
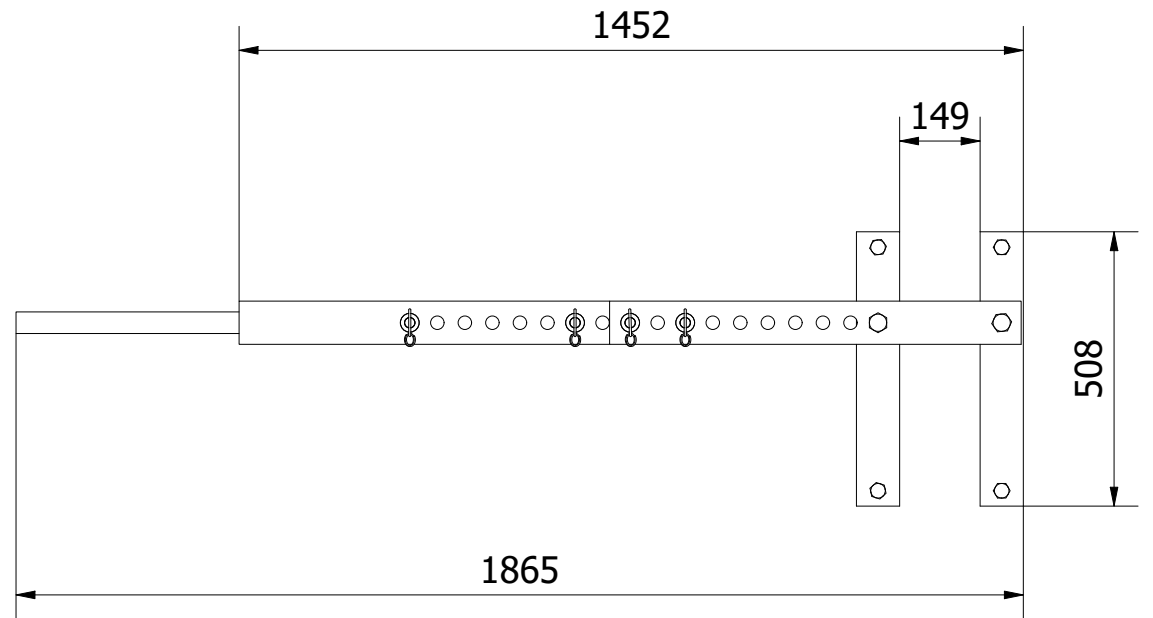
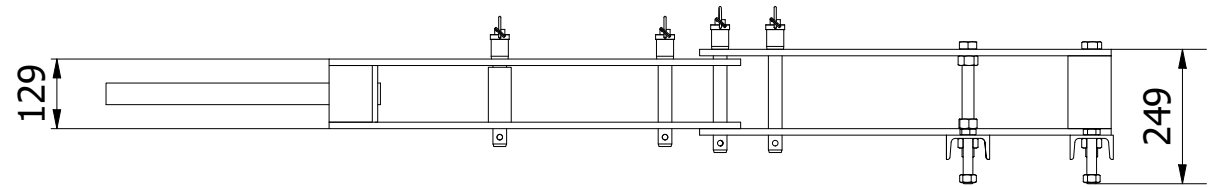
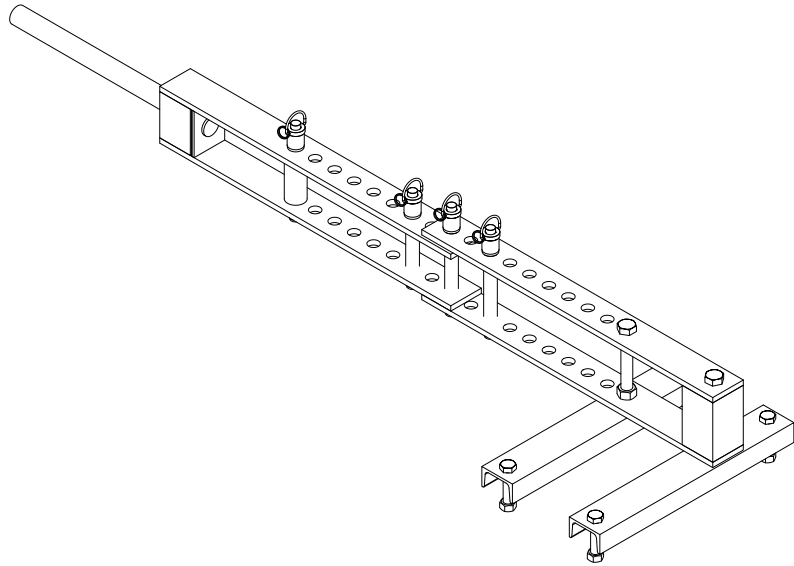



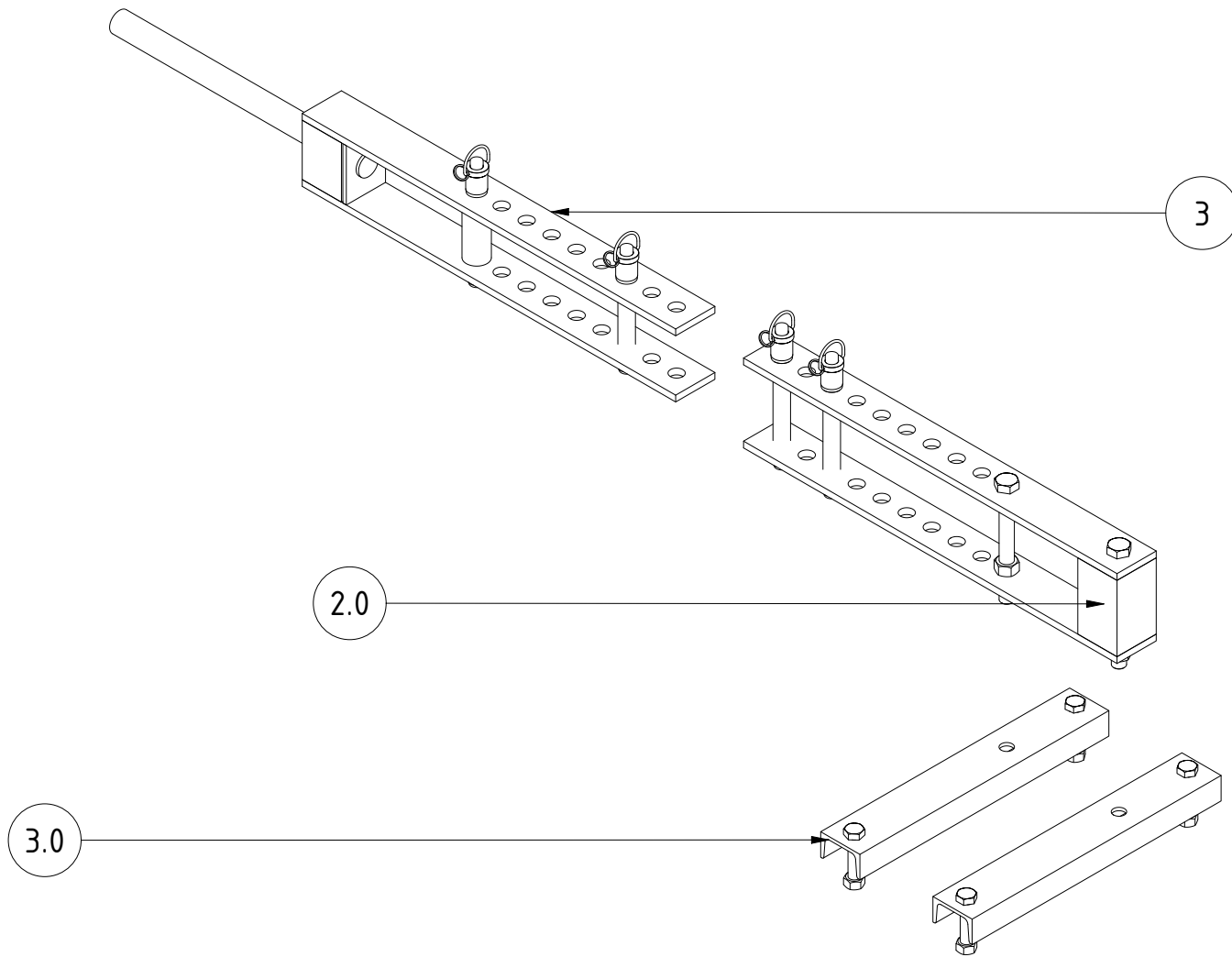
Note: All units in mm.


|  |                              |             |            |          |
|--|------------------------------|-------------|------------|----------|
| PROJECT  | CREATED BY                   | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano                  | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME                    |             |            | POS      |
| 3d views   | nkm-btb_bench_top_bender.iam |             |            | A1       |
| PUBLISHED BY   | DOC. TYPE                    |             | MATERIAL   | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Assembly                     |             |            | 1        |
|  | LICENCE                      |             | SCALE      | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0                 |             | 1/8        | 1 /18    |



Note: All units in mm.


|  |                              |             |            |          |
|--|------------------------------|-------------|------------|----------|
| PROJECT  | CREATED BY                   | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano                  | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME                    |             |            | POS      |
| 3d views   | nkm-btb_bench_top_bender.iam |             |            | A1       |
| PUBLISHED BY   | DOC. TYPE                    |             | MATERIAL   | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Assembly                     |             |            | 1        |
|  | LICENCE                      |             | SCALE      | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0                 |             | 1/14       | 2 /18    |



|  |                              |             |            |         |
|--|------------------------------|-------------|------------|---------|
| PROJECT  | CREATED BY                   | APPROVED BY | DATE       | VERSION |
| Bench Top Bender   | J. Rosciano                  | A. Morillo  | 10/08/2021 | 1.1     |
| PART NAME  | FILE NAME                    |             |            | POS     |
| Exploded 3d view   | nkm-btb_bench_top_bender.ipn |             |            | A2      |
| PUBLISHED BY   | DOC. TYPE                    | MATERIAL    | QUANTITY   |         |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Assembly                     |             | 1          |         |
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| OHO e.V.   | CC-BY-SA 4.0                 | 1/10        | 3 /18      |         |


## Parts list

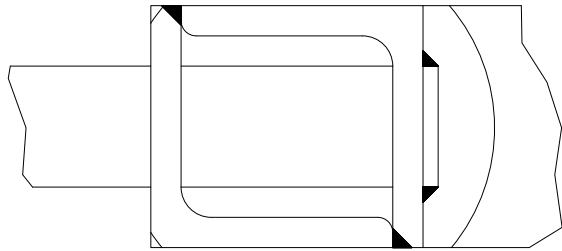
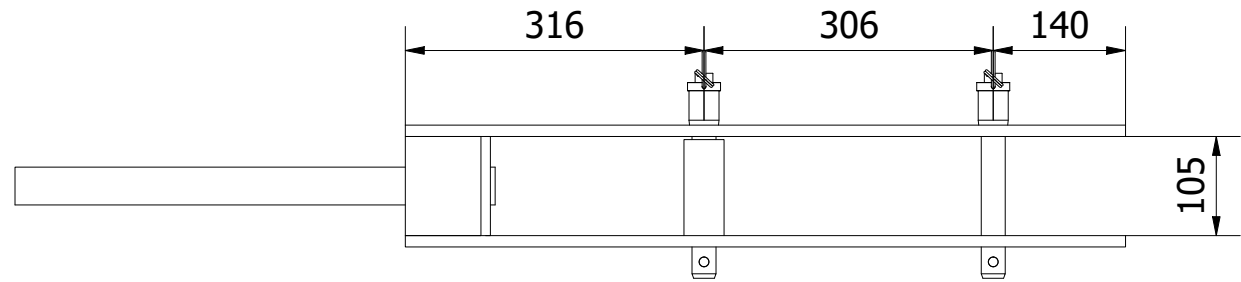
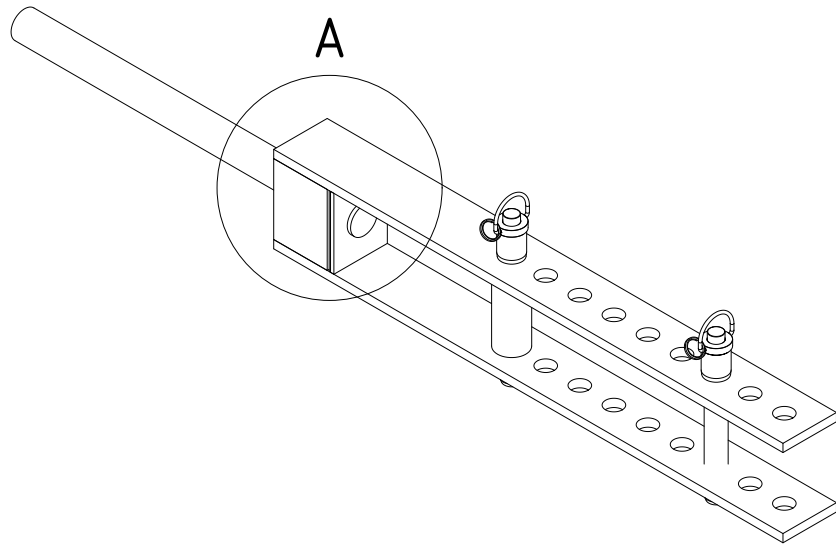
| POS | QTY | PART NAME               | FILE NAME                    | PART TYPE  | SPECIFICATIONS                      | SHEET |
|-----|-----|-------------------------|------------------------------|------------|-------------------------------------|-------|
| A1  |     | 3d views                | nkm-btb_bench_top_bender.iam |            |                                     | 1     |
| A1  |     | 3d views                | nkm-btb_bench_top_bender.iam |            |                                     | 2     |
| A2  |     | Exploded 3d view        | nkm-btb_bench_top_bender.ipn |            |                                     | 3     |
| B1  |     | Parts list              | nkm-btb_bench_top_bender.csv |            |                                     | 4     |
| C1  |     | Technical notes         |                              |            |                                     | 5     |
| 1.0 | 1   | Rotating arm assembly   | Rotating arm assembly.iam    |            |                                     | 6-7   |
| 1.1 | 2   | Pivoting arm            | Pivoting arm.ipt             | Production | DIN 174 - 80 x 12 ASTM A36          | 8     |
| 1.2 | 2   | Pivoting angle steel    | Pivoting angle steel.ipt     | Production | DIN EN 10056-1 - L80x80x10 ASTM A36 | 9     |
| 1.3 | 1   | Steel rod               | Steel rod.ipt                | Production | EN 10060 - OD 40 Steel C45          | 10    |
| 1.4 | 1   | Cylindrical roller      | Cylindrical roller.ipt       | Production | DIN2448 - OD 42.4 x 5 Steel C45     | 11    |
| 1.5 | 2   | Quick relase pin 140 mm |                              | Standard   | 17-4 SS Shank                       |       |
| 2.0 | 1   | Fixed arm assembly      | Fixed arm assembly.iam       |            |                                     | 12-13 |
| 2.1 | 2   | Fixed arm               | Fixed arm.ipt                | Production | DIN 174 - 80 x 12 ASTM A36          | 14    |
| 2.2 | 2   | Fixed angle steel       | Fixed angle steel.ipt        | Production | DIN EN 10056-1 - L80x80x10 ASTM A36 | 15    |
| 2.4 | 2   | Quick relase pin 165 mm |                              | Standard   | 17-4 SS Shank                       |       |
| 2.5 | 2   | Fixed arm bolt          |                              | Standard   | DIN 933 M22x200                     |       |
| 2.6 | 4   | Fixed arm nut           |                              | Standard   | DIN 555 M22                         |       |
| 3.0 | 1   | Mounting support        | Mounting support.iam         |            |                                     | 16-17 |
| 3.1 | 2   | Support                 | Support.ipt                  | Production | DIN1026-1 - U 80 ASTM A36           | 18    |
| 3.2 | 4   | Bolt                    |                              | Standard   | DIN 931-1 M18x90                    |       |
| 3.3 | 4   | Nut                     |                              | Standard   | DIN 555 M18                         |       |

|   |                              |             |            |          |
|---|------------------------------|-------------|------------|----------|
| PROJECT   | CREATED BY                   | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender  | J. Rosciano                  | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME   | FILE NAME                    |             |            | POS      |
| Parts list  | nkm-btb_bench_top_bender.csv |             |            | B1       |
| PUBLISHED BY  | DOC. TYPE                    | MATERIAL    |            | QUANTITY |
|  OPEN HARDWARE OBSERVATORY<br>Free Blueprints for Sustainable Development | Parts list                   |             |            |          |
| OHO e.V.  | LICENCE                      | SCALE       |            | SHEET    |
|   | CC-BY-SA 4.0                 |             |            | 4 /18    |

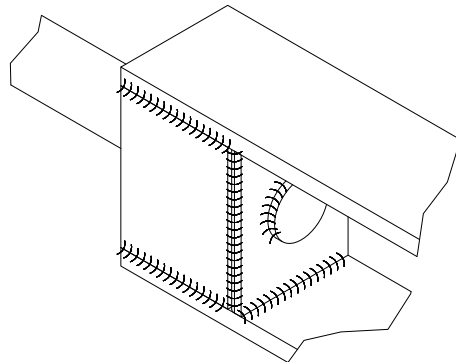
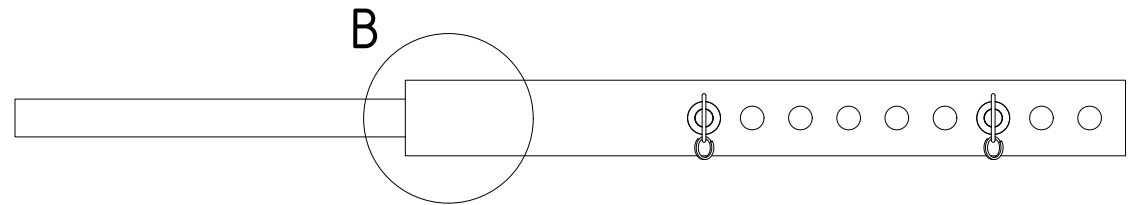
TECHNICAL NOTES

| NOTES                     | CONTENT  |
|---------------------------|--|
| GENERAL NOTES             |  |
| Metal structure treatment | Iron structures should be painted to prevent rust and improve equipment life. <ul style="list-style-type: none"> <li>- Remove loose rust with a wire brush, sandpaper or chemical rust remover.</li> <li>- If applicable, sand areas where paint is chipping until surface is smooth.</li> <li>- Remove dust or oil with a degreaser or denatured alcohol.</li> <li>- Prime surface to protect against rust and corrosion</li> </ul> |

|   |                           |                              |                    |                |
|---|---------------------------|------------------------------|--------------------|----------------|
| PROJECT<br>Bench Top Bender   | CREATED BY<br>J. Rosciano | APPROVED BY<br>A. Morillo    | DATE<br>10/08/2021 | VERSION<br>1.1 |
| PART NAME<br>Technical notes  | FILE NAME                 |                              |                    | POS<br>C1      |
| PUBLISHED BY<br> OPEN HARDWARE OBSERVATORY<br>Free Blueprints for Sustainable Development |                           | DOC. TYPE<br>Technical notes | MATERIAL           | QUANTITY       |
| OHO e.V.  |                           | LICENCE<br>CC-BY-SA 4.0      | SCALE              | SHEET<br>5 /18 |




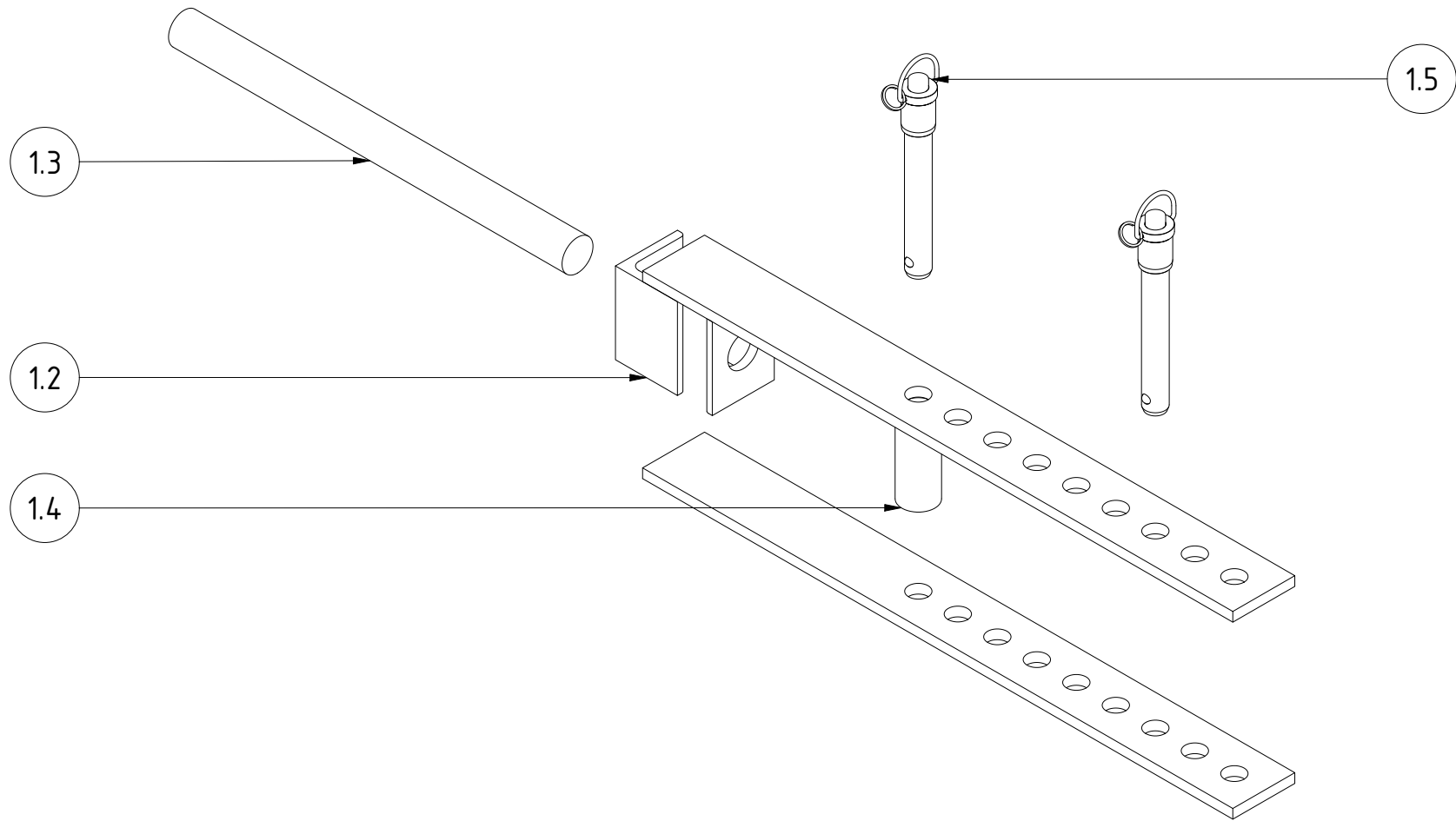
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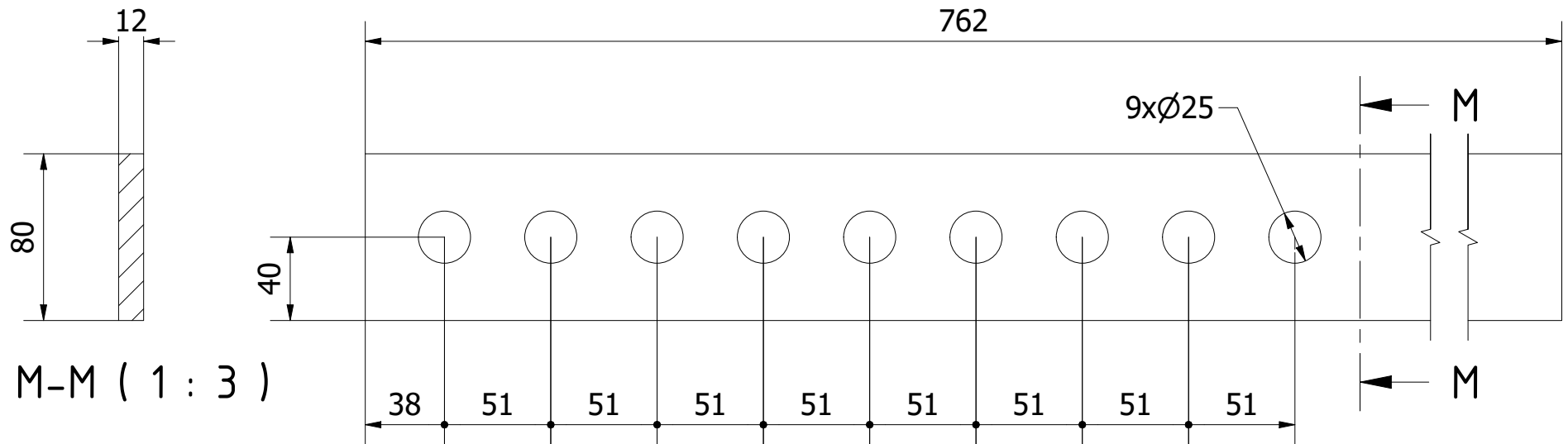
A ( 1 : 4 )

Note: All units in mm.


|  |                           |             |            |          |
|--|---------------------------|-------------|------------|----------|
| PROJECT  | CREATED BY                | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano               | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME                 |             |            | POS      |
| Rotating arm assembly  | Rotating arm assembly.iam |             |            | 1.0      |
| PUBLISHED BY   | DOC. TYPE                 | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Assembly                  |             |            | 1        |
|  | LICENCE                   | SCALE       |            | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0              | 1/8         |            | 6 /18    |



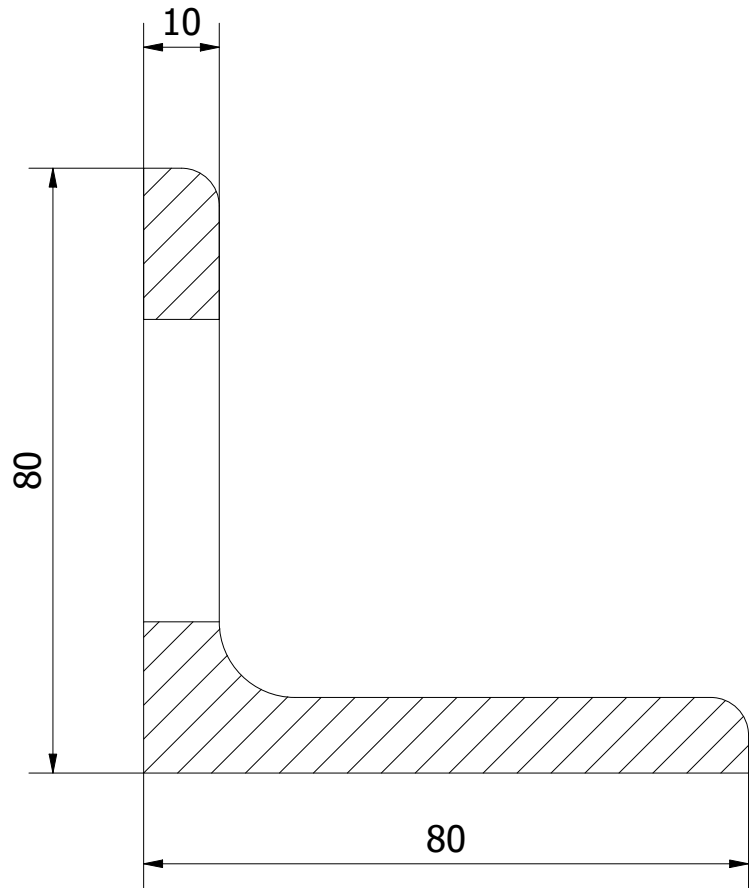
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| PROJECT  | CREATED BY                | APPROVED BY | DATE       | VERSION |
| Bench Top Bender   | J. Rosciano               | A. Morillo  | 10/08/2021 | 1.1     |
| PART NAME  | FILE NAME                 |             |            | POS     |
| Rotating arm assembly  | Rotating arm assembly.ipn |             |            | 1.0     |
| PUBLISHED BY   | DOC. TYPE                 | MATERIAL    | QUANTITY   |         |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Assembly                  |             | 1          |         |
|  | LICENCE                   | SCALE       | SHEET      |         |
| OHO e.V.   | CC-BY-SA 4.0              | 1/6         | 7 /18      |         |



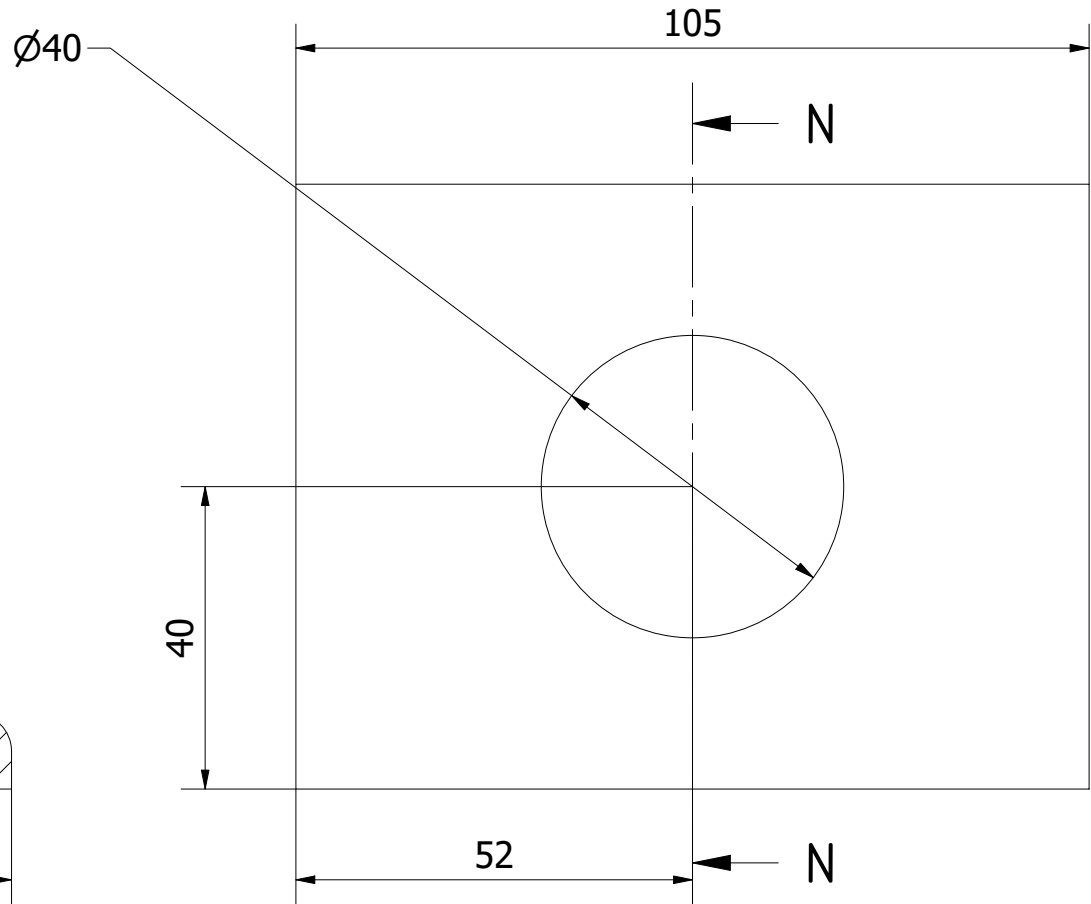
Note: All units in mm.

|  |                  |             |            |          |
|--|------------------|-------------|------------|----------|
| PROJECT  | CREATED BY       | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano      | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME        |             |            | POS      |
| Pivoting arm   | Pivoting arm.ipt |             |            | 1.1      |
| PUBLISHED BY   | DOC. TYPE        | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Part             | ASTM A36    |            | 2        |
|  | LICENCE          | SCALE       |            | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0     | 1/3         |            | 8 /18    |




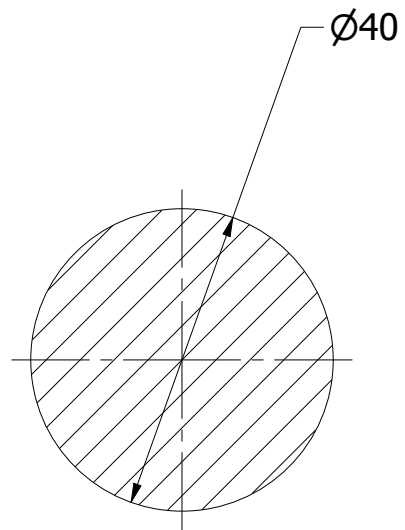


N-N ( 1 : 1 )

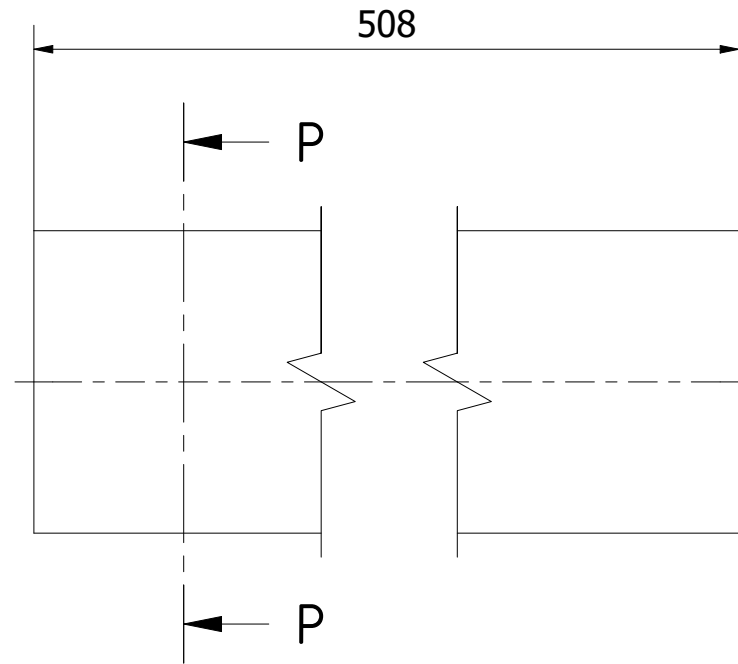


Note: All units in mm.


|  |                          |             |            |          |
|--|--------------------------|-------------|------------|----------|
| PROJECT  | CREATED BY               | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano              | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME                |             |            | POS      |
| Pivoting angle steel   | Pivoting angle steel.ipt |             |            | 1.2      |
| PUBLISHED BY   | DOC. TYPE                | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Part                     | ASTM A36    |            | 2        |
|  | LICENCE                  | SCALE       |            | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0             | 1/1         |            | 9 /18    |

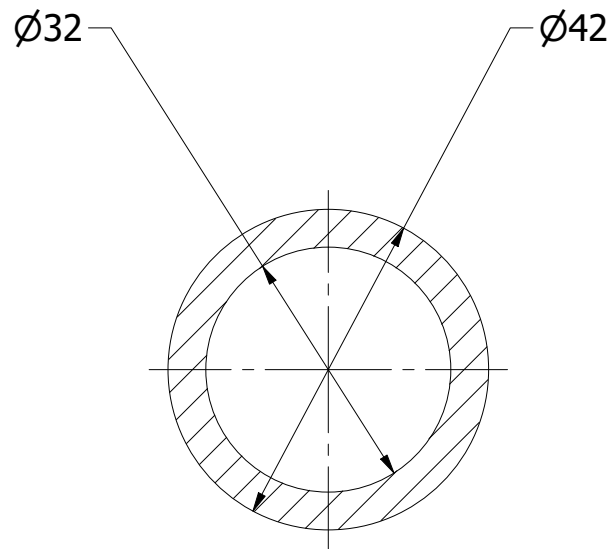


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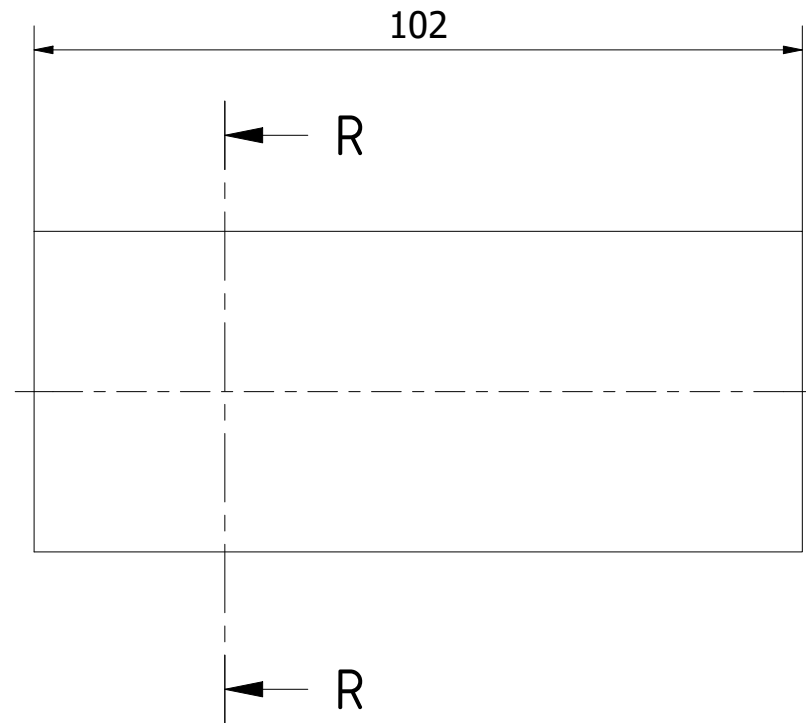


Note: All units in mm.


|  |               |             |            |          |
|--|---------------|-------------|------------|----------|
| PROJECT  | CREATED BY    | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano   | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME     |             |            | POS      |
| Steel rod  | Steel rod.ipt |             |            | 1.3      |
| PUBLISHED BY   | DOC. TYPE     | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Part          | Steel C45   |            | 1        |
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| OHO e.V.   | CC-BY-SA 4.0  | 1/1         |            | 10 /18   |

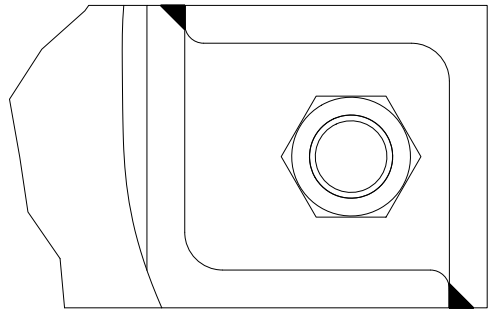
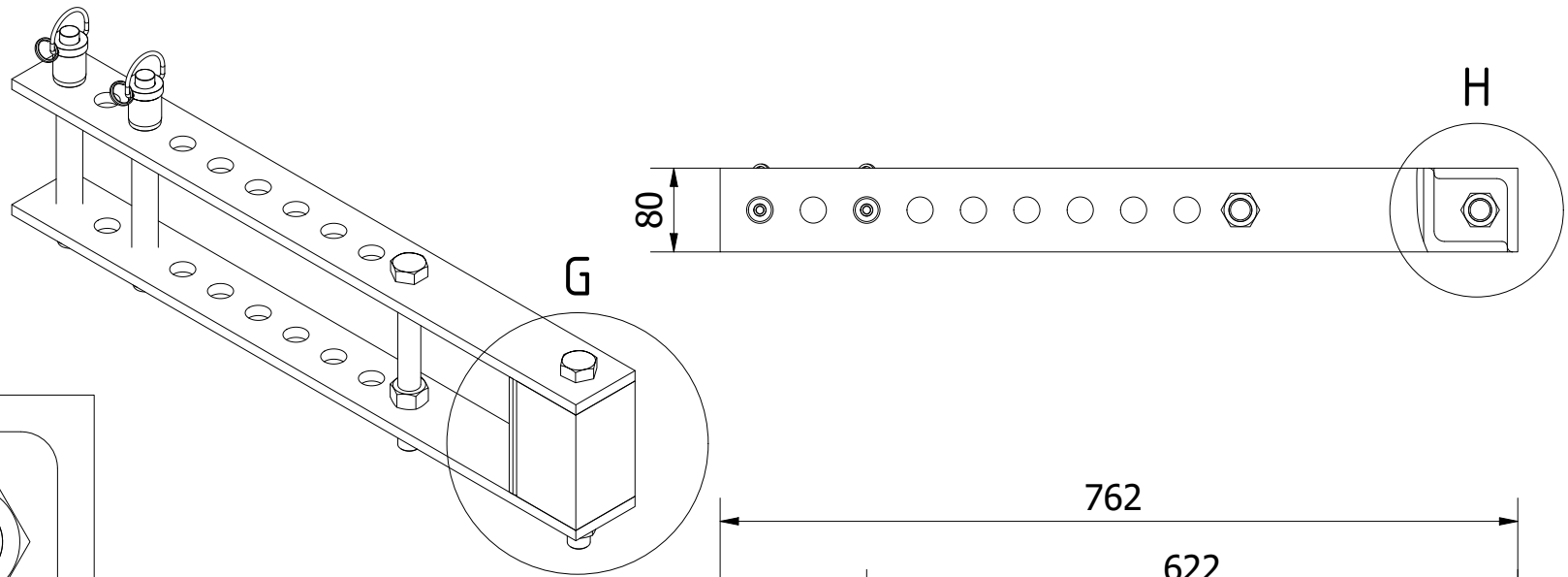


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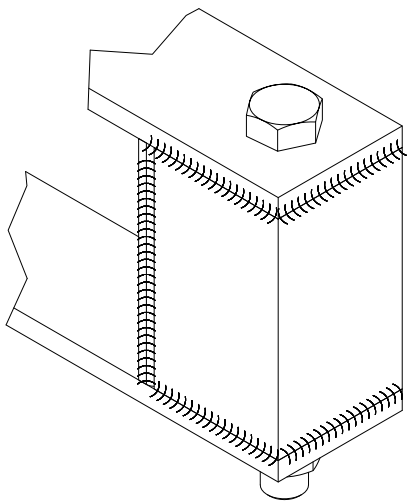


Note: All units in mm.

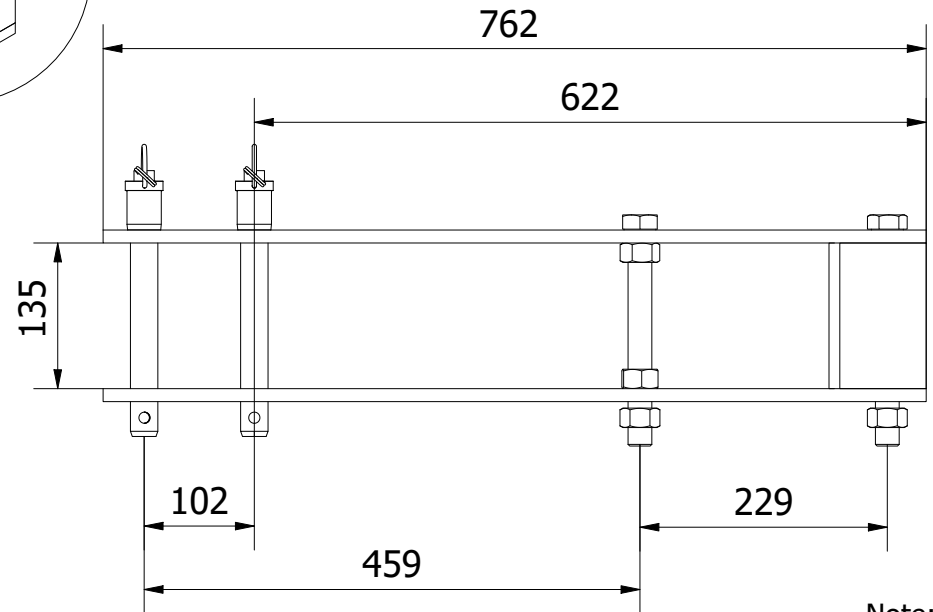
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| PROJECT  | CREATED BY             | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano            | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME              |             |            | POS      |
| Cylindrical roller   | Cylindrical roller.ipt |             |            | 1.4      |
| PUBLISHED BY   | DOC. TYPE              | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Part                   | Steel C45   |            | 1        |
|  | LICENCE                | SCALE       |            | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0           | 1/1         |            | 11 /18   |




H ( 0.5/1 )

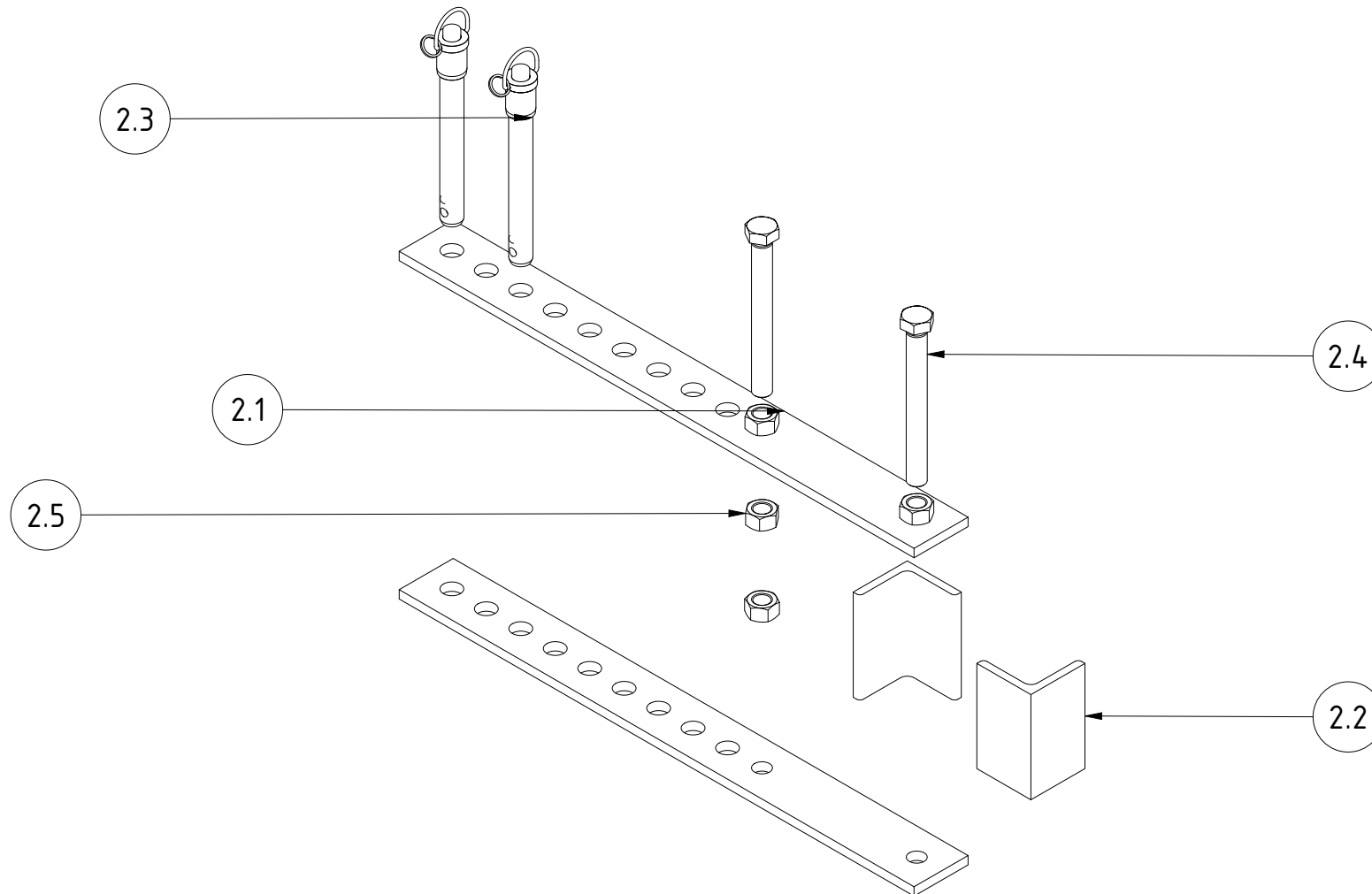



G ( 0.29 : 1 )

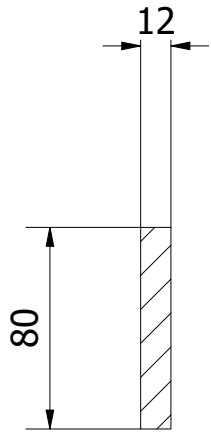


Note: All units in mm.

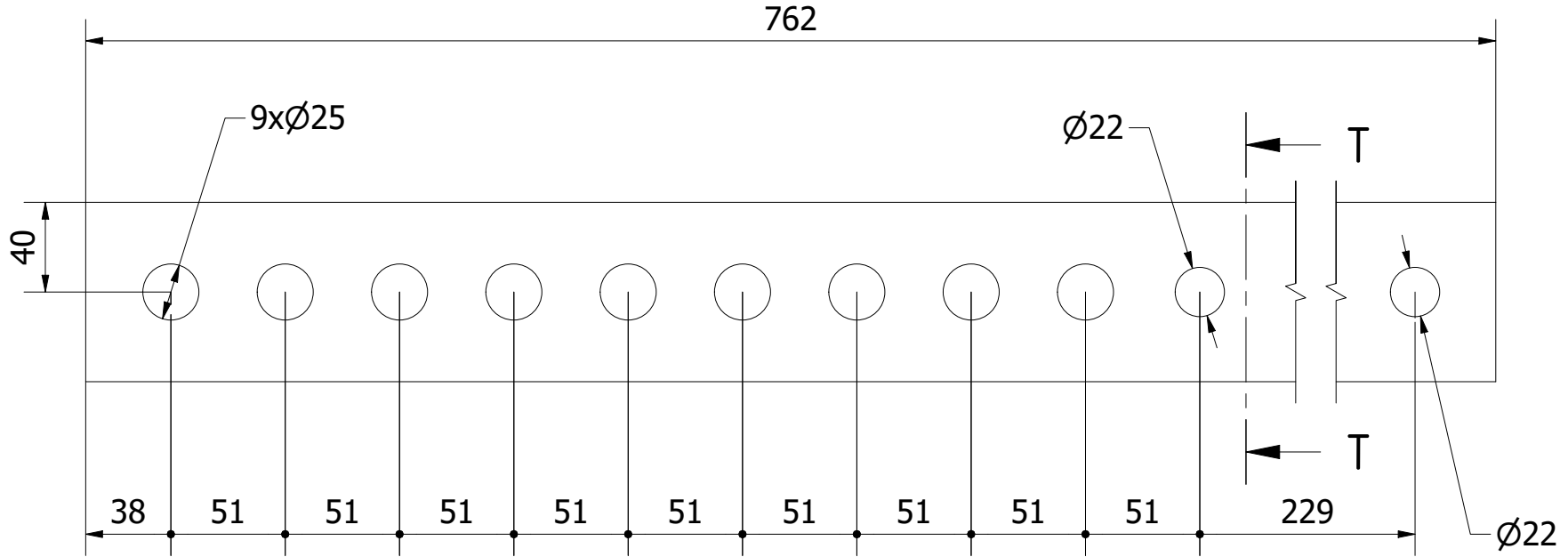
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| PROJECT  | CREATED BY             | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano            | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME              |             |            | POS      |
| Fixed arm assembly   | Fixed arm assembly.iam |             |            | 2.0      |
| PUBLISHED BY   | DOC. TYPE              | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Assembly               |             |            | 1        |
|  | LICENCE                | SCALE       |            | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0           | 1/7         |            | 12 /18   |




|  |                        |             |            |          |
|--|------------------------|-------------|------------|----------|
| PROJECT  | CREATED BY             | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano            | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME              |             |            | POS      |
| Fixed arm assembly   | Fixed arm assembly.ipn |             |            | 2.0      |
| PUBLISHED BY   | DOC. TYPE              | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Assembly               |             |            | 1        |
|  | LICENCE                | SCALE       |            | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0           | 1/7         |            | 13 /18   |

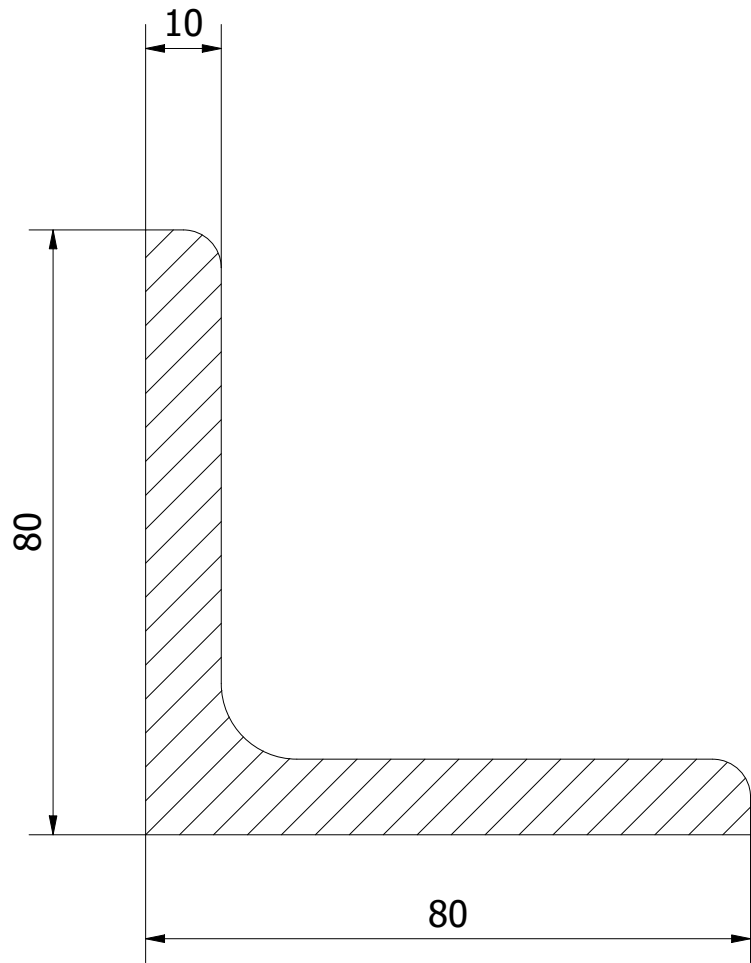


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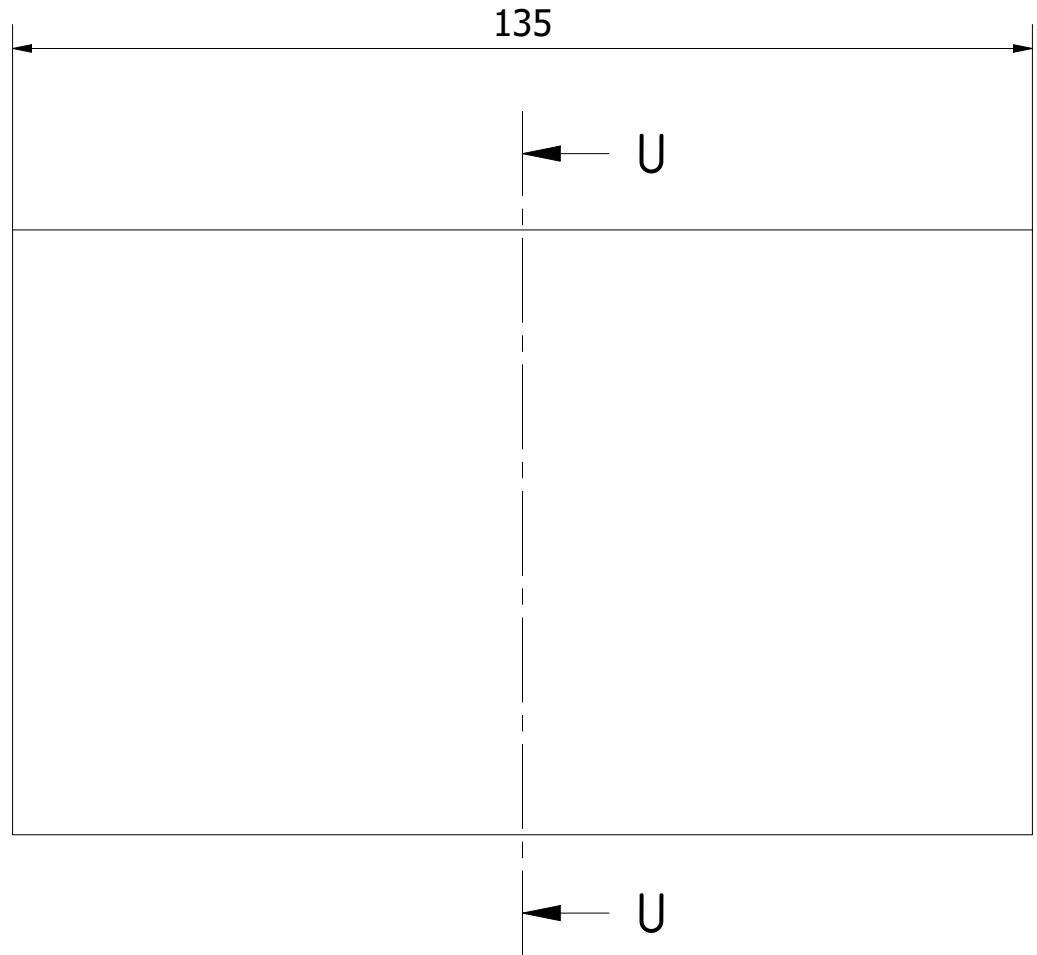


Note: All units in mm.


|  |               |             |            |         |
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| PROJECT  | CREATED BY    | APPROVED BY | DATE       | VERSION |
| Bench Top Bender   | J. Rosciano   | A. Morillo  | 10/08/2021 | 1.1     |
| PART NAME  | FILE NAME     |             |            | POS     |
| Fixed arm  | Fixed arm.ipt |             |            | 2.1     |
| PUBLISHED BY   | DOC. TYPE     | MATERIAL    | QUANTITY   |         |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Part          | ASTM A36    | 2          |         |
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| OHO e.V.   | CC-BY-SA 4.0  | 1/3         | 14 /18     |         |

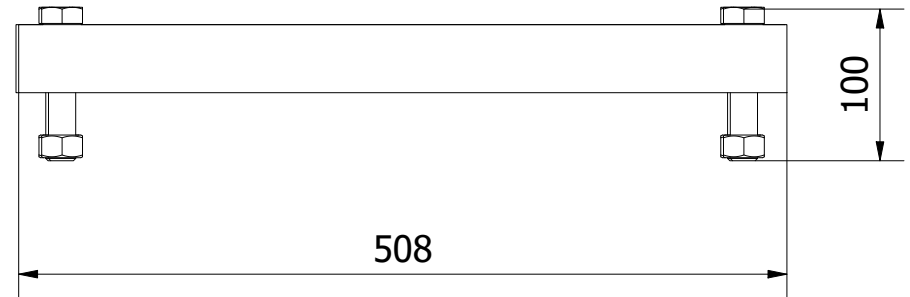
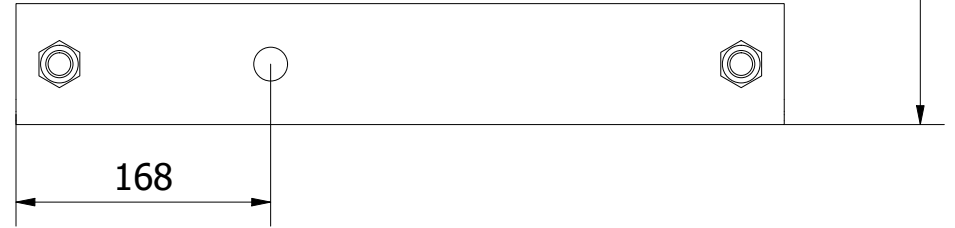
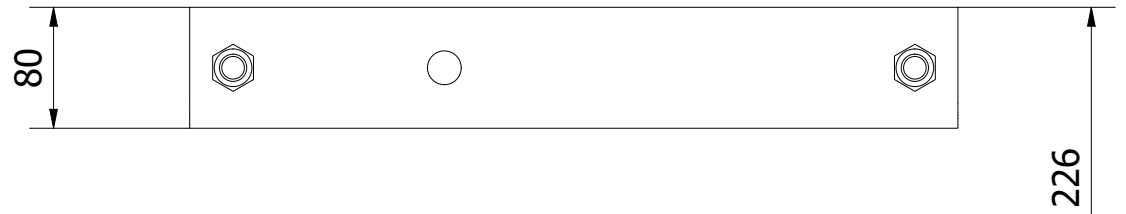
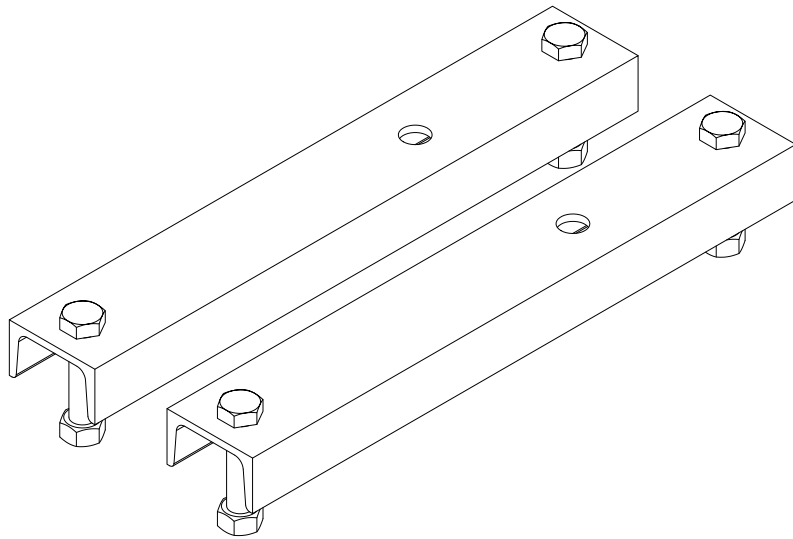


U-U ( 1 : 1 )




Note: All units in mm.

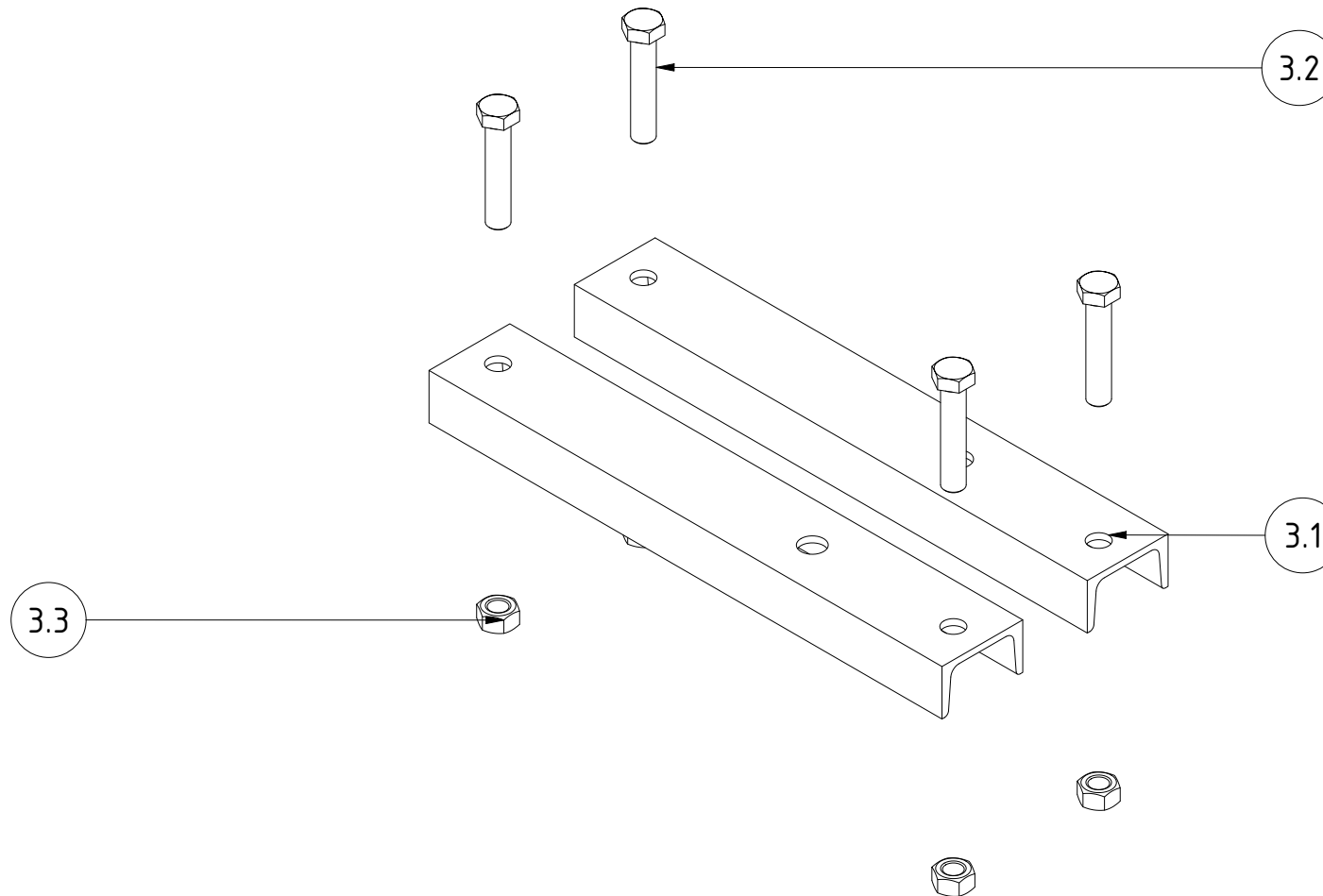
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| PROJECT  | CREATED BY            | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano           | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME             |             |            | POS      |
| Fixed angle steel  | Fixed angle steel.ipt |             |            | 2.2      |
| PUBLISHED BY   | DOC. TYPE             | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Part                  | ASTM A36    |            | 2        |
|  | LICENCE               | SCALE       |            | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0          | 1/1         |            | 15 /18   |




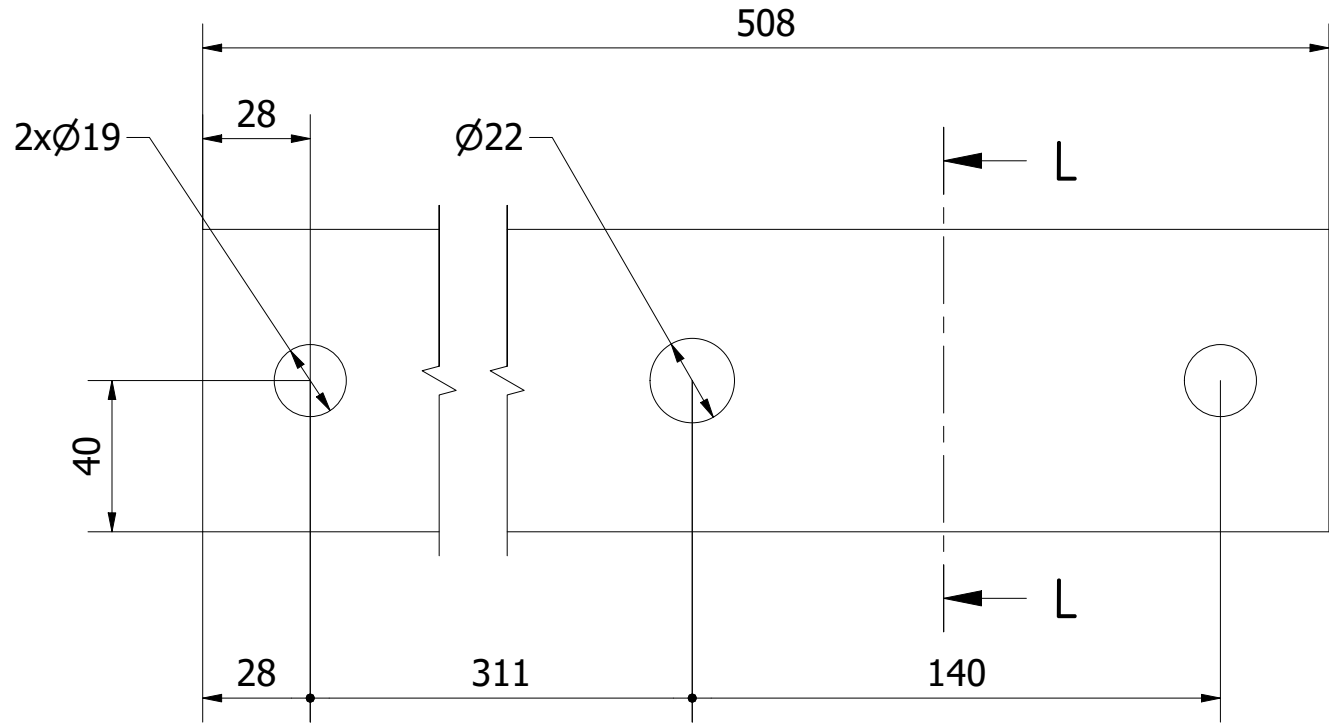
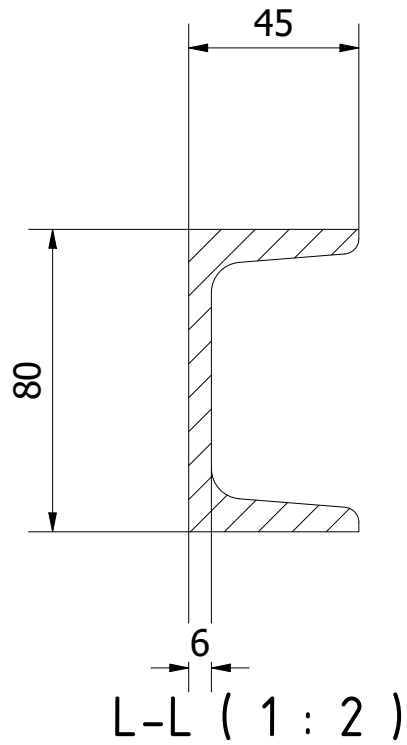
Note: All units in mm.

|  |                      |             |            |          |
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| PROJECT  | CREATED BY           | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano          | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME            |             |            | POS      |
| Mounting support   | Mounting support.iam |             |            | 3.0      |
| PUBLISHED BY   | DOC. TYPE            | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Assembly             |             |            | 1        |
|  | LICENCE              | SCALE       |            | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0         | 1/5         |            | 16 /18   |






|  |                      |             |            |         |
|--|----------------------|-------------|------------|---------|
| PROJECT  | CREATED BY           | APPROVED BY | DATE       | VERSION |
| Bench Top Bender   | J. Rosciano          | A. Morillo  | 10/08/2021 | 1.1     |
| PART NAME  | FILE NAME            |             |            | POS     |
| Mounting support   | Mounting support.ipn |             |            | 3.0     |
| PUBLISHED BY   | DOC. TYPE            | MATERIAL    | QUANTITY   |         |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Assembly             |             | 1          |         |
|  | LICENCE              | SCALE       | SHEET      |         |
| OHO e.V.   | CC-BY-SA 4.0         | 1/5         | 17 /18     |         |



Note: All units in mm.

|  |              |             |            |          |
|--|--------------|-------------|------------|----------|
| PROJECT  | CREATED BY   | APPROVED BY | DATE       | VERSION  |
| Bench Top Bender   | J. Rosciano  | A. Morillo  | 10/08/2021 | 1.1      |
| PART NAME  | FILE NAME    |             |            | POS      |
| Support  | Support.ipt  |             |            | 3.1      |
| PUBLISHED BY   | DOC. TYPE    | MATERIAL    |            | QUANTITY |
|  <b>OPEN HARDWARE OBSERVATORY</b><br>Free Blueprints for Sustainable Development | Part         | ASTM A36    |            | 2        |
|  | LICENCE      | SCALE       |            | SHEET    |
| OHO e.V.   | CC-BY-SA 4.0 | 1/3         |            | 18 /18   |