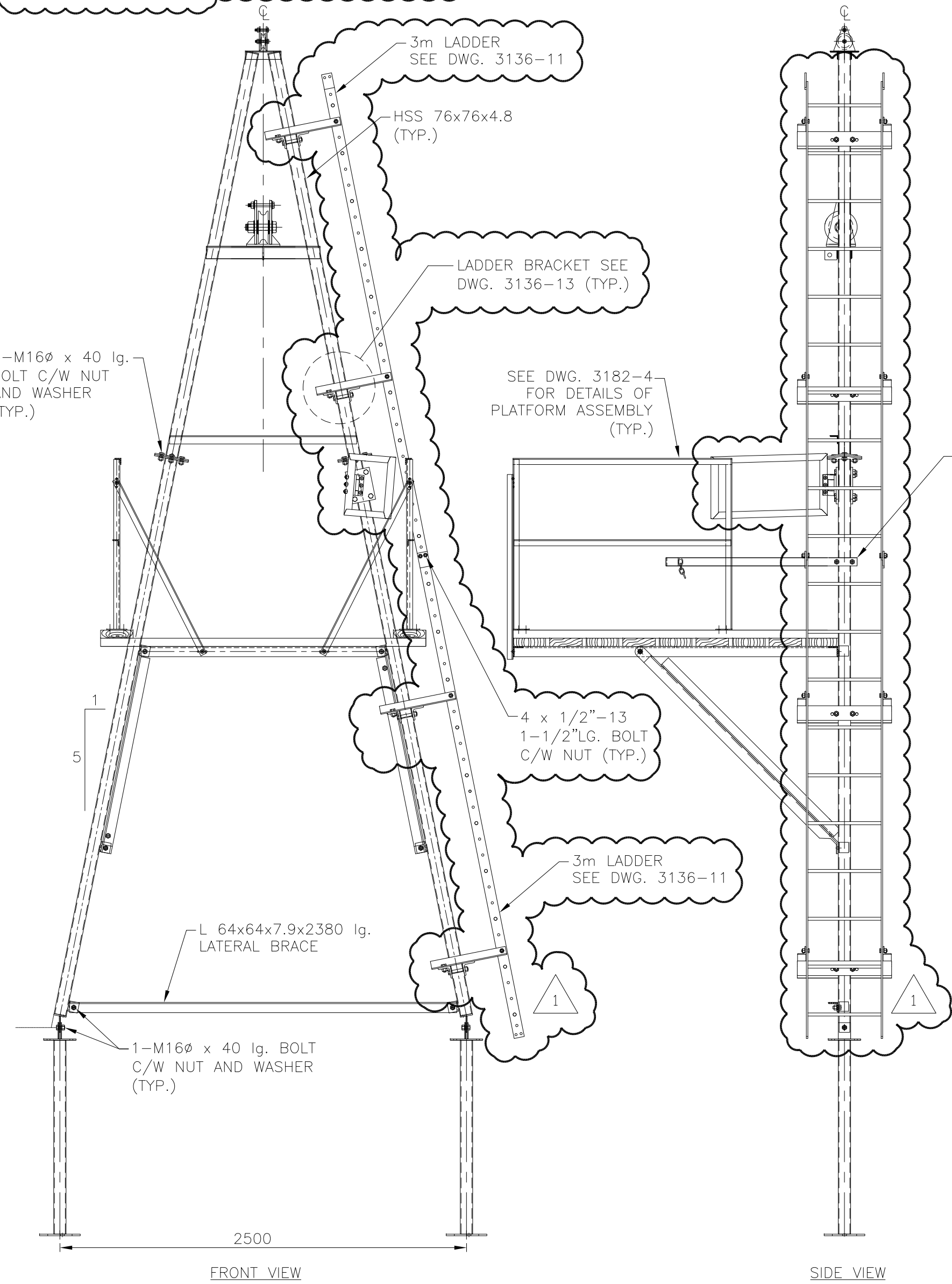
203-502 Bow Valley Trail, Canmore, AB, Canada T1W 1N9 Telephone 403-609-3992

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Filename: S:\Project Files\2531-366 Environment Canada\02-00 A-Frame Ladders\7.0 Drawings\7.1 Working Dwg\Drawings\Existing\01745 LD A-Frames.dwg  
Plotted: March 22, 2019, 14:44:42

5.0 m LIGHT A-FRAME

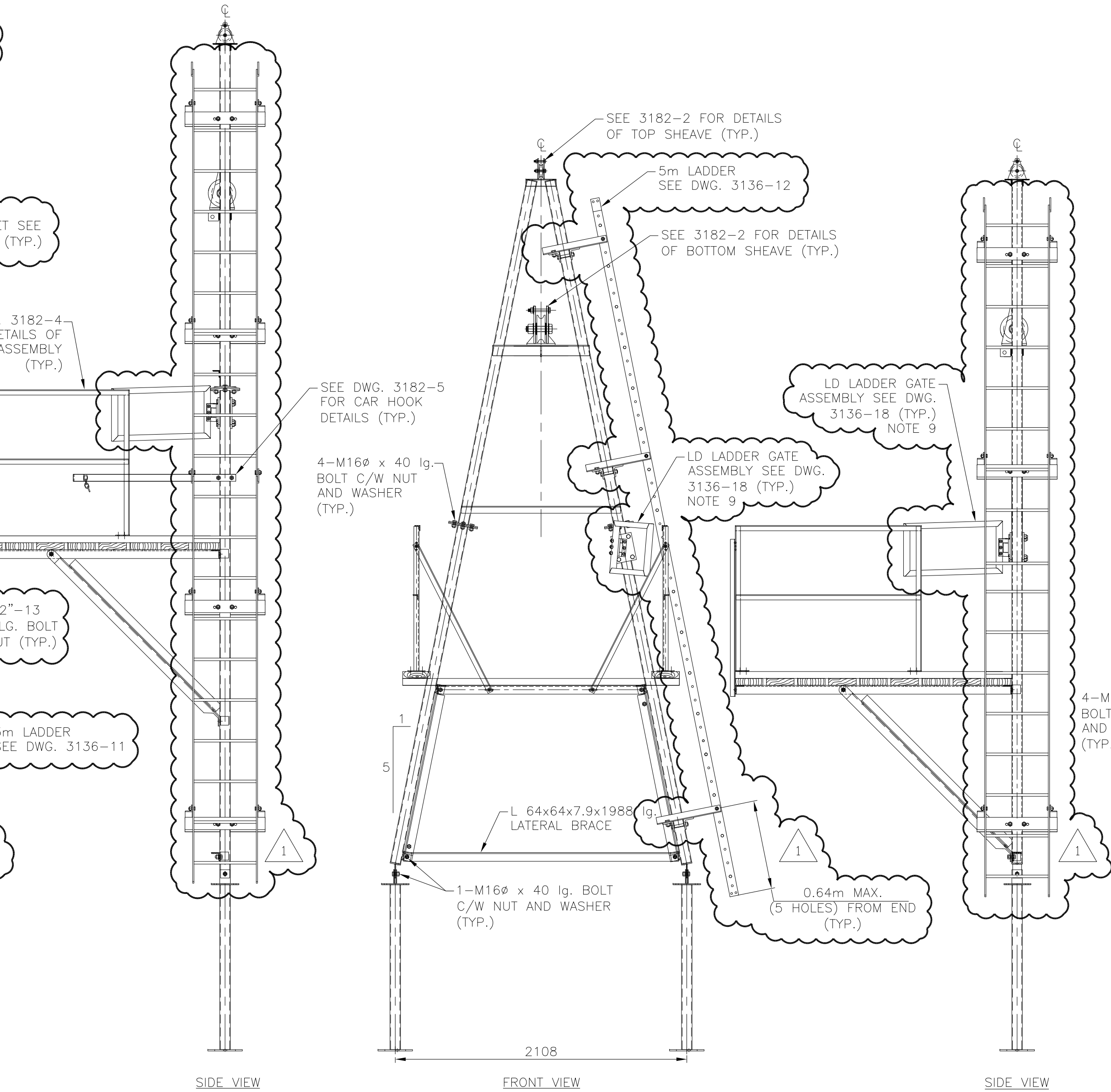
| QTY. | DESCRIPTION                                     | DWG.    | SUPPLIER   |
|------|---|---------|------------|
| 1    | 1.5m A-FRAME TOP                                | 3182-2  | FABRICATOR |
| 1    | CAR HOOK ASSEMBLY                               | 3182-5  | FABRICATOR |
| 12   | M16x40 A325M GALV. STRUCTURAL BOLTS             | 3182-1  | FABRICATOR |
| 12   | M16x120 A325M GALV. STRUCTURAL BOLTS            | 3182-1  | FABRICATOR |
| 10   | U-BOLTS FOR BRACKET                             | 3182-1  | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING)       | 3182-3  | FABRICATOR |
| 1    | 3.5m LEG ASSEMBLY                               | 3182-3  | FABRICATOR |
| 1    | 2.38m LATERAL BRACE                             | 3182-1  | FABRICATOR |
| 1    | PLATFORM ASSEMBLY FOR 5m A-FRAME                | 3182-4  | FABRICATOR |
| 4    | LADDER BRACKET ASSEMBLY                         | 3136-13 | FABRICATOR |
| 2    | 3m LADDER                                       | 3136-11 | FABRICATOR |
| 1    | LD LADDER GATE ASSEMBLY                         | 3136-18 | FABRICATOR |
| 4    | 1/2"-13 1-1/2"L.G. ASTM - A325M GALV. HEX BOLTS |         | FABRICATOR |
| 4    | 1/2"-13 ASTM A325M GALV. HEX NUTS               |         | FABRICATOR |



5.0 m LIGHT A-FRAME  
1:25

4.0 m LIGHT A-FRAME

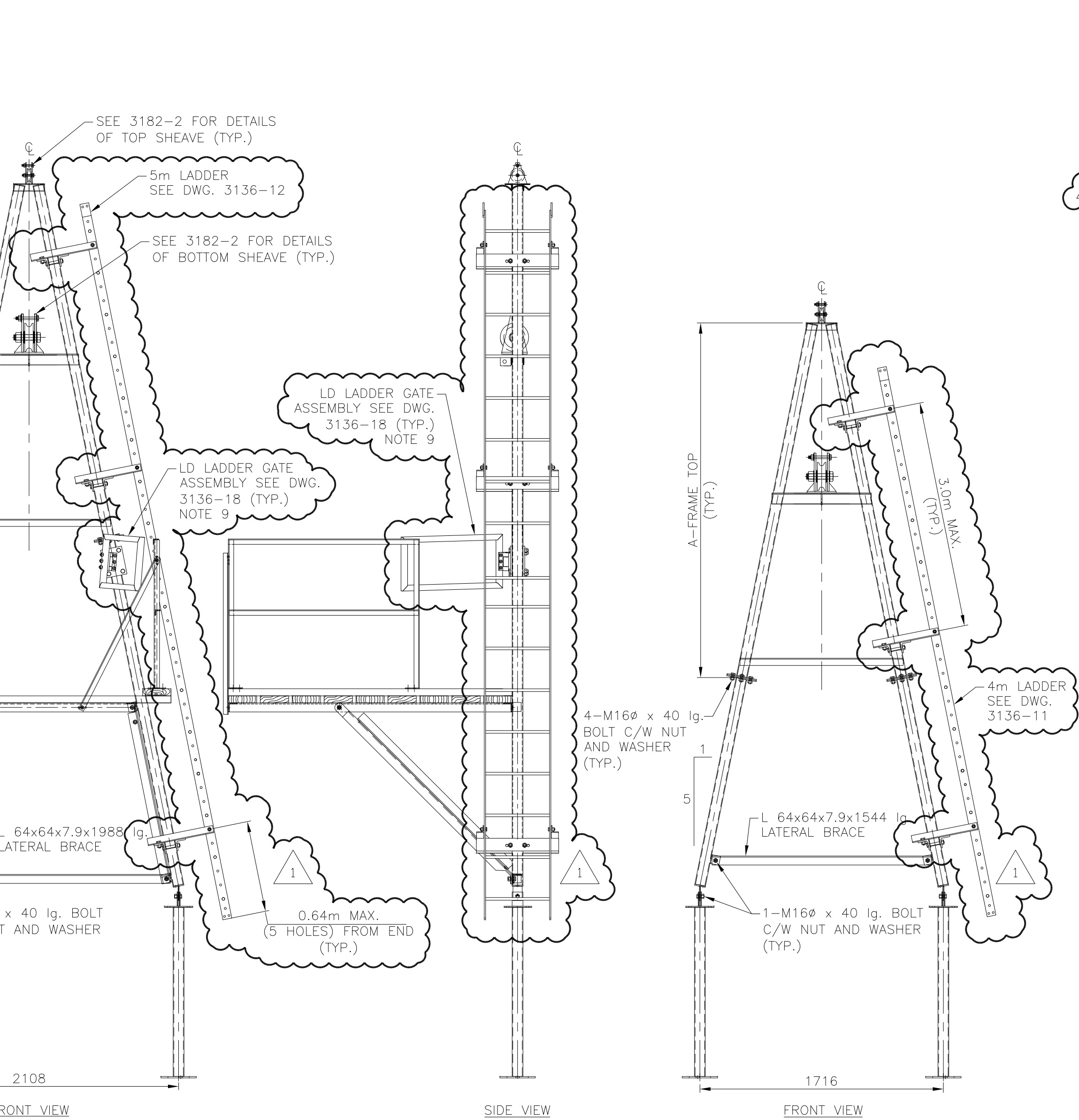
| QTY. | DESCRIPTION                               | DWG.    | SUPPLIER   |
|------|---|---------|------------|
| 1    | 1.5m A-FRAME TOP                          | 3182-2  | FABRICATOR |
| 1    | CAR HOOK ASSEMBLY                         | 3182-5  | FABRICATOR |
| 12   | M16x40 A325M GALV. STRUCTURAL BOLTS       | 3182-1  | FABRICATOR |
| 12   | M16x120 A325M GALV. STRUCTURAL BOLTS      | 3182-1  | FABRICATOR |
| 10   | U-BOLTS FOR BRACKET                       | 3182-1  | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING) | 3182-3  | FABRICATOR |
| 1    | 2.5m LEG ASSEMBLY                         | 3182-3  | FABRICATOR |
| 1    | 1.98m LATERAL BRACE                       | 3182-1  | FABRICATOR |
| 1    | PLATFORM ASSEMBLY FOR 4m A-FRAME          | 3182-4  | FABRICATOR |
| 3    | LADDER BRACKET ASSEMBLY                   | 3136-13 | FABRICATOR |
| 1    | 5m LADDER                                 | 3136-12 | FABRICATOR |
| 1    | LD LADDER GATE ASSEMBLY                   | 3136-18 | FABRICATOR |



4.0 m LIGHT A-FRAME  
1:25

3.0 m LIGHT A-FRAME

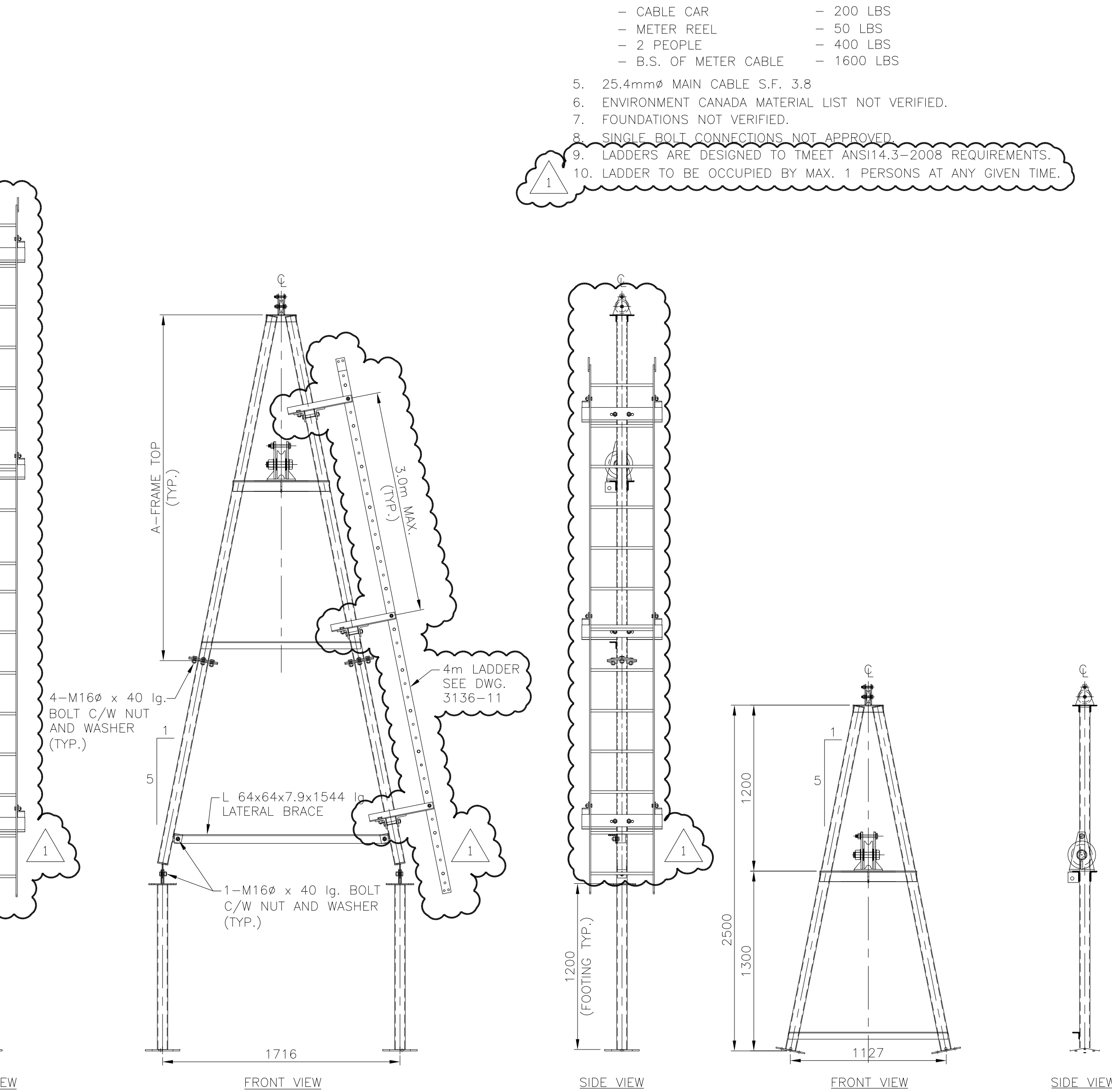
| QTY. | DESCRIPTION                               | DWG.    | SUPPLIER   |
|------|---|---------|------------|
| 1    | 1.5m A-FRAME TOP                          | 3182-2  | FABRICATOR |
| 1    | CAR HOOK ASSEMBLY                         | 3182-5  | FABRICATOR |
| 12   | M16x40 A325M GALV. STRUCTURAL BOLTS       | 3182-1  | FABRICATOR |
| 10   | M16x120 A325M GALV. STRUCTURAL BOLTS      | 3182-1  | FABRICATOR |
| 8    | U-BOLTS FOR BRACKET                       | 3182-1  | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING) | 3182-3  | FABRICATOR |
| 1    | 1.5m LEG ASSEMBLY                         | 3182-3  | FABRICATOR |
| 1    | 1.54m LATERAL BRACE                       | 3182-1  | FABRICATOR |
| 3    | LADDER BRACKET ASSEMBLY                   | 3136-13 | FABRICATOR |
| 1    | 4m LADDER                                 | 3136-11 | FABRICATOR |



3.0 m LIGHT A-FRAME  
1:25

1.5 m LIGHT A-FRAME

| QTY. | DESCRIPTION                               | DWG.   | SUPPLIER   |
|------|---|--------|------------|
| 1    | 1.5m A-FRAME TOP                          | 3182-2 | FABRICATOR |
| 2    | 1.5m A-FRAME SPLICE PLATES                | 3182-2 | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING) | 3182-3 | FABRICATOR |
| 1    | 1.15m LATERAL BRACE                       | 3182-2 | FABRICATOR |



1.5 m LIGHT A-FRAME TOP  
1:25

NOTES:

1. ALL STEEL SHALL CONFORM TO CSA G40.21M STRUCTURAL QUALITY STEEL.
2. ALL PARTS TO BE HOT DIP GALVANIZED (AS PER ASTM A123/A123M).
3. ALL NUTS AND BOLTS TO BE M16, A325M, GALVANIZED, UNLESS NOTED OTHERWISE.
4. ALL BOLT HOLES TO BE DRILLED 2mm LARGER THAN BOLTS UNLESS NOTED OTHERWISE.
5. THIS STRUCTURE IS DESIGNED FOR SPANS UP TO 150m WITH MAX. A-FRAME HEIGHT = 5m IN AREAS NOT SUBJECT TO HEAVY ICE OR SNOW LOADS OVER 4.5kN/m
6. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
7. ALL TOLERANCES SHOULD BE CHECKED PRIOR TO SHIPMENT.
8. LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
9. LD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.

McELHANNEY NOTES

1. ORIGINAL DESIGN BY ENVIRONMENT CANADA.
2. McELHANNEY CHECKED AND APPROVED A-FRAME STRUCTURE ONLY, INCLUDING THE PLATFORM AND BRACING. ALL OTHER COMPONENTS SUCH AS SHEAVES, LADDER BRACKETS, CAR HOOKS, AND FOOTING PLATES ETC. WERE NOT REVIEWED. FOR DETAILS REFER TO LETTER REPORT DATED APRIL 27, 2000.
3. MAXIMUM SNOW DEPTH ON PLATFORMS NOT TO EXCEED 30cm PRIOR TO PERFORMING HYDROMETRIC MEASUREMENTS.
4. DESIGN LOAD = 2250 LBS. CONSISTING OF:
  - CABLE CAR
  - METER REEL
  - 2 PEOPLE
  - B.S. OF METER CABLE
5. 25.4mmØ MAIN CABLE S.F. 3.8
6. ENVIRONMENT CANADA MATERIAL LIST NOT VERIFIED.
7. FOUNDATIONS NOT VERIFIED.
8. SINGLE BOLT CONNECTIONS NOT APPROVED.
9. LADDERS ARE DESIGNED TO TMEET ANSI14.3-2008 REQUIREMENTS.
10. LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.

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203-502 Bow Valley Trail  
Canmore, AB T1W 1N9  
PH 403-609-3992

Designed: KEL  
Drawn: LLP  
Checked: Surveyed:  
Date: MARCH 2010

SCALE : AS SHOWN

Approved Sealed

ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

**LIGHT DUTY A-FRAME**  
1.5, 3.0, 4.0, 5.0m A-FRAMES

Client Project No

MCSL Project No. 2111-01745-5

Drawing No.

**3182-1**

Revision 1

Destroy all prints bearing previous number



MOVED LADDER DETAILS TO 3136-11

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PH 403-609-3992

PH 403-609-3992

Date: MARCH 2010

Approved   Sealed

ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

# LIGHT DUTY A-FRAME

## LADDER DETAILS

Client Project No

MCSL Project No. 2111-01745-5

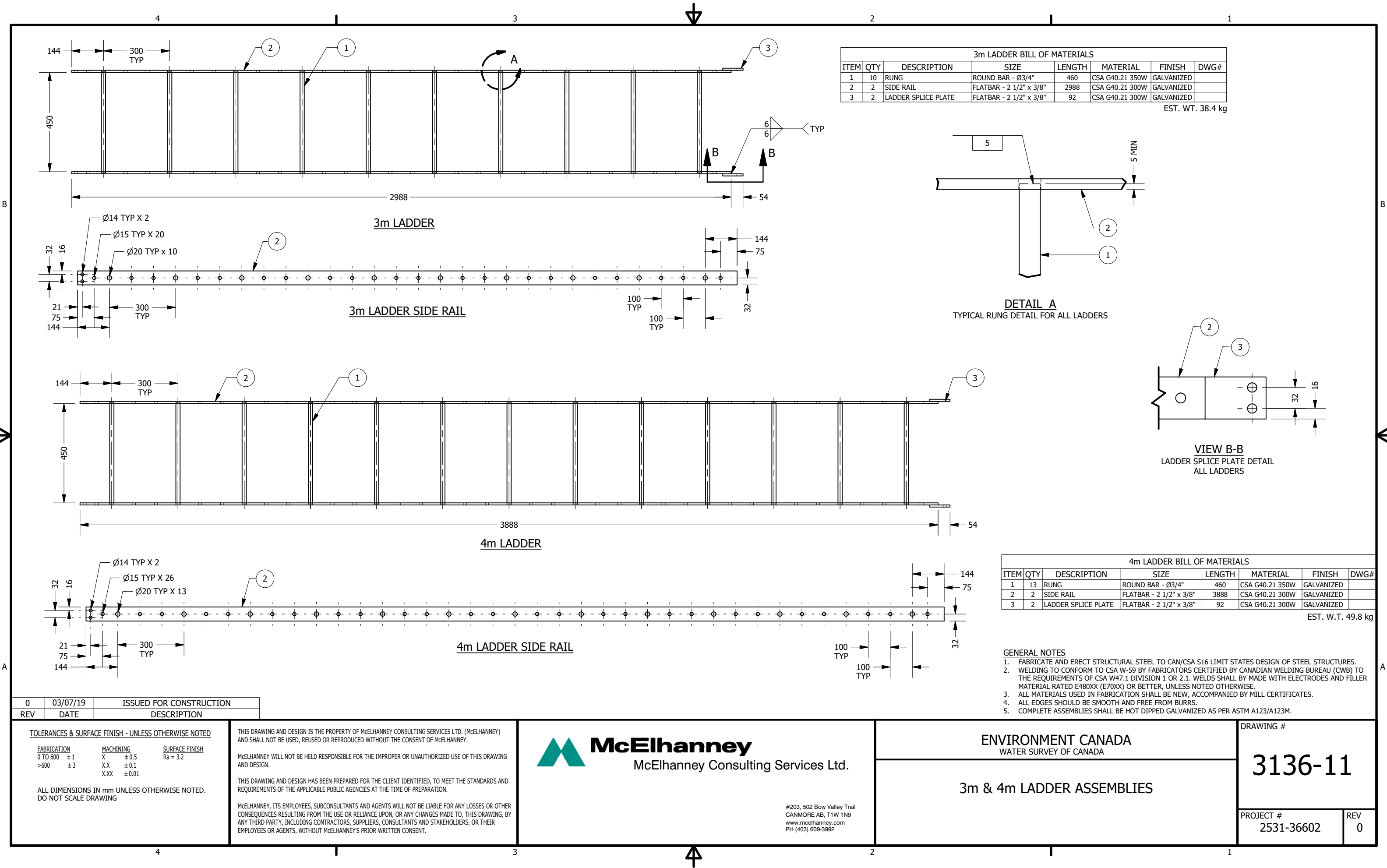
Drawing No.

3182-5

Revision 1

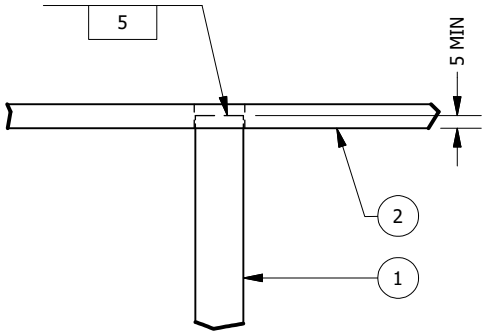
Destroy all prints bearing previous number ▲



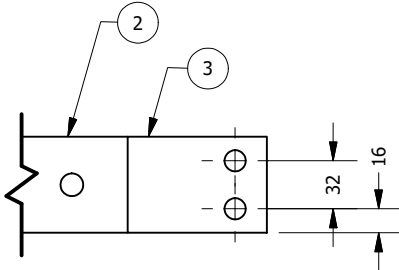


| 3m LADDER BILL OF MATERIALS |     |                     |                         |        |                 |            |      |
|-----------------------------|-----|---------------------|-------------------------|--------|-----------------|------------|------|
| ITEM                        | QTY | DESCRIPTION         | SIZE                    | LENGTH | MATERIAL        | FINISH     | DWG# |
| 1                           | 10  | RUNG                | ROUND BAR - Ø3/4"       | 460    | CSA G40.21 350W | GALVANIZED |      |
| 2                           | 2   | SIDE RAIL           | FLATBAR - 2 1/2" x 3/8" | 2988   | CSA G40.21 300W | GALVANIZED |      |
| 3                           | 2   | LADDER SPLICE PLATE | FLATBAR - 2 1/2" x 3/8" | 92     | CSA G40.21 300W | GALVANIZED |      |

EST. WT. 38.4 kg



DETAIL A  
TYPICAL RUNG DETAIL FOR ALL LADDERS



VIEW B-B  
LADDER SPLICE PLATE DETAIL  
ALL LADDERS

| 4m LADDER BILL OF MATERIALS |     |                     |                         |        |                 |            |      |
|-----------------------------|-----|---------------------|-------------------------|--------|-----------------|------------|------|
| ITEM                        | QTY | DESCRIPTION         | SIZE                    | LENGTH | MATERIAL        | FINISH     | DWG# |
| 1                           | 13  | RUNG                | ROUND BAR - Ø3/4"       | 460    | CSA G40.21 350W | GALVANIZED |      |
| 2                           | 2   | SIDE RAIL           | FLATBAR - 2 1/2" x 3/8" | 3888   | CSA G40.21 300W | GALVANIZED |      |
| 3                           | 2   | LADDER SPLICE PLATE | FLATBAR - 2 1/2" x 3/8" | 92     | CSA G40.21 300W | GALVANIZED |      |

EST. W.T. 49.8 kg

- GENERAL NOTES
- FABRICATE AND ERECT STRUCTURAL STEEL TO CAN/CSA S16 LIMIT STATES DESIGN OF STEEL STRUCTURES.
  - WELDING TO CONFORM TO CSA W-59 BY FABRICATORS CERTIFIED BY CANADIAN WELDING BUREAU (CWB) TO THE REQUIREMENTS OF CSA W47.1 DIVISION 1 OR 2.1. WELDS SHALL BY MADE WITH ELECTRODES AND FILLER MATERIAL RATED E480XX (E70XX) OR BETTER, UNLESS NOTED OTHERWISE.
  - ALL MATERIALS USED IN FABRICATION SHALL BE NEW, ACCOMPANIED BY MILL CERTIFICATES.
  - ALL EDGES SHOULD BE SMOOTH AND FREE FROM BURRS.
  - COMPLETE ASSEMBLIES SHALL BE HOT DIPPED GALVANIZED AS PER ASTM A123/A123M.

|     |          |                         |
|-----|----------|-------------------------|
| 0   | 03/07/19 | ISSUED FOR CONSTRUCTION |
| REV | DATE     | DESCRIPTION             |

TOLERANCES & SURFACE FINISH - UNLESS OTHERWISE NOTED

| FABRICATION | MACHINING  | SURFACE FINISH |
|-------------|------------|----------------|
| 0 TO 600 ±1 | X ±0.5     | Ra = 3.2       |
| >600 ±3     | X.X ±0.1   |                |
|             | X.XX ±0.01 |                |

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ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

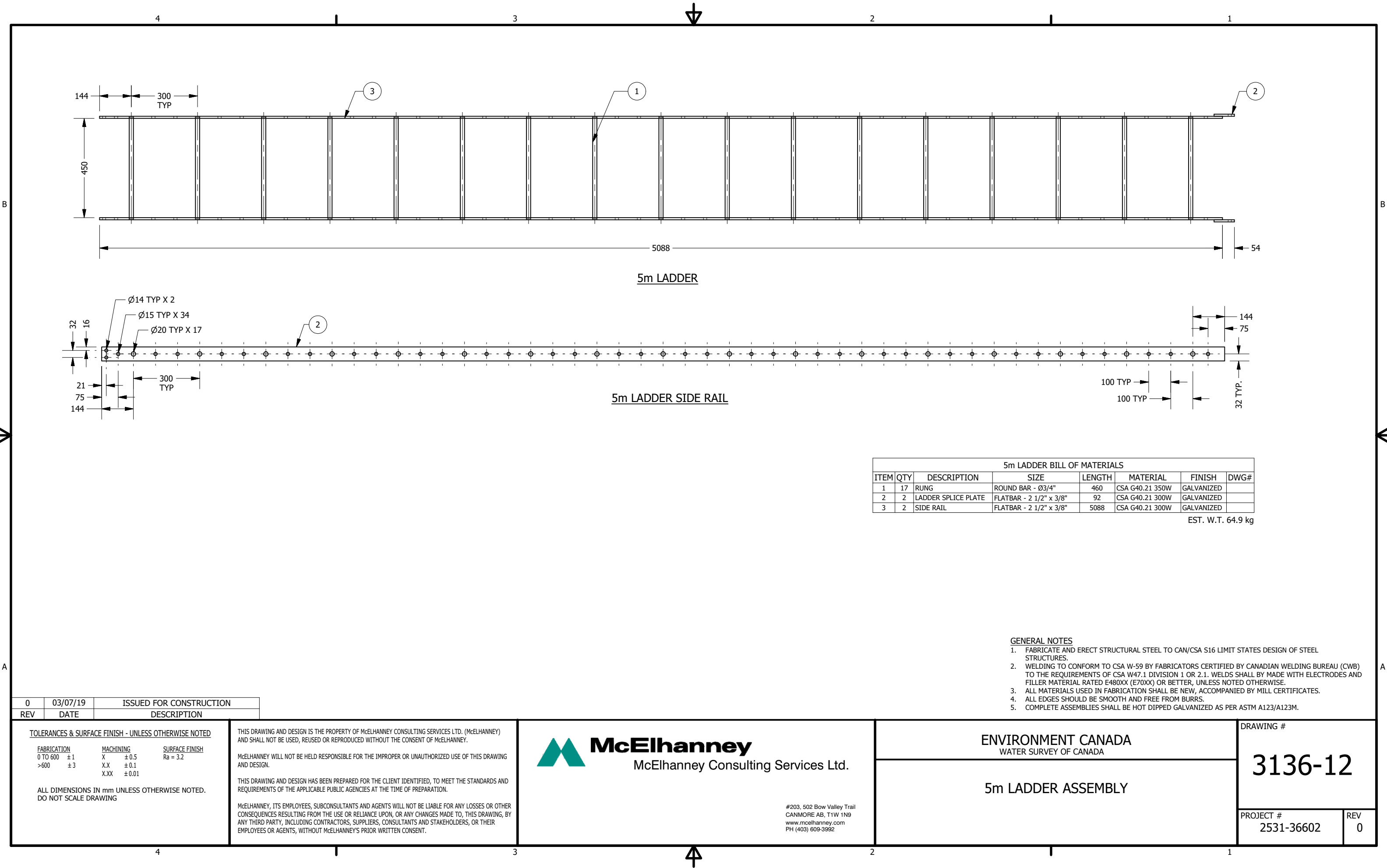
3m & 4m LADDER ASSEMBLIES

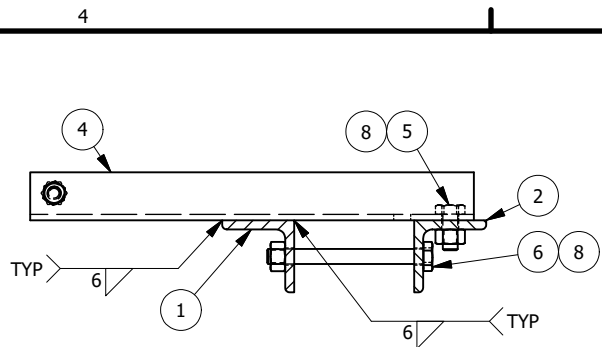
DRAWING #

3136-11

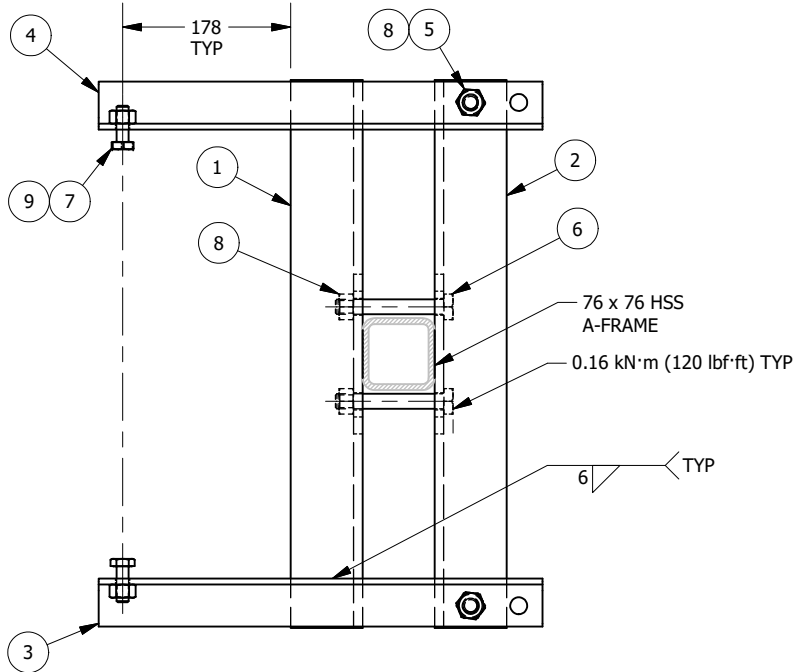
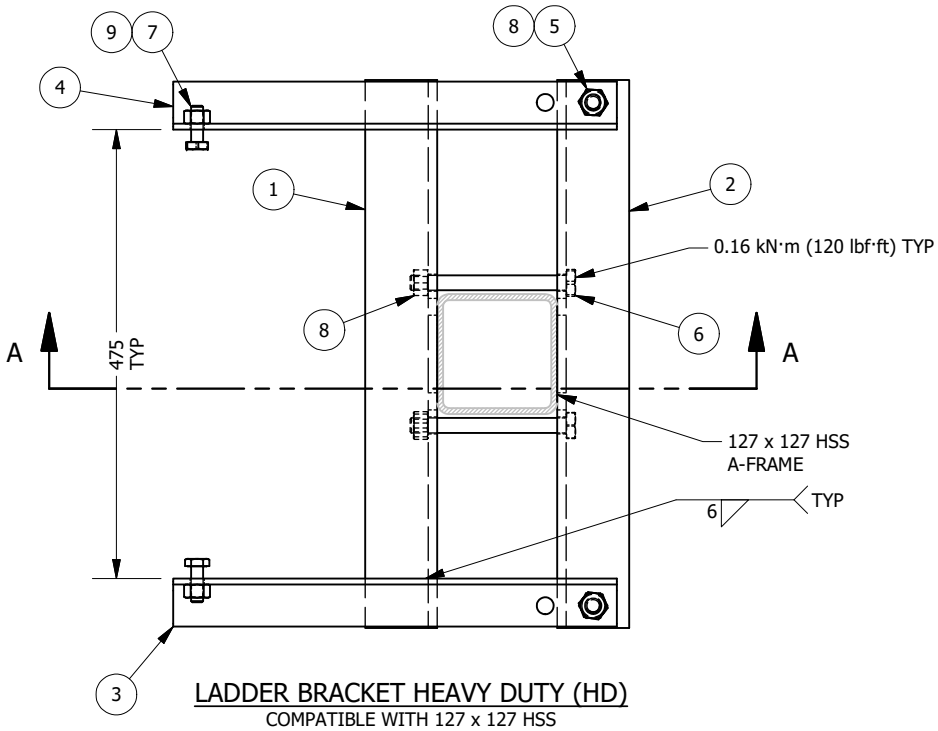
PROJECT #  
2531-36602

REV  
0





SECTION A-A  
A-FRAME HSS OMITTED FOR CLARITY



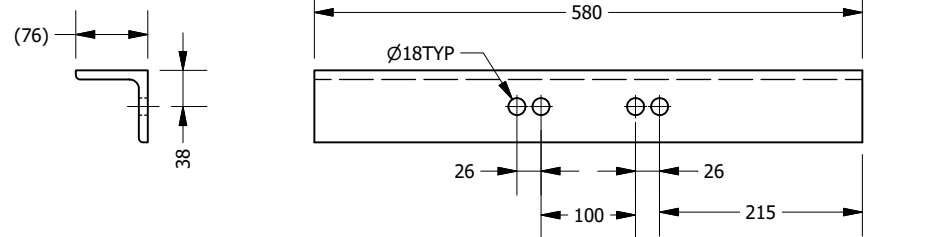
LADDER BRACKET LIGHT DUTY (LD)  
COMPATIBLE WITH 76 x 76 HSS

| HD LADDER BRACKET BILL OF MATERIALS |     |                          |                        |        |                 |            |      |
|-------------------------------------|-----|--------------------------|------------------------|--------|-----------------|------------|------|
| ITEM                                | QTY | DESCRIPTION              | SIZE                   | LENGTH | MATERIAL        | FINISH     | DWG# |
| 1                                   | 1   | A-FRAME WELDED           | ANGLE - 3" x 3" x 3/8" | 580    | CSA G40.21 350W | GALVANIZED |      |
| 2                                   | 1   | A-FRAME BOLTED           | ANGLE - 3" x 3" x 3/8" | 580    | CSA G40.21 350W | GALVANIZED |      |
| 3                                   | 1   | LADDER MOUNT ANGLE LEFT  | ANGLE - 2" x 2" x 1/4" | 470    | CSA G40.21 350W | GALVANIZED |      |
| 4                                   | 1   | LADDER MOUNT ANGLE RIGHT | ANGLE - 2" x 2" x 1/4" | 470    | CSA G40.21 350W | GALVANIZED |      |
| 5                                   | 2   | HEX BOLT                 | 5/8" - 11              | 1-1/2" | ASTM A325M      | GALVANIZED |      |
| 6                                   | 2   | HEX BOLT                 | 5/8" - 11              | 6-1/2" | ASTM A325M      | GALVANIZED |      |
| 7                                   | 2   | HEX BOLT                 | 1/2" - 13              | 1-1/2" | ASTM A325M      | GALVANIZED |      |
| 8                                   | 4   | HEX NUT                  | 5/8" - 11              |        | ASTM A325M      | GALVANIZED |      |
| 9                                   | 2   | HEX NUT                  | 1/2" - 13              |        | ASTM A325M      | GALVANIZED |      |

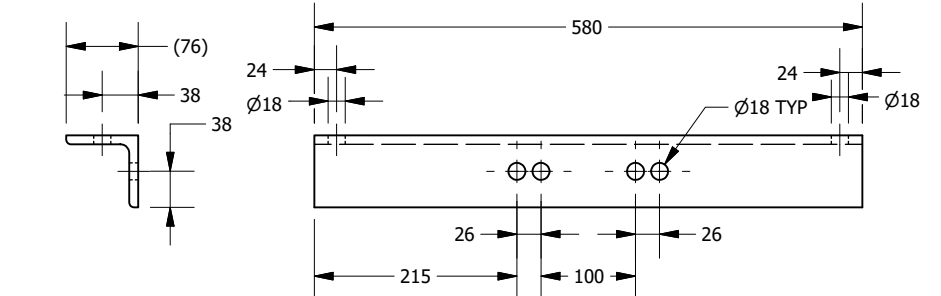
EST. W.T. 18.0 kg

| LD LADDER BRACKET BILL OF MATERIALS |     |                          |                        |        |                 |            |      |
|-------------------------------------|-----|--------------------------|------------------------|--------|-----------------|------------|------|
| ITEM                                | QTY | DESCRIPTION              | SIZE                   | LENGTH | MATERIAL        | FINISH     | DWG# |
| 1                                   | 1   | A-FRAME WELDED           | ANGLE - 3" x 3" x 3/8" | 580    | CSA G40.21 350W | GALVANIZED |      |
| 2                                   | 1   | A-FRAME BOLTED           | ANGLE - 3" x 3" x 3/8" | 580    | CSA G40.21 350W | GALVANIZED |      |
| 3                                   | 1   | LADDER MOUNT ANGLE LEFT  | ANGLE - 2" x 2" x 1/4" | 470    | CSA G40.21 350W | GALVANIZED |      |
| 4                                   | 1   | LADDER MOUNT ANGLE RIGHT | ANGLE - 2" x 2" x 1/4" | 470    | CSA G40.21 350W | GALVANIZED |      |
| 5                                   | 2   | HEX BOLT                 | 5/8" - 11              | 1-1/2" | ASTM A325M      | GALVANIZED |      |
| 6                                   | 2   | HEX BOLT                 | 5/8" - 11              | 4-1/2" | ASTM A325M      | GALVANIZED |      |
| 7                                   | 2   | HEX BOLT                 | 1/2" - 13              | 1-1/2" | ASTM A325M      | GALVANIZED |      |
| 8                                   | 4   | HEX NUT                  | 5/8" - 11              |        | ASTM A325M      | GALVANIZED |      |
| 9                                   | 2   | HEX NUT                  | 1/2" - 13              |        | ASTM A325M      | GALVANIZED |      |

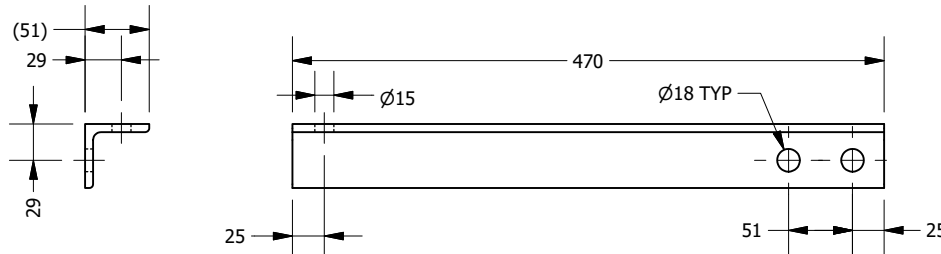
EST. W.T. 17.8 kg



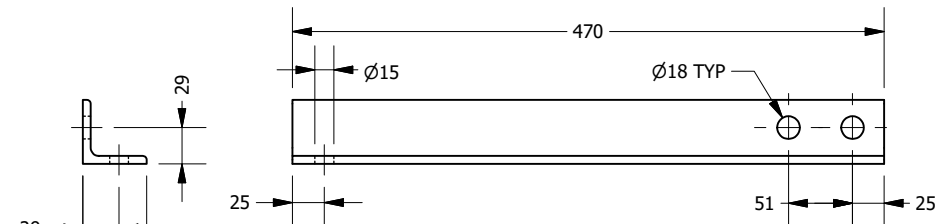
ITEM #1 DETAIL  
A-FRAME CONNECTION WELDED



ITEM #2 DETAIL  
A-FRAME CONNECTION BOLTED



ITEM #3 DETAIL  
LADDER CONNECTION ANGLE



ITEM #4 DETAIL  
LADDER CONNECTION ANGLE

GENERAL NOTES

- FABRICATE AND ERECT STRUCTURAL STEEL TO CAN/CSA S16 LIMIT STATES DESIGN OF STEEL STRUCTURES.
- WELDING TO CONFORM TO CSA W-59 BY FABRICATORS CERTIFIED BY CANADIAN WELDING BUREAU (CWB) TO THE REQUIREMENTS OF CSA W47.1 DIVISION 1 OR 2.1. WELDS SHALL BE MADE WITH ELECTRODES AND FILLER MATERIAL RATED E480XX (E70XX) OR BETTER, UNLESS NOTED OTHERWISE.
- ALL MATERIALS USED IN FABRICATION SHALL BE NEW, ACCOMPANIED BY MILL CERTIFICATES.
- ALL EDGES SHOULD BE SMOOTH AND FREE FROM BURRS.
- COMPLETE ASSEMBLIES SHALL BE HOT DIPPED GALVANIZED AS PER ASTM A123/A123M.

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| REV | DATE     | DESCRIPTION             |

TOLERANCES & SURFACE FINISH - UNLESS OTHERWISE NOTED

| FABRICATION | MACHINING  | SURFACE FINISH |
|-------------|------------|----------------|
| 0 TO 600 ±1 | X ±0.5     | Ra = 3.2       |
| >600 ±3     | X.X ±0.1   |                |
|             | X.XX ±0.01 |                |

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ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

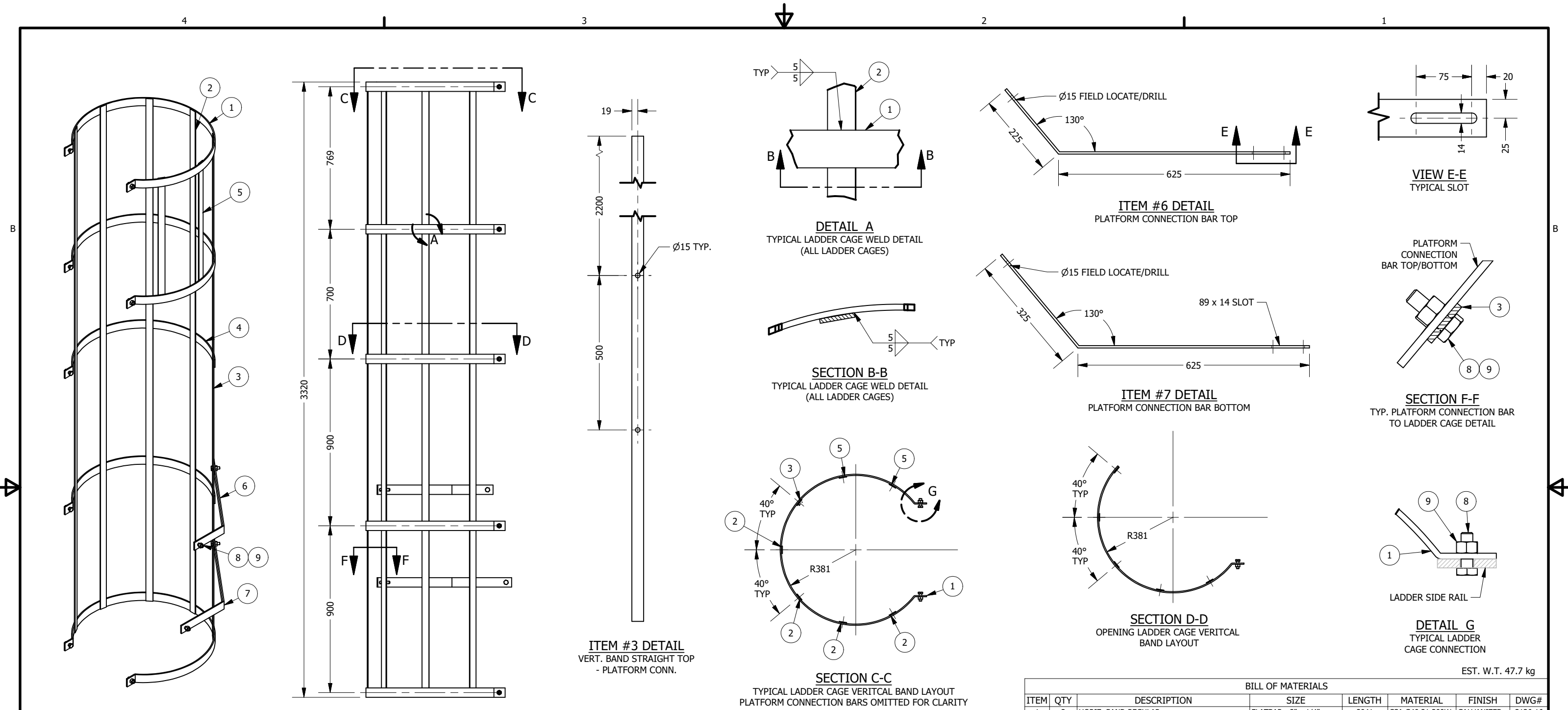
LADDER BRACKETS

DRAWING #

3136-13

PROJECT #  
2531-36602

REV  
0



- GENERAL NOTES**
1. FABRICATE AND ERECT STRUCTURAL STEEL TO CAN/CSA S16 LIMIT STATES DESIGN OF STEEL STRUCTURES.
  2. WELDING TO CONFORM TO CSA W-59 BY FABRICATORS CERTIFIED BY CANADIAN WELDING BUREAU (CWB) TO THE REQUIREMENTS OF CSA W47.1 DIVISION 1 OR 2.1. WELDS SHALL BY MADE WITH ELECTRODES AND FILLER MATERIAL RATED E480XX (E70XX) OR BETTER, UNLESS NOTED OTHERWISE.
  3. ALL MATERIALS USED IN FABRICATION SHALL BE NEW, ACCOMPANIED BY MILL CERTIFICATES.
  4. ALL EDGES SHOULD BE SMOOTH AND FREE FROM BURRS.
  5. COMPLETE ASSEMBLIES SHALL BE HOT DIPPED GALVANIZED AS PER ASTM A123/A123M.
  6. PLATFORM CONNECTION BAR TOP/BOTTOM ITEMS FIELD INSTALLED BASED ON MODIFIED PLATFORM RAILING LOCATION.

| BILL OF MATERIALS |     |  |                          |        |                 |            |
|-------------------|-----|--|--------------------------|--------|-----------------|------------|
| ITEM              | QTY | DESCRIPTION                              | SIZE                     | LENGTH | MATERIAL        | FINISH     |
| 1                 | 3   | HORIZ. BAND REGULAR                      | FLATBAR - 2" x 1/4"      | 2041   | CSA G40.21 300W | GALVANIZED |
| 2                 | 4   | VERT. BAND STRAIGHT TOP                  | FLATBAR - 1 1/2" x 3/16" | 3320   | CSA G40.21 300W | GALVANIZED |
| 3                 | 1   | VERT. BAND STRAIGHT TOP - PLATFORM CONN. | FLATBAR - 1 1/2" x 3/16" | 3320   | CSA G40.21 300W | GALVANIZED |
| 4                 | 2   | HORIZ. BAND OPENING                      | FLATBAR - 2" x 1/4"      | 1311   | CSA G40.21 300W | GALVANIZED |
| 5                 | 2   | VERT. BAND OPENING                       | FLATBAR - 1 1/2" x 3/16" | 820    | CSA G40.21 300W | GALVANIZED |
| 6                 | 1   | PLATFORM CONNECTION BAR TOP              | FLATBAR - 2" x 1/4"      | 850    | CSA G40.21 300W | GALVANIZED |
| 7                 | 1   | PLATFORM CONNECTION BAR BOTTOM           | FLATBAR - 2" x 1/4"      | 950    | CSA G40.21 300W | GALVANIZED |
| 8                 | 12  | HEX BOLT                                 | 1/2" - 13                | 1 1/2" | ASTM A325       | GALVANIZED |
| 9                 | 12  | HEX NUT                                  | 1/2" - 13                |        | ASTM A325       | GALVANIZED |

|     |          |                         |
|-----|----------|-------------------------|
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| REV | DATE     | DESCRIPTION             |

**TOLERANCES & SURFACE FINISH - UNLESS OTHERWISE NOTED**

|             |            |                |
|-------------|------------|----------------|
| FABRICATION | MACHINING  | SURFACE FINISH |
| 0 TO 600 ±1 | X ±0.5     | Ra = 3.2       |
| >600 ±3     | X.X ±0.1   |                |
|             | X.XX ±0.01 |                |

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PH (403) 609-3992

ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

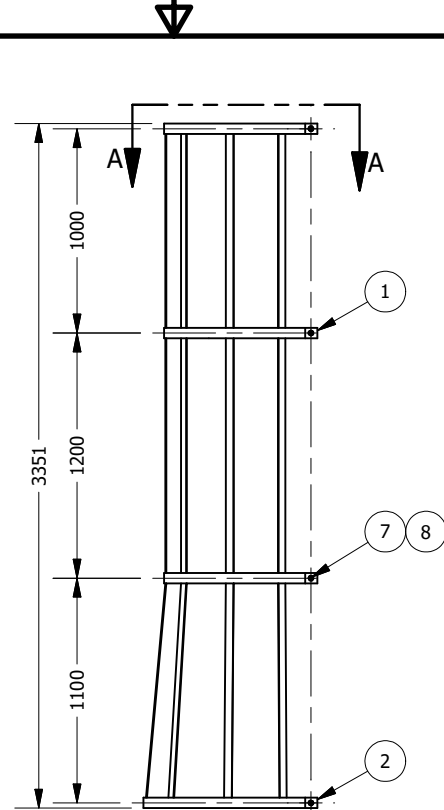
TOP LADDER CAGE

DRAWING #  
**3136-14**

PROJECT #  
2531-36602

REV  
0



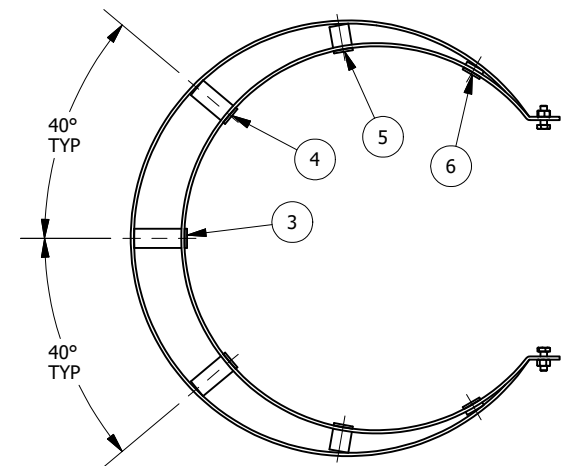


### MEDIUM FLARE LADDER CAGE

### SHORT FLARE LADDER CAGE BILL OF MATERIALS

MEDIUM FLARE LADDER CAGE BILL OF MATERIALS

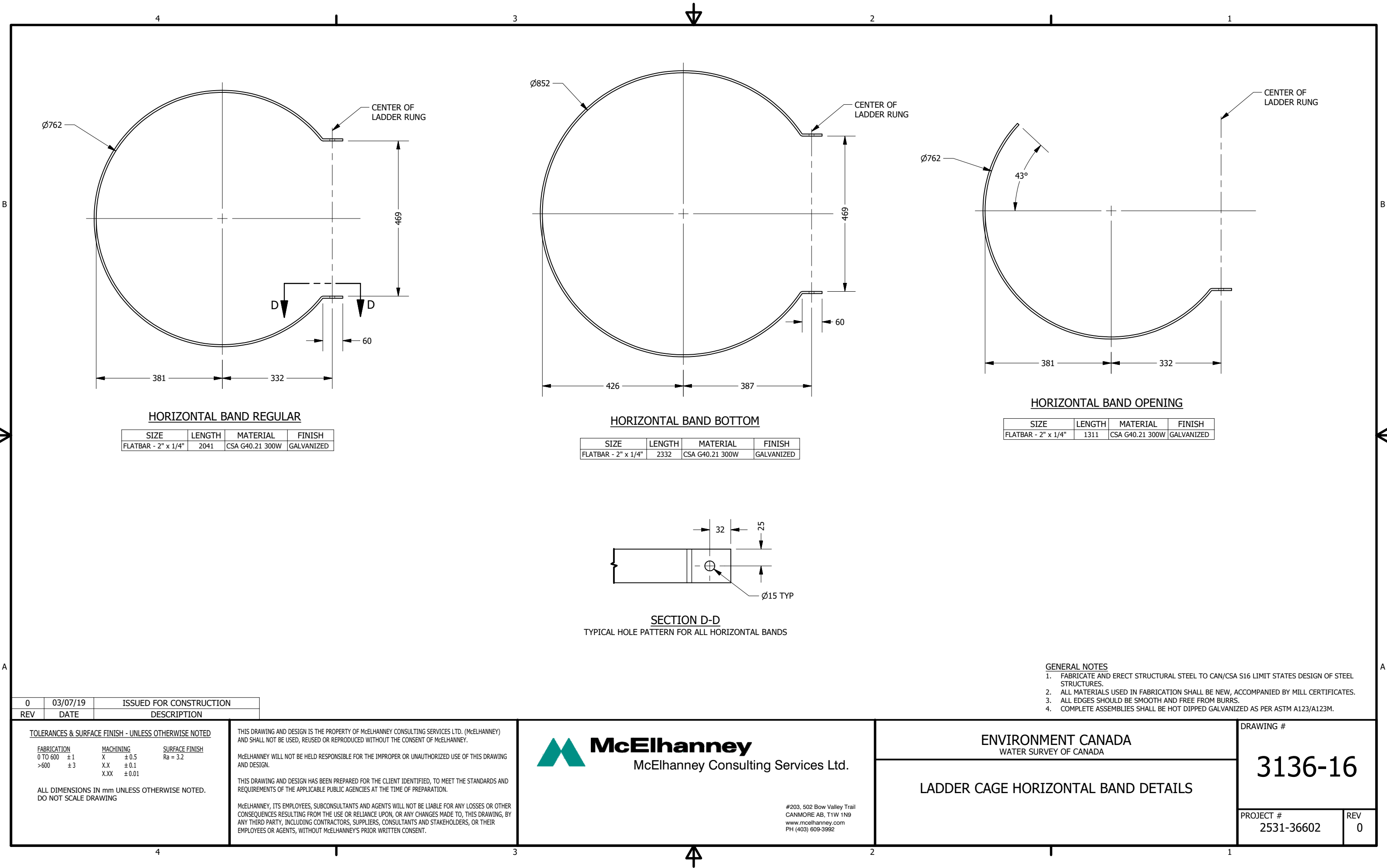
## RESULTS

TYPICAL CONNECTION AND WELD DETAILS ON 3136-14

ITEM #6 DETAIL  
VERT. BAND C

1. FABRICATE AND ERECT STRUCTURAL STEEL TO CAN/CSA S16 LIMIT STATES DESIGN OF STEEL STRUCTURES.
2. WELDING TO CONFORM TO CSA W-59 BY FABRICATORS CERTIFIED BY CANADIAN WELDING BUREAU (CWB) TO THE REQUIREMENTS OF CSA W47.1 DIVISION 1 OR 2.1. WELDS SHALL BE MADE WITH ELECTRODES AND FILLER MATERIAL RATED E480XX (E70XX) OR BETTER, UNLESS NOTED OTHERWISE.
3. ALL MATERIALS USED IN FABRICATION SHALL BE NEW, ACCOMPANIED BY MILL CERTIFICATES.
4. ALL EDGES SHOULD BE SMOOTH AND FREE FROM BURRS.
5. COMPLETE ASSEMBLIES SHALL BE HOT DIPPED GALVANIZED AS PER ASTM A123/A123M.

REV  
0



|     |          |                         |
|-----|----------|-------------------------|
| 0   | 03/07/19 | ISSUED FOR CONSTRUCTION |
| REV | DATE     | DESCRIPTION             |

TOLERANCES & SURFACE FINISH - UNLESS OTHERWISE NOTED

|             |            |                |
|-------------|------------|----------------|
| FABRICATION | MACHINING  | SURFACE FINISH |
| 0 TO 600 ±1 | X ±0.5     | Ra = 3.2       |
| >600 ±3     | X,X ±0.1   |                |
|             | X,XX ±0.01 |                |

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ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

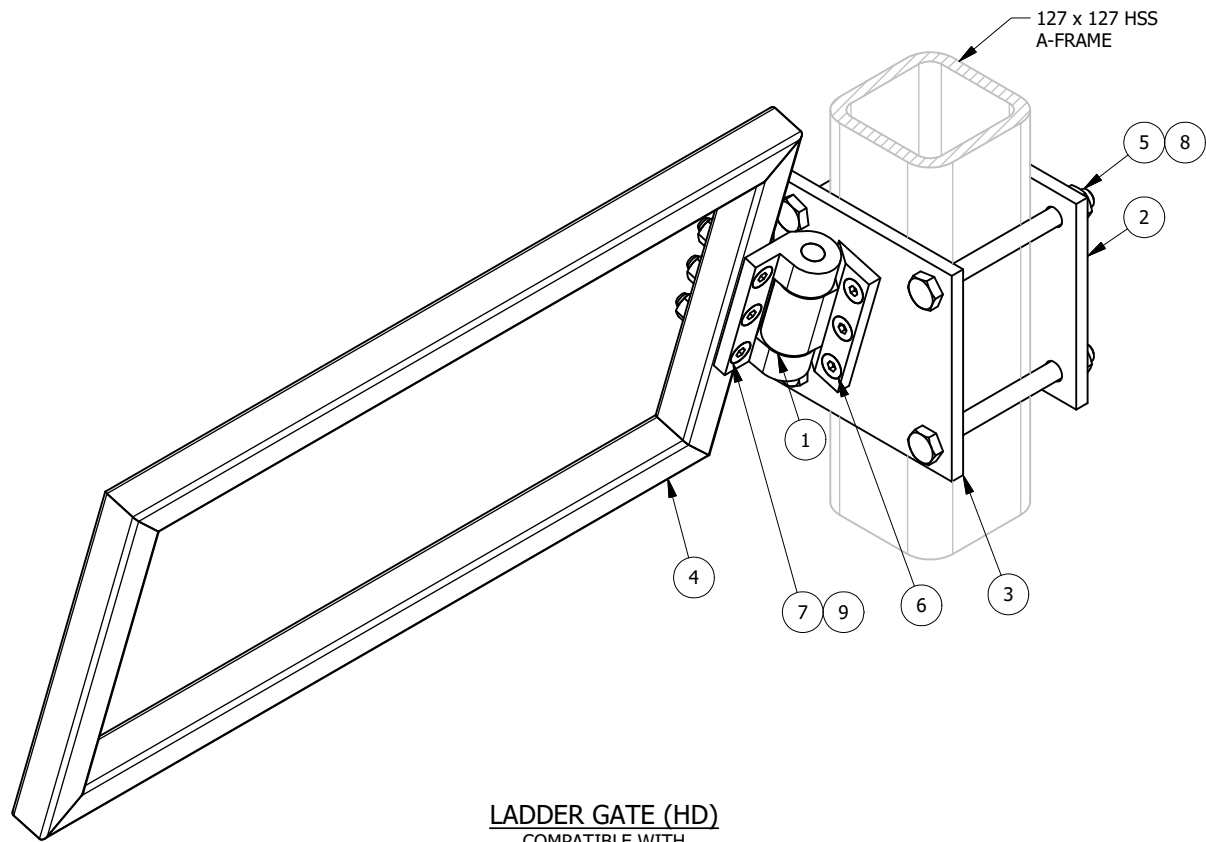
LADDER CAGE HORIZONTAL BAND DETAILS

DRAWING #

3136-16

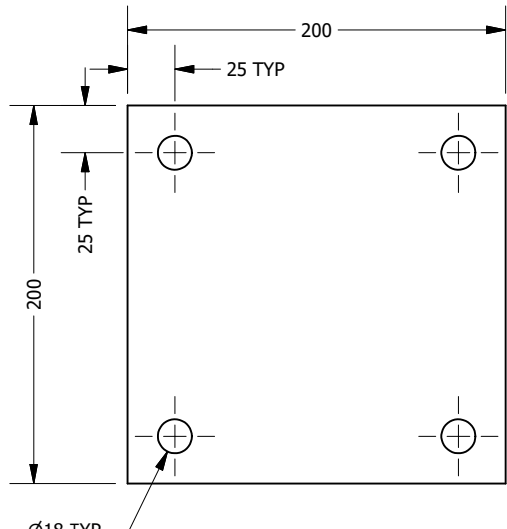
PROJECT #  
2531-36602

REV  
0

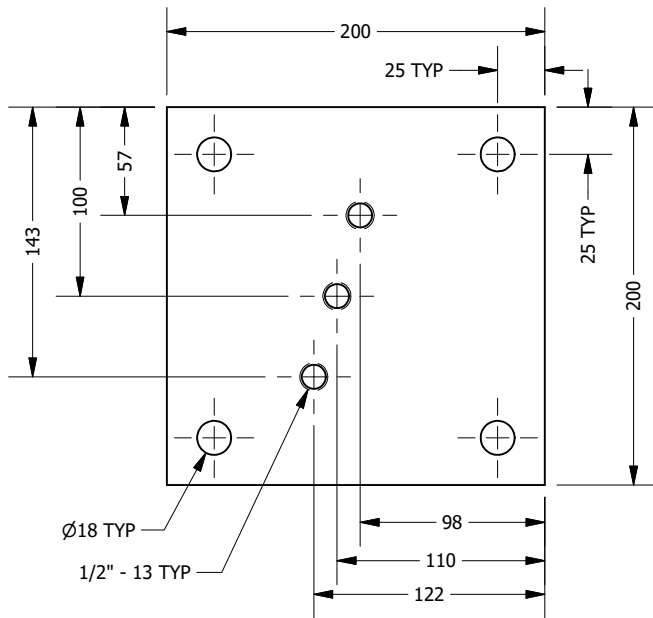


| LADDER GATE (HD) BILL OF MATERIALS |     |                               |              |           |                 |             |      |
|------------------------------------|-----|-------------------------------|--------------|-----------|-----------------|-------------|------|
| ITEM                               | QTY | DESCRIPTION                   | SIZE         | LENGTH    | MATERIAL        | FINISH      | DWG# |
| 1                                  | 1   | HINGE - MCMASTER-CARR 1484A31 |              |           | STEEL           |             |      |
| 2                                  | 1   | HD BACKING PLATE              | PLATE - 1/2" | 200 x 200 | CSA G40.21 300W | GALVANIZED  |      |
| 3                                  | 1   | HINGE MOUNT HD                | PLATE - 1/2" | 200 x 200 | CSA G40.21 300W | GALVANIZED  |      |
| 4                                  | 1   | GATE                          |              |           |                 | GALVANIZED  |      |
| 6                                  | 3   | HEX SOCKET COUNTERSUNK BOLT   | 1/2" - 13    | 1"        | ASTM F835       | BLACK OXIDE |      |
| 7                                  | 3   | HEX SOCKET COUNTERSUNK BOLT   | 1/2" - 13    | 2-3/4"    | ASTM F835       | BLACK OXIDE |      |
| 5                                  | 4   | HEX BOLT                      | 5/8" - 11    | 7"        | ASTM A325M      | GALVANIZED  |      |
| 8                                  | 4   | HEX NUT                       | 5/8" - 11    |           | ASTM A325M      | GALVANIZED  |      |
| 9                                  | 3   | HEX NUT                       | 1/2" - 13    |           | ASTM A325M      | GALVANIZED  |      |

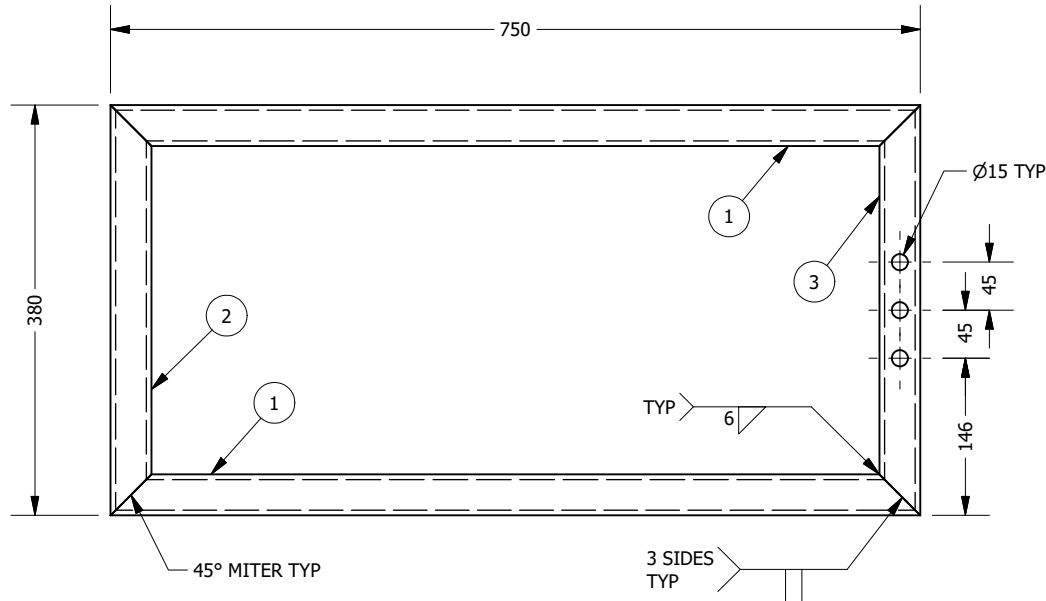
EST. W.T. 11.3kg



ITEM #2 DETAIL  
HD BACKING PLATE



ITEM #3 DETAIL  
HINGE MOUNT HD



ITEM #4 DETAIL  
GATE

| GATE BILL OF MATERIALS |     |                     |                              |        |                 |            |      |
|------------------------|-----|---------------------|------------------------------|--------|-----------------|------------|------|
| ITEM                   | QTY | DESCRIPTION         | SIZE                         | LENGTH | MATERIAL        | FINISH     | DWG# |
| 1                      | 2   | HORIZONTAL BAR      | HSS - 1 1/2" x 1 1/2" x 1/4" | 750    | CSA G40.21 350W | GALVANIZED |      |
| 2                      | 1   | VERTICAL BAR        | HSS - 1 1/2" x 1 1/2" x 1/4" | 380    | CSA G40.21 350W | GALVANIZED |      |
| 3                      | 1   | VERTICAL BAR BOLTED | HSS - 1 1/2" x 1 1/2" x 1/4" | 380    | CSA G40.21 350W | GALVANIZED |      |

- GENERAL NOTES
- FABRICATE AND ERECT STRUCTURAL STEEL TO CAN/CSA S16 LIMIT STATES DESIGN OF STEEL STRUCTURES.
  - ALL MATERIALS USED IN FABRICATION SHALL BE NEW, ACCOMPANIED BY MILL CERTIFICATES.
  - ALL EDGES SHOULD BE SMOOTH AND FREE FROM BURRS.
  - COMPLETE ASSEMBLIES SHALL BE HOT DIPPED GALVANIZED AS PER ASTM A123/A123M.

|     |          |                         |
|-----|----------|-------------------------|
| 0   | 03/07/19 | ISSUED FOR CONSTRUCTION |
| REV | DATE     | DESCRIPTION             |

TOLERANCES & SURFACE FINISH - UNLESS OTHERWISE NOTED

| FABRICATION | MACHINING  | SURFACE FINISH |
|-------------|------------|----------------|
| 0 TO 600 ±1 | X ±0.5     | Ra = 3.2       |
| >600 ±3     | X.X ±0.1   |                |
|             | X.XX ±0.01 |                |

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ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

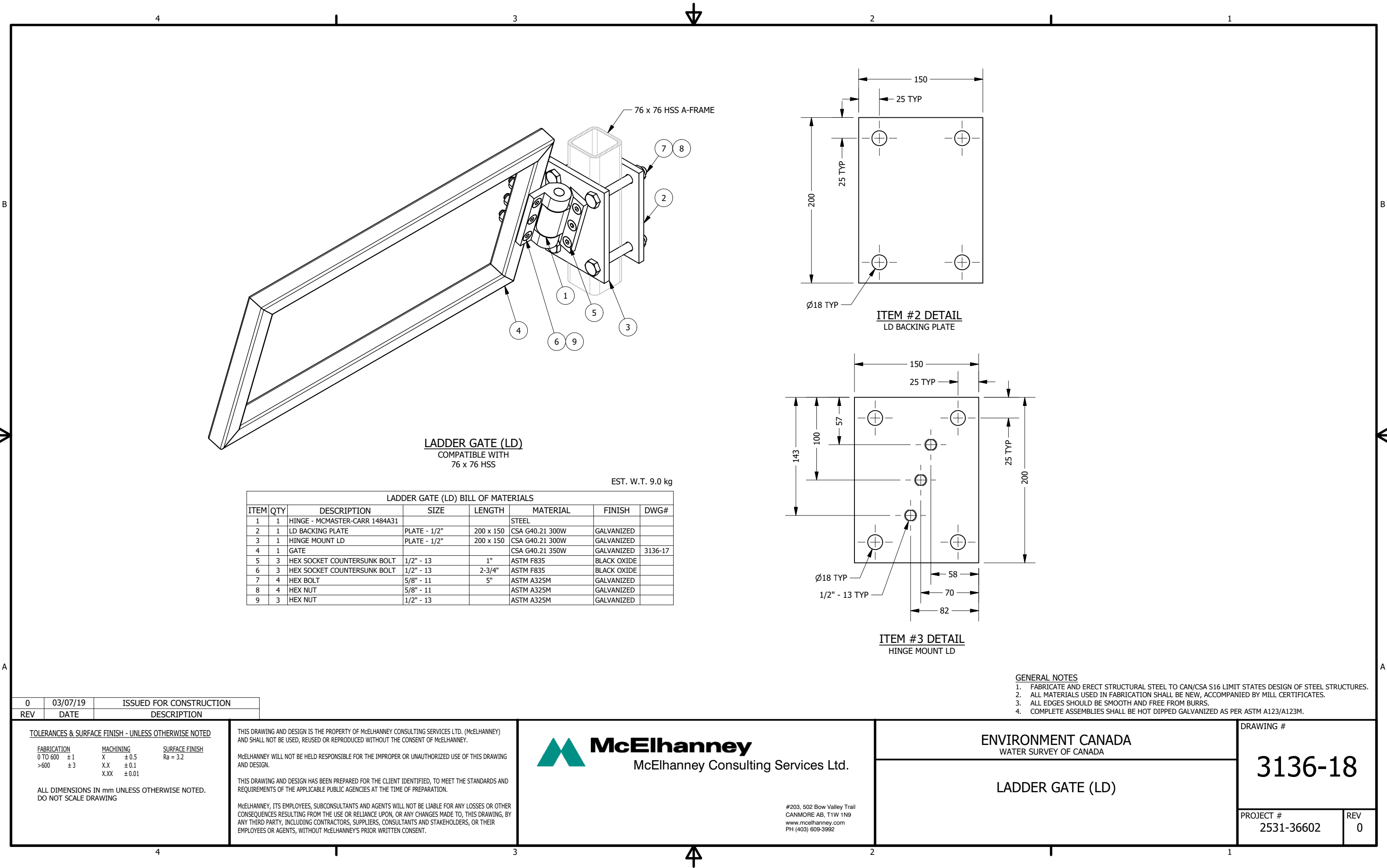
LADDER GATE (HD)

DRAWING #

3136-17

PROJECT #  
2531-36602

REV  
0



|     |          |                         |
|-----|----------|-------------------------|
| 0   | 03/07/19 | ISSUED FOR CONSTRUCTION |
| REV | DATE     | DESCRIPTION             |

TOLERANCES & SURFACE FINISH - UNLESS OTHERWISE NOTED

|             |            |                |
|-------------|------------|----------------|
| FABRICATION | MACHINING  | SURFACE FINISH |
| 0 TO 600 ±1 | X ±0.5     | Ra = 3.2       |
| >600 ±3     | X,X ±0.1   |                |
|             | X,XX ±0.01 |                |

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ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

LADDER GATE (LD)

DRAWING #

3136-18

PROJECT #

2531-36602

REV

0

GENERAL NOTES

- FABRICATE AND ERECT STRUCTURAL STEEL TO CAN/CSA S16 LIMIT STATES DESIGN OF STEEL STRUCTURES.
- ALL MATERIALS USED IN FABRICATION SHALL BE NEW, ACCOMPANIED BY MILL CERTIFICATES.
- ALL EDGES SHOULD BE SMOOTH AND FREE FROM BURRS.
- COMPLETE ASSEMBLIES SHALL BE HOT DIPPED GALVANIZED AS PER ASTM A123/A123M.



BILLS OF MATERIAL

A COMPLETE 2 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 2 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.1 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 2   | LADDER BRACKET ASSEMBLY             | 3136-13 | CONTRACTOR |
| 1   | 3m LADDER                           | 3136-11 | CONTRACTOR |

A COMPLETE 3 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 3 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.5 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 3   | LADDER BRACKET ASSEMBLY             | 3136-13 | CONTRACTOR |
| 1   | 4m LADDER                           | 3136-11 | CONTRACTOR |

A COMPLETE 4 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                   | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 3   | LADDER BRACKET ASSEMBLY             | 3136-13 | CONTRACTOR |
| 1   | 5m LADDER                           | 3136-12 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY             | 3136-17 | CONTRACTOR |

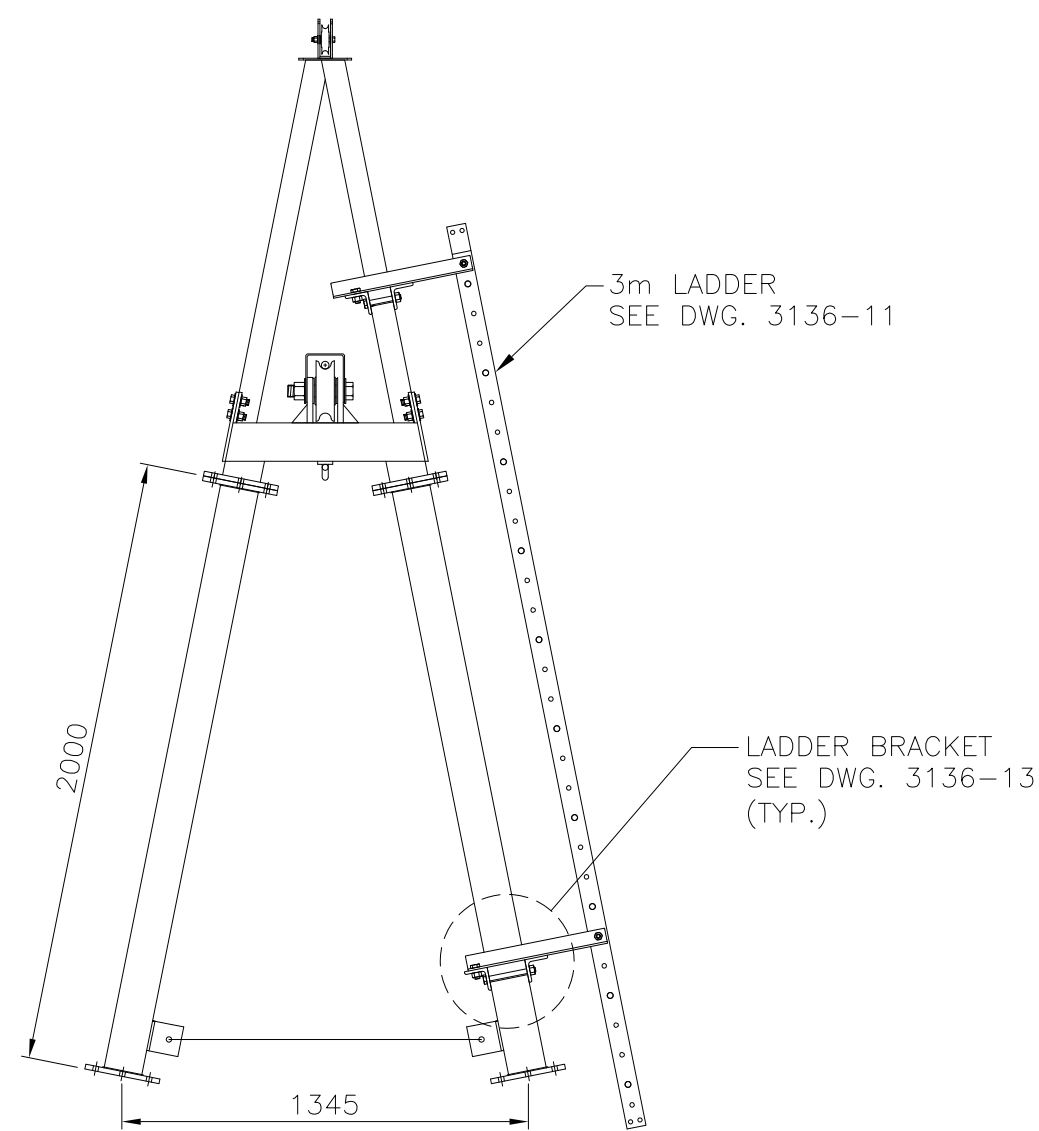
A COMPLETE 5 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                   | DWG No. | SUPPLIER   |
|-----|---|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                          | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                          | 3136-5  | CONTRACTOR |
| 1   | 1 METRE LEG ASSEMBLY                          | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY           | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                             | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                         | 3136-10 | CONTRACTOR |
| 4   | LADDER BRACKET ASSEMBLY                       | 3136-13 | CONTRACTOR |
| 2   | 3m LADDER                                     | 3136-11 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                       | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"L.G. ASTM A325M GALV. HEX BOLTS | —       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS             | —       | CONTRACTOR |

A COMPLETE 1 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

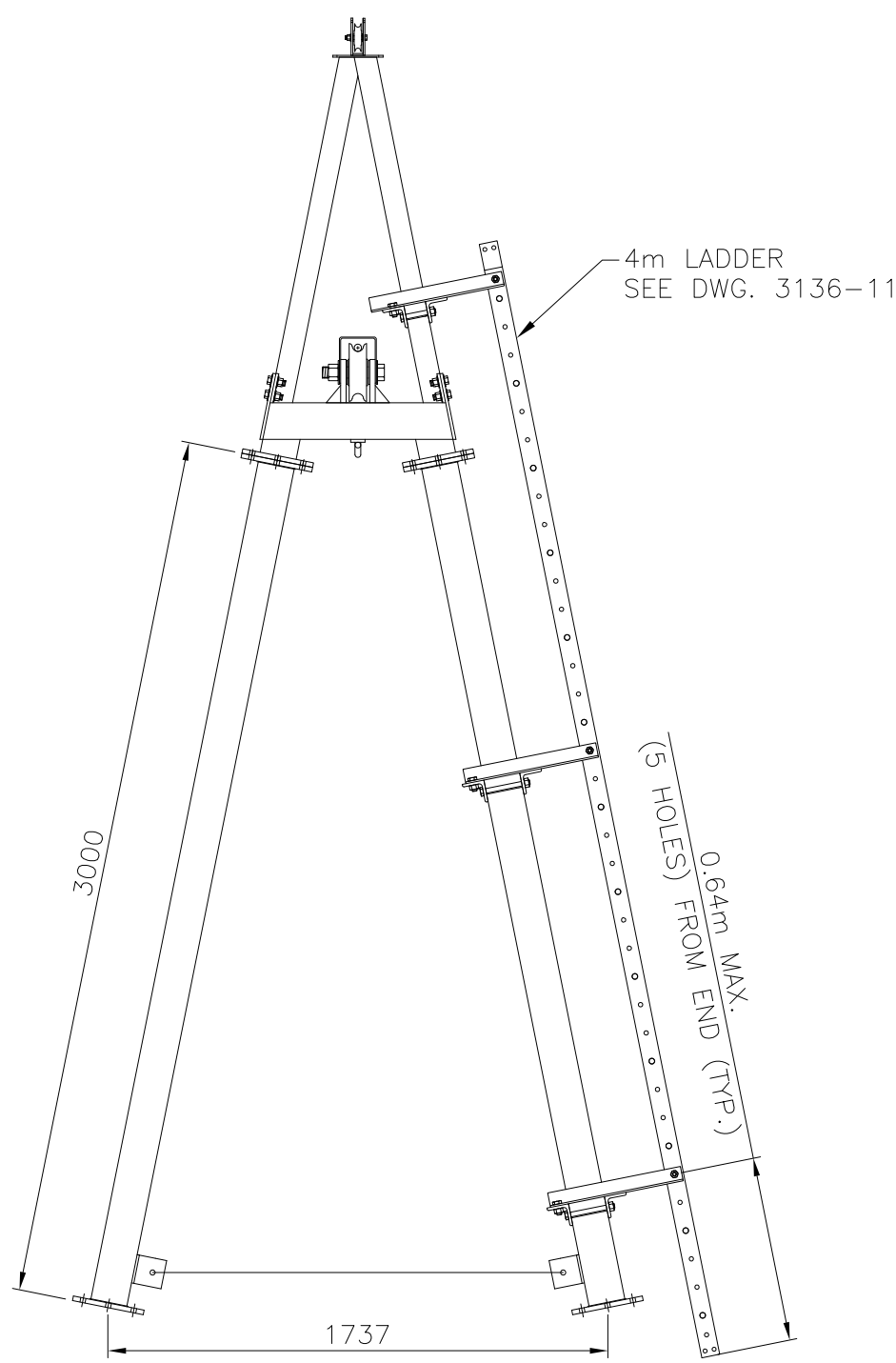
| QTY | DESCRIPTION          | DWG No. | SUPPLIER   |
|-----|----------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY | 3136-4  | CONTRACTOR |
| 1   | 1 METRE LEG ASSEMBLY | 3136-5  | CONTRACTOR |

EST. W.T. 173.4 kg



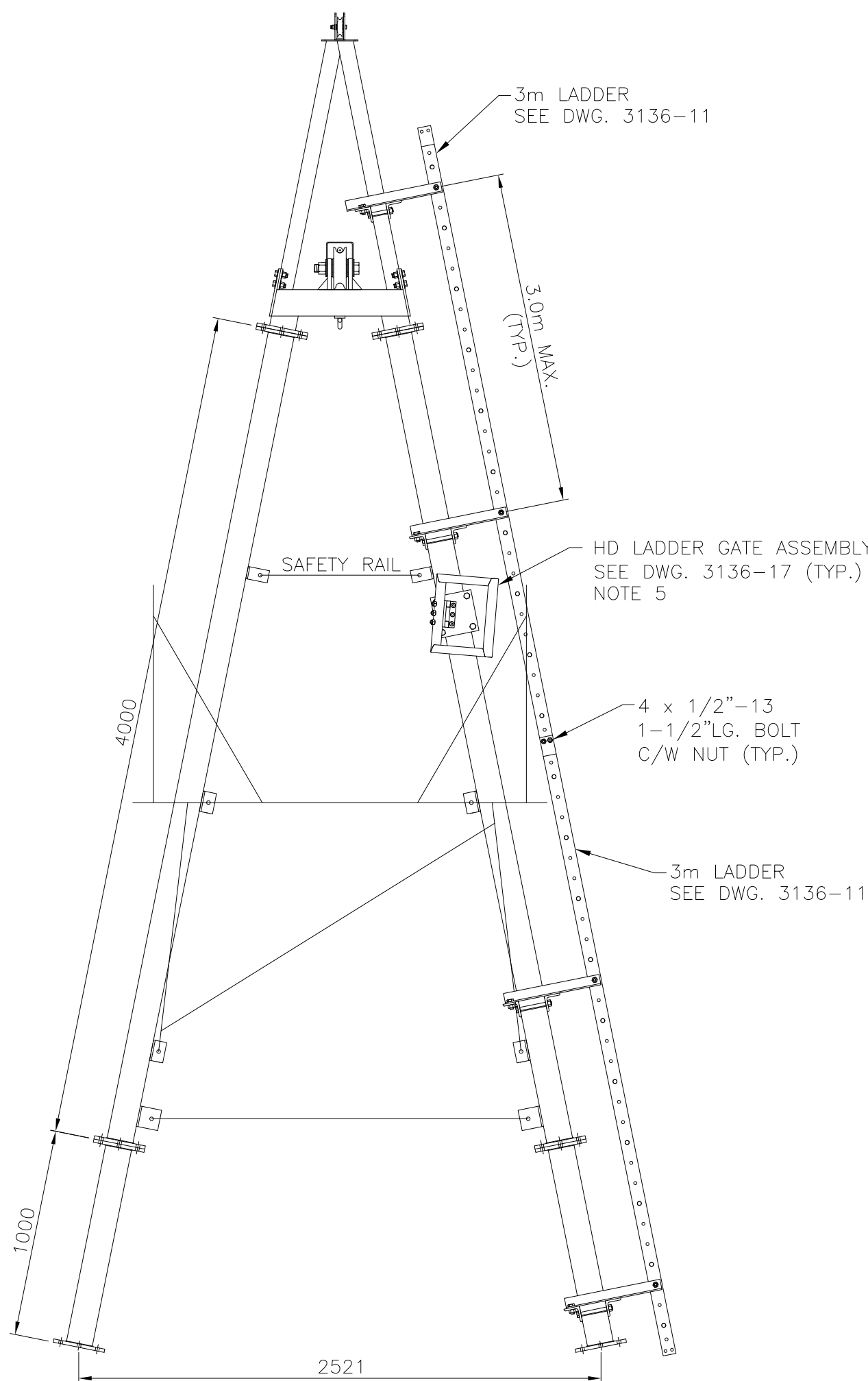
2 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 2.352 METRES (WITHOUT FOOT PIECE)



3 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 3.332 METRES (WITHOUT FOOT PIECE)



5 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 5.294 METRES (WITHOUT FOOT PIECE)

DESIGN LOAD

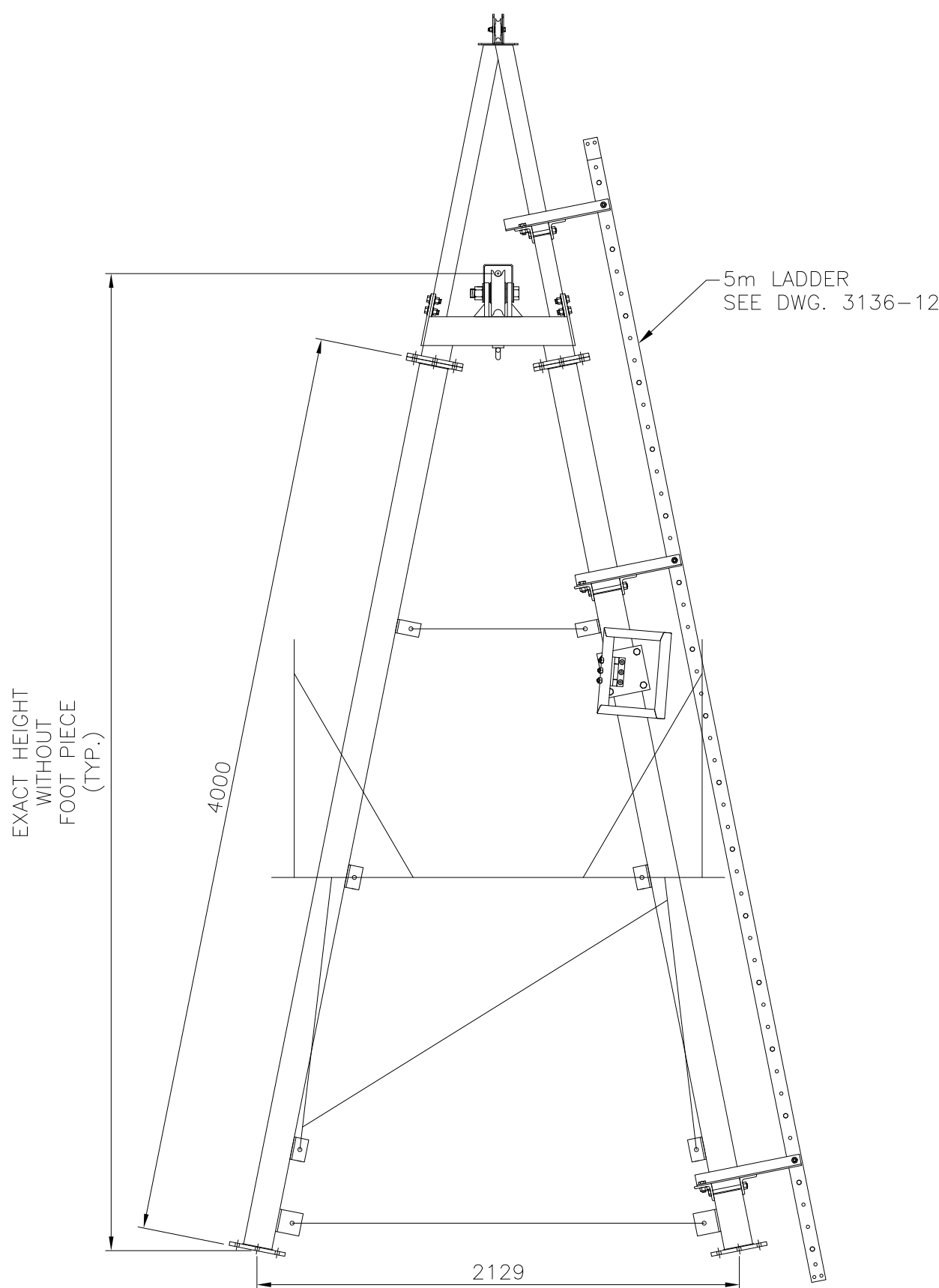
|       |          |
|-------|----------|
| CAR   | 200      |
| 2 MEN | 400      |
| REEL  | 50       |
|       | 650 lbs. |

PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY  
ANGLE = 1600 lbs. BREAKING STRENGTH.

NOTES:

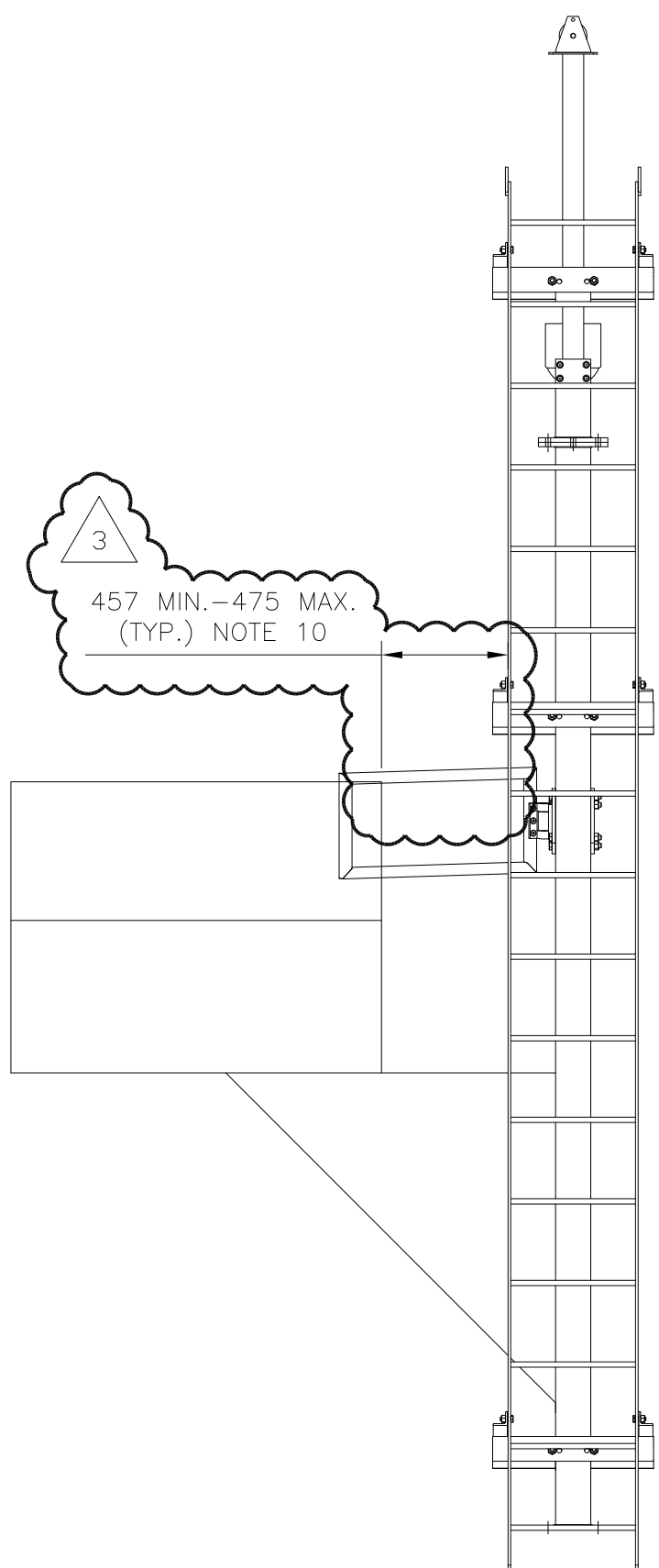
- ALL PARTS TO BE HOT-DIPPED GALVANIZED AS PER ASTM A123/A123M.
- ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED, UNLESS OTHERWISE NOTED.
- ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED, UNLESS OTHERWISE NOTED.
- LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
- HD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.
- LADDERS ARE DESIGNED TO MEET ANSI14.3-2008 REQUIREMENTS.
- LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.
- FIELD MODIFY EXISTING PLATFORM RAILING TO CLEARANCE OF 457mm MIN.-475mm MAX. FROM BACK OF RAILING TO O/S LADDER SIDE RAIL.

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED

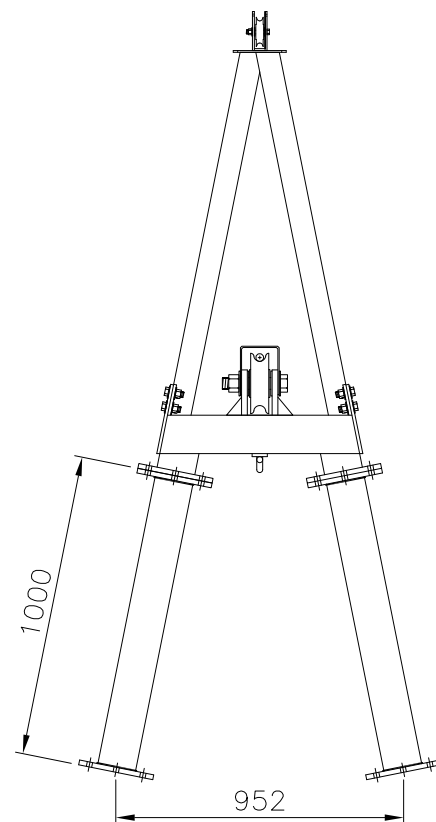


4 METRE A-FRAME

(THIS SECTION IS TYPICAL OF ALL FRAMES OVER 4 METRES)  
EXACT HEIGHT TO CENTRE OF 25ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 4.313 METRES (WITHOUT FOOT PIECE)



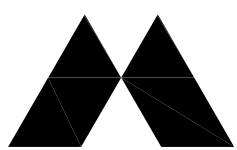
4 METRE A-FRAME SECTION



1 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25ø  
WIRE ROPE IN MAIN CABLE SHEAVE =  
1.371 METRES (WITHOUT FOOT PIECE)

|     |         |                                       |     |     |
|-----|---------|---------------------------------------|-----|-----|
| 3   | MAR/19  | ADDED PLATFORM RAILING CLEARANCE NOTE | WC  | BB  |
| 2   | MAR/19  | ISSUED FOR CONSTRUCTION               | WC  | BB  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL          | KDW | AAW |
| No. | Date    | Revision                              | Dr  | Ch  |



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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
1, 2, 3, 4, & 5 METRE HEIGHTS

VANCOUVER, B.C.

Designed D.O.E.

Job No. 2111-01745-1

Drawing No.

Drawn K.D.W

Scale 1:25

Checked A.A.W.

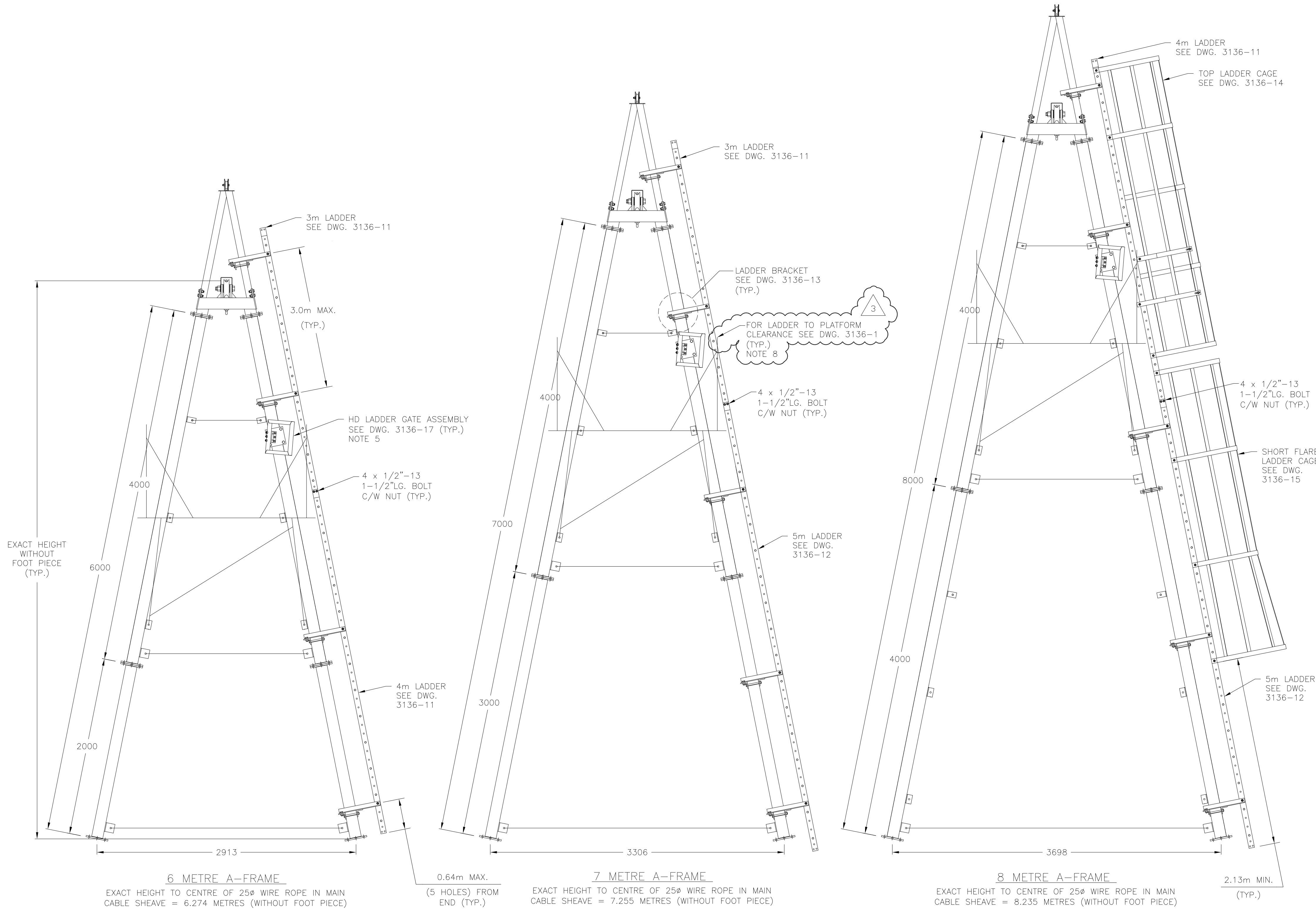
Date APRIL 2002

Approved

Revision 3

of 18

Destroy all prints bearing previous number.



## BILLS OF MATERIAL

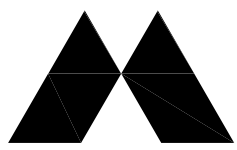
| A COMPLETE 6 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING: |  |         |            |
|--|--|---------|------------|
| QTY  | DESCRIPTION                                  | DWG No. | SUPPLIER   |
| 1  | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 1  | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1  | 2 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1  | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1  | 2.7 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1  | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1  | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 4  | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 1  | 3m LADDER                                    | 3136-11 | CONTRACTOR |
| 1  | 4m LADDER                                    | 3136-11 | CONTRACTOR |
| 1  | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4  | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | -       | CONTRACTOR |
| 4  | 1/2"-13 ASTM A325M GALV. HEX NUTS            | -       | CONTRACTOR |

| A COMPLETE 7 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING: |  |         |            |
|--|--|---------|------------|
| QTY  | DESCRIPTION                                  | DWG No. | SUPPLIER   |
| 1  | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 1  | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1  | 3 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1  | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1  | 3.1 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1  | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1  | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 5  | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 1  | 5m LADDER                                    | 3136-12 | CONTRACTOR |
| 1  | 3m LADDER                                    | 3136-11 | CONTRACTOR |
| 1  | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4  | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | -       | CONTRACTOR |
| 4  | 1/2"-13 ASTM A325M GALV. HEX NUTS            | -       | CONTRACTOR |

| A COMPLETE 8 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING: |  |         |            |
|--|--|---------|------------|
| QTY  | DESCRIPTION                                  | DWG No. | SUPPLIER   |
| 1  | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 2  | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1  | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1  | 3.5 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1  | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1  | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 5  | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 1  | 4m LADDER                                    | 3136-11 | CONTRACTOR |
| 1  | 5m LADDER                                    | 3136-12 | CONTRACTOR |
| 1  | TOP LADDER CAGE                              | 3136-14 | CONTRACTOR |
| 1  | SHORT FLARE LADDER CAGE                      | 3136-15 | CONTRACTOR |
| 1  | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4  | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | -       | CONTRACTOR |
| 4  | 1/2"-13 ASTM A325M GALV. HEX NUTS            | -       | CONTRACTOR |

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED

| No. | Date    | Revision                              | Dr  | Ch  |
|-----|---------|---------------------------------------|-----|-----|
| 3   | MAR/19  | ADDED PLATFORM RAILING CLEARANCE NOTE | WC  | BB  |
| 2   | MAR/19  | ISSUED FOR CONSTRUCTION               | WC  | BB  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL          | KDW | AAW |



**McElhanney**

McElhanney Consulting Services Ltd.

203-502 Bow Valley Trail, Canmore, AB, Canada T1W 1N9 Telephone 403-609-3992

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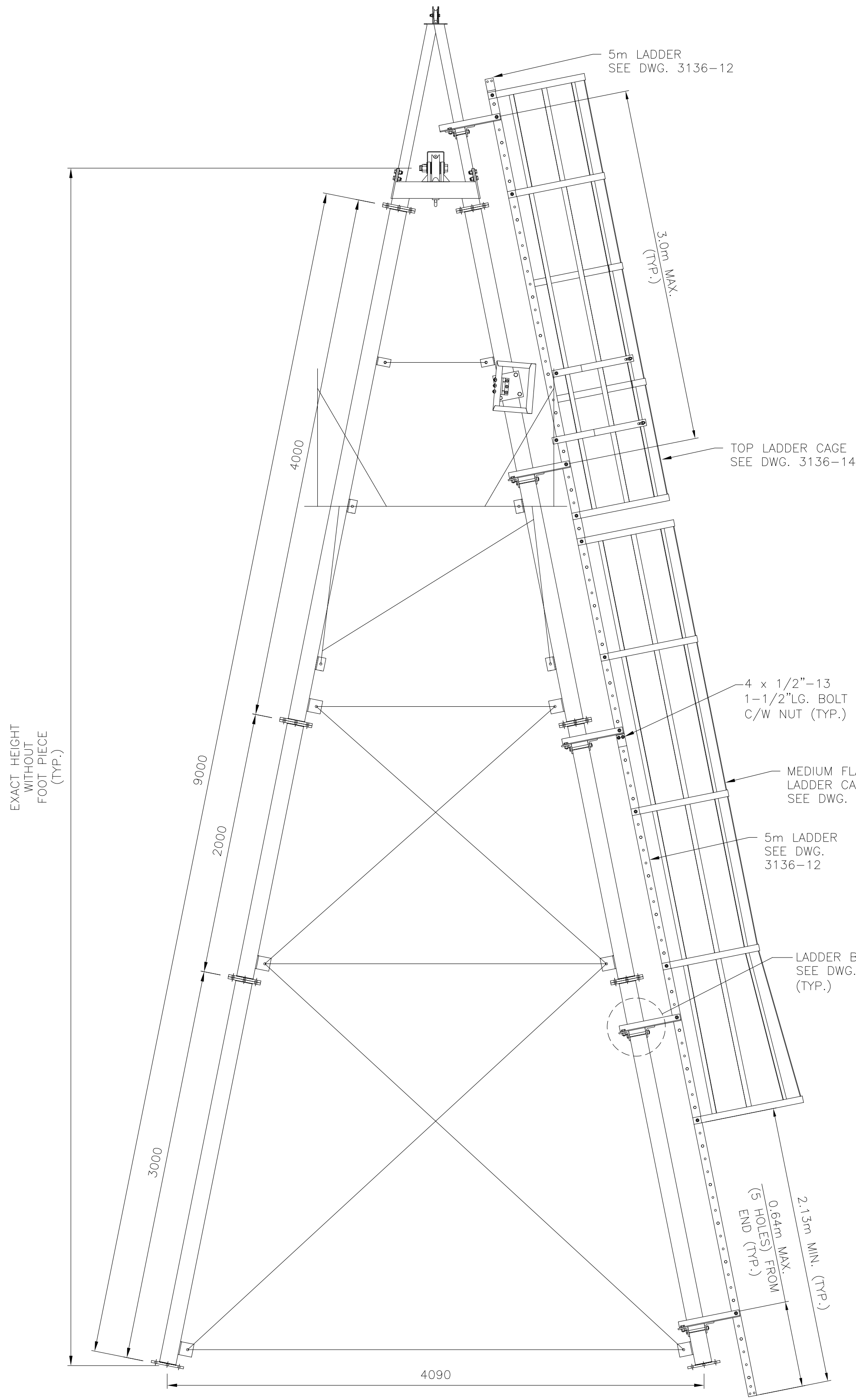
DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
6, 7, & 8 METRES

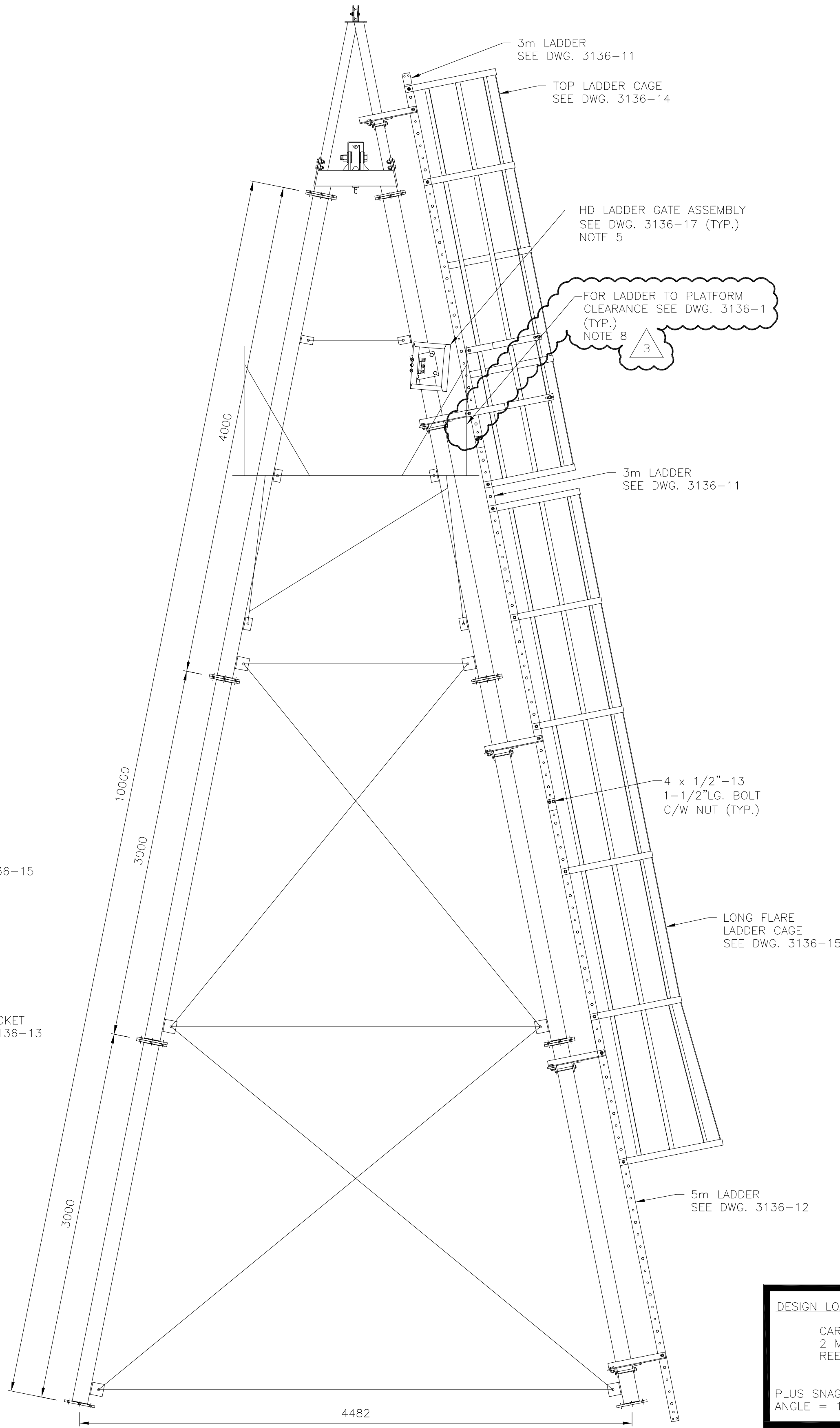
VANCOUVER, B.C.

|                 |                      |  |
|-----------------|----------------------|--|
| Designed D.O.E. | Job No. 2111-01745-1 | Drawing No.<br><br>3136-2<br><br>of 18 |
| Drawn K.D.W.    | Scale 1:25           |  |
| Checked A.A.W.  | Date APRIL 2002      |  |
| Approved        | Revision 3           |  |

Destroy all prints bearing previous number-3



9 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 9.216 METRES (WITHOUT FOOT PIECE)



10 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 10.197 METRES (WITHOUT FOOT PIECE)

| DESIGN LOAD   |          |  |
|---|----------|--|
| CAR   | 200      |  |
| 2 MEN   | 400      |  |
| REEL  | 50       |  |
|   | 650 lbs. |  |
| PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY<br>ANGLE = 1600 lbs. BREAKING STRENGTH. |          |  |

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED

## BILLS OF MATERIAL

| A COMPLETE 9 METRE A-FRAME ASSEMBLY<br>CONSISTS OF THE FOLLOWING: |   |         |            |
|---|---|---------|------------|
| QTY   | DESCRIPTION                                     | DWG No. | SUPPLIER   |
| 1   | A-FRAME TOP ASSEMBLY                            | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR |
| 1   | 2 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR |
| 1   | 3 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY             | 3136-6  | CONTRACTOR |
| 1   | 2.7 METRE HORIZONTAL BRACE ASSEMBLY             | 3136-6  | CONTRACTOR |
| 1   | 3.9 METRE HORIZONTAL BRACE ASSEMBLY             | 3136-6  | CONTRACTOR |
| 1   | LATERAL BRACING ASSEMBLY FOR 9<br>METRE A-FRAME | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                               | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                           | 3136-10 | CONTRACTOR |
| 5   | LADDER BRACKET ASSEMBLY                         | 3136-13 | CONTRACTOR |
| 2   | 5m LADDER                                       | 3136-12 | CONTRACTOR |
| 1   | TOP LADDER CAGE                                 | 3136-14 | CONTRACTOR |
| 1   | MEDIUM FLARE LADDER CAGE                        | 3136-15 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                         | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS    | -       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS               | -       | CONTRACTOR |

| A COMPLETE 10 METRE A-FRAME ASSEMBLY<br>CONSISTS OF THE FOLLOWING: |  |         |            |
|--|--|---------|------------|
| QTY  | DESCRIPTION                                      | DWG No. | SUPPLIER   |
| 1  | A-FRAME TOP ASSEMBLY                             | 3136-4  | CONTRACTOR |
| 1  | 4 METRE LEG ASSEMBLY                             | 3136-5  | CONTRACTOR |
| 2  | 3 METRE LEG ASSEMBLY                             | 3136-5  | CONTRACTOR |
| 1  | 1.9 METRE HORIZONTAL BRACE ASSEMBLY              | 3136-6  | CONTRACTOR |
| 1  | 3.1 METRE HORIZONTAL BRACE ASSEMBLY              | 3136-6  | CONTRACTOR |
| 1  | 4.2 METRE HORIZONTAL BRACE ASSEMBLY              | 3136-6  | CONTRACTOR |
| 1  | LATERAL BRACING ASSEMBLY FOR 10<br>METRE A-FRAME | 3136-6  | CONTRACTOR |
| 1  | PLATFORM ASSEMBLY                                | 3136-9  | CONTRACTOR |
| 1  | CAR HOOK ASSEMBLY LEG                            | 3136-10 | CONTRACTOR |
| 5  | LADDER BRACKET ASSEMBLY                          | 3136-13 | CONTRACTOR |
| 1  | 5m LADDER  | 3136-12 | CONTRACTOR |
| 2  | 3m LADDER  | 3136-11 | CONTRACTOR |
| 1  | TOP LADDER CAGE                                  | 3136-14 | CONTRACTOR |
| 1  | LONG FLARE LADDER CAGE                           | 3136-15 | CONTRACTOR |
| 1  | HD LADDER GATE ASSEMBLY                          | 3136-17 | CONTRACTOR |
| 8  | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS     | -       | CONTRACTOR |
| 8  | 1/2"-13 ASTM A325M GALV. HEX NUTS                | -       | CONTRACTOR |

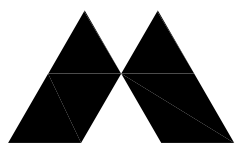
### NOTES:

- ALL PARTS TO BE HOT-DIPPED GALVANIZED AS PER ASTM A123/A123M.
- ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED, UNLESS OTHERWISE NOTED.
- ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED, UNLESS OTHERWISE NOTED.
- LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
- HD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.
- LADDERS ARE DESIGNED TO MEET ANSI14.3-2008 REQUIREMENTS.
- LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.

8. FIELD MODIFY EXISTING PLATFORM RAILING TO  
CLEARANCE OF 457mm MIN.-475mm MAX. FROM  
BACK OF RAILING TO O/S LADDER SIDE RAIL.

APRIL 26, 2002  
M2111-01745-1 (DRAFT) 1/45-03.DWG

| No. | Date    | Revision                              | Dr  | Ch  |
|-----|---------|---------------------------------------|-----|-----|
| 3   | MAR/19  | ADDED PLATFORM RAILING CLEARANCE NOTE | WC  | BB  |
| 2   | MAR/19  | ISSUED FOR CONSTRUCTION               | WC  | BB  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL          | KDW | AAW |



**McElhanney**

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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
9 & 10 METRES

VANCOUVER, B.C.

|                 |                      |  |
|-----------------|----------------------|--|
| Designed D.O.E. | Job No. 2111-01745-1 | Drawing No.<br><br>3136-3<br><br>of 18 |
| Drawn K.D.W.    | Scale 1:25           |  |
| Checked A.A.W.  | Date APRIL 2002      |  |
| Approved        | Revision 3           |  |

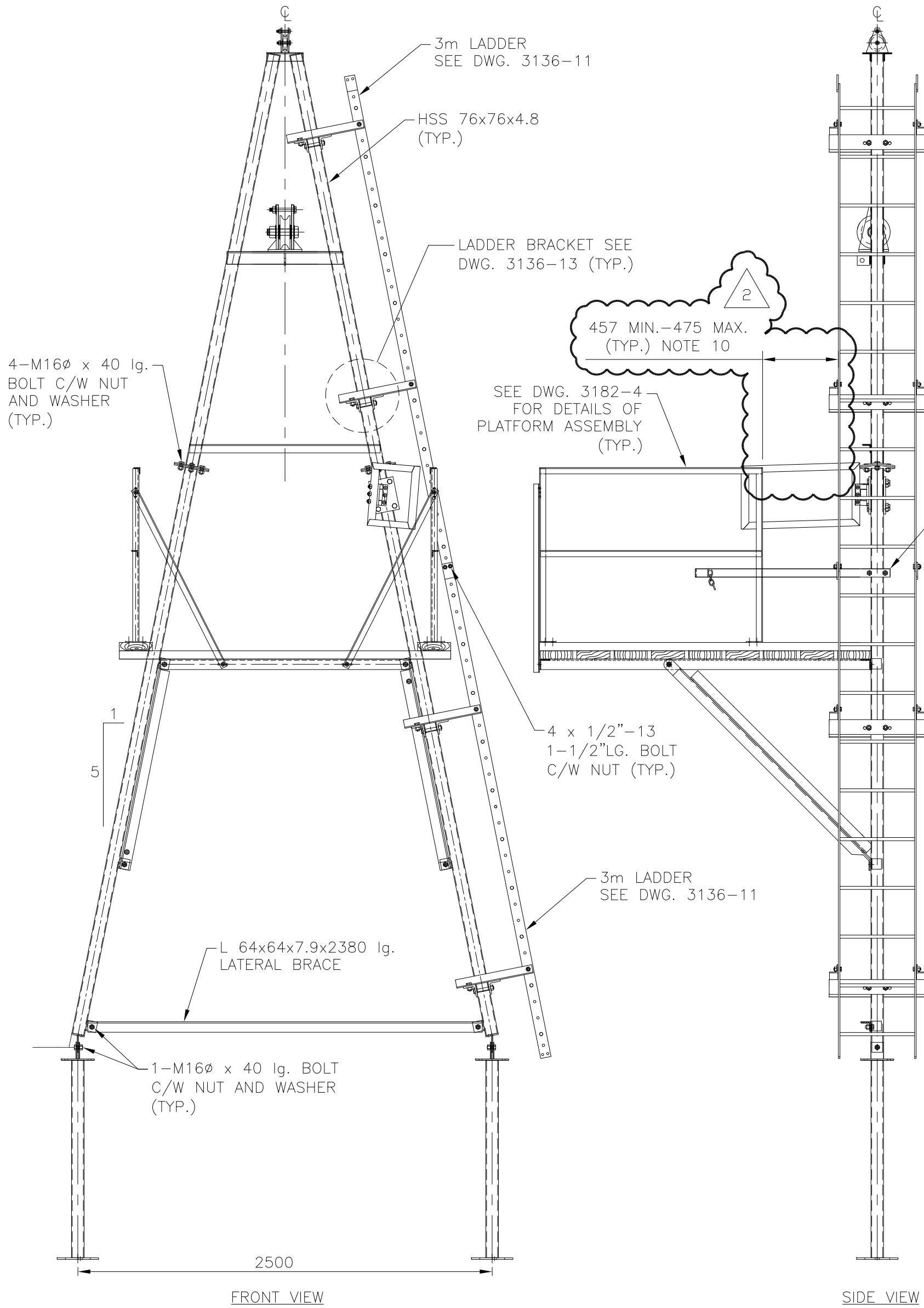
Destroy all prints bearing previous number.



Plotted: March 28, 2019, 12:07:41  
Filename: S:\Project Files\231-366 Environment Canada\02-40 A-Frame Ladders\7.0 Drawings\7.1 Working Dwg\Drawings\Existing\01745 LD A-Frames.dwg

5.0 m LIGHT A-FRAME

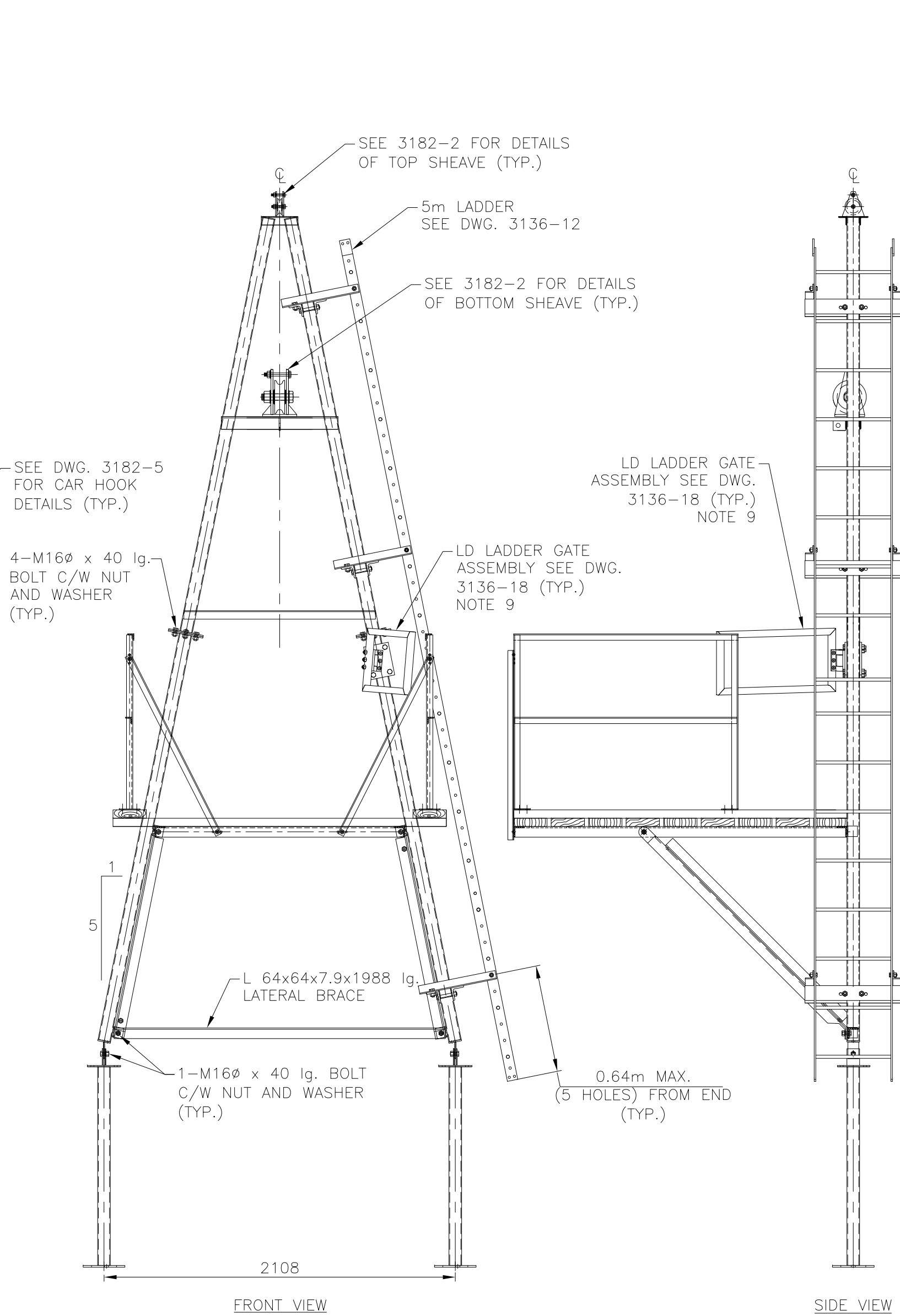
| QTY. | DESCRIPTION                                    | DWG.    | SUPPLIER   |
|------|--|---------|------------|
| 1    | 1.5m A-FRAME TOP                               | 3182-2  | FABRICATOR |
| 1    | CAR HOOK ASSEMBLY                              | 3182-5  | FABRICATOR |
| 12   | M16x40 A325M GALV. STRUCTURAL BOLTS            | 3182-1  | FABRICATOR |
| 12   | M16x120 A325M GALV. STRUCTURAL BOLTS           | 3182-1  | FABRICATOR |
| 10   | U-BOLTS FOR BRACKET                            | 3182-1  | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING)      | 3182-3  | FABRICATOR |
| 1    | 3.5m LEG ASSEMBLY                              | 3182-3  | FABRICATOR |
| 1    | 2.38m LATERAL BRACE                            | 3182-1  | FABRICATOR |
| 1    | PLATFORM ASSEMBLY FOR 5m A-FRAME               | 3182-4  | FABRICATOR |
| 4    | LADDER BRACKET ASSEMBLY                        | 3136-13 | FABRICATOR |
| 2    | 3m LADDER                                      | 3136-11 | FABRICATOR |
| 1    | LD LADDER GATE ASSEMBLY                        | 3136-18 | FABRICATOR |
| 4    | 1/2"-13 1-1/2"LG. ASTM - A325M GALV. HEX BOLTS |         | FABRICATOR |
| 4    | 1/2"-13 ASTM A325M GALV. HEX NUTS              | -       | FABRICATOR |



5.0 m LIGHT A-FRAME  
1:25

4.0 m LIGHT A-FRAME

| QTY. | DESCRIPTION                               | DWG.    | SUPPLIER   |
|------|---|---------|------------|
| 1    | 1.5m A-FRAME TOP                          | 3182-2  | FABRICATOR |
| 1    | CAR HOOK ASSEMBLY                         | 3182-5  | FABRICATOR |
| 12   | M16x40 A325M GALV. STRUCTURAL BOLTS       | 3182-1  | FABRICATOR |
| 12   | M16x120 A325M GALV. STRUCTURAL BOLTS      | 3182-1  | FABRICATOR |
| 10   | U-BOLTS FOR BRACKET                       | 3182-1  | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING) | 3182-3  | FABRICATOR |
| 1    | 2.5m LEG ASSEMBLY                         | 3182-3  | FABRICATOR |
| 1    | 1.98m LATERAL BRACE                       | 3182-1  | FABRICATOR |
| 1    | PLATFORM ASSEMBLY FOR 4m A-FRAME          | 3182-4  | FABRICATOR |
| 3    | LADDER BRACKET ASSEMBLY                   | 3136-13 | FABRICATOR |
| 1    | 5m LADDER                                 | 3136-12 | FABRICATOR |
| 1    | LD LADDER GATE ASSEMBLY                   | 3136-18 | FABRICATOR |



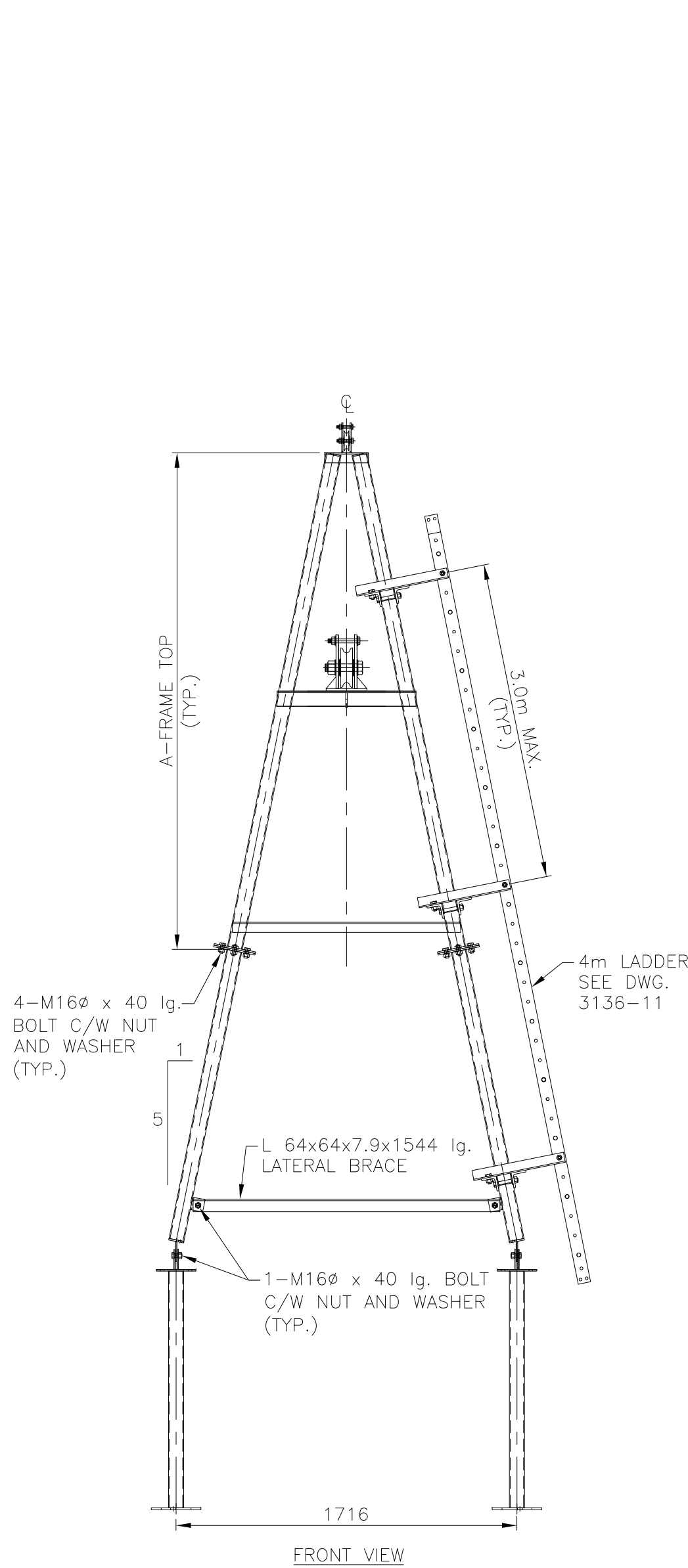
4.0 m LIGHT A-FRAME  
1:25

3.0 m LIGHT A-FRAME

| QTY. | DESCRIPTION                               | DWG.    | SUPPLIER   |
|------|---|---------|------------|
| 1    | 1.5m A-FRAME TOP                          | 3182-2  | FABRICATOR |
| 1    | CAR HOOK ASSEMBLY                         | 3182-5  | FABRICATOR |
| 12   | M16x40 A325M GALV. STRUCTURAL BOLTS       | 3182-1  | FABRICATOR |
| 10   | M16x120 A325M GALV. STRUCTURAL BOLTS      | 3182-1  | FABRICATOR |
| 8    | U-BOLTS FOR BRACKET                       | 3182-1  | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING) | 3182-3  | FABRICATOR |
| 1    | 1.5m LEG ASSEMBLY                         | 3182-3  | FABRICATOR |
| 1    | 1.54m LATERAL BRACE                       | 3182-1  | FABRICATOR |
| 3    | LADDER BRACKET ASSEMBLY                   | 3136-13 | FABRICATOR |
| 1    | 4m LADDER                                 | 3136-11 | FABRICATOR |

1.5 m LIGHT A-FRAME

| QTY. | DESCRIPTION                               | DWG.   | SUPPLIER   |
|------|---|--------|------------|
| 1    | 1.5m A-FRAME TOP                          | 3182-2 | FABRICATOR |
| 2    | 1.5m A-FRAME SPLICE PLATES                | 3182-2 | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING) | 3182-3 | FABRICATOR |
| 1    | 1.15m LATERAL BRACE                       | 3182-2 | FABRICATOR |



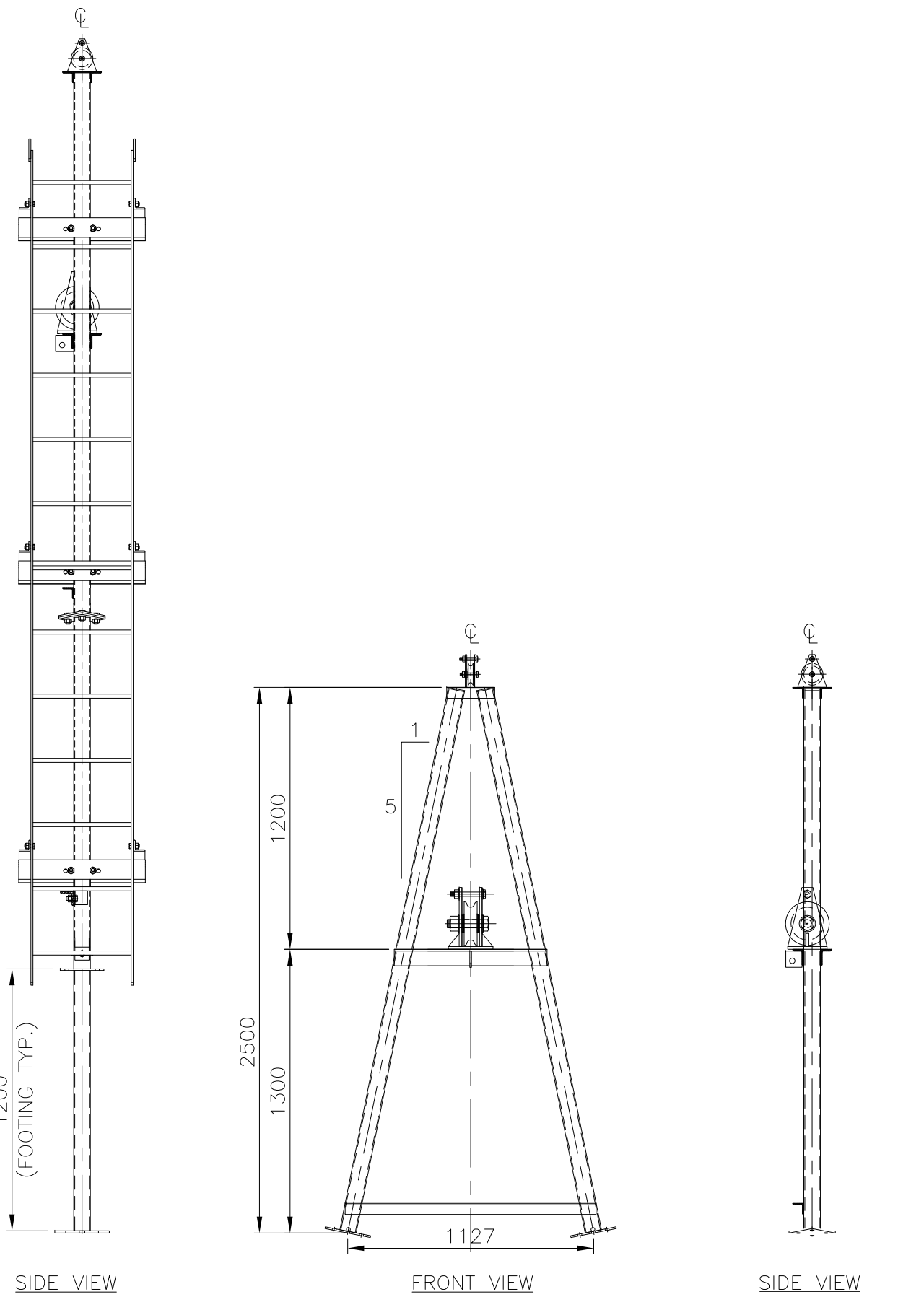
3.0 m LIGHT A-FRAME  
1:25

NOTES:

- ALL STEEL SHALL CONFORM TO CSA G40.21M STRUCTURAL QUALITY STEEL.
- ALL PARTS TO BE HOT DIP GALVANIZED AS PER ASTM A123/A123M.
- ALL NUTS AND BOLTS TO BE M16, A325M, GALVANIZED, UNLESS NOTED OTHERWISE.
- ALL BOLT HOLES TO BE DRILLED 2mm LARGER THAN BOLTS UNLESS NOTED OTHERWISE.
- THIS STRUCTURE IS DESIGNED FOR SPANS UP TO 150m WITH MAX. A-FRAME HEIGHT = 5m IN AREAS NOT SUBJECT TO HEAVY ICE OR SNOW LOADS OVER 4.5kN/m
- ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
- ALL TOLERANCES SHOULD BE CHECKED PRIOR TO SHIPMENT.
- LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
- LD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.
- FIELD MODIFY EXISTING PLATFORM RAILING TO CLEARANCE OF 457mm MIN. - 475mm MAX. FROM BACK OF RAILING POST TO O/S LADDER SIDE RAIL.

McELHANNEY NOTES

- ORIGINAL DESIGN BY ENVIRONMENT CANADA.
- McELHANNEY CHECKED AND APPROVED A-FRAME STRUCTURE ONLY, INCLUDING THE PLATFORM AND BRACING. ALL OTHER COMPONENTS SUCH AS SHEAVES, LADDER BRACKETS, CAR HOOKS, AND FOOTING PLATES ETC. WERE NOT REVIEWED. FOR DETAILS REFER TO LETTER REPORT DATED APRIL 27, 2000.
- MAXIMUM SNOW DEPTH ON PLATFORMS NOT TO EXCEED 30cm PRIOR TO PERFORMING HYDROMETRIC MEASUREMENTS.
- DESIGN LOAD = 2250 LBS. CONSISTING OF:
  - CABLE CAR - 200 LBS
  - METER REEL - 50 LBS
  - 2 PEOPLE - 400 LBS
  - B.S. OF METER CABLE - 1600 LBS
- 25.4mmø MAIN CABLE S.F. 3.8
- ENVIRONMENT CANADA MATERIAL LIST NOT VERIFIED.
- FOUNDATIONS NOT VERIFIED.
- SINGLE BOLT CONNECTIONS NOT APPROVED.
- LADDERS ARE DESIGNED TO MEET ANSI14.3-2008 REQUIREMENTS.
- LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.



1.5 m LIGHT A-FRAME TOP  
1:25

| No. | Date   | Revision                              | Dr. | Ch. |
|-----|--------|---------------------------------------|-----|-----|
| 2   | MAR/19 | ADDED PLATFORM RAILING CLEARANCE NOTE | WC  | BB  |
| 1   | MAR/19 | ISSUED FOR CONSTRUCTION               | WC  | BB  |

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**McElhanney**

McElhanney Consulting Services Ltd.  
203-502 Bow Valley Trail  
Canmore, AB T1W 1N9  
PH 403-609-3992

|               |           |                  |
|---------------|-----------|------------------|
| Designed: KEL | Checked:  | Date: MARCH 2010 |
| Drawn: LLP    | Surveyed: |                  |

SCALE : AS SHOWN

Approved Sealed

ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

**LIGHT DUTY A-FRAME**  
1.5, 3.0, 4.0, 5.0m A-FRAMES

Client Project No

MCSL Project No. 2111-01745-5

Drawing No.

**3182-1**

Revision 2

Destroy all prints bearing previous number





BILLS OF MATERIAL

| A COMPLETE 2 METRE A-FRAME ASSEMBLY<br>CONSISTS OF THE FOLLOWING: |  |         |                   |
|---|--|---------|-------------------|
| QTY   | DESCRIPTION                            | DWG No. | SUPPLIER          |
| 1   | A-FRAME TOP ASSEMBLY                   | 3136-4  | CONTRACTOR        |
| 1   | 2 METRE LEG ASSEMBLY                   | 3136-5  | CONTRACTOR        |
| 1   | 1.1 METRE HORIZONTAL<br>BRACE ASSEMBLY | 3136-6  | CONTRACTOR        |
| 1   | CAR HOOK ASSEMBLY LEG                  | 3136-10 | CONTRACTOR        |
| 2   | LADDER BRACKET ASSEMBLY                | 3136-10 | CONTRACTOR        |
| 1   | 3m LADDER                              | 3136-10 | OTHER<br>* W.S.C. |

EST. W.T. 217.0 kg

| A COMPLETE 3 METRE A-FRAME ASSEMBLY<br>CONSISTS OF THE FOLLOWING: |  |         |                   |
|---|--|---------|-------------------|
| QTY   | DESCRIPTION                            | DWG No. | SUPPLIER          |
| 1   | A-FRAME TOP ASSEMBLY                   | 3136-4  | CONTRACTOR        |
| 1   | 3 METRE LEG ASSEMBLY                   | 3136-5  | CONTRACTOR        |
| 1   | 1.5 METRE HORIZONTAL<br>BRACE ASSEMBLY | 3136-6  | CONTRACTOR        |
| 1   | CAR HOOK ASSEMBLY LEG                  | 3136-10 | CONTRACTOR        |
| 2   | LADDER BRACKET ASSEMBLY                | 3136-10 | CONTRACTOR        |
| 1   | 4m LADDER                              | 3136-10 | OTHER<br>* W.S.C. |

EST. W.T. 265.3 kg

| A COMPLETE 4 METRE A-FRAME ASSEMBLY<br>CONSISTS OF THE FOLLOWING: |  |         |                   |
|---|--|---------|-------------------|
| QTY   | DESCRIPTION                            | DWG No. | SUPPLIER          |
| 1   | A-FRAME TOP ASSEMBLY                   | 3136-4  | CONTRACTOR        |
| 1   | 4 METRE LEG ASSEMBLY                   | 3136-5  | CONTRACTOR        |
| 1   | 1.9 METRE HORIZONTAL<br>BRACE ASSEMBLY | 3136-6  | CONTRACTOR        |
| 1   | PLATFORM ASSEMBLY                      | 3136-9  | CONTRACTOR        |
| 1   | CAR HOOK ASSEMBLY LEG                  | 3136-10 | CONTRACTOR        |
| 2   | LADDER BRACKET ASSEMBLY                | 3136-10 | CONTRACTOR        |
| 1   | 2m LADDER                              | 3136-10 | OTHER<br>* W.S.C. |
| 1   | 3m LADDER                              |         |                   |

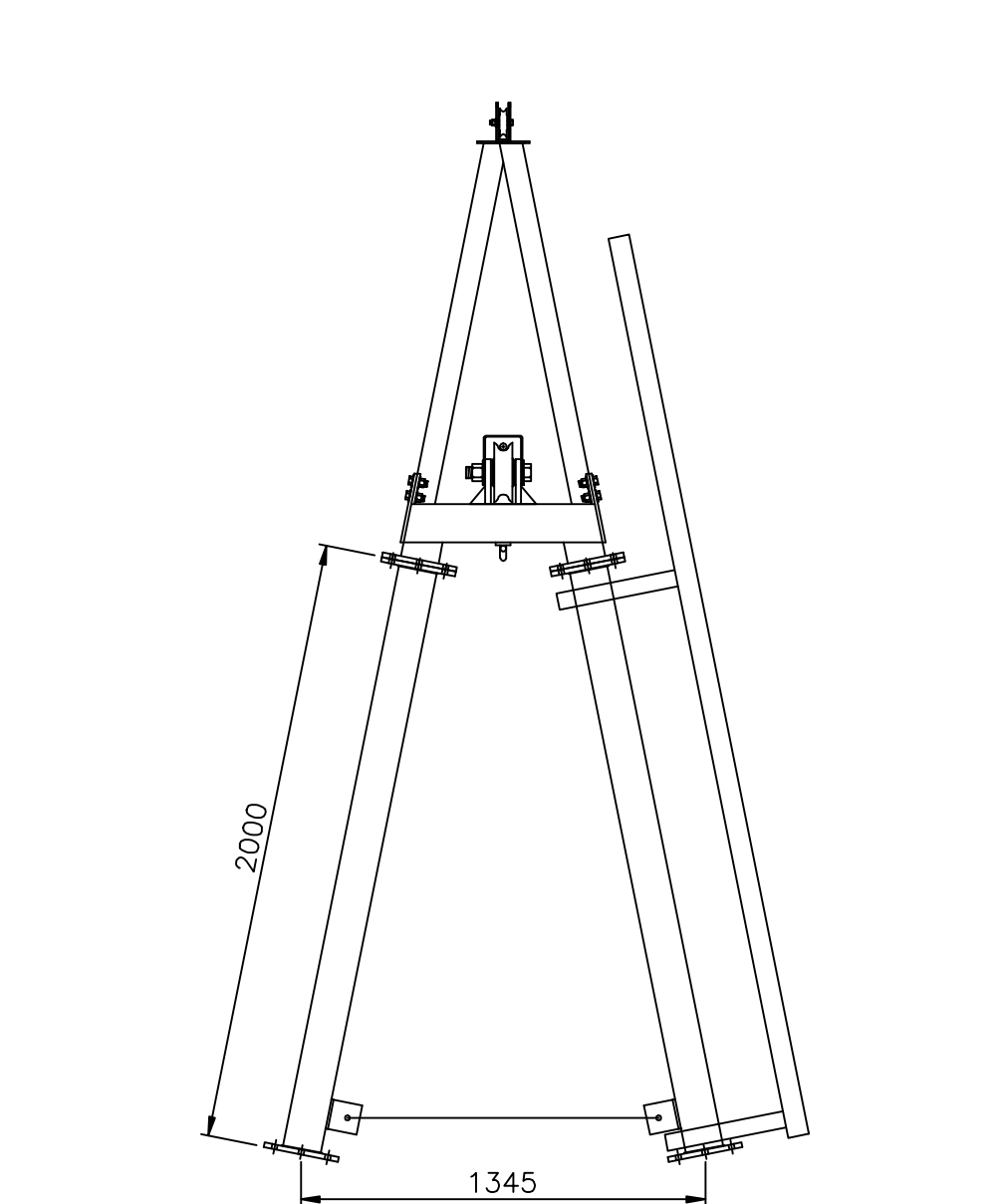
EST. W.T. 580.3 kg

| A COMPLETE 5 METRE A-FRAME ASSEMBLY<br>CONSISTS OF THE FOLLOWING: |  |         |                   |
|---|--|---------|-------------------|
| QTY   | DESCRIPTION                            | DWG No. | SUPPLIER          |
| 1   | A-FRAME TOP ASSEMBLY                   | 3136-4  | CONTRACTOR        |
| 1   | 4 METRE LEG ASSEMBLY                   | 3136-5  | CONTRACTOR        |
| 1   | 1 METRE LEG ASSEMBLY                   | 3136-5  | CONTRACTOR        |
| 1   | 1.9 METRE HORIZONTAL<br>BRACE ASSEMBLY | 3136-6  | CONTRACTOR        |
| 1   | PLATFORM ASSEMBLY                      | 3136-9  | CONTRACTOR        |
| 1   | CAR HOOK ASSEMBLY LEG                  | 3136-10 | CONTRACTOR        |
| 4   | LADDER BRACKET ASSEMBLY                | 3136-10 | CONTRACTOR        |
| 2   | 3m LADDERS                             |         | OTHER<br>* W.S.C. |

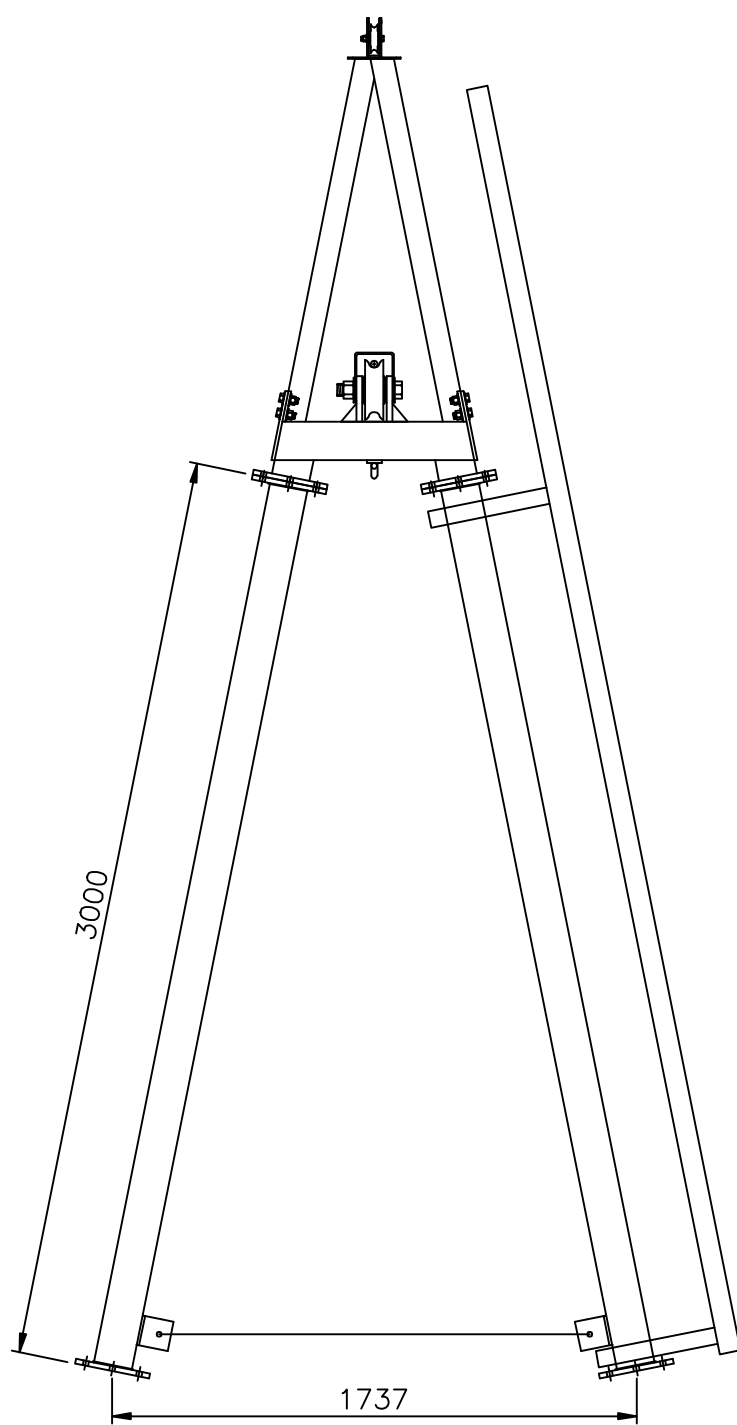
EST. W.T. 668.0 kg  
\* WATER SURVEY OF CANADA

| A COMPLETE 1 METRE A-FRAME ASSEMBLY<br>CONSISTS OF THE FOLLOWING: |                      |         |            |
|---|----------------------|---------|------------|
| QTY   | DESCRIPTION          | DWG No. | SUPPLIER   |
| 1   | A-FRAME TOP ASSEMBLY | 3136-4  | CONTRACTOR |
| 1   | 1 METRE LEG ASSEMBLY | 3136-5  | CONTRACTOR |

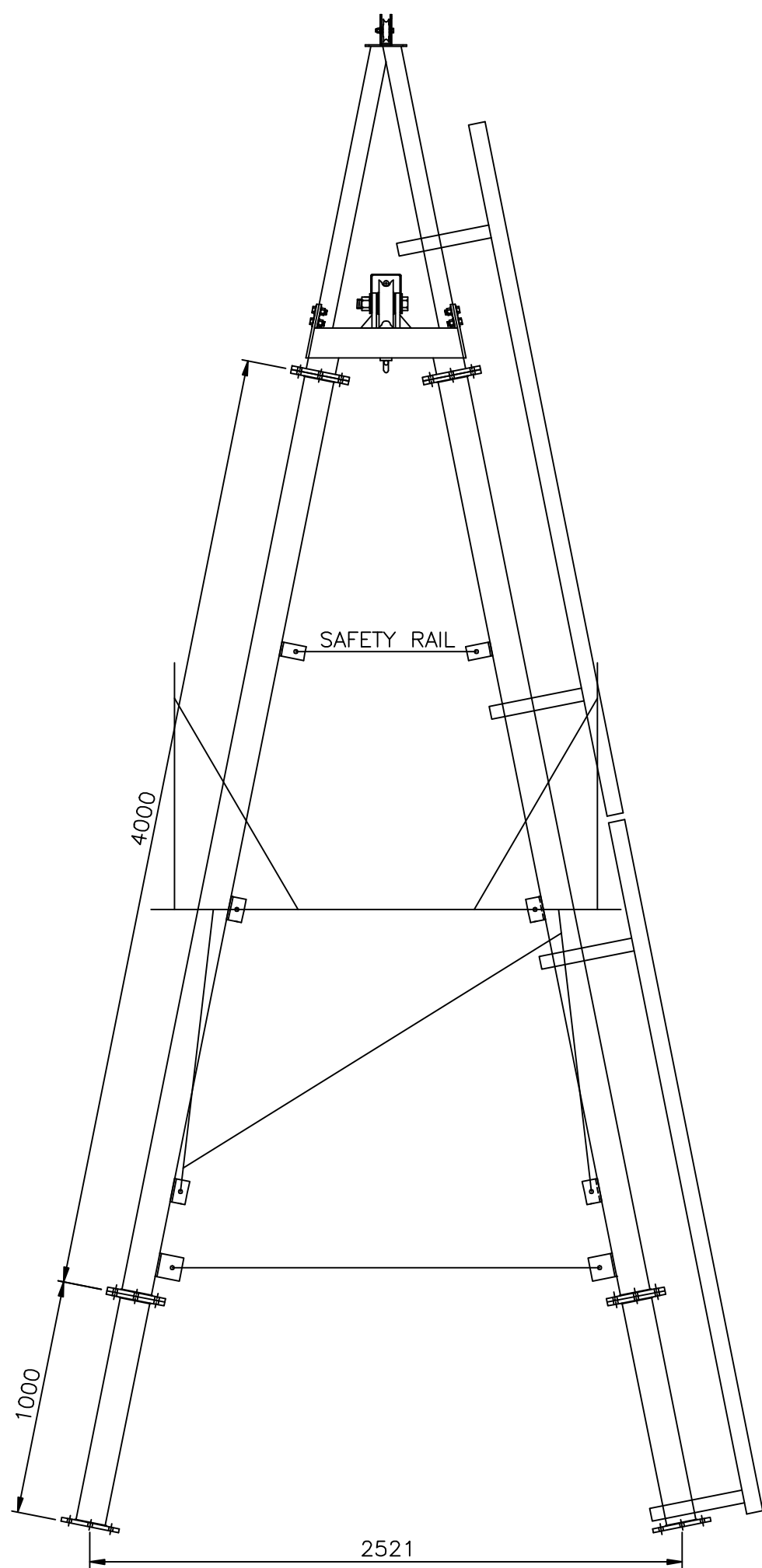
EST. W.T. 173.4 kg



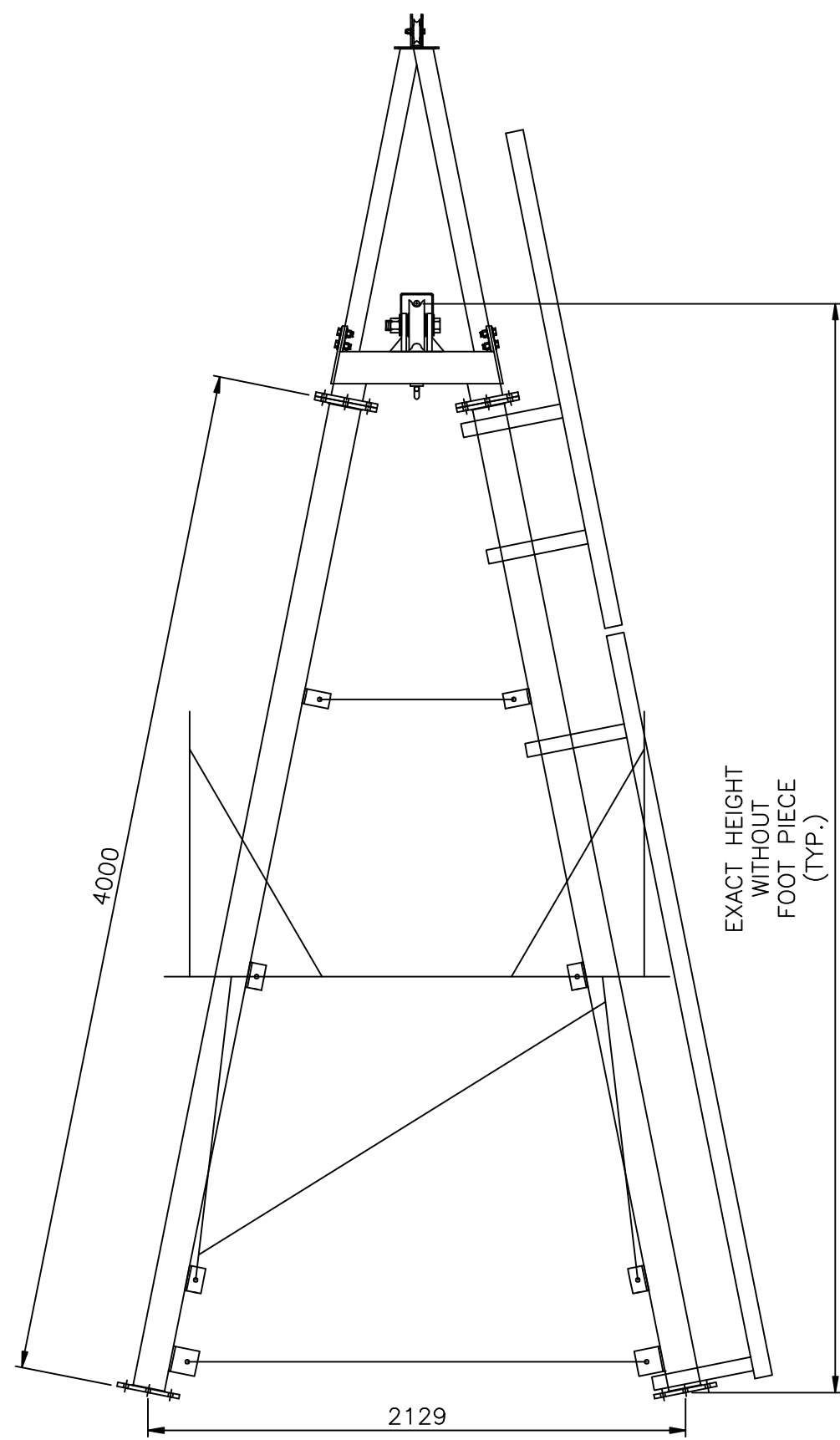
2 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 2.352 METRES (WITHOUT FOOT PIECE)



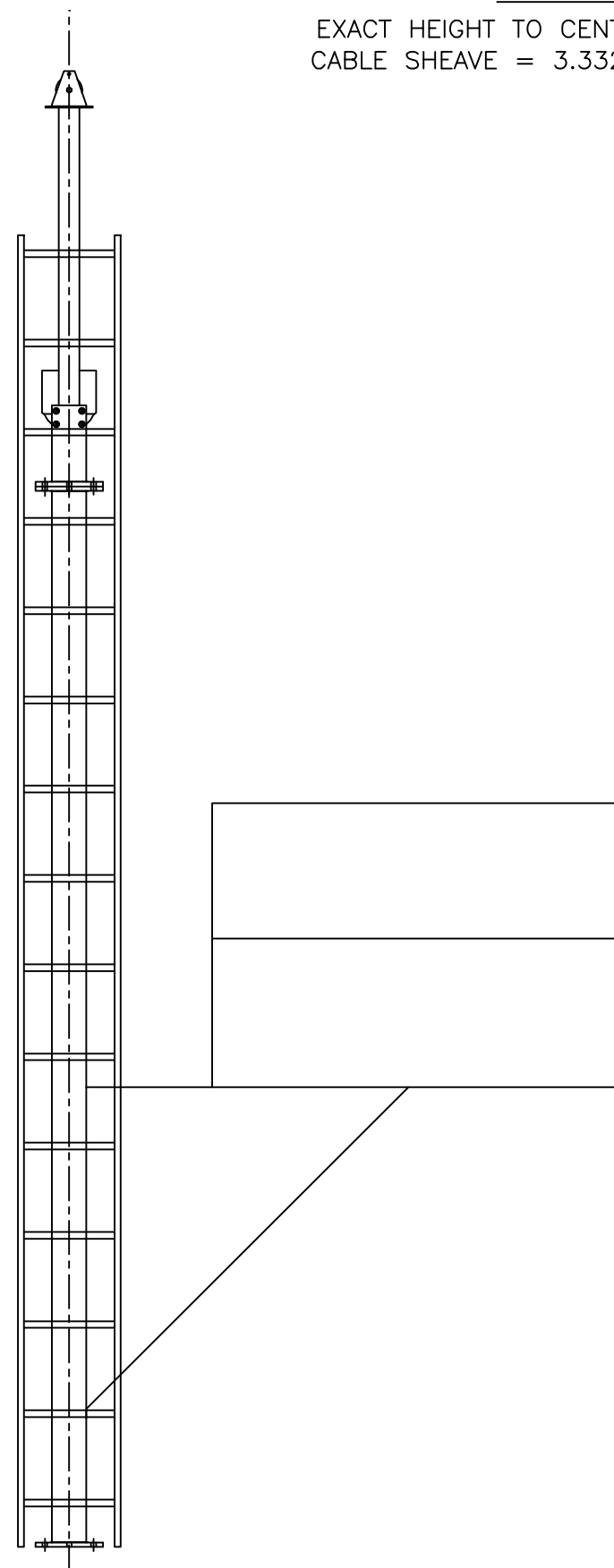
3 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 3.332 METRES (WITHOUT FOOT PIECE)



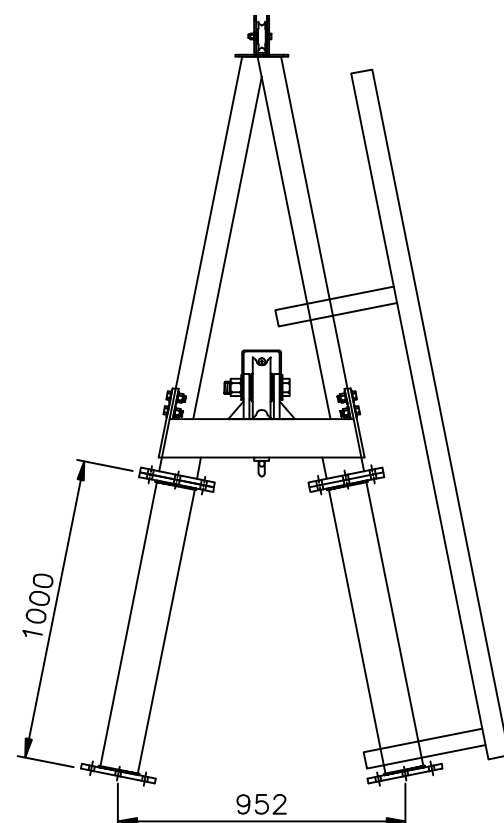
5 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 5.294 METRES (WITHOUT FOOT PIECE)



4 METRE A-FRAME  
(THIS SECTION IS TYPICAL OF ALL FRAMES OVER 4 METRES)  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 4.313 METRES (WITHOUT FOOT PIECE)



4 METRE A-FRAME SECTION



1 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 1.371 METRES (WITHOUT FOOT PIECE)

| DESIGN LOAD   |          |
|---|----------|
| CAR   | 200      |
| 2 MEN   | 400      |
| REEL  | 50       |
|   | 650 lbs. |
| PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY<br>ANGLE = 1600 lbs. BREAKING STRENGTH. |          |

NOTES:

1. ALL PARTS TO BE HOT-DIPPED GALVANIZED C.S.A. G-164.
2. ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED.
3. ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED.

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED

|     |         |                              |     |     |
|-----|---------|------------------------------|-----|-----|
|     |         |                              |     |     |
|     |         |                              |     |     |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |
| No. | Date    | Revision                     | Dr  | Ch  |



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13160-88 Ave., Surrey, B.C., Canada V3W 3K3 Telephone (604)596-0391  
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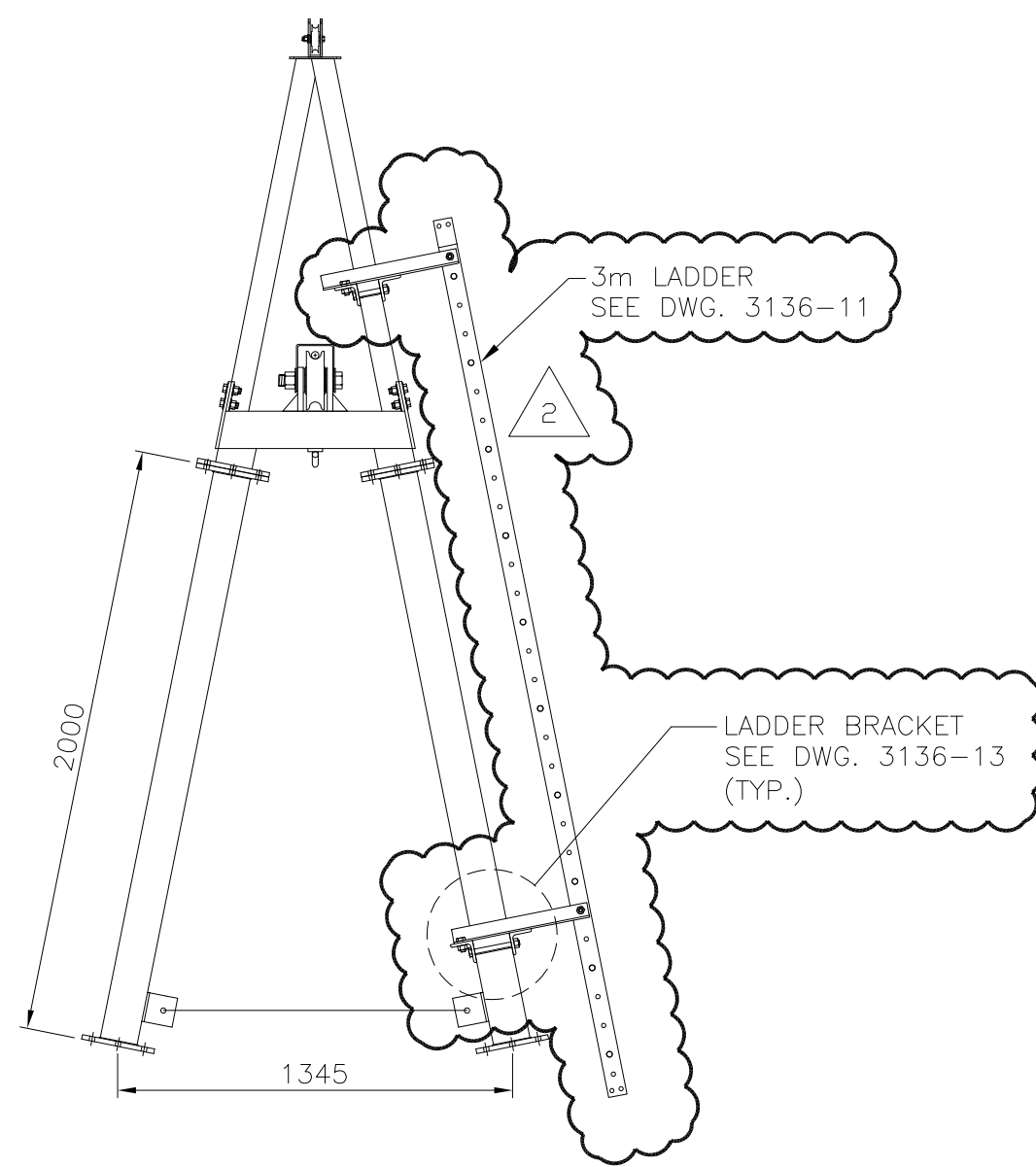
DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
1, 2, 3, 4, & 5 METRE HEIGHTS

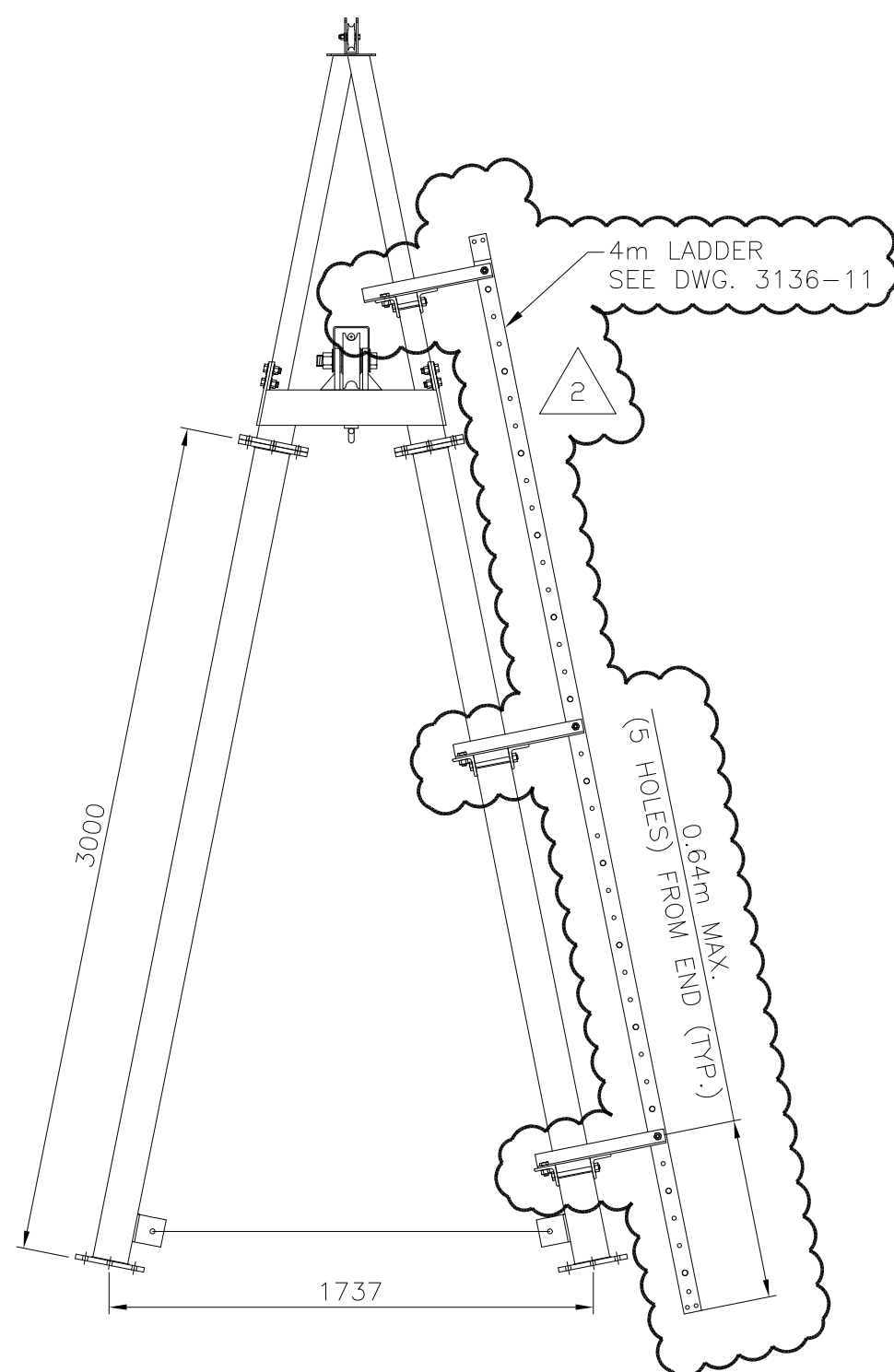
VANCOUVER, B.C.

|                 |                      |  |
|-----------------|----------------------|--|
| Designed D.O.E. | Job No. 2111-01745-1 | Drawing No.<br><br>3136-1<br><br>of 10 |
| Drawn K.D.W.    | Scale 1:25           |  |
| Checked A.A.W.  | Date APRIL 2002      |  |
| Approved        | Revision 1           |  |

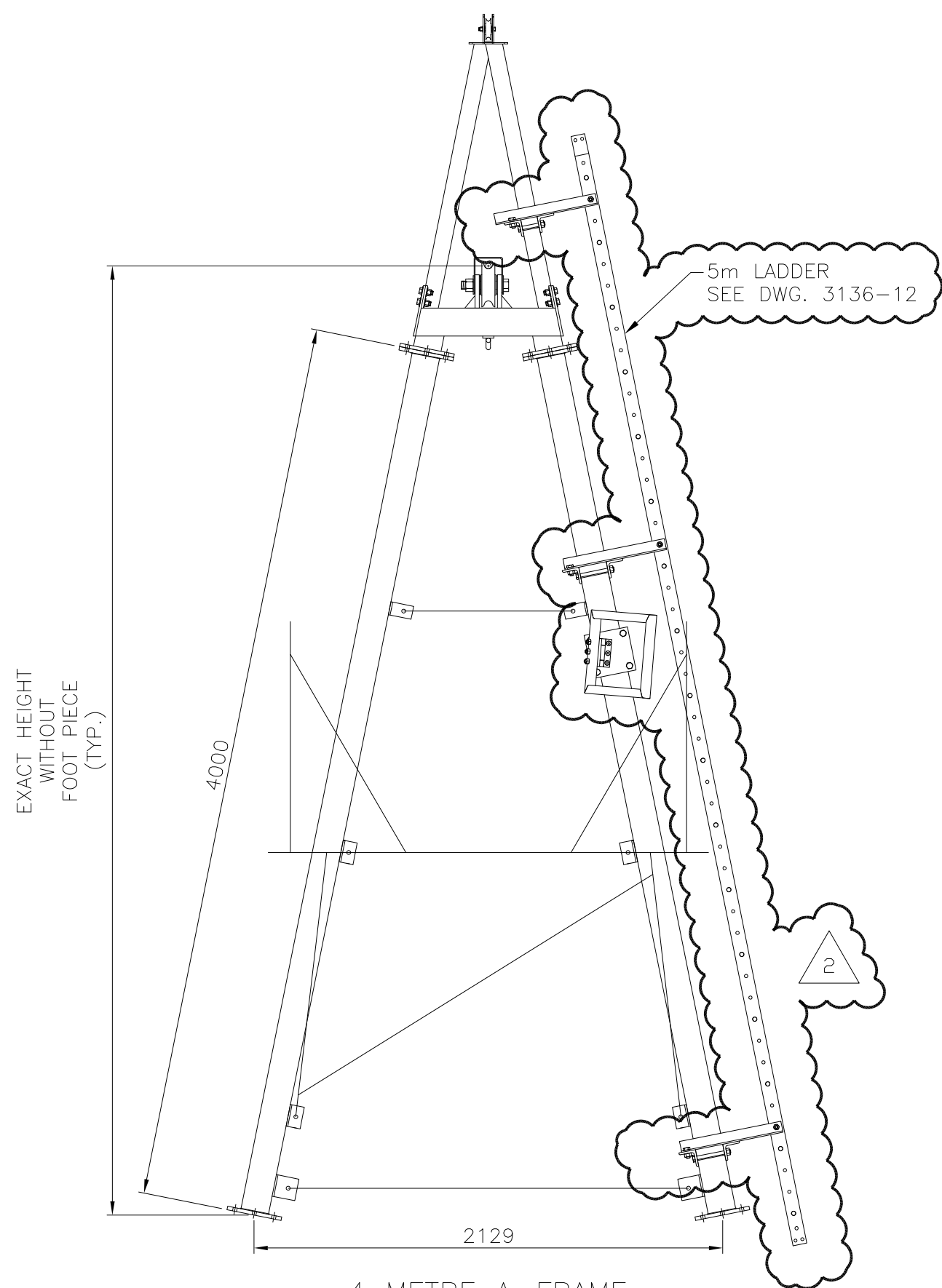




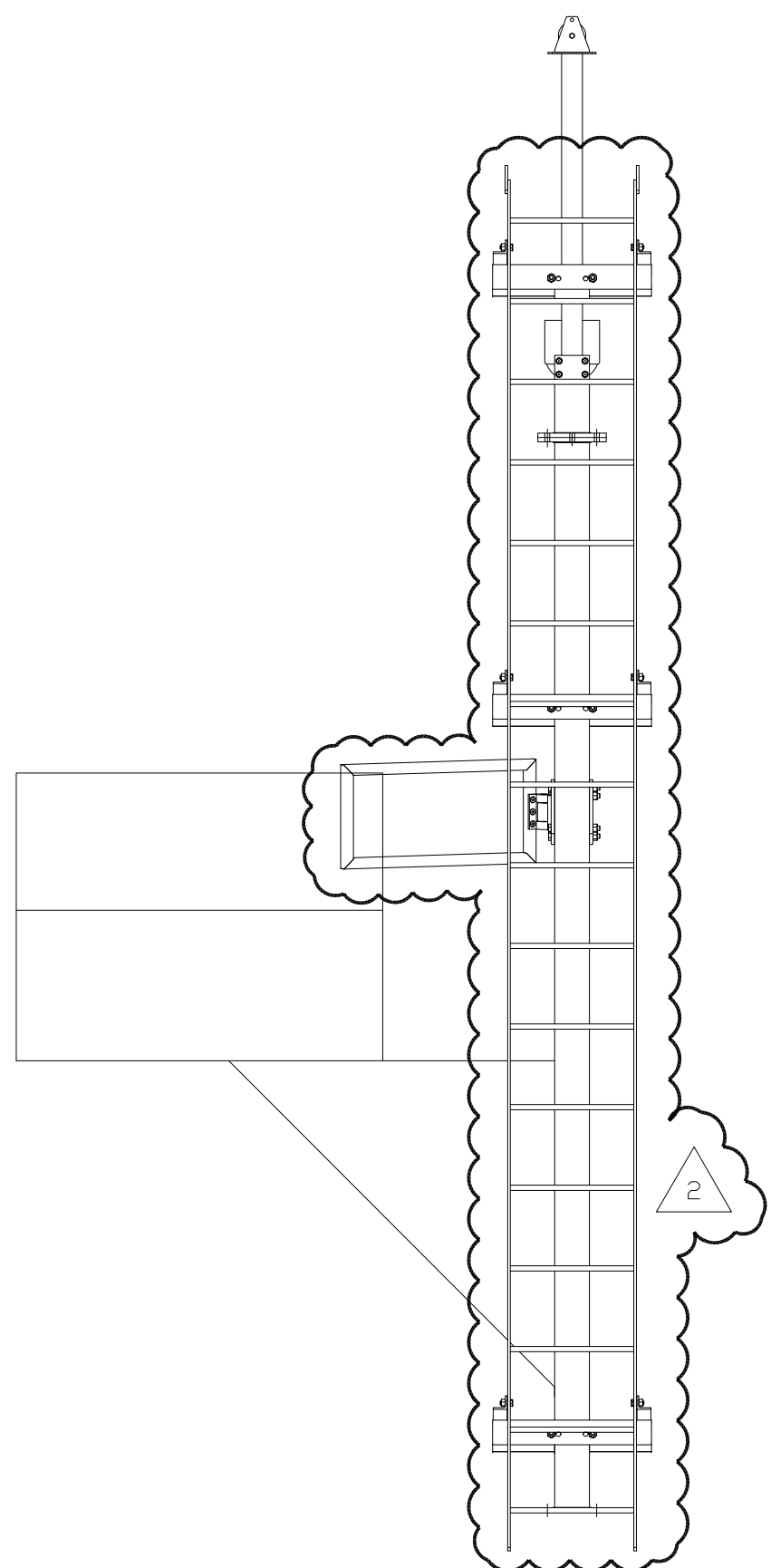
2 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN CABLE SHEAVE = 2.352 METRES (WITHOUT FOOT PIECE)



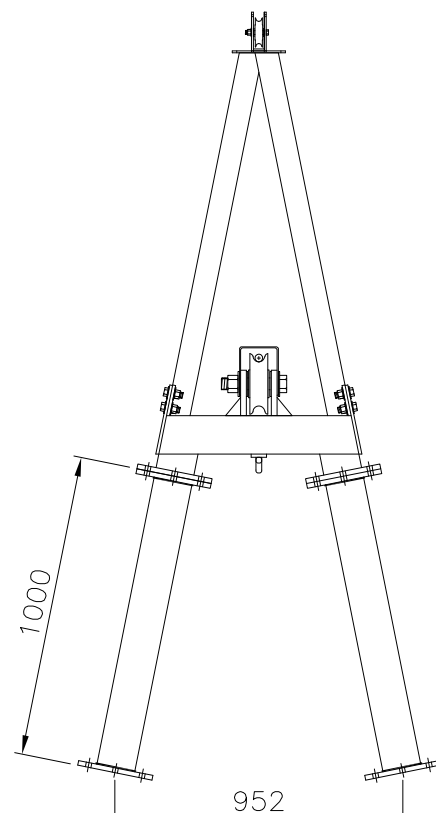
3 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN CABLE SHEAVE = 3.332 METRES (WITHOUT FOOT PIECE)



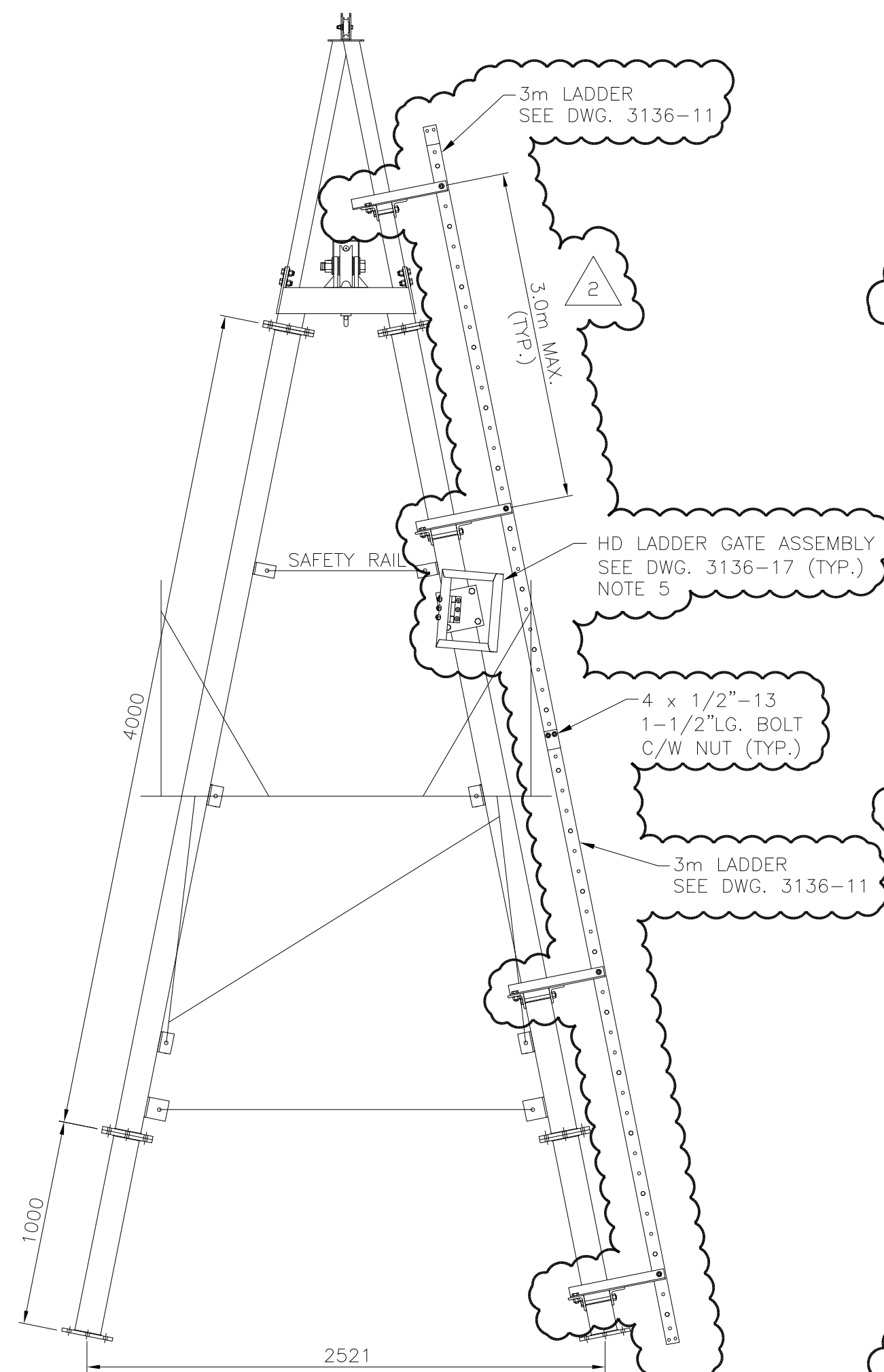
4 METRE A-FRAME  
(THIS SECTION IS TYPICAL OF ALL FRAMES OVER 4 METRES)  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN CABLE SHEAVE = 4.313 METRES (WITHOUT FOOT PIECE)



4 METRE A-FRAME SECTION



1 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN CABLE SHEAVE = 1.371 METRES (WITHOUT FOOT PIECE)



5 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN CABLE SHEAVE = 5.294 METRES (WITHOUT FOOT PIECE)

DESIGN LOAD

|       |          |
|-------|----------|
| CAR   | 200      |
| 2 MEN | 400      |
| REEL  | 50       |
|       | 650 lbs. |

PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY ANGLE = 1600 lbs. BREAKING STRENGTH.

NOTES:

1. ALL PARTS TO BE HOT-DIPPED GALVANIZED AS PER ASTM A123/A123M.
2. ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED, UNLESS OTHERWISE NOTED.
3. ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED, UNLESS OTHERWISE NOTED.
4. LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
5. HD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.
6. LADDERS ARE DESIGNED TO MEET ANSI14.3-2008 REQUIREMENTS.
7. LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED

BILLS OF MATERIAL

A COMPLETE 2 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 2 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.1 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 2   | LADDER BRACKET ASSEMBLY             | 3136-13 | CONTRACTOR |
| 1   | 3m LADDER                           | 3136-11 | CONTRACTOR |

A COMPLETE 3 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 3 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.5 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 3   | LADDER BRACKET ASSEMBLY             | 3136-13 | CONTRACTOR |
| 1   | 4m LADDER                           | 3136-11 | CONTRACTOR |

A COMPLETE 4 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                   | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 3   | LADDER BRACKET ASSEMBLY             | 3136-13 | CONTRACTOR |
| 1   | 5m LADDER                           | 3136-12 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY             | 3136-17 | CONTRACTOR |

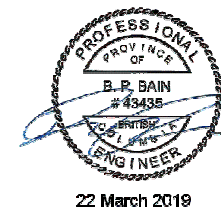
A COMPLETE 5 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                  | DWG No. | SUPPLIER   |
|-----|--|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 1 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 4   | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 2   | 3m LADDER                                    | 3136-11 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | —       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS            | —       | CONTRACTOR |

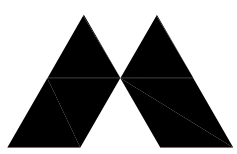
A COMPLETE 1 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION          | DWG No. | SUPPLIER   |
|-----|----------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY | 3136-4  | CONTRACTOR |
| 1   | 1 METRE LEG ASSEMBLY | 3136-5  | CONTRACTOR |

EST. W.T. 173.4 kg



|     |         |                              |     |     |
|-----|---------|------------------------------|-----|-----|
| No. | Date    | Revision                     | Dr  | Ch  |
| 2   | MAR/19  | ISSUED FOR CONSTRUCTION      | WC  | BB  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |



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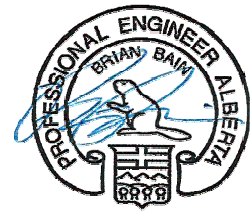
203-502 Bow Valley Trail, Canmore, AB, Canada T1W 1N9 Telephone 403-609-3992  
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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
1, 2, 3, 4, & 5 METRE HEIGHTS

VANCOUVER, B.C.

APEGA Perm# 06383



Designed D.O.E.

Drawn K.D.W.

Checked A.A.W.

Approved

Job No. 2111-01745-1

Scale 1:25

Date APRIL 2002

Revision 2

Drawing No.

3136-1

of 18

Destroy all prints bearing previous number—



BILLS OF MATERIAL

A COMPLETE 6 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                  | DWG No. | SUPPLIER   |
|-----|--|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 2 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | 2.7 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 4   | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 1   | 3m LADDER                                    | 3136-11 | CONTRACTOR |
| 1   | 4m LADDER                                    | 3136-11 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | -       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS            | -       | CONTRACTOR |

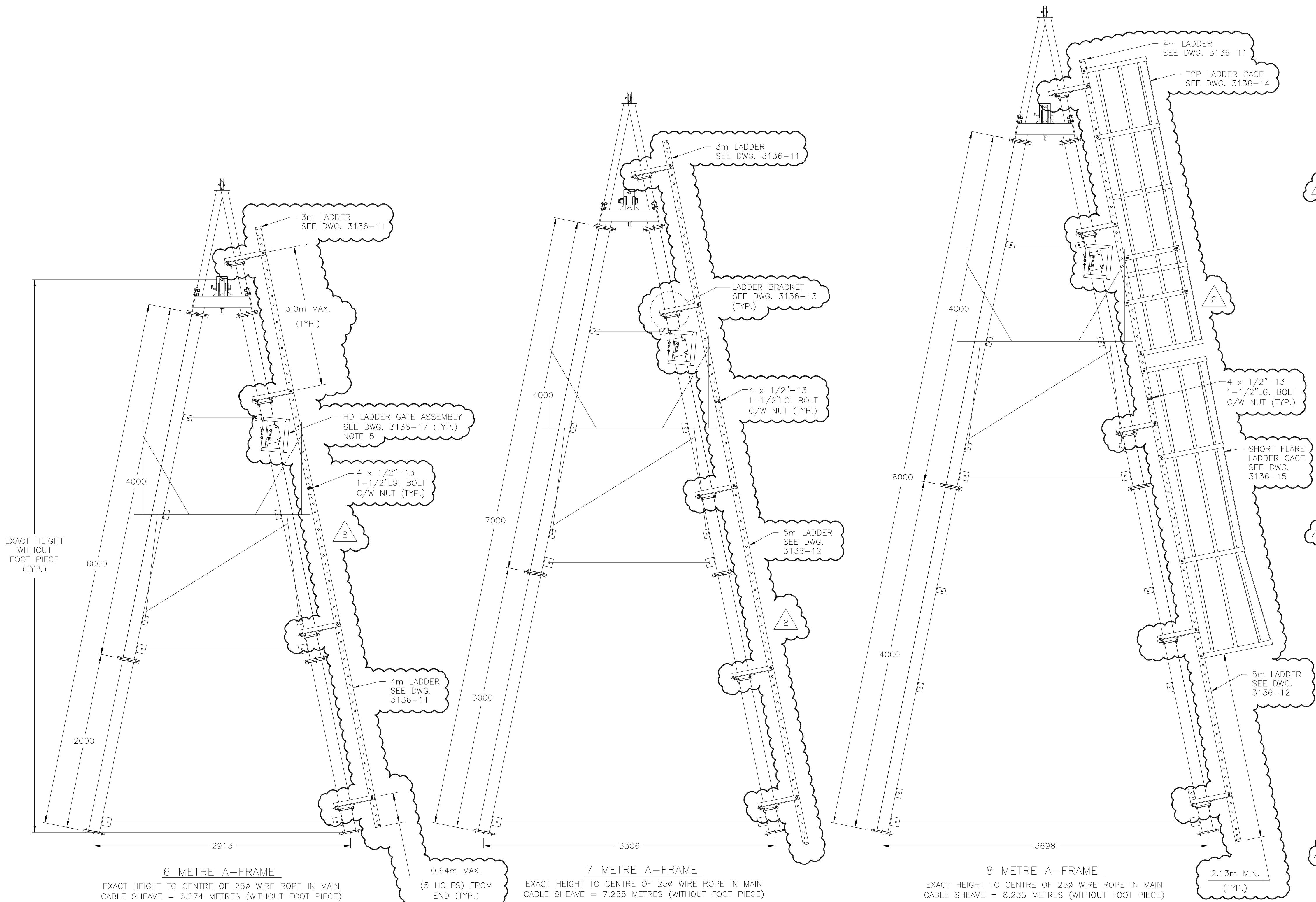
A COMPLETE 7 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                  | DWG No. | SUPPLIER   |
|-----|--|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 3 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | 3.1 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 5   | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 1   | 5m LADDER                                    | 3136-12 | CONTRACTOR |
| 1   | 3m LADDER                                    | 3136-11 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | -       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS            | -       | CONTRACTOR |

A COMPLETE 8 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                  | DWG No. | SUPPLIER   |
|-----|--|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                         | 3136-4  | CONTRACTOR |
| 2   | 4 METRE LEG ASSEMBLY                         | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | 3.5 METRE HORIZONTAL BRACE ASSEMBLY          | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                            | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                        | 3136-10 | CONTRACTOR |
| 5   | LADDER BRACKET ASSEMBLY                      | 3136-13 | CONTRACTOR |
| 1   | 4m LADDER                                    | 3136-11 | CONTRACTOR |
| 1   | 5m LADDER                                    | 3136-12 | CONTRACTOR |
| 1   | TOP LADDER CAGE                              | 3136-14 | CONTRACTOR |
| 1   | SHORT FLARE LADDER CAGE                      | 3136-15 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                      | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS | -       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS            | -       | CONTRACTOR |

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED



NOTES:

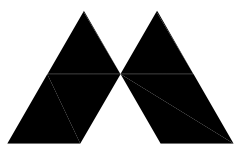
1. ALL PARTS TO BE HOT-DIPPED GALVANIZED AS PER ASTM A123/A123M.
2. ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED, UNLESS OTHERWISE NOTED.
3. ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED, UNLESS OTHERWISE NOTED.
4. LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
5. HD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.
6. LADDERS ARE DESIGNED TO MEET ANSI14.3-2008 REQUIREMENTS.
7. LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.

DESIGN LOAD

|       |          |
|-------|----------|
| CAR   | 200      |
| 2 MEN | 400      |
| REEL  | 50       |
|       | 650 lbs. |

PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY  
ANGLE = 1600 lbs. BREAKING STRENGTH.

| No. | Date    | Revision                     | Dr  | Ch  |
|-----|---------|------------------------------|-----|-----|
| 2   | MAR/19  | ISSUED FOR CONSTRUCTION      | WC  | BB  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |



**McElhanney**

McElhanney Consulting Services Ltd.

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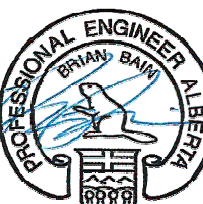
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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
6, 7, & 8 METRES

VANCOUVER, B.C.

APEGA Permit# 06383



Designed D.O.E.

Drawn K.D.W.

Checked A.A.W.

Approved

Job No. 2111-01745-1

Scale 1:25

Date APRIL 2002

Revision 2

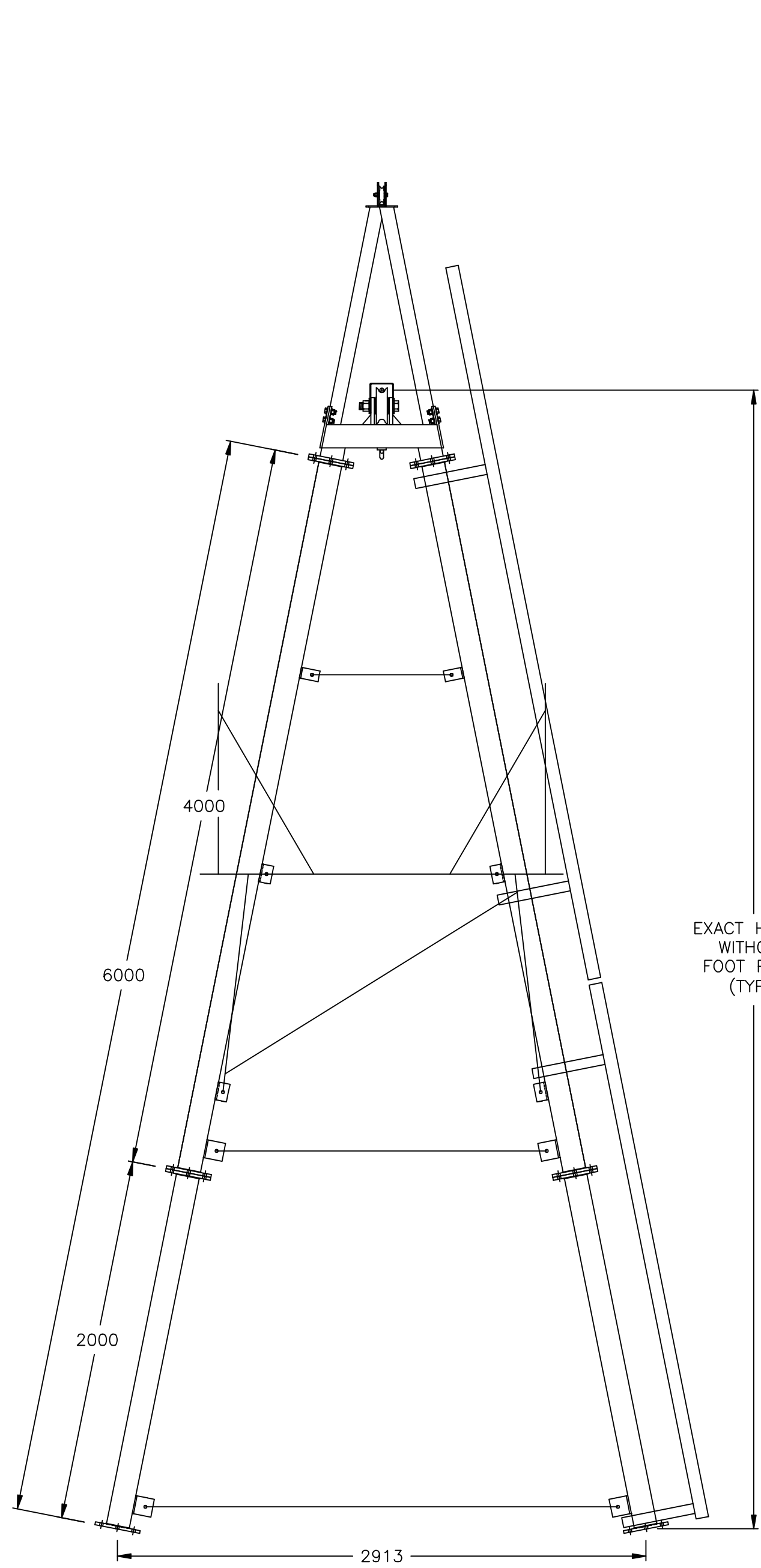
Drawing No.

3136-2

of 18

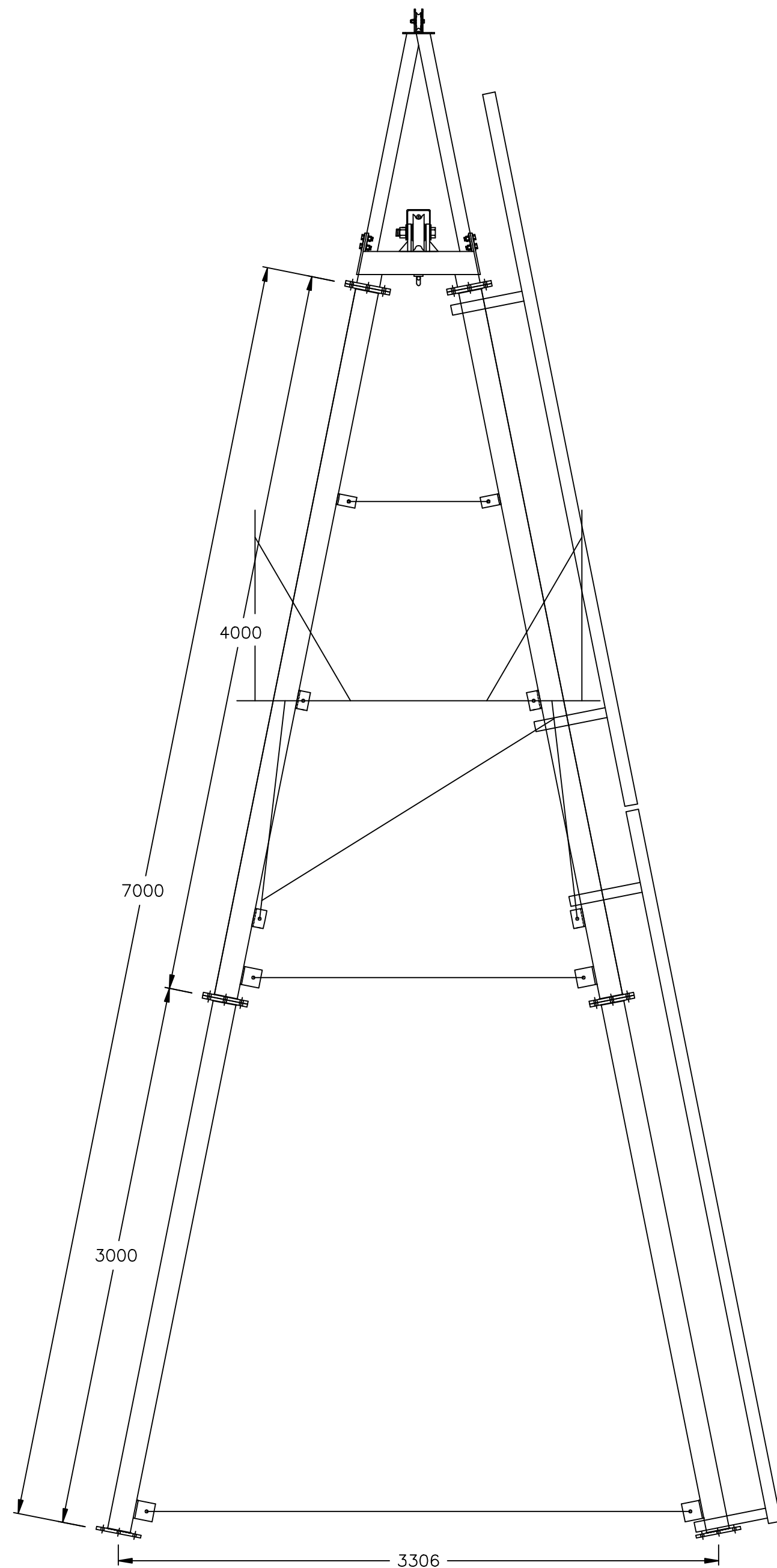
Destroy all prints bearing previous number.





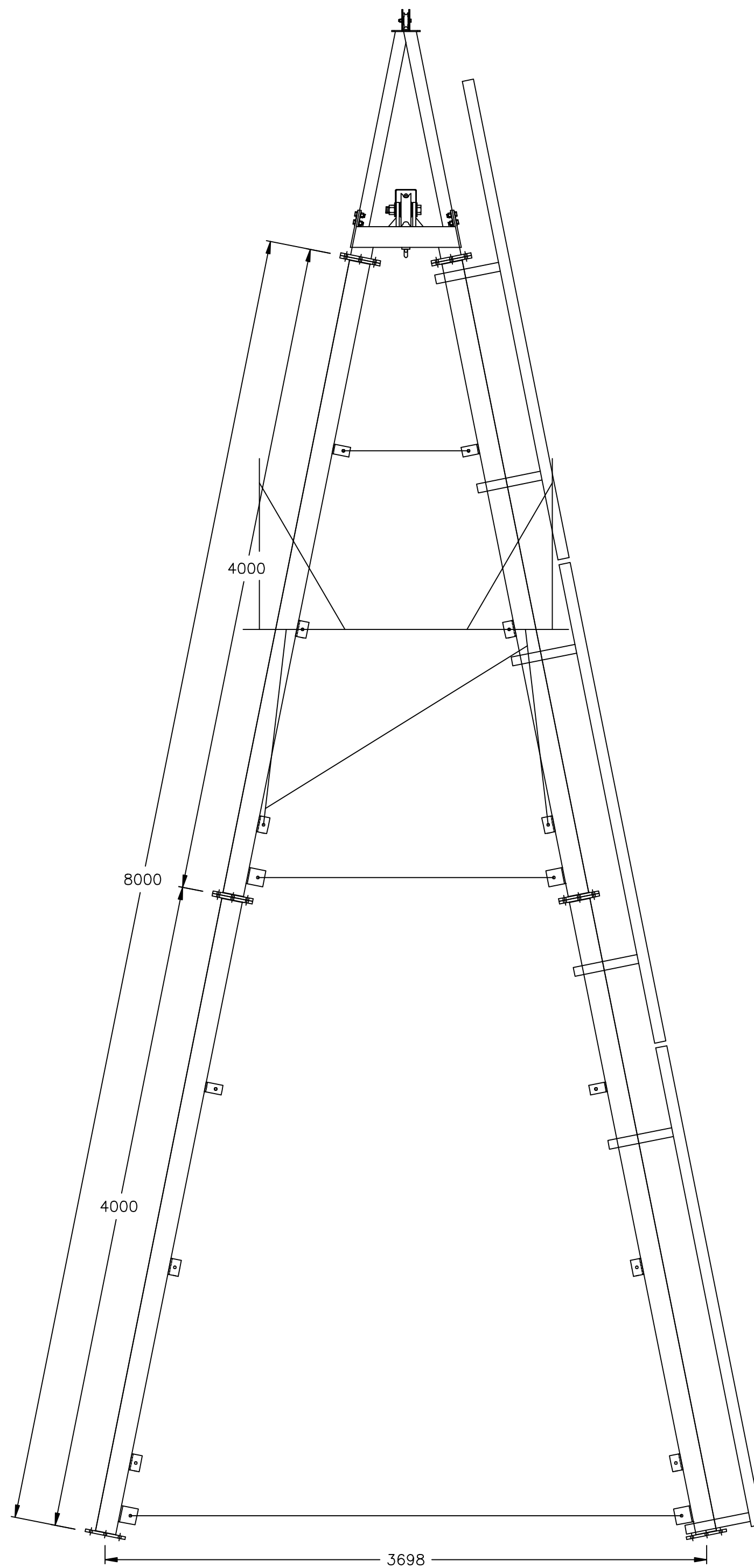
6 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN CABLE SHEAVE = 6.274 METRES (WITHOUT FOOT PIECE)



7 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN CABLE SHEAVE = 7.255 METRES (WITHOUT FOOT PIECE)



8 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN CABLE SHEAVE = 8.235 METRES (WITHOUT FOOT PIECE)

DESIGN LOAD

|       |          |
|-------|----------|
| CAR   | 200      |
| 2 MEN | 400      |
| REEL  | 50       |
|       | 650 lbs. |

PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY ANGLE = 1600 lbs. BREAKING STRENGTH.

NOTES:

1. ALL PARTS TO BE HOT-DIPPED GALVANIZED C.S.A. G-164.
2. ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED.
3. ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED.

BILLS OF MATERIAL

A COMPLETE 6 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 2 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | 2.7 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                   | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 4   | LADDER BRACKET ASSEMBLY             | 3136-10 | CONTRACTOR |
| 1   | 4m LADDER                           | 3136-10 | OTHER      |
| 1   | 3m LADDER                           |         | * W.S.C.   |

EST. W.T. 718.1 kg

A COMPLETE 7 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 3 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | 3.1 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                   | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 4   | LADDER BRACKET ASSEMBLY             | 3136-10 | CONTRACTOR |
| 2   | 4m LADDERS                          | 3136-10 | OTHER      |
|     |                                     |         | * W.S.C.   |

EST. W.T. 763.6 kg

A COMPLETE 8 METRE A-FRAME ASSEMBLY CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                         | DWG No. | SUPPLIER   |
|-----|-------------------------------------|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                | 3136-4  | CONTRACTOR |
| 2   | 4 METRE LEG ASSEMBLY                | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | 3.5 METRE HORIZONTAL BRACE ASSEMBLY | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                   | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG               | 3136-10 | CONTRACTOR |
| 6   | LADDER BRACKET ASSEMBLY             | 3136-10 | CONTRACTOR |
| 3   | 3m LADDERS                          | 3136-10 | OTHER      |
|     |                                     |         | * W.S.C.   |

EST. W.T. 811.3 kg  
\* WATER SURVEY OF CANADA

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED



**McElhanney**

McElhanney Consulting Services Ltd.

13160-88 Ave., Surrey, B.C., Canada V3W 3K3 Telephone (604)596-0391

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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
6, 7, & 8 METRES

VANCOUVER, B.C.

Designed D.O.E.

Job No. 2111-01745-1

Drawing No.

Drawn K.D.W.

Scale 1:25

3136-2

Checked A.A.W.

Date APRIL 2002

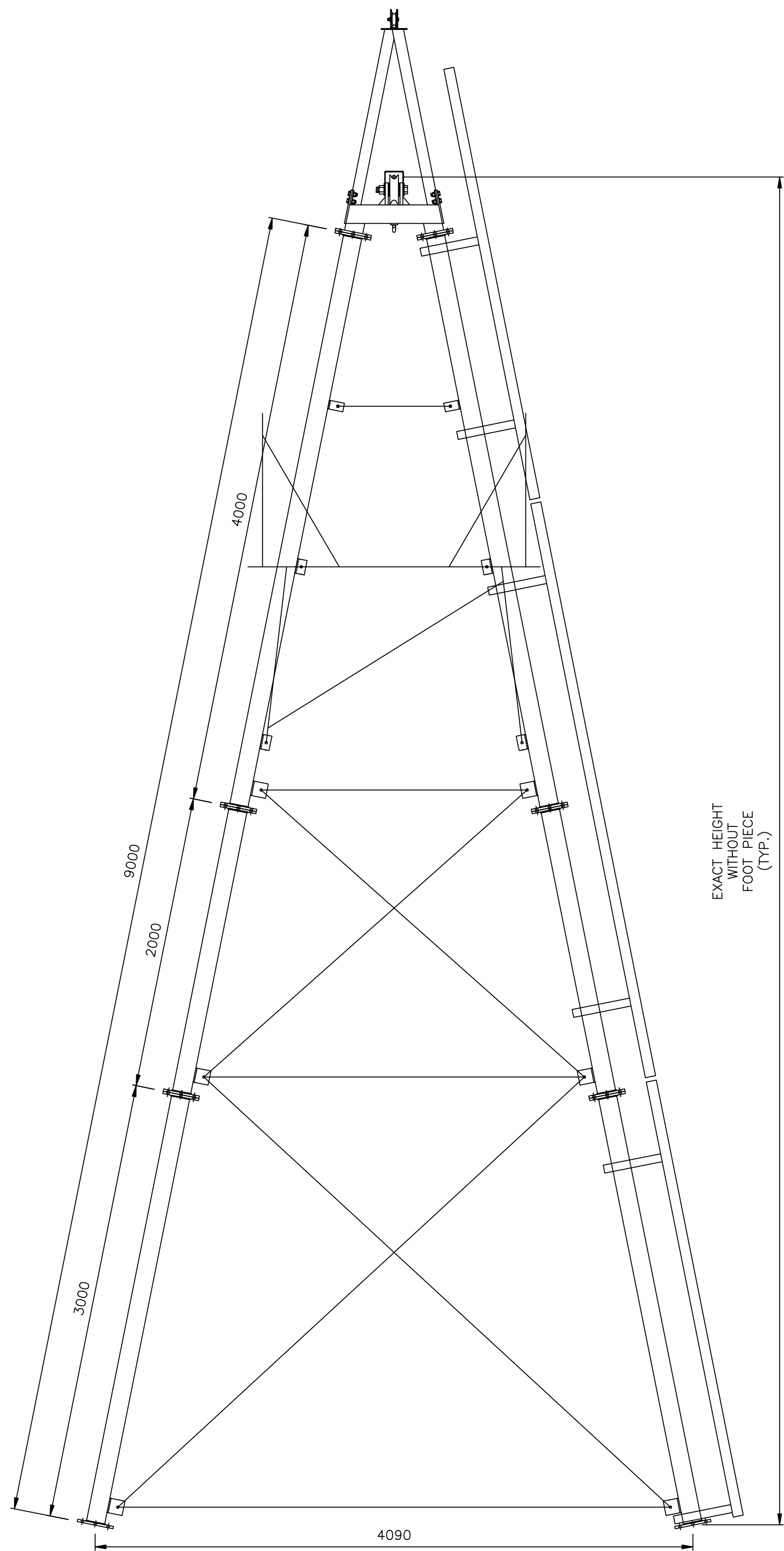
of 10

Approved

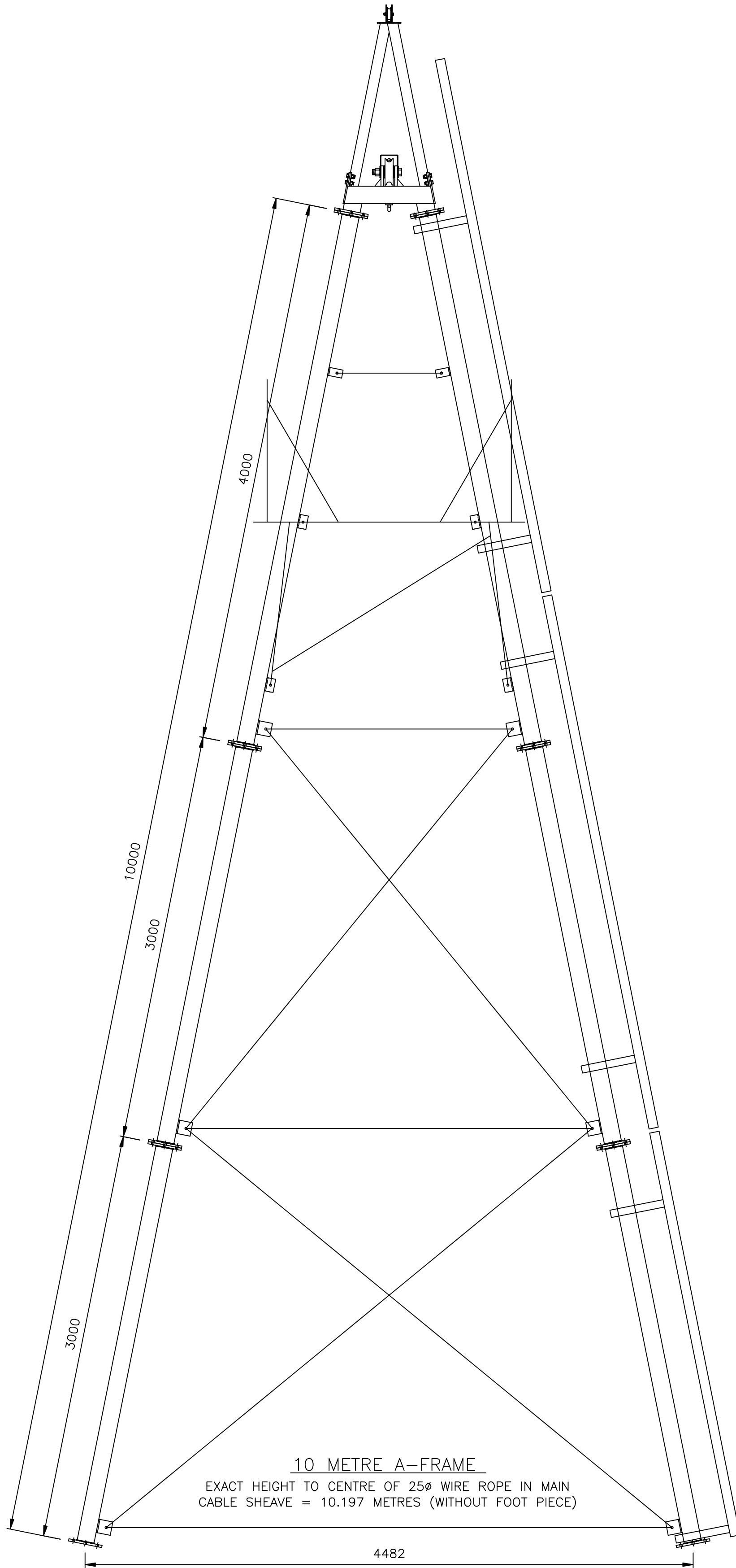
Revision 1

Destroy all prints bearing previous number-T

|     |         |                              |     |     |  |
|-----|---------|------------------------------|-----|-----|--|
|     |         |                              |     |     |  |
|     |         |                              |     |     |  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |  |
| No. | Date    | Revision                     | Dr  | Ch  |  |



9 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 9.216 METRES (WITHOUT FOOT PIECE)



10 METRE A-FRAME  
EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 10.197 METRES (WITHOUT FOOT PIECE)

BILLS OF MATERIAL

| A COMPLETE 9 METRE A-FRAME ASSEMBLY<br>CONSISTS OF THE FOLLOWING: |   |         |                   |
|---|---|---------|-------------------|
| QTY   | DESCRIPTION                                     | DWG No. | SUPPLIER          |
| 1   | A-FRAME TOP ASSEMBLY                            | 3136-4  | CONTRACTOR        |
| 1   | 4 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR        |
| 1   | 2 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR        |
| 1   | 3 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR        |
| 1   | 1.9 METRE HORIZONTAL<br>BRACE ASSEMBLY          | 3136-6  | CONTRACTOR        |
| 1   | 2.7 METRE HORIZONTAL<br>BRACE ASSEMBLY          | 3136-6  | CONTRACTOR        |
| 1   | 3.9 METRE HORIZONTAL<br>BRACE ASSEMBLY          | 3136-6  | CONTRACTOR        |
| 1   | LATERAL BRACING ASSEMBLY<br>FOR 9 METRE A-FRAME | 3136-6  | CONTRACTOR        |
| 1   | PLATFORM ASSEMBLY                               | 3136-9  | CONTRACTOR        |
| 1   | CAR HOOK ASSEMBLY LEG                           | 3136-10 | CONTRACTOR        |
| 6   | LADDER BRACKET ASSEMBLY                         | 3136-10 | CONTRACTOR        |
| 1<br>2  | 4m LADDER<br>3m LADDERS                         | 3136-10 | OTHER<br>* W.S.C. |

EST. W.T. 980.7 kg  
\* WATER SURVEY OF CANADA

| A COMPLETE 10 METRE A-FRAME ASSEMBLY<br>CONSISTS OF THE FOLLOWING: |  |         |                   |
|--|--|---------|-------------------|
| QTY  | DESCRIPTION                                      | DWG No. | SUPPLIER          |
| 1  | A-FRAME TOP ASSEMBLY                             | 3136-4  | CONTRACTOR        |
| 1  | 4 METRE LEG ASSEMBLY                             | 3136-5  | CONTRACTOR        |
| 2  | 3 METRE LEG ASSEMBLY                             | 3136-5  | CONTRACTOR        |
| 1  | 1.9 METRE HORIZONTAL<br>BRACE ASSEMBLY           | 3136-6  | CONTRACTOR        |
| 1  | 3.1 METRE HORIZONTAL<br>BRACE ASSEMBLY           | 3136-6  | CONTRACTOR        |
| 1  | 4.2 METRE HORIZONTAL<br>BRACE ASSEMBLY           | 3136-6  | CONTRACTOR        |
| 1  | LATERAL BRACING ASSEMBLY<br>FOR 10 METRE A-FRAME | 3136-6  | CONTRACTOR        |
| 1  | PLATFORM ASSEMBLY                                | 3136-9  | CONTRACTOR        |
| 1  | CAR HOOK ASSEMBLY LEG                            | 3136-10 | CONTRACTOR        |
| 6  | LADDER BRACKET ASSEMBLY                          | 3136-10 | CONTRACTOR        |
| 1<br>2   | 3m LADDER<br>4m LADDERS                          | 3136-10 | OTHER<br>* W.S.C. |

EST. W.T. 1056.9 kg

NOTES:

1. ALL PARTS TO BE HOT-DIPPED GALVANIZED C.S.A. G-164.
2. ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED.
3. ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED.

| DESIGN LOAD   |          |
|---|----------|
| CAR   | 200      |
| 2 MEN   | 400      |
| REEL  | 50       |
|   | 650 lbs. |
| PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY<br>ANGLE = 1600 lbs. BREAKING STRENGTH. |          |

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED

| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |  |
|-----|---------|------------------------------|-----|-----|--|
| No. | Date    | Revision                     | Dr  | Ch  |  |



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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

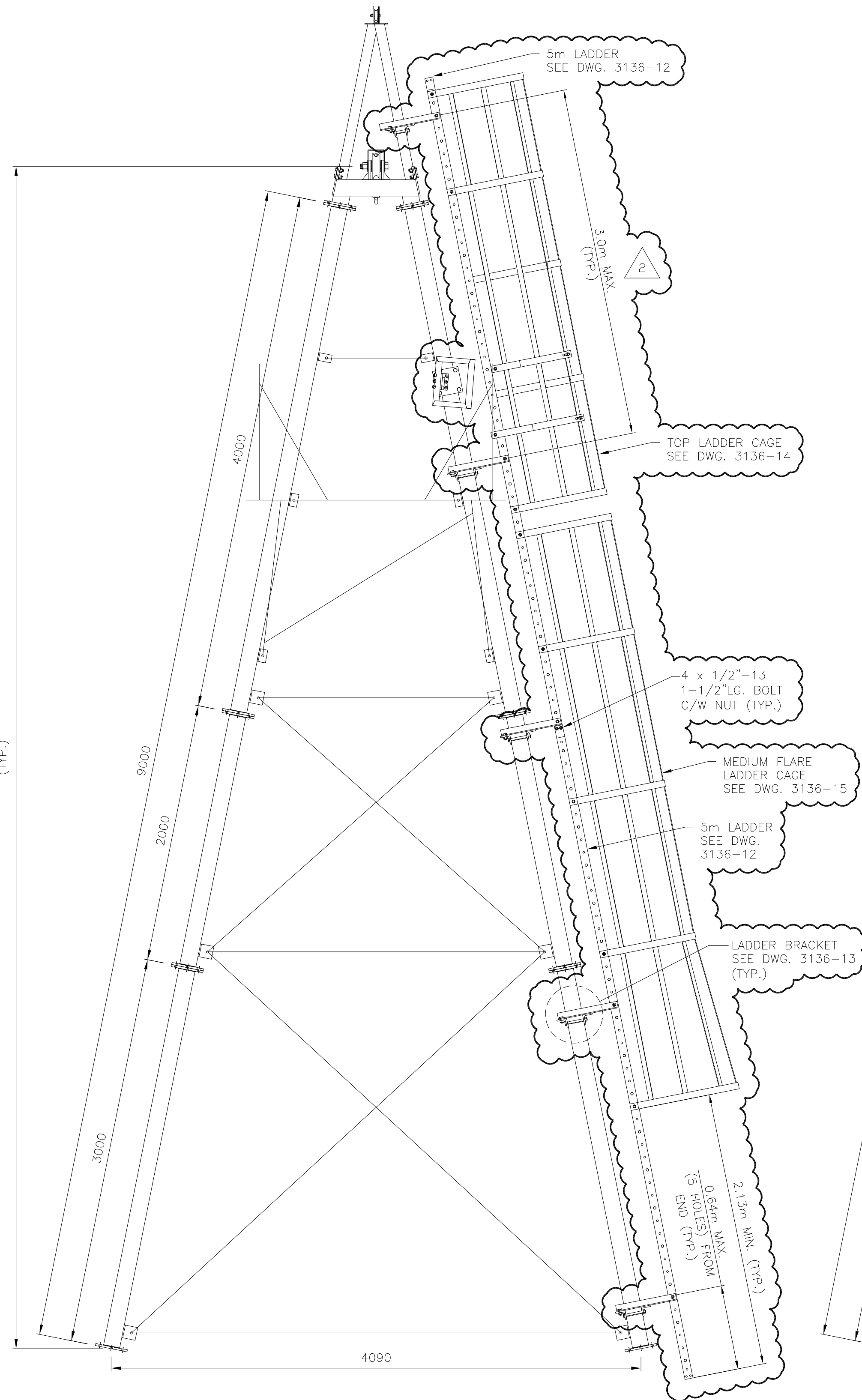
HEAVY DUTY A-FRAMES  
9 & 10 METRES

VANCOUVER, B.C.

|                 |                      |  |
|-----------------|----------------------|--|
| Designed D.O.E. | Job No. 2111-01745-1 | Drawing No.<br><br>3136-3<br><br>of 10 |
| Drawn K.D.W.    | Scale 1:25           |  |
| Checked A.A.W.  | Date APRIL 2002      |  |
| Approved        | Revision 1           |  |

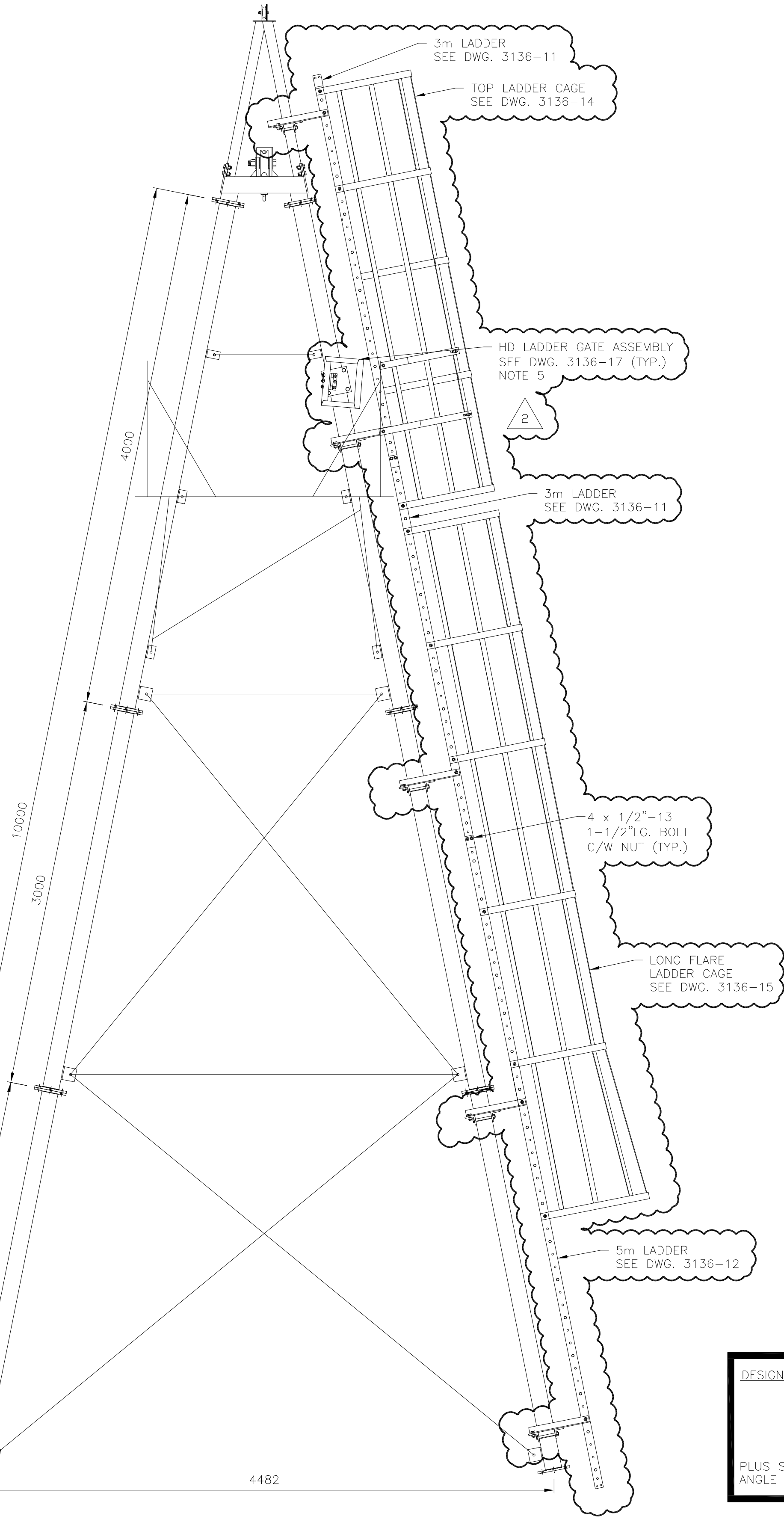


EXACT HEIGHT  
WITHOUT  
FOOT PIECE  
(TYP.)



#### 9 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 9.216 METRES (WITHOUT FOOT PIECE)



#### 10 METRE A-FRAME

EXACT HEIGHT TO CENTRE OF 25Ø WIRE ROPE IN MAIN  
CABLE SHEAVE = 10.197 METRES (WITHOUT FOOT PIECE)

#### DESIGN LOAD

|       |          |
|-------|----------|
| CAR   | 200      |
| 2 MEN | 400      |
| REEL  | 50       |
|       | 650 lbs. |

PLUS SNAG LOAD OF 1/8" WIRE ROPE AT ANY  
ANGLE = 1600 lbs. BREAKING STRENGTH.



ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED

## BILLS OF MATERIAL

A COMPLETE 9 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                     | DWG No. | SUPPLIER   |
|-----|---|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                            | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR |
| 1   | 2 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR |
| 1   | 3 METRE LEG ASSEMBLY                            | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY             | 3136-6  | CONTRACTOR |
| 1   | 2.7 METRE HORIZONTAL BRACE ASSEMBLY             | 3136-6  | CONTRACTOR |
| 1   | 3.9 METRE HORIZONTAL BRACE ASSEMBLY             | 3136-6  | CONTRACTOR |
| 1   | LATERAL BRACING ASSEMBLY FOR 9<br>METRE A-FRAME | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                               | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                           | 3136-10 | CONTRACTOR |
| 5   | LADDER BRACKET ASSEMBLY                         | 3136-13 | CONTRACTOR |
| 2   | 5m LADDER                                       | 3136-12 | CONTRACTOR |
| 1   | TOP LADDER CAGE                                 | 3136-14 | CONTRACTOR |
| 1   | MEDIUM FLARE LADDER CAGE                        | 3136-15 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                         | 3136-17 | CONTRACTOR |
| 4   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS    | -       | CONTRACTOR |
| 4   | 1/2"-13 ASTM A325M GALV. HEX NUTS               | -       | CONTRACTOR |

A COMPLETE 10 METRE A-FRAME ASSEMBLY  
CONSISTS OF THE FOLLOWING:

| QTY | DESCRIPTION                                      | DWG No. | SUPPLIER   |
|-----|--|---------|------------|
| 1   | A-FRAME TOP ASSEMBLY                             | 3136-4  | CONTRACTOR |
| 1   | 4 METRE LEG ASSEMBLY                             | 3136-5  | CONTRACTOR |
| 2   | 3 METRE LEG ASSEMBLY                             | 3136-5  | CONTRACTOR |
| 1   | 1.9 METRE HORIZONTAL BRACE ASSEMBLY              | 3136-6  | CONTRACTOR |
| 1   | 3.1 METRE HORIZONTAL BRACE ASSEMBLY              | 3136-6  | CONTRACTOR |
| 1   | 4.2 METRE HORIZONTAL BRACE ASSEMBLY              | 3136-6  | CONTRACTOR |
| 1   | LATERAL BRACING ASSEMBLY FOR 10<br>METRE A-FRAME | 3136-6  | CONTRACTOR |
| 1   | PLATFORM ASSEMBLY                                | 3136-9  | CONTRACTOR |
| 1   | CAR HOOK ASSEMBLY LEG                            | 3136-10 | CONTRACTOR |
| 5   | LADDER BRACKET ASSEMBLY                          | 3136-13 | CONTRACTOR |
| 1   | 5m LADDER  | 3136-12 | CONTRACTOR |
| 2   | 3m LADDER  | 3136-11 | CONTRACTOR |
| 1   | TOP LADDER CAGE                                  | 3136-14 | CONTRACTOR |
| 1   | LONG FLARE LADDER CAGE                           | 3136-15 | CONTRACTOR |
| 1   | HD LADDER GATE ASSEMBLY                          | 3136-17 | CONTRACTOR |
| 8   | 1/2"-13 1-1/2"LG. ASTM A325M GALV. HEX BOLTS     | -       | CONTRACTOR |
| 8   | 1/2"-13 ASTM A325M GALV. HEX NUTS                | -       | CONTRACTOR |

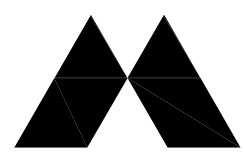
#### NOTES:

- ALL PARTS TO BE HOT-DIPPED GALVANIZED AS PER ASTM A123/A123M.
- ALL BOLTS & NUTS TO BE M16 A325M TYPE 2 GALVANIZED, UNLESS OTHERWISE NOTED.
- ALL STEEL SHALL CONFORM TO C.S.A. G40.21M GRADE 350W GALVANIZED, UNLESS OTHERWISE NOTED.
- LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
- HD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.
- LADDERS ARE DESIGNED TO MEET ANSI14.3-2008 REQUIREMENTS.
- LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.

MAX 2111-01745-1 (DRAWINGS) 1745-01.DWG

APRIL 25, 2002

| No. | Date    | Revision                     | Dr  | Ch  |
|-----|---------|------------------------------|-----|-----|
| 2   | MAR/19  | ISSUED FOR CONSTRUCTION      | WC  | BB  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |



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McElhanney Consulting Services Ltd.

203-502 Bow Valley Trail, Canmore, AB, Canada T1W 1N9 Telephone 403-609-3992

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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
9 & 10 METRES

VANCOUVER, B.C.

APEGA Permit# 06363



Designed D.O.E.

Drawn K.D.W.

Checked A.A.W.

Approved

Job No. 2111-01745-1

Scale 1:25

Date APRIL 2002

Revision 2

Drawing No.

3136-3

of 18

Destroy all prints bearing previous number.



Filename: S:\Project Files\2531-366 Environment Canada\02-00 A-Frame Ladders\7.0 Drawings\7.1 Working Drawings\Drawings\01745 LD A-Frames.dwg  
Plotted: March 22, 2019, 14:44:42  
Plotted Full Size on 22 x 34 Sheet

5.0 m LIGHT A-FRAME

| QTY. | DESCRIPTION                                    | DWG.    | SUPPLIER   |
|------|--|---------|------------|
| 1    | 1.5m A-FRAME TOP                               | 3182-2  | FABRICATOR |
| 1    | CAR HOOK ASSEMBLY                              | 3182-5  | FABRICATOR |
| 12   | M16x40 A325M GALV. STRUCTURAL BOLTS            | 3182-1  | FABRICATOR |
| 12   | M16x120 A325M GALV. STRUCTURAL BOLTS           | 3182-1  | FABRICATOR |
| 10   | U-BOLTS FOR BRACKET                            | 3182-1  | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING)      | 3182-3  | FABRICATOR |
| 1    | 3.5m LEG ASSEMBLY                              | 3182-3  | FABRICATOR |
| 1    | 2.38m LATERAL BRACE                            | 3182-1  | FABRICATOR |
| 1    | PLATFORM ASSEMBLY FOR 5m A-FRAME               | 3182-4  | FABRICATOR |
| 4    | LADDER BRACKET ASSEMBLY                        | 3136-13 | FABRICATOR |
| 2    | 3m LADDER                                      | 3136-11 | FABRICATOR |
| 1    | LD LADDER GATE ASSEMBLY                        | 3136-18 | FABRICATOR |
| 4    | 1/2"-13 1-1/2"LG. ASTM - A325M GALV. HEX BOLTS |         | FABRICATOR |
| 4    | 1/2"-13 ASTM A325M GALV. HEX NUTS              |         | FABRICATOR |

4.0 m LIGHT A-FRAME

| QTY. | DESCRIPTION                               | DWG.    | SUPPLIER   |
|------|---|---------|------------|
| 1    | 1.5m A-FRAME TOP                          | 3182-2  | FABRICATOR |
| 1    | CAR HOOK ASSEMBLY                         | 3182-5  | FABRICATOR |
| 12   | M16x40 A325M GALV. STRUCTURAL BOLTS       | 3182-1  | FABRICATOR |
| 12   | M16x120 A325M GALV. STRUCTURAL BOLTS      | 3182-1  | FABRICATOR |
| 10   | U-BOLTS FOR BRACKET                       | 3182-1  | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING) | 3182-3  | FABRICATOR |
| 1    | 2.5m LEG ASSEMBLY                         | 3182-3  | FABRICATOR |
| 1    | 1.98m LATERAL BRACE                       | 3182-1  | FABRICATOR |
| 1    | PLATFORM ASSEMBLY FOR 4m A-FRAME          | 3182-4  | FABRICATOR |
| 3    | LADDER BRACKET ASSEMBLY                   | 3136-13 | FABRICATOR |
| 1    | 5m LADDER                                 | 3136-12 | FABRICATOR |
| 1    | LD LADDER GATE ASSEMBLY                   | 3136-18 | FABRICATOR |

3.0 m LIGHT A-FRAME

| QTY. | DESCRIPTION                               | DWG.    | SUPPLIER   |
|------|---|---------|------------|
| 1    | 1.5m A-FRAME TOP                          | 3182-2  | FABRICATOR |
| 1    | CAR HOOK ASSEMBLY                         | 3182-5  | FABRICATOR |
| 12   | M16x40 A325M GALV. STRUCTURAL BOLTS       | 3182-1  | FABRICATOR |
| 10   | M16x120 A325M GALV. STRUCTURAL BOLTS      | 3182-1  | FABRICATOR |
| 8    | U-BOLTS FOR BRACKET                       | 3182-1  | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING) | 3182-3  | FABRICATOR |
| 1    | 1.5m LEG ASSEMBLY                         | 3182-3  | FABRICATOR |
| 1    | 1.54m LATERAL BRACE                       | 3182-1  | FABRICATOR |
| 3    | LADDER BRACKET ASSEMBLY                   | 3136-13 | FABRICATOR |
| 1    | 4m LADDER                                 | 3136-11 | FABRICATOR |

1.5 m LIGHT A-FRAME

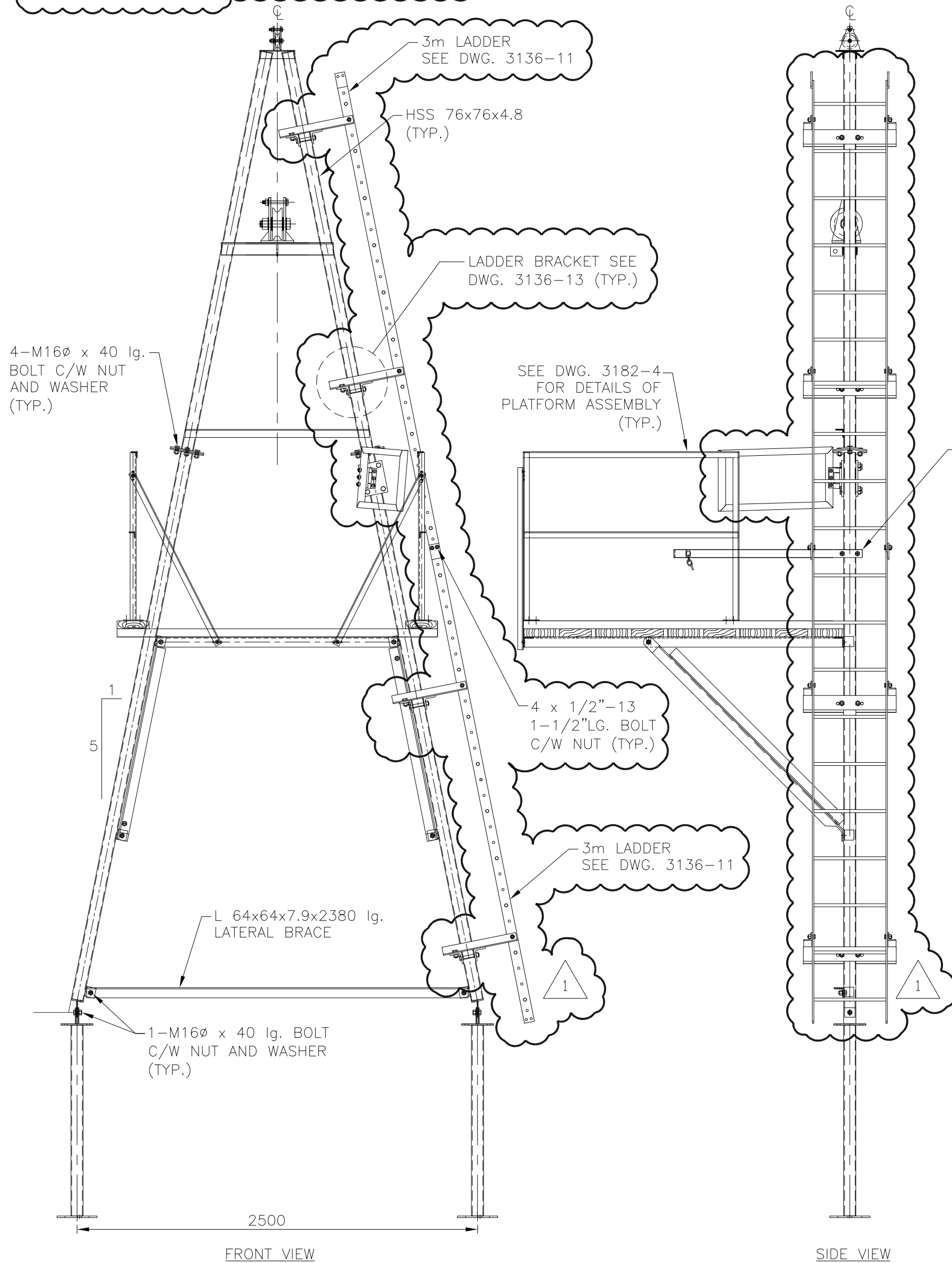
| QTY. | DESCRIPTION                               | DWG.   | SUPPLIER   |
|------|---|--------|------------|
| 1    | 1.5m A-FRAME TOP                          | 3182-2 | FABRICATOR |
| 2    | 1.5m A-FRAME SPLICE PLATES                | 3182-2 | FABRICATOR |
| 2    | FOOTINGS OR FOOTING PLATES (FOR CRIBBING) | 3182-3 | FABRICATOR |
| 1    | 1.15m LATERAL BRACE                       | 3182-2 | FABRICATOR |

NOTES:

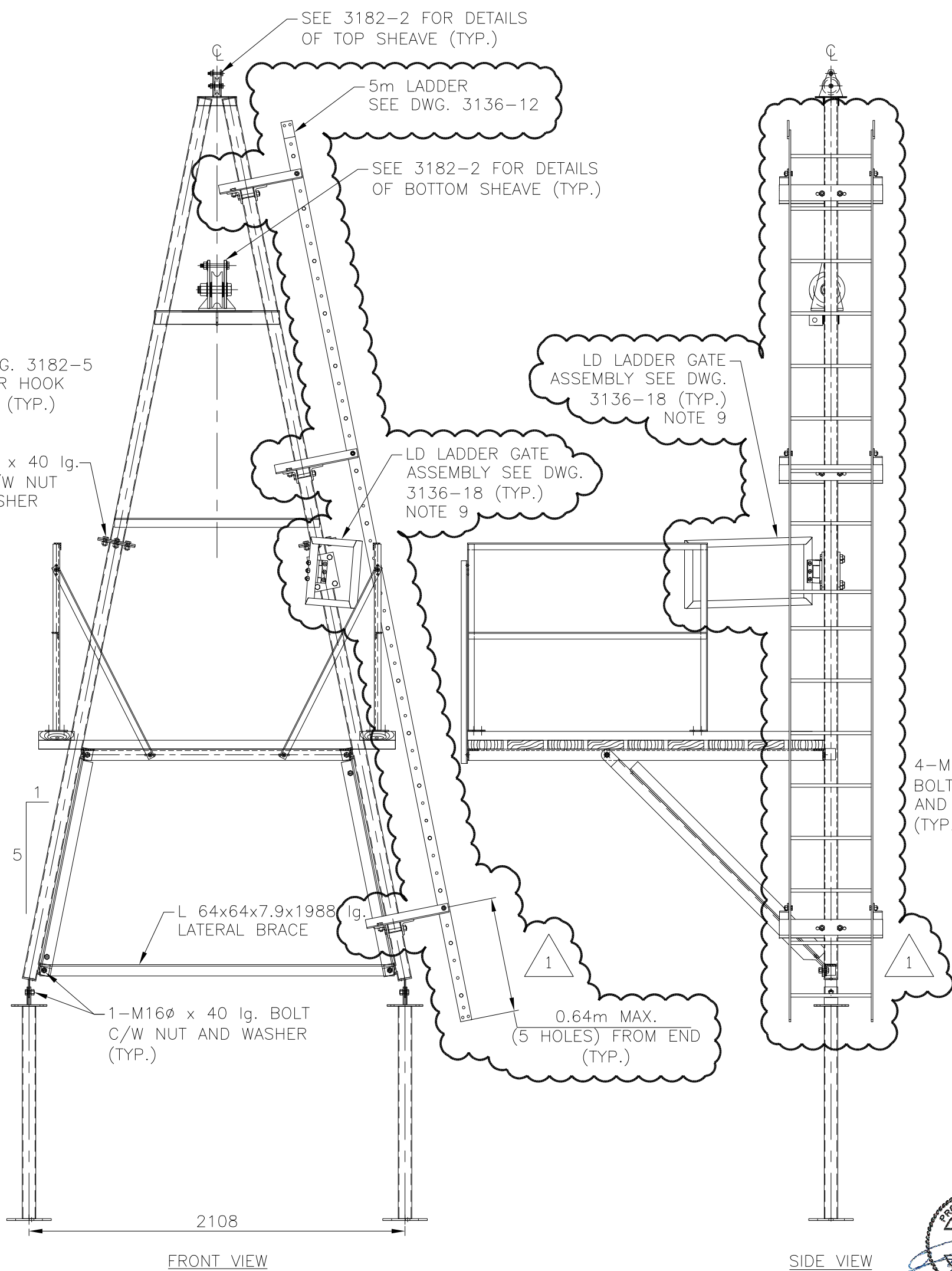
- ALL STEEL SHALL CONFORM TO CSA G40.21M STRUCTURAL QUALITY STEEL.
- ALL PARTS TO BE HOT DIP GALVANIZED (AS PER ASTM A123/A123M).
- ALL NUTS AND BOLTS TO BE M16, A325M, GALVANIZED, UNLESS NOTED OTHERWISE.
- ALL BOLT HOLES TO BE DRILLED 2mm LARGER THAN BOLTS UNLESS NOTED OTHERWISE.
- THIS STRUCTURE IS DESIGNED FOR SPANS UP TO 150m WITH MAX. A-FRAME HEIGHT = 5m IN AREAS NOT SUBJECT TO HEAVY ICE OR SNOW LOADS OVER 4.5kN/m
- ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
- ALL TOLERANCES SHOULD BE CHECKED PRIOR TO SHIPMENT.
- LADDER BRACKET SPACING; 3.0m MAX. AND 0.64m MAX. (5 HOLES) FROM ENDS.
- LD LADDER GATE ASSEMBLY TO BE INSTALLED SO TOP OF GATE IS LEVEL WITH TOP OF PLATFORM RAILING.

McELHANNEY NOTES

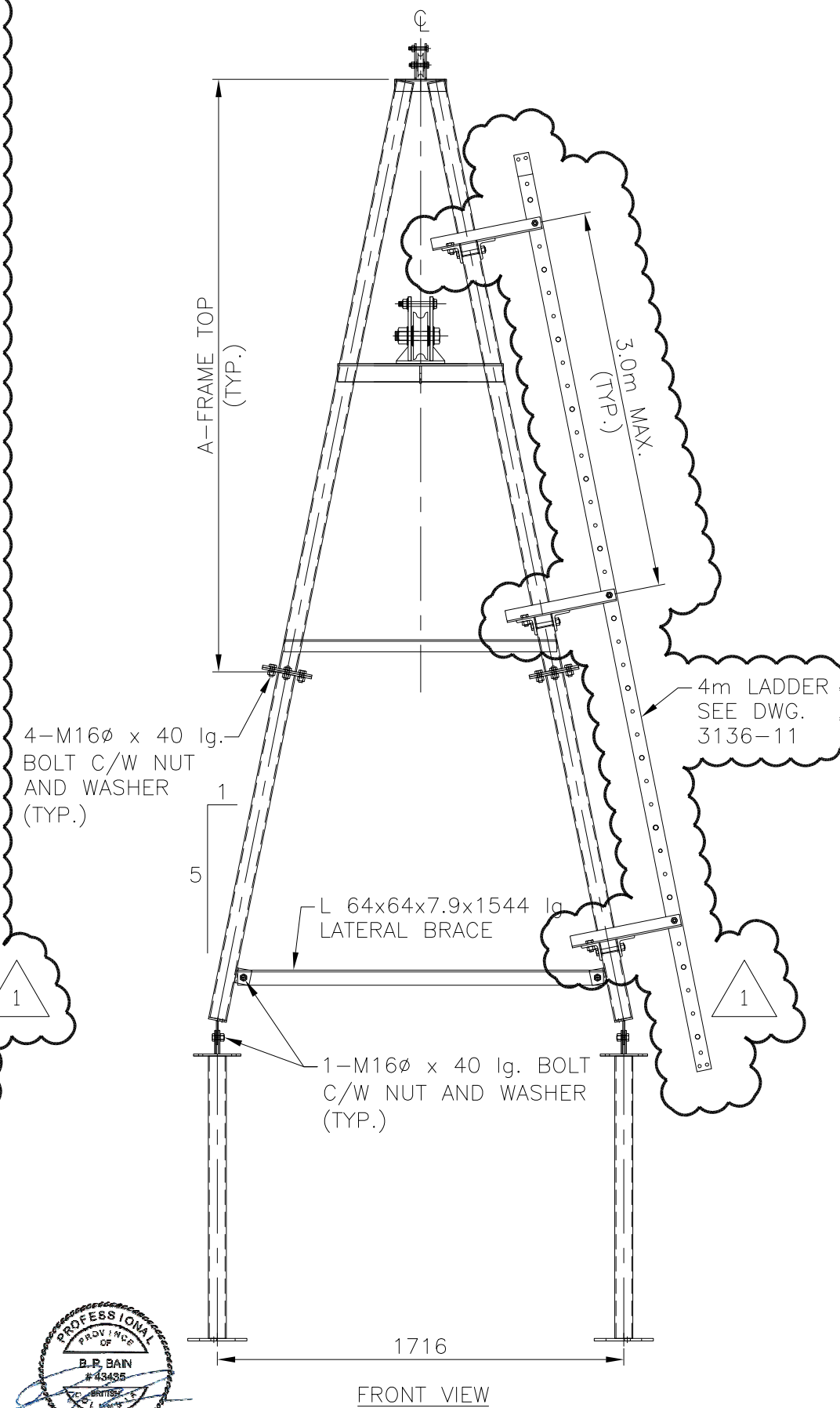
- ORIGINAL DESIGN BY ENVIRONMENT CANADA.
- McELHANNEY CHECKED AND APPROVED A-FRAME STRUCTURE ONLY, INCLUDING THE PLATFORM AND BRACING. ALL OTHER COMPONENTS SUCH AS SHEAVES, LADDER BRACKETS, CAR HOOKS, AND FOOTING PLATES ETC. WERE NOT REVIEWED. FOR DETAILS REFER TO LETTER REPORT DATED APRIL 27, 2000.
- MAXIMUM SNOW DEPTH ON PLATFORMS NOT TO EXCEED 30cm PRIOR TO PERFORMING HYDROMETRIC MEASUREMENTS.
- DESIGN LOAD = 2250 LBS. CONSISTING OF:
  - CABLE CAR - 200 LBS
  - METER REEL - 50 LBS
  - 2 PEOPLE - 400 LBS
  - B.S. OF METER CABLE - 1600 LBS
- 25.4mmØ MAIN CABLE S.F. 3.8
- ENVIRONMENT CANADA MATERIAL LIST NOT VERIFIED.
- FOUNDATIONS NOT VERIFIED.
- SINGLE BOLT CONNECTIONS NOT APPROVED.
- LADDERS ARE DESIGNED TO TMEET ANSI14.3-2008 REQUIREMENTS.
- LADDER TO BE OCCUPIED BY MAX. 1 PERSONS AT ANY GIVEN TIME.



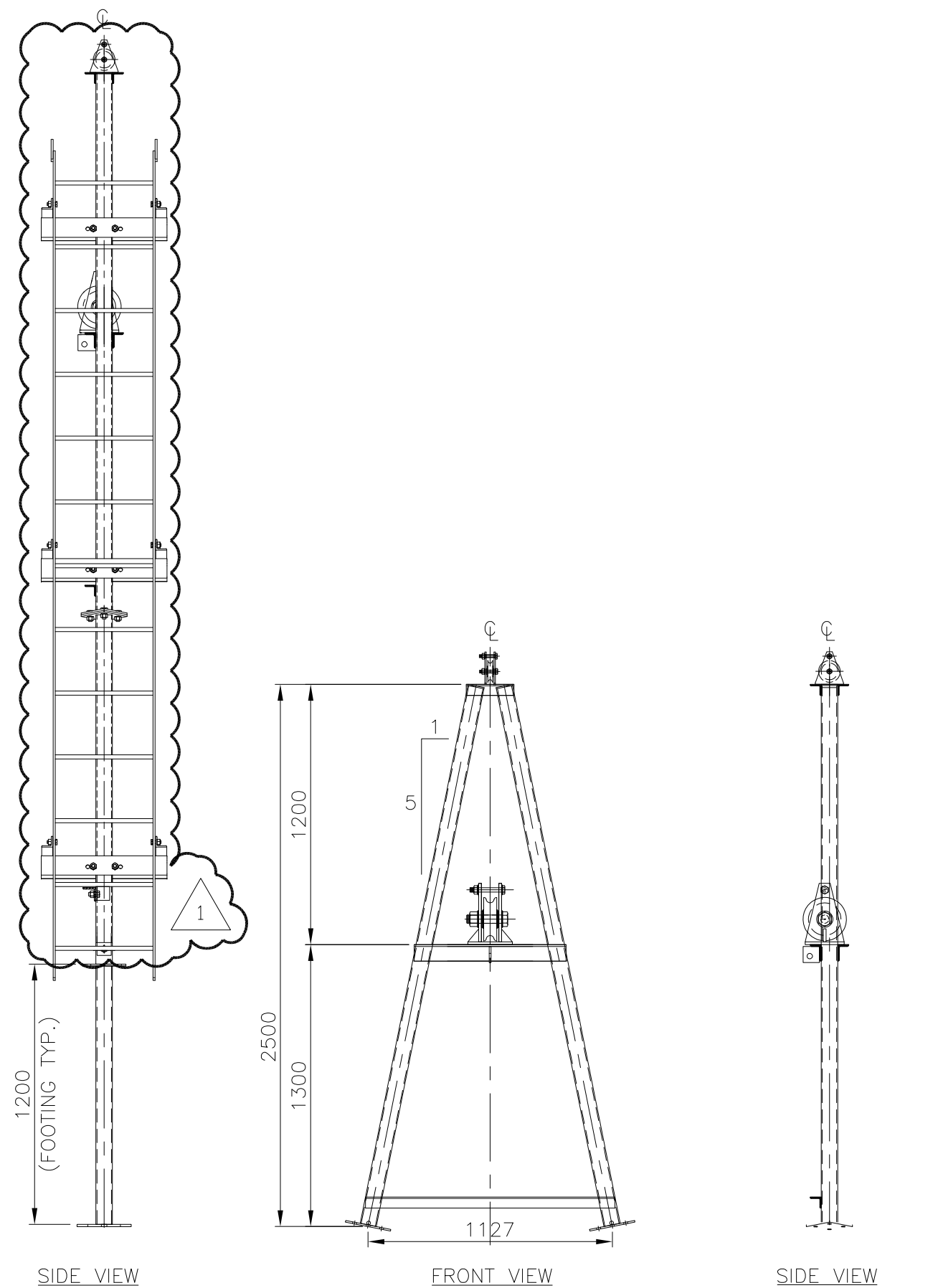
5.0 m LIGHT A-FRAME  
1:25



4.0 m LIGHT A-FRAME  
1:25



3.0 m LIGHT A-FRAME  
1:25



1.5 m LIGHT A-FRAME TOP  
1:25

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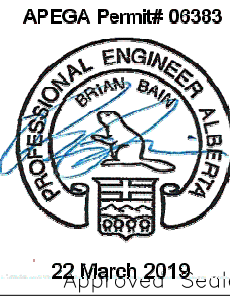


**McElhanney**

McElhanney Consulting Services Ltd.  
203-502 Bow Valley Trail  
Canmore, AB T1W 1N9  
PH 403-609-3992

Designed: KEL  
Drawn: LLP  
Checked: Surveyed:  
Date: MARCH 2010

SCALE : AS SHOWN



ENVIRONMENT CANADA  
WATER SURVEY OF CANADA

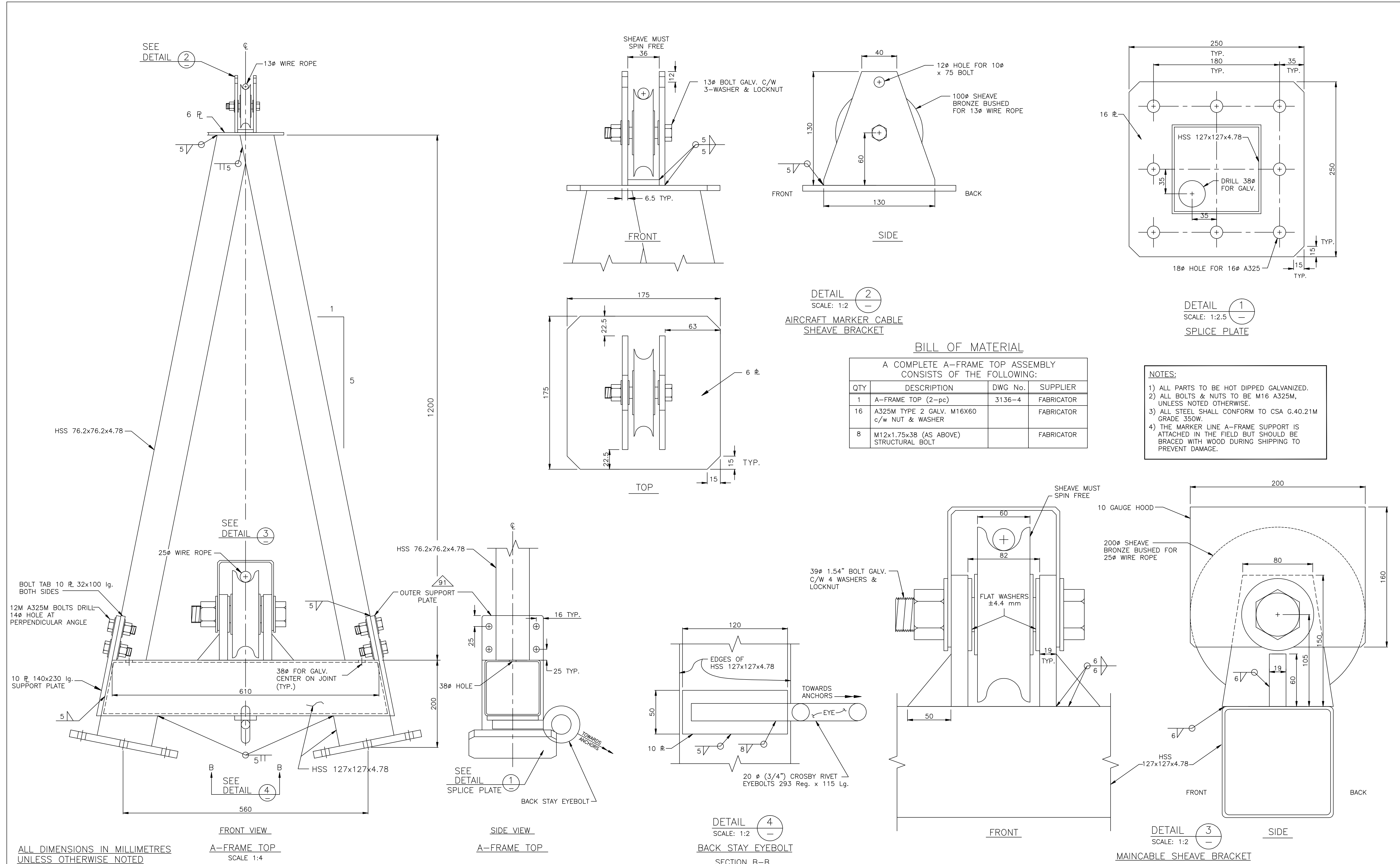
**LIGHT DUTY A-FRAME**  
1.5, 3.0, 4.0, 5.0m A-FRAMES

Client Project No

MCSL Project No. 2111-01745-5

Drawing No.  
**3182-1**

Revision 1  
Destroy all prints bearing previous number



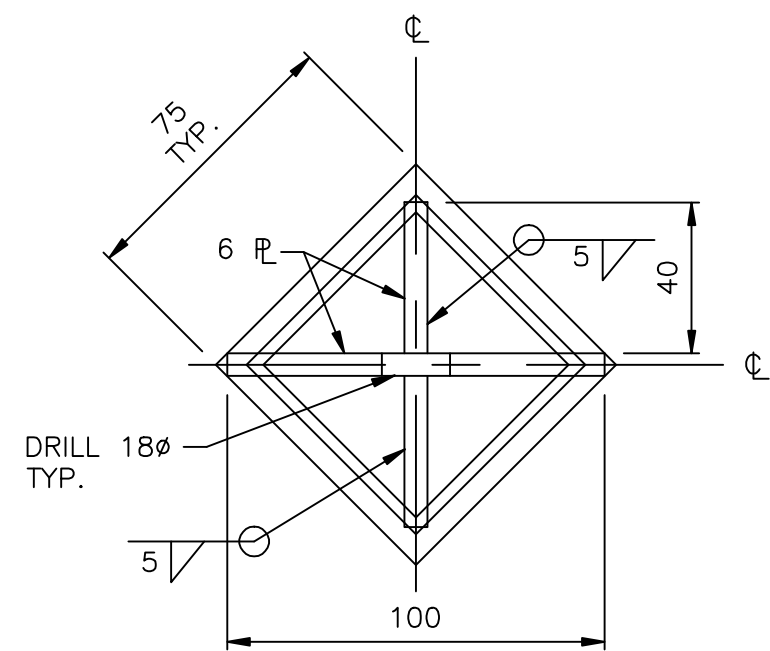
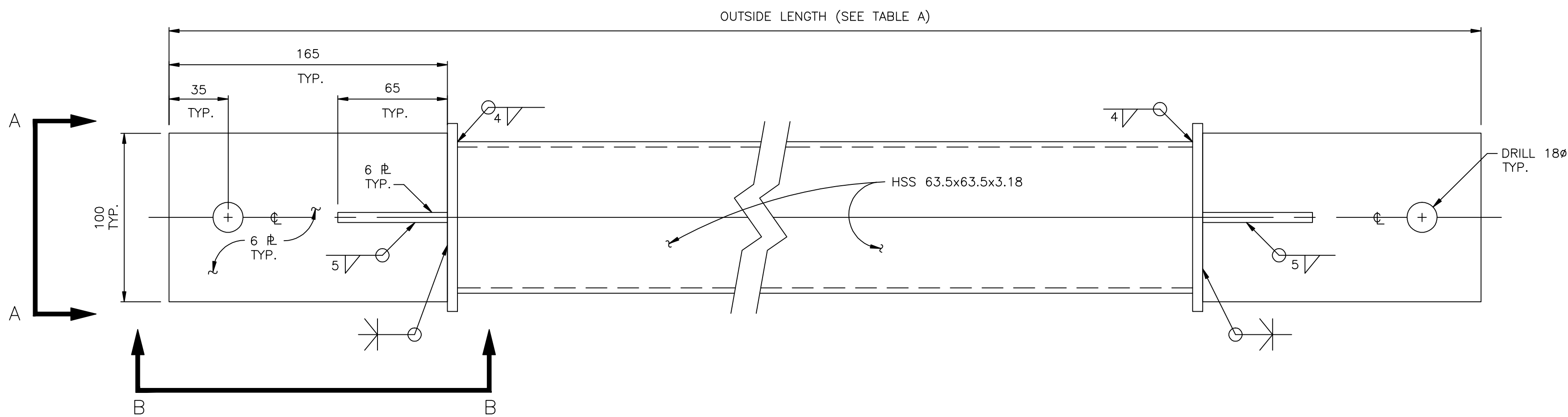
|  |  |  |  |   |  |                 |                      |             |
|--|--|--|--|---|--|-----------------|----------------------|-------------|
|  |  |  |  | DEPT. OF THE ENVIRONMENT<br>WATER SURVEY OF CANADA, VANCOUVER, B.C. |  | Designed D.O.E. | Job No. 2111-01745-1 | Drawing No. |
|  |  |  |  | HEAVY DUTY A-FRAMES<br>VARIOUS DETAILS, TOP ASSEMBLY                |  | Drawn K.D.W.    | Scale AS SHOWN       | 3136-4      |
|  |  |  |  | VANCOUVER, B.C.   |  | Checked A.A.W.  | Date APRIL 2002      | of 10       |
|  |  |  |  |   |  | Approved        | Revision 1           |             |

|     |         |                              |     |     |
|-----|---------|------------------------------|-----|-----|
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |
| No. | Date    | Revision                     | Dr  | Ch  |

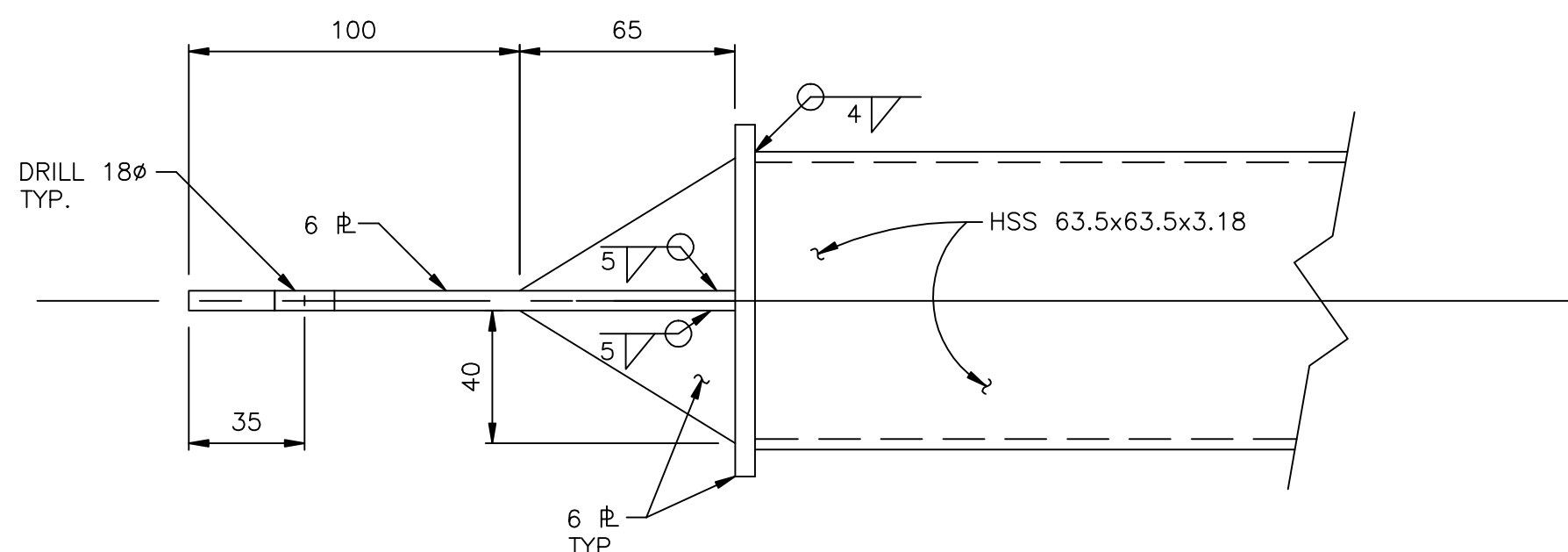
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13160-88 Ave., Surrey, B.C., Canada V3W 3K3 Telephone (604)596-0391  
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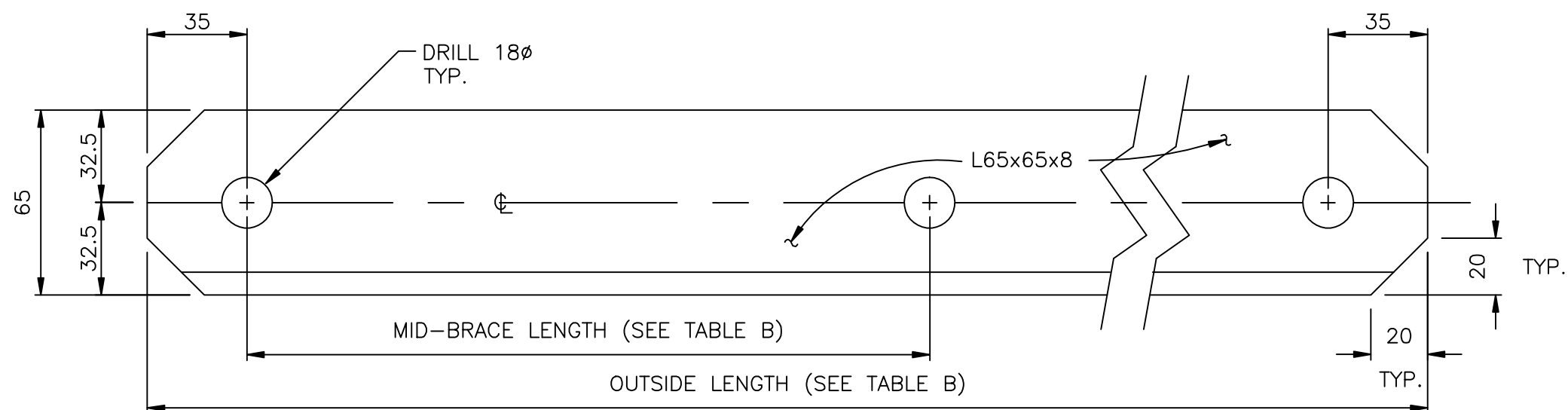


SECTION A-A

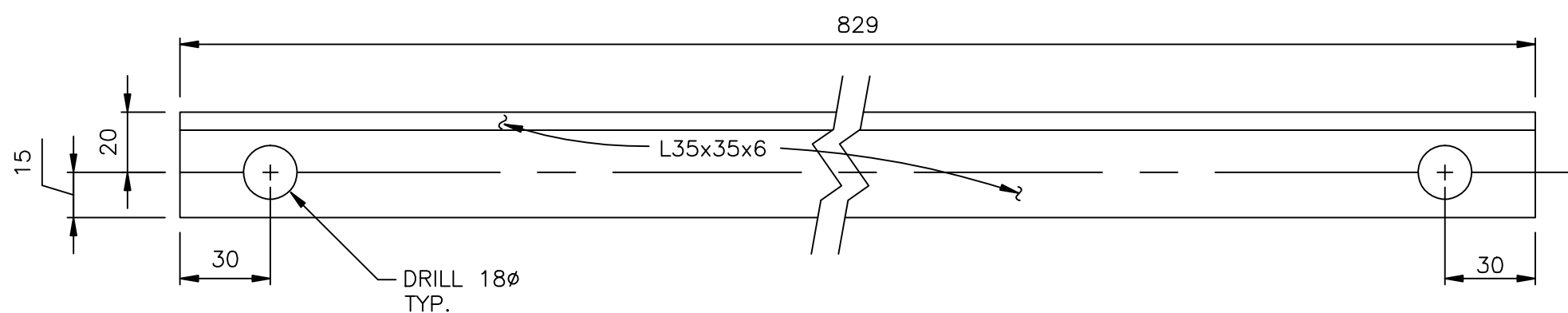


SECTION B-B

HORIZONTAL BRACE



LATERAL BRACE



SAFETY RAIL (SEE ALSO DWG 3136-9)  
EST. WT. 4.9 kg

## BILLS OF MATERIAL

| A COMPLETE HORIZONTAL BRACE ASSEMBLY CONSISTS OF THE FOLLOWING: |   |         |            |
|---|---|---------|------------|
| QTY   | DESCRIPTION   | DWG No. | SUPPLIER   |
| 1   | HORIZONTAL BRACE OF VARIOUS NOMINAL LENGTHS (SEE TABLE A) | 3136-6  | FABRICATOR |
| 2   | BOLT M16x45, C/W NUT & WASHER                             |         | FABRICATOR |

| A COMPLETE LATERAL BRACING ASSEMBLY FOR A 9 METRE A-FRAME CONSISTS OF: |                                       |         |            |
|--|---------------------------------------|---------|------------|
| QTY  | DESCRIPTION                           | DWG No. | SUPPLIER   |
| 2  | 3 METRE LATERAL BRACE (SEE TABLE B)   | 3136-6  | FABRICATOR |
| 2  | 4.4 METRE LATERAL BRACE (SEE TABLE B) | 3136-6  | FABRICATOR |
| 2  | BOLTS M16x50, C/W NUT & WASHER        |         | FABRICATOR |

EST. W.T. 86.9 kg

| A COMPLETE LATERAL BRACING ASSEMBLY FOR A 10 METRE A-FRAME CONSISTS OF: |                                       |         |            |
|---|---------------------------------------|---------|------------|
| QTY   | DESCRIPTION                           | DWG No. | SUPPLIER   |
| 2   | 3.9 METRE LATERAL BRACE (SEE TABLE B) | 3136-6  | FABRICATOR |
| 2   | 4.7 METRE LATERAL BRACE (SEE TABLE B) | 3136-6  | FABRICATOR |
| 2   | BOLTS M16x50, C/W NUT & WASHER        |         | FABRICATOR |

EST. W.T. 100.5 kg

TABLE A

| NOMINAL LENGTH OF HORIZONTAL BRACE | OUTSIDE LENGTH IN MILLIMETRES | EST. WT. & BOLTS |
|------------------------------------|-------------------------------|------------------|
| 1.1 METRE                          | 1104                          | 7.3 kg           |
| 1.5 METRE                          | 1496                          | 9.6 kg           |
| 1.9 METRE                          | 1888                          | 11.9 kg          |
| 2.7 METRE                          | 2673                          | 16.5 kg          |
| 3.1 METRE                          | 3065                          | 18.7 kg          |
| 3.5 METRE                          | 3457                          | 21.0 kg          |
| 3.9 METRE                          | 3849                          | 23.3 kg          |
| 4.2 METRE                          | 4241                          | 25.6 kg          |

TABLE B

| NOMINAL LENGTH OF LATERAL BRACE | MID-BRACE LENGTH IN MILLIMETRES | OUTSIDE LENGTH IN MILLIMETRES | EST. WT. (kg) |
|---------------------------------|---------------------------------|-------------------------------|---------------|
| 3.0 METRE                       | 1740                            | 3025                          | 17.5          |
| 4.4 METRE                       | 2570                            | 4410                          | 25.7          |
| 3.9 METRE                       | 2365                            | 3871                          | 22.5          |
| 4.7 METRE                       | 2699                            | 4706                          | 27.5          |

### NOTES:

- ALL PARTS TO BE HOT-DIPPED GALVANIZED C.S.A. G-164
- ALL BOLTS & NUTS TO BE A325M TYPE2 GALVANIZED, UNLESS NOTED OTHERWISE
- ALL STEEL SHALL CONFORM TO C.S.A. G. 40.21M GRADE 350W.

ALL DIMENSIONS IN MILLIMETRES  
UNLESS OTHERWISE NOTED

|     |         |                              |     |     |  |
|-----|---------|------------------------------|-----|-----|--|
|     |         |                              |     |     |  |
|     |         |                              |     |     |  |
| 1   | JUNE/02 | APPROVED AND REDRAWN BY MCSL | KDW | AAW |  |
| No. | Date    | Revision                     | Dr  | Ch  |  |



**McElhanney**

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DEPT. OF THE ENVIRONMENT  
WATER SURVEY OF CANADA, VANCOUVER, B.C.

HEAVY DUTY A-FRAMES  
VARIOUS DETAILS, HORIZONTAL BRACE ASSEMBLY LATERAL BRACING ASSEMBLY  
SAFETY RAIL  
VANCOUVER, B.C.

|                 |                      |  |
|-----------------|----------------------|--|
| Designed D.O.E. | Job No. 2111-01745-1 | Drawing No.<br><br>3136-6<br><br>of 10 |
| Drawn K.D.W.    | Scale AS SHOWN       |  |
| Checked A.A.W.  | Date APRIL 2002      |  |
| Approved        | Revision 1           |  |