Frame scheme single set
Technical drawings and specifications
Furniture Contractor shall provide UNICEF representative with UNICEF:

1.01 SUMMARY
A. The scope of work includes the fabrication and delivery of freestanding “weather-resistant” classroom furniture:
1. Chair
2. Desk
B. Work includes, but is not limited to the following:
1. Labor, equipment, and material to fabricate freestanding classroom furniture.
2. Labor, equipment, and material to protect and transport freestanding classroom furniture, and/or its components, from the factory/workshop to the final installation locations.
3. Testing and quality control of classroom furniture and/or its components.
C. In the context of this specification, “weather-resistant” classroom furniture refers to the ability of the furniture to withstand limited exterior conditions such as humidity and moisture. The furniture is intended for use in indoor, unconditioned spaces, or semi-outdoor spaces, such as verandas, patios, etc.

1.02 REFERENCES
A. Reference Standards and Regulatory Requirements:
1. Where there are in existence national standards, regional standards, European Standard (EN), European Standard adopted International Organization for Standardization (EN ISO), or Normes Française (NF) Standards applicable to this type of product and work, the recommendations and requirements of such Standards shall be considered minimum standards for the installation described, and must be complied with.
2. Reference to a Standard or Code shall be deemed to include all other Standards and Codes referred to in the specified Standard or Code.
3. Nothing herein shall relieve Trade Contractor of its responsibility to provide a higher standard than the relevant Code or Standard, where that is required in order to comply with other parts of the Specifications.

1.03 SUSTAINABILITY REQUIREMENTS
A. Specific project goals of work include: use of recycled-content materials, use of recyclable materials, use of locally-manufactured materials, use of woods and plywood that are certified as renewable, use of low VOC-emitting materials, construction waste management and recycling, and the implementation of a construction indoor air quality management plan.
B. For wood, and plywood, certification of origin from a sustainable source shall be provided.
C. Furniture Contractor shall provide UNICEF representative with sustainability criteria for all component parts of classroom furniture prior to fabrication.

QUALITY ASSURANCE
A. The following methods of assuring quality are required by UNICEF:
1. Furniture Contractor shall fabricate and assemble one piece of each type of furniture prior to production. This “Test Unit” shall be used to verify drilled hole locations, assure alignments are consistent with the Design Drawings and Technical Specifications and perform all Quality Assurance Tests identified in Section 2.01 on each test unit. All tests shall be observed by the UNICEF representative. Apply all sample finishes to test units in areas of at least 150mm x 150mm and apply each of the finish colors to an entire steel leg or leg support component. The assembled Test Units and sample finishes shall be evaluated for compliance with the Design Drawings and Technical Specifications and approved by the UNICEF representative prior to commencement of production.
2. Conduct a detailed inspection and testing of one piece of each type of fully assembled furniture during production in the fabricator’s workshop in the presence of the UNICEF representative for every 100 units or less produced using all Quality Assurance tests identified in Section 2.01.
3. Conduct a detailed inspection and testing of one piece of each type of furniture taken at random once assembled and installed in a school for every 100 units or less assembled using Quality Assurance tests identified in Section 2.01.

WARRANTY
A. Furniture Contractor shall submit a written warranty agreeing to repair or replace units or components which fail in materials or workmanship within the specified warranty period. Warranty period is one year after the date of furniture delivery/installation.

PART 2 - TESTING
2.01 QUALITY ASSURANCE TESTS
A. General
1. Refer to Section 1.04 for description of testing of Test Units, assembled units during production in the fabricator’s workshop, and randomly selected assembled furniture in a school.
2. Test F, listed below, shall be performed on assembled furniture pieces both at the production workshop and at the school. A UNICEF representative shall be present for testing/test results.
B. Bend test on metal finishes
1. Test a finished metal piece by bending it over a 12 mm mandrel. If the finish cracks, it is not acceptable.
C. Scratch test on metal finishes
1. Pull a rough-edged stone weighing 3 kg over a finished metal piece. If the finish is scratched, it is not acceptable.
D. Adhesion test on metal finishes
1. Firmly apply a 100 mm piece of clear-self-adhesive tape on finished metal piece and rip it off. If the finish damaged, it is not acceptable.
E. Resistance to marking by liquids
1. Place a sponge (50x75x25 mm) soaked with water on top of the finished surface of a desk and chair/bench for 4 days. The sponge shall be kept wet for the duration of the test. At the end of the test, the surface shall be dried. If there is damage to the finish, it is not acceptable.
F. Loading test
1. Drop a 60 kg weight from 100 mm above onto the desk and chair/bench surfaces 30 times. If there is damage to the furniture, it is not acceptable.
2. Place 25 kg weights at 3 of the 4 corners of the desk and chair/bench surfaces 30 times. If there is damage to the furniture, it is not acceptable.
3. Place the bottom of the side legs against a fixed edge along the floor. Apply moderate pressure from the opposite side by pushing against the seat, bench or desk top. If the furniture racks, it is not acceptable.

PART 3 - MATERIALS
3.01 ACCEPTABLE CONSTRUCTION OPTIONS
A. Frame Furniture
1. Laminated plywood with steel frame, or
2. Laminated plywood with steel frame, or
3. Laminboard with steel frame, or
4. Laminboard with steel frame, or
5. Plastic laminate on laminated plywood or composite wood with steel frame.

PART 4 – TECHNICAL SPECIFICATIONS

4.01 DESIGN

A. Sizes: Refer to Design Drawings for small, medium and large furniture descriptions and all dimensions and component part configurations.

B. Colors
1. Steel components of furniture shall be painted in four different finish colors in equal numbers for each size of furniture provided.
2. Steel components for each desk, bench and chair shall be a single color. They shall also be the same for each desk / chair and desk / bench set.
3. Colors are:
   - UNICEF Blue – Pantone Process Cyan C
   - Orange – Pantone Orange 021 C
   - Light Green – Pantone 376 C
   - Chartreuse – Pantone 3965 C

4. Refer to Pantone web site to see image of colors: http://www.pantone.com/pages/pantone/colorfinder.aspx
5. Samples of color ranges shall be submitted to the UNICEF representative for evaluation and approval before fabrication.
6. Certain areas of the furniture shall be painted with chalkboard paint, refer to Design Drawings and Section 4.03 Finishes.

4.02 FABRICATION

A. Sheet Material and Wood
1. Cut sheet material and leg pieces to size using table and band saws to achieve straight and square cuts.
2. Rout edges to achieve rounded profiles as described in the Design Drawings.
3. Ease exposed wood edges that are not otherwise routed.
4. Drill holes to receive bolts as described in the Design Drawings (do not countersink bold heads).

B. Steel
1. Use a pneumatic metal break or a custom jig to bend steel tubes.
2. Steel tubes shall be cut so they are square to the frame assembly.
3. Steel tubes shall be continuous.
4. All welds on or behind surfaces which will be exposed to view shall be done so as to prevent distortion of finished surface.
5. All exposed edges shall be slightly eased to eliminate sharp edges.
6. TIG (Argon-arc) welding is recommended. Any commercial welding is acceptable. Add filler metal as required. Weld size shall be equal to the thickness of the steel being joined. Electrodes for standard grade steel A36 shall be AWS 5.1, Class E70XX.

A. Metals
1. 1. All metal parts shall receive powder coat painting. Substrate shall be free of grease, oil, dirt, fingerprints and drawing compounds.
2. For regions where powder coating is not available, hand painting metals shall be acceptable. Thoroughly cleaned metal shall receive one coat of red-oxide primer and 3 coats of enamel paint. Each coat of enamel paint shall be lightly diluted with thinner (2% max), and after the first and second coat of enamel paint has dried properly, metal shall be lightly sanded with flint paper (grade 200 and above) to remove bubbles and sharp points. The final coat shall give a smooth, even, and hard topcoat. Paint coats shall be fully dried prior to application of next coat.
3. Enamel shall be a non-chipping type.
4. Refer to colors in Section 4.01 of this design specification.

B. Wood
steel being joined. Electrodes for standard grade steel A36 shall be AWS 5.1, Class E70XX.

4.03 FINISHES
A. Metals
1. All metal parts shall receive powder coat painting. Substrate shall be free of grease, oil, dirt, fingerprints and drawing compounds.
2. For regions where powder coating is not available, hand painting metals shall be acceptable. Thoroughly cleaned metal shall receive one coat of red-oxide primer and 3 coats of enamel paint. Each coat of enamel paint shall be lightly diluted with thinner (2% max), and after the first and second coat of enamel paint has dried properly, metal shall be lightly sanded with flint paper (grade 200 and above) to remove bubbles and sharp points. The final coat shall give a smooth, even, and hard topcoat. Paint coats shall be fully dried prior to application of next coat.
3. Enamel shall be a non-chipping type.
4. Refer to colors in Section 4.01 of this design specification.

B. Wood
1. Wood shall be thoroughly sanded in the direction of wood grain using three gradations of sandpaper to produce a smooth surface.
2. All wood shall be finished with 3 coats of lacquer with a light sanding between coats 1 and 2.
3. All wood surfaces to receive lacquer shall be thoroughly cleaned and free of dirt, oil, grease, moisture, or other foreign matter prior to painting.
4. All wood finishes shall be non-toxic.
5. Chalkboard paint
   a. Two coats of acrylic paint with durable finish shall be used.
   b. Apply to a wood surface with primer designed to provide block between wood and finish paint.

PART 5 - MISCELLANEOUS

5.01 PACKAGING
A. Internal packaging components
   1. Furniture component parts to be shipped in flat corrugated cardboard containers and packed in such a way to avoid crushing, scratches and abrasions during shipping.
B. Furniture contractor shall be responsible for protection of furniture pieces during transportation.

5.02 ASSEMBLY/REPAIR KIT
A. Provide one adjustable bolt wrench that fits the specified hex nut, one flathead screwdriver sized for the specified screws and a rubber mallet.
B. Provide up to two screws and bolt/nut assemblies in each size for each desk and bench unit provided by the Furniture Contractor.
C. Provide four additional feet for each individual furniture piece.
D. Assembly/Repair Kit: Provide two kits for orders between 1 and 200 desk and chair/bench units and an additional kit for each additional 1 to 100 unit increment.

5.03 TRAINING
A. Furniture Contractor shall provide an information session to school personnel on assembling and maintaining the furniture. This is required at each school where classroom furniture is installed.
B. Certification letter from Furniture Contractor stating successful completion of school personnel training, signed by both the Furniture Contractor and school representative.

END
Frame Scheme

DESK COMPONENTS

SCHEDULE: SINGLE DESK

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY</th>
<th>DESCRIPTION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>DESK FRAME</td>
<td>18mm STEEL SQUARE TUBE FRAME</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>DESKTOP</td>
<td>18mm THICK SHEET MATERIAL</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>MOODITY PANEL</td>
<td>18mm THICK SHEET MATERIAL</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>SHELF STORAGE 67 INSETS</td>
<td>18mm THICK SHEET MATERIAL</td>
</tr>
<tr>
<td>E1</td>
<td>12</td>
<td>CARTRIDGE BOLT</td>
<td>M6 x 45 mm ZINC PLATED STEEL</td>
</tr>
<tr>
<td>E2</td>
<td>12</td>
<td>HEX LOCKNUT</td>
<td>M6 x 1.25, ZINC PLATED STEEL WITH NYLON INSETS</td>
</tr>
<tr>
<td>E3</td>
<td>12</td>
<td>WASHER</td>
<td>M6 ZINC PLATED</td>
</tr>
<tr>
<td>F</td>
<td>6</td>
<td>LEG CAP</td>
<td>HARD PLASTIC</td>
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CHAIR COMPONENTS

SCHEDULE: CHAIR

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY</th>
<th>DESCRIPTION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>CHAIR FRAME</td>
<td>18mm STEEL SQUARE TUBE FRAME</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>BACK</td>
<td>18mm THICK SHEET MATERIAL</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>SEAT</td>
<td>18mm THICK SHEET MATERIAL</td>
</tr>
<tr>
<td>D</td>
<td>3</td>
<td>ARM CAP</td>
<td>HARD PLASTIC</td>
</tr>
<tr>
<td>E1</td>
<td>6</td>
<td>CARTRIDGE BOLT</td>
<td>M6 x 45 mm ZINC PLATED STEEL</td>
</tr>
<tr>
<td>E2</td>
<td>8</td>
<td>HEX LOCKNUT</td>
<td>M6 x 1.25, ZINC PLATED STEEL WITH NYLON INSETS</td>
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<tr>
<td>E3</td>
<td>8</td>
<td>WASHER</td>
<td>M6 ZINC PLATED</td>
</tr>
<tr>
<td>F</td>
<td>6</td>
<td>LEG CAP</td>
<td>HARD PLASTIC</td>
</tr>
</tbody>
</table>

Scale
Not To Scale
Date
26 August 2015
Frame Scheme

01 CHAIR FRONT ELEVATION 1:8 SCALE

02 CHAIR SIDE ELEVATION 1:8 SCALE

03 CHAIR REAR ELEVATION 1:8 SCALE

04 CHAIR PLAN 1:8 SCALE

A SECTION DETAIL 1:1 SCALE

B SECTION DETAIL 1:1 SCALE

NOTE: REFER TO DRAWING F-2 FOR OVERALL FURNITURE DIMENSIONS FOR SMALL, MEDIUM AND LARGE UNITS.

Scale
As Noted
Date
26 August 2015

Frame Scheme
Chair
Sheet 6 of 20
Frame Scheme

Frame Scheme

WELDED CONNECTION SHALL BE GROUND SMOOTH, TYP.

PREDRILED 6 MM HOLE TO RECEIVE BOLT AND LOCKNUT, TYP.

OPTIONAL 3 mm THICK BENT STEEL WIRE HOOK FOR SCHOOL BAGS WELDED TO UNDERSIDE OF STEEL TUBE.

HARD PLASTIC LEG CAP, TYP.

Scale

1:4

Date

26 August 2015
**Hardware Required for Assembly**

<table>
<thead>
<tr>
<th>Frame Chair</th>
<th>Frame Single Desk</th>
</tr>
</thead>
<tbody>
<tr>
<td>- X 8 Carriage Bolt M8 x 45 mm</td>
<td></td>
</tr>
<tr>
<td>- X 8 M8 washer</td>
<td></td>
</tr>
<tr>
<td>- X 8 M8 hex locknut with nylon insert</td>
<td></td>
</tr>
<tr>
<td>- X 4 Hard plastic foot</td>
<td></td>
</tr>
<tr>
<td>- X 2 Hard plastic cap</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame Chair</th>
<th>Frame Single Desk</th>
</tr>
</thead>
<tbody>
<tr>
<td>- X 48 Carriage Bolt M8 x 45 mm</td>
<td></td>
</tr>
<tr>
<td>- X 32 M8 washer</td>
<td></td>
</tr>
<tr>
<td>- X 48 M8 hex locknut with nylon insert</td>
<td></td>
</tr>
<tr>
<td>- X 16 Hard plastic foot</td>
<td></td>
</tr>
</tbody>
</table>

**Assembly / Repair Kit**

<table>
<thead>
<tr>
<th>Tools</th>
<th>Spare Parts (for one single desk/chair unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- X 1 Wrench</td>
<td></td>
</tr>
<tr>
<td>- X 32 M8 washer</td>
<td></td>
</tr>
<tr>
<td>- X 1 Rubber mallet</td>
<td></td>
</tr>
<tr>
<td>- X 32 M8 hex locknut with nylon insert</td>
<td></td>
</tr>
<tr>
<td>- X 1 Fabric drawstring bag for tools and spare parts</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Two assembly/repair kits shall be provided for each school with orders between 1 and 200 chair/bench and desk units. One additional kit shall be provided for each 1 to 100 unit increment.
**SCALE**

Not To Scale

**DATE**

26 August 2015

1. **STEP 1**
   - Lay seat top on table or elevated work surface that is protected by fabric or other soft material
   - Position the frame on top of the holes to receive bolts
   - Tap in the bolts so the head is flat to the wood and tighten nuts. Be careful not to tighten too much to avoid breaking the wood surface.

2. **STEP 2**
   - Fasten the other frame to the seat

3. **STEP 3**
   - Fasten the back to both frames
   - Go back and tighten all bolts as tight as possible without cracking wood surface.

4. **STEP 4**
   - Add hard plastic cap to each arm
   - Add hard plastic foot to each leg end

**TOOLS REQUIRED:**

- (2x) bolts - "B1"
- (4x) bolts - "B1"
**Frame Scheme**

**Scale**
Not To Scale

**Date**
26 August 2015

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**Frame Scheme**

**Frame Scheme**

**Assembly Drawings**

Sheet 18 of 20

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**STEP 1**

- Lay the desk shelf on table or elevated work surface that is protected by fabric or another soft material
- Position the frame on top of the holes to receive bolts
- Tap in the bolts so the head is flat to the wood and tighten nuts. Be careful not to tighten too much to avoid breaking the wood surface.

**STEP 2**

- Lay the desktop on top of the leg frames
- Fasten the desktop to the leg frames

**STEP 3**

- Lay the modesty panel against the leg frames
- Go back and tighten each bolt as tight as possible without cracking wood surface

**STEP 4**

- Add hard plastic foot to each leg end

**TOOLS REQUIRED:**

---

**COMPLETE**
Frame Scheme

CHAIR SEAT / LEG CONNECTION

LEG CONNECTION SHOWING TRIMMED BOLT ENDS

DESK / SHELF CONNECTION SHOWING BAG HOOK

FRONT DESK CONNECTION SHOWING CHALKBOARD EDGE AFTER ROUTING AND BOLT HEAT TO SURFACE

Scale
Not To Scale
Date
26 August 2015

Frame Scheme
Detail Photos
Sheet 19 of 20