NIJ Standard 0101.07, *Ballistic Resistance of Body Armor*
Addendum 2

July 1, 2025

This addendum includes revisions to NIJ Standard 0101.07, *Ballistic Resistance of Body Armor*. Users of the NIJ Standard should incorporate the revisions in this addendum as a part of the NIJ Standard.

The revisions are presented in the following format:

Revision: [description of the revision]

[relevant section of NIJ Standard 0101.07 or Addendum 1 with new or modified text in red and ~~text to be removed in red strikethrough~~.]

*** REVISIONS ***

Revision: Revised section 1.1. and its subsections to clarify the scope of the standard.

1.1. This standard specifies minimum performance requirements and test methods for the ballistic resistance of some types of body armor used by U.S. law enforcement intended to protect the torso against handgun and rifle ammunition.

1.1.1. The test methods within this standard were developed and validated for broadly available armor designs. Some armor designs may require additional testing.

Revised to state:

1.1. This standard specifies minimum performance requirements and test methods for the ballistic resistance of some types of body armor used by U.S. law enforcement intended to protect the human torso against handgun and rifle ammunition.

1.1.1. The test methods within this standard were developed and validated for broadly available armor designs. Some armor designs may require additional testing.

1.1.2. The geometries of the test templates, shot patterns, and shot locations, among other considerations, limit the scope of this standard to body armor specifically designed for the human torso. Other form factors of body armor, such as accessory panels, limb and groin protection, and canine or equine equipment, are outside the scope of this standard as they would require different test template geometries, shot patterns, and shot locations, among other considerations.

Revision: Modified section 3.2.3. as revised in Addendum 1 to include a more robust definition of complete penetration when conducting an edge shot on soft armor. The definition of a complete penetration for shot 7 is deleted later in section 9.2.6 since the modified section 3.2.3 addresses the information that was in 9.2.6.

3.2.3. *complete penetration* (CP), n. – the result of a test threat impact if one or more of the following conditions are met:

(1) any portion of a test threat or a fragment of a test threat passes through the wear face of the test item.
(2) the test threat is visible from the wear face of the test item.
(3) a hole is created through the test item by the test threat.
(4) for soft armor, any portion of a test threat or a fragment of a test threat is embedded in or passes into the backing material directly behind the test item.
~~(5) for hard armor, any portion of a test threat, a fragment of a test threat, or a fragment of the test item is embedded in or passes into the backing material directly behind the test item.~~
(5) for any shot at a nonzero angle of obliquity on soft armor, including shot 7, any portion of a test threat or a fragment of a test threat that is visible through the panel cover.
(6) for any shot at a nonzero angle of obliquity on soft armor, including shot 7, if the shot exits the panel cover from the edge and is not fully retained by the ballistic panel.

NOTE for (5) and (6): For any shot at a nonzero angle of obliquity on soft armor, including shot 7, test threats protruding from the edge shall be considered fully retained if the test threat is encapsulated in the panel cover and not visible. If the test threat penetrates the panel cover but is retained in the polycotton carrier, the test result shall be considered a complete penetration.

(7) for hard armor, any portion of a test threat or a fragment of a test threat embedded in or passes into the backing material directly behind the test item.

(8) for hard armor, a fragment of any hard component of the test item that penetrates the cover material on the back of the test item.

NOTE: For the purposes of this definition, ceramics and metals shall be considered hard components.

NOTE: Spall embedded in the clay surface beyond the perimeter of the test item shall not be considered a complete penetration.

Revised to state:

3.2.3. *complete penetration* (CP), n. – the result of a test threat impact if one or more of the following conditions are met:

(1) any portion of a test threat or a fragment of a test threat passes through the wear face of the test item.
(2) the test threat is visible from the wear face of the test item.
(3) a hole is created through the test item by the test threat.
(4) for soft armor, any portion of a test threat or a fragment of a test threat is embedded in or passes into the backing material directly behind the test item.
~~(5) for hard armor, any portion of a test threat, a fragment of a test threat, or a fragment of the test item is embedded in or passes into the backing material directly behind the test item.~~
(5) for any shot at a nonzero angle of obliquity on soft armor, including shot 7, any portion of a test threat or a fragment of a test threat that is visible through the panel cover.
(6) for any shot at a nonzero angle of obliquity on soft armor, including shot 7, if the shot exits the panel cover from the edge and is not ~~fully~~ retained by the ballistic panel.

~~NOTE for (5) and (6): For any shot at a nonzero angle of obliquity on soft armor, including shot 7, test threats protruding from the edge shall be considered fully retained if the test threat is encapsulated in the panel cover and not visible. If the test threat penetrates the panel cover but is retained in the polycotton carrier, the test result shall be considered a complete penetration.~~

(7) for any shot at a nonzero angle of obliquity on soft armor, including shot 7, any portion of a test threat or a fragment of a test threat deflecting toward an edge between layers of ballistic material that meets *all* the following three conditions:
    (a) breaks the ballistic panel cover;
    (b) is visible when facing the wear face (i.e., line of sight is normal to the wear face); and
    (c) extends beyond the edge contour of the armor panel.

NOTE: Any portion of a test threat or a fragment of a test threat that penetrates through the polycotton carrier shall indicate a complete penetration. The edge contour shall be defined as the outer edge of any unpenetrated layer of ballistic material on the wear face side of the armor panel.

(8) for hard armor, any portion of a test threat or a fragment of a test threat embedded in or passes into the backing material directly behind the test item.

(9) for hard armor, a fragment of any hard component of the test item that penetrates the cover material on the back of the test item.

NOTE: For the purposes of this definition, ceramics and metals shall be considered hard components.

NOTE: Spall embedded in the clay surface beyond the perimeter of the test item shall not be considered a complete penetration.

Revision: Added new section 4.4.1.1. to clarify that all testing shall be conducted on a flat clay surface until specified otherwise.

4.4.1.1. All testing shall be conducted on a flat clay surface until specified otherwise.

Revision: Added new section 7.1.4. to clarify that armor models with construction elements shall be tested as a nonplanar armor.

7.1.4. Any armor model with stitches, seams, folds, and other shaping features shall be considered nonplanar armor for the purposes of testing, regardless of whether the model is designated for female wearers, and shall be tested accordingly.

Revision: Added new section 9.2.1.1. that specifies the locations of shots 1, 2, and 3 on a C-1 test item.

9.2.1.1. For NIJ-C-1 test items, shots 1, 2, and 3 shall be placed within the shaded bands indicated in Figure X.1. The light gray band applies to the lesser mass test threat and dark gray band applies to the greater mass test threat. Each band is 0.75 in. wide and the center of the band represented by the dashed white line is the minimum shot-to-edge distance for the respective test threats. Shots shall be placed as follows:

Shot 1: For odd-numbered test items, place the shot on the respective band within the green region in the upper right. For even-numbered test items, place the shot on the respective band within the orange region in the upper left.

Shot 2: Place the shot on the respective band within the green region in the lower left.

Shot 3: Place the shot on the respective band within the green region in the lower right.

Revision: Added new section 9.2.1.2. that specifies shot locations on a C-5 test item.

9.2.1.2. For NIJ-C-5 test items, shots 1, 2, and 3 shall be placed within the shaded bands indicated in Figure X.2. The light gray band applies to the lesser mass test threat and dark gray band applies to the greater mass test threat. Each band is 0.75 in. wide and the center of the band represented by the dashed white line is the minimum shot-to-edge distance for the respective test threats. shall be placed as follows:

Shot 1: For odd-numbered test items, place the shot on the respective band within the green region in the upper right. For even-numbered test items, place the shot on the respective band within the orange region in the upper left.

Shot 2: For odd-numbered test items, place the shot on the respective band within the green region in the middle left. For even-numbered test items, place the shot on the respective band within the orange region in the lower left.

Shot 3: For odd-numbered test items, place the shot on the respective band within the green region in the middle right. For even-numbered test items, place the shot on the respective band within the orange region in the lower right.

Revision: Added new section 9.2.1.3. to further clarify the locations of shots 4, 5, 6, and 7.

9.2.1.3. Shots 4, 5, 6, and 7 shall be placed in accordance with ASTM E3107, Section 11.

Revision: Modified section 9.2.6. to describe the use of a witness panel and clay surface observations during edge shots. The definition of a complete penetration for shot 7 is deleted since section 3.2.3. was modified to include the new definition of complete penetration for all edge shots, including shot 7.

~~9.2.6. For shot 7 on a front panel, if any portion of a test threat or a fragment of a test threat is embedded in or passes into any area of the backing material, that shall be considered a CP.~~

~~NOTE: This is an exception to the definition of a CP on soft armor from Section 3.2.3 of this NIJ standard that applies only to shot 7 at the neck of a front panel.~~

Revised to state:

9.2.6 For any shot at a nonzero angle of obliquity on soft armor, including shot 7, a witness panel and the clay surface between the test item and witness panel shall be used to determine if any portion of a test threat or a fragment of a test threat exited the side of the armor.

9.2.6.1. The witness panel shall be composed of 1/8 in. thick corrugated cardboard and shall be affixed to the metal frame of the clay box such that the cardboard panel extends perpendicular to the clay surface.

9.2.6.2 The cardboard panel shall be affixed to the side of the clay block where the path of the projectile is expected to cross should it exit from the side of the soft armor.

9.2.6.3. The cardboard panel shall be large enough to accommodate a wide range of possible projectile trajectories from the edge of the test item.

9.2.6.4. The witness panel should be placed at a standoff distance of 4 inches or greater.

9.2.6.5. If any portion of a test threat or a fragment of a test threat embeds into or passes into any area of the clay surface between the edge of the test item and the witness panel, or strikes or passes through the witness panel, the shot shall be considered a complete penetration.

Revision: Added new section 9.3.4.3. to specify that a clay block that meets the acceptance criteria may be used for up to 45 minutes after the final drop in the verification procedure.

9.3.4.3. A clay block that meets the acceptance criteria may be used for up to 45 minutes from the final drop in the verification procedure.

Revision: Modified section 9.3.7. to remove clay block verification between test items.

9.3.7. If there are additional test items in the test series, ~~perform the procedure of ASTM E3004, Section 6.6, with the modifications listed in Appendix B, Section B.3: Modifications to ASTM E3004, Section 6.6, Clay Block Verification Procedure: Between Test Items, and~~ repeat the above procedure on another test item.

Revision: Deleted section 9.3.7. to remove clay block verification after the final test item.

~~9.3.8. After the final test item in the test series has been tested, perform the procedure of ASTM E3004, Section 6.7, with the modifications listed in Appendix B, Section B.4: Modifications to ASTM E3004, Section 6.7, Clay Block Verification Procedure: After Final Shot on Clay Block.~~

Revision: Added new section 9.4.6.3. to specify that a clay block that meets the acceptance criteria may be used for up to 45 minutes after the final drop in the verification procedure.

9.4.6.3. A clay block that meets the acceptance criteria may be used for up to 45 minutes from the final drop in the verification procedure.

Revision: Revised section 9.4.10. to remove clay block verification between test items.

9.4.10. If there are additional test items in the test series, ~~perform the procedure of ASTM E3004, Section 6.6, with the modifications listed in Appendix B, Section B.3: Modifications to ASTM E3004, Section 6.6, Clay Block Verification Procedure: Between Test Items, and~~ repeat the above procedure on another test item.

Revision: Deleted section 9.4.11. to remove clay block verification after the final test item.

~~9.4.11. After the final test item in the test series has been tested, perform the procedure of ASTM E3004, Section 6.7, with the modifications listed in Appendix B, Section B.4: Modifications to ASTM E3004, Section 6.7, Clay Block Verification Procedure: After Final Shot on Clay Block.~~

Revision: Modified revised section 9.5.1.1. of Addendum 1 to clarify the velocity range on the first shot of the ballistic limit test series.

9.5.1.1. The actual velocity of the first shot shall be the reference velocity ~~–/+100 ft/s (–/+30 m/s)~~ –30/+100 ft/s (–9/+30 m/s) for the test threat.

Revision: Modified section 9.6.2.1. to specify the shot pattern to use for ballistic limit testing on soft armor test items.

9.6.2.1. Following the required conditioning procedure or sequence, mark the shot locations on each test item using the shot pattern indicated in Figure X.3. Shots for ballistic limit testing shall be taken at these locations in the order enumerated, following the shot spacing requirements of Section 9.5.5 of this NIJ standard.

Revision: Modify section 10.5.2. to clarify the intent of holding the test items at controlled ambient for 24 hours upon receipt.

10.5.2. All test items shall be ~~conditioned~~ acclimated at controlled ambient for at least 24 hours prior to ~~subsequent~~ hard armor conditioning or conditioning by submersion.

Revision: Modify section 12.3.2.3 to bring it into alignment with the modified section 12.2.3.2.

12.3.2.3. When taking six shots per test item, BFD measurements shall be made on ~~shot 6 and three of the shots within the shaded band~~ shots 1 and 2.

Revision: Added new section 12.4.5.3. to specify that a clay block that meets the acceptance criteria may be used for up to 45 minutes after the final drop in the verification procedure.

12.4.5.3. A clay block that meets the acceptance criteria may be used for up to 45 minutes from the final drop in the verification procedure.

Revision: Added new section 12.4.6.1. to amend the requirements in ASTM E3107, Section 12.3.2.

12.4.6.1. The requirements in ASTM E3107, Section 12.3.2. shall be amended as follows: The applique shall be formed such that it completely fills the space between the test item and the clay block surface. The applique shall be the minimum thickness required to completely fill the space. A multi-curve plate shall have at least four points of contact 6 mm (0.25 in.) or less between its edges and the surface of the clay block.

Revision: Added new section 12.4.6.2. to allow the use of clay to fill gaps.

12.4.6.2. Clay may be added to fill in gaps.

Revision: Revised section 12.4.8. to remove clay block verification between test items.

12.4.8. If there are additional test items in the test series, ~~perform the procedure of ASTM E3004, Section 6.6, with the modifications listed in Appendix B, Section B.3: Modifications to ASTM E3004, Section 6.6, Clay Block Verification Procedure: Between Test Items, and~~ repeat the above procedure on another test item.

Revision: Revised section 12.4.8.1 to remove clay block verification between test items.

~~12.4.8.1. When conducting RF1 or RF2 testing using three shots per item, clay block verification shall be required only after six shots have been fired (i.e., after every other test item). The six shots shall be fired in consecutive order using the same clay~~

~~block. Please refer to "Option 2" in Figure 4 and Figure 5. Clay block verification shall be conducted after all other test items are tested.~~

Revision: Revised section 12.4.8.2 to remove clay block verification between test items.

~~12.4.8.2. When conducting RF3 testing using less than six shots per test item, clay block verification shall be required only after six shots have been fired. The six shots shall be fired in consecutive order using the same clay block. Please refer to "Option 2," "Option 3," and "Option 4" in Figure 6. Clay block verification shall be conducted after all other test items are tested.~~

Revision: Revised section 12.4.9. to remove clay block verification after the final test item.

~~12.4.9. After the final test item in the test series has been tested, perform the procedure of ASTM E3004, Section 6.7, with the modifications listed in Appendix B, Section B.4: Modifications to ASTM E3004, Section 6.7, Clay Block Verification Procedure: After Final Shot on Clay Block.~~

Revision: Added new section 12.6.3.1. to clarify the shot patterns used for ballistic limit testing on hard armor test items.

12.6.3.1. The ballistic limit shot pattern for six-shot hard armor test items will be the "dice" pattern as indicated in Figure X.4. Shot 1 is top left, shot 2 is top right, shot 3 is middle left, shot 4 is middle right, shot 5 is lower left, and shot 6 is lower right. Shoot test item 1 in the following order: 1, 2, 3, 4, 5, 6. Shoot test item 2 in the following order: 2, 3, 4, 5, 6, 1. Shoot test item 3 in the following order: 3, 4, 5, 6, 1, 2. And so on, repeating the cycle, until all shots are taken.

Revision: Added new section 12.6.3.2. to clarify the shot patterns used for ballistic limit testing on hard armor test items.

12.6.3.2. The ballistic limit shot pattern for three-shot hard armor test items will be the "dice" pattern for the six-shot plate but fired in an alternating way as follows as indicated in Figure X.5. Shoot test item 1 in the following order: 1, 4, 5. Shoot test item 2 in the

following order: 2, 3, 6. Shoot test item 3 in the following order: 4, 5, 1. Shoot test item 4 in the following order: 3, 6, 2. And so on, repeating the cycle, until all shots are taken.

Revision: Added new section 12.6.3.3. to clarify the shot patterns used for ballistic limit testing on hard armor test items.

12.6.3.3. The ballistic limit shot pattern for one-shot hard armor test items will be shooting each test item in designated locations as indicated in Figure X.6. Top left, top center, top right, middle left, center, middle right, lower left, lower center, lower right. Shoot test items in that order, repeating the cycle, until all shots are taken.

Revision: Added new section 12.6.4.3. to specify that a clay block that meets the acceptance criteria may be used for up to 45 minutes after the final drop in the verification procedure.

12.6.4.3. A clay block that meets the acceptance criteria may be used for up to 45 minutes from the final drop in the verification procedure.

Revision: Revised section 12.6.7. to remove clay block verification between test items.

12.6.7. If there are additional test items in the test series, ~~perform the procedure of ASTM E3004, Section 6.6, with the modifications listed in Appendix B, Section B.3: Modifications to ASTM E3004, Section 6.6, Clay Block Verification Procedure: Between Test Items, and~~ repeat the above procedure on another test item.

Revision: Delete Section B.3. to remove procedure for clay block verification between test items.

~~**B.3 Modifications to ASTM E3004, Section 6.6, Clay Block Verification Procedure: Between Test Items**~~

~~(1) Section 6.6, Clay Block Verification Procedure: Between Test Items, is required.~~
~~(2) Section 6.6.2.2 shall apply, with these additions:~~
~~Five drop target positions shall be marked on the clay surface, attempting to avoid~~

placing drop target locations on the most recently repaired clay. Remove the template.

(3) Section 6.6.2.4 shall be replaced with:
Drop the impactor onto the clay block. The impactor shall be dropped five times, once on each of the marks on the clay surface.

(4) Section 6.6.2.5 shall be modified to require that the five indentation measurements be recorded.

(5) Section 6.6.3, Acceptance Criteria, shall not apply. The acceptance criteria shall be:

- The arithmetic mean of the five indentation depth measurements shall be 19.0 mm ± 2.0 mm (0.748 in ± 0.08 in).
- Each indentation depth measurement shall be 19.0 mm ± 3.0 mm (0.748 ± 0.12) .
- The measurements shall not be rounded off.

Revision: Delete Section B.4. to remove procedure for clay block verification after final shot on clay block.

B.4 Modifications to ASTM E3004, Section 6.7, Clay Block Verification Procedure: After Final Shot on Clay Block

(1) Section 6.7, Clay Block Verification Procedure: After Final Shot on Clay Block is required.

(2) Section 6.7.2.1 shall apply, but the clay block shall be repaired.

(3) Sections 6.7.2.3 and 6.7.2.4, shall be replaced with:
Place the drop template on the clay surface in an arbitrary rotational position, attempting to avoid placing drop target locations on the most recently repaired clay. Mark the surface of the clay block (for example, by nicking the surface, laser marking, applying ink) to indicate five drop target positions. Remove the template.

(4) Section 6.7.2.5, shall be replaced with:
Drop the impactor onto the clay block. The impactor shall be dropped five times, once on each of the marks on the clay surface.

(5) Section 6.7.2.6 shall be modified to require that the five indentation measurements be recorded.

(6) Section 6.7.3, Acceptance Criteria, shall not apply. The acceptance criteria shall be:

- The arithmetic mean of the five indentation depth measurements shall be 19.0 mm ±
- 2.0 mm (0.748 in ± 0.08 in).
- Each indentation depth measurement shall be 19.0 mm ± 3.0 mm (0.748 ± 0.12).
- The measurements shall not be rounded off.

Revision: Revised section F.2.1.2.3. to correct a typo in the label requirement.

F.2.1.2.3. The label itself shall be no less than 0.5 in (13 mm) away from and parallel to the long edges of the substrate.

Revision: Modify F.2.1.3.2. in Appendix F to improve the practicality of the test.

~~F.2.1.3.2. If the label substrate material is not a stand-alone material (e.g., spray liner or fabric wrap), then the manufacturer shall submit test items with representative substrates applied to a nominally planar surface (e.g., plastic, steel or wood). The surface finish of this material shall be representative of the surface finish that will be present in the finished product.~~

Revised to state:

F.2.1.3.2. If the label substrate material derived from the test item cannot be tested in a stand-alone fashion, then the manufacturer shall submit labels applied to a 4mm or less thick purpose-built coupon of the exact substrate material with the characteristics—such as flexibility and physical integrity—to permit completion of label testing.

Revision: Added new Figures X.1. through X.6. and new figure captions.

Figure X.1. Shot locations for shots 1, 2, and 3 on a C-1 panel for B-PBD testing of soft armor. Shots shall be placed within the shaded bands where the light gray band applies to the lesser mass test threat and dark gray band applies to the greater mass test threat. Each band is 0.75 in. wide and the center of the band represented by the dashed white line approximate the minimum shot-to-edge distance for the respective test threats. Note that the overlaid bands in this figure are for illustrative purposes and may not be exactly to scale. Shot 1 on odd-numbered test items shall be taken in the green region. Shot 1 on even-numbered test items shall be taken in the orange region. Shot 2 and shot 3 shall be taken in the purple regions.

Figure X.2. Shot locations for shots 1, 2, and 3 on a C-5 panel for B-PBD testing of soft armor. Shots shall be placed within the shaded bands where the light gray band applies to the lesser mass test threat and dark gray band applies to the greater mass test threat. Each band is 0.75 in. wide and the center of the band represented by the dashed white line approximate the minimum shot-to-edge distance for the respective test threats. Note that

the overlaid bands in this figure are for illustrative purposes and may not be exactly to scale. Shot 1, shot 3, and shot 3 on odd-numbered test items shall be taken in the green regions. Shot 1, shot 3, and shot 3 on even-numbered test items shall be taken in the green regions.

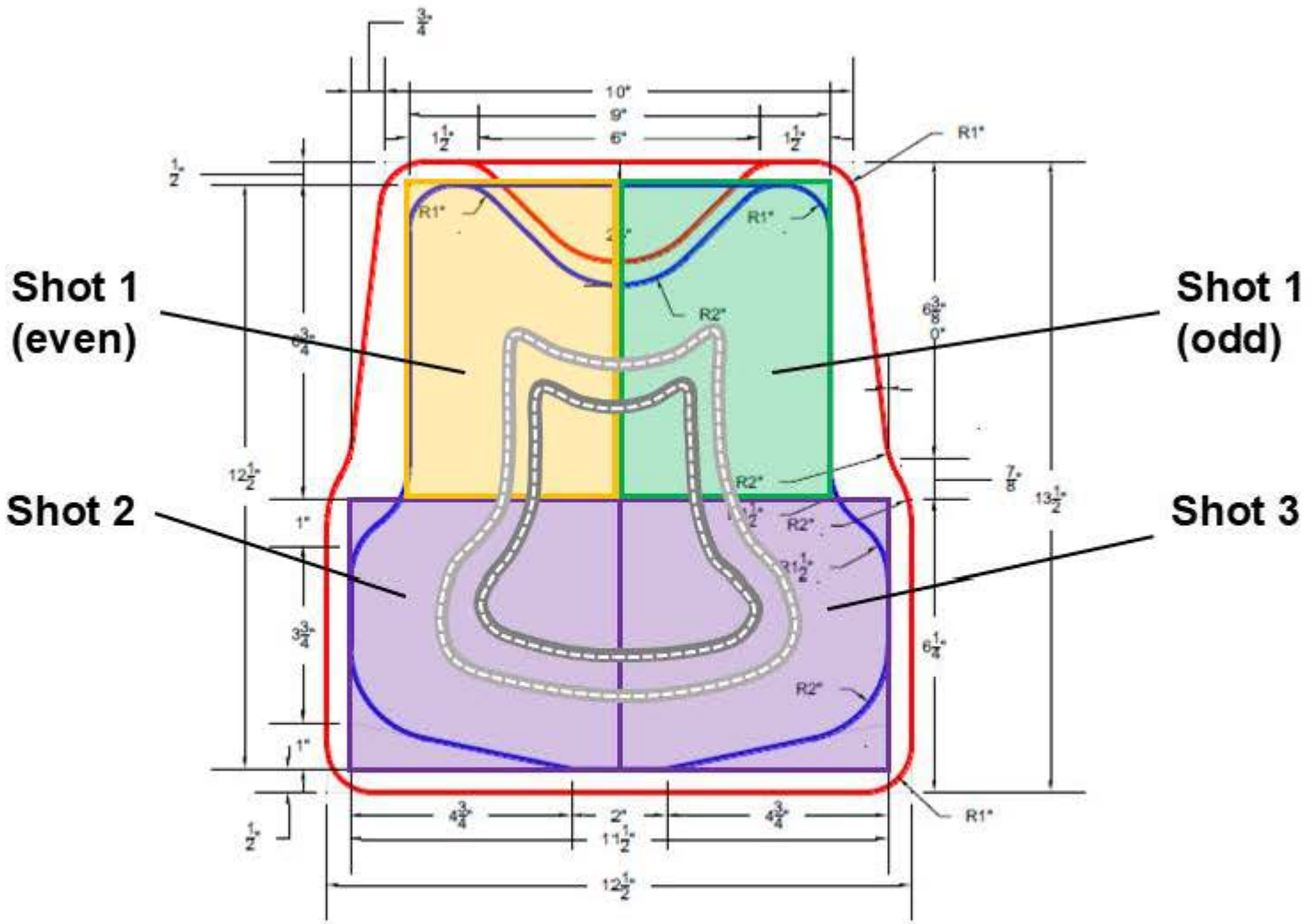
Figure X.3. Shot pattern for ballistic limit testing on soft armor test items with the shot locations and shot order indicated. The shot locations approximate a minimum shot-to-shot distance for the heavier threat in a ballistic protection level. Note that the shot locations in this figure are for illustrative purposes and may not be exactly to scale.

Figure X.4. The shot pattern for ballistic limit testing using six-shot hard armor test items. Note that the shot locations in this figure are for illustrative purposes and shall follow additional shot-to-shot and shot-to-edge distance requirements specified in this standard.

Figure X.5. The shot pattern for ballistic limit testing using three-shot hard armor test items. Note that the shot locations in this figure are for illustrative purposes and shall follow additional shot-to-shot and shot-to-edge distance requirements specified in this standard.

Figure X.6. The shot pattern for ballistic limit testing using one-shot hard armor test items. Note that the shot locations in this figure are for illustrative purposes and shall follow additional shot-to-shot and shot-to-edge distance requirements specified in this standard.

Fig. X.1.



NIJ NATIONAL INSTITUTE OF JUSTICE	Sizing Template For Armor Samples	SIZE Letter (8.5" x 11")	REV 2.0
	Template Size NIJ-C-1 - Smallest	SCALE Approx. 1:4	SHEET 1 of 5

Fig. X.2.

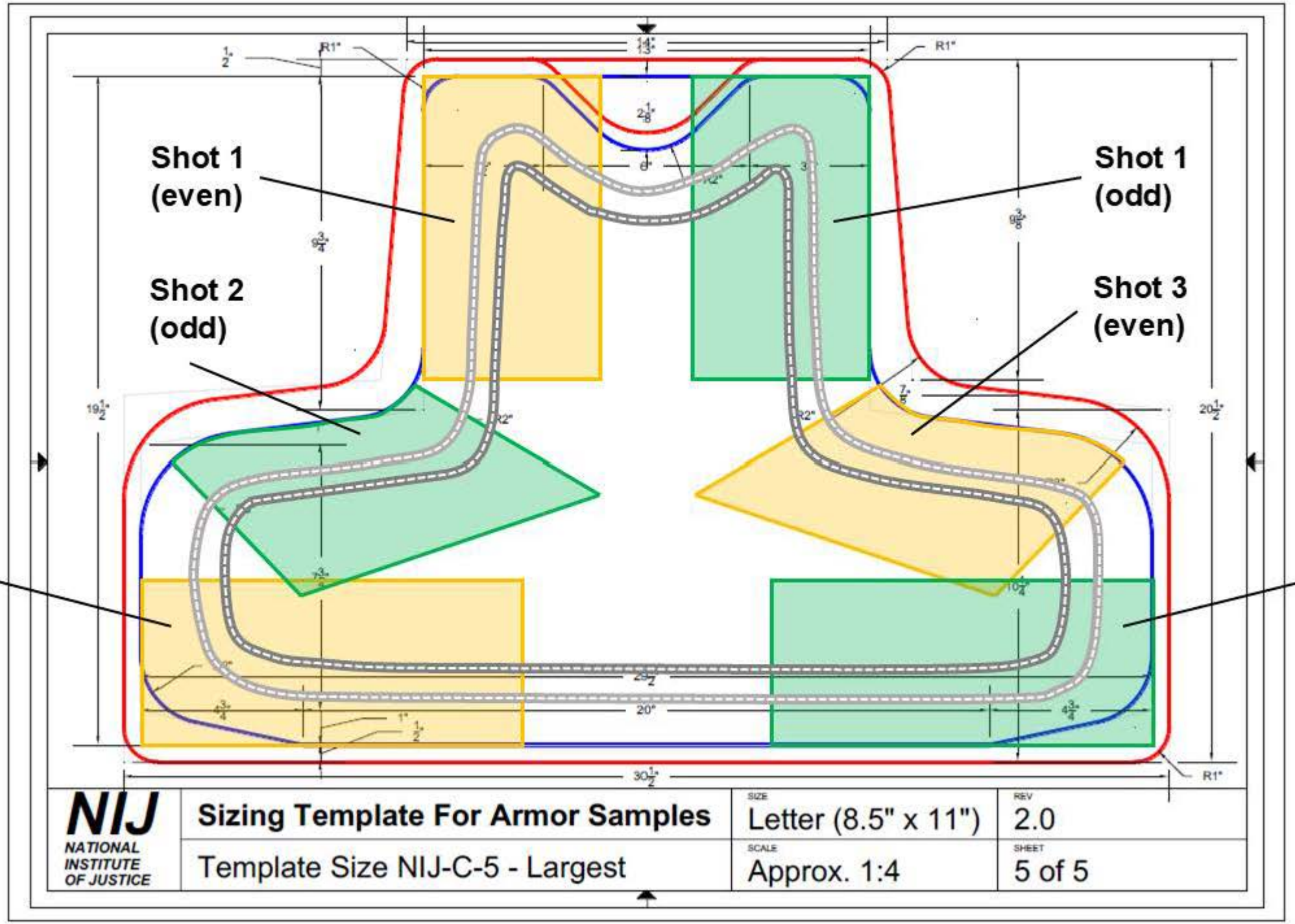
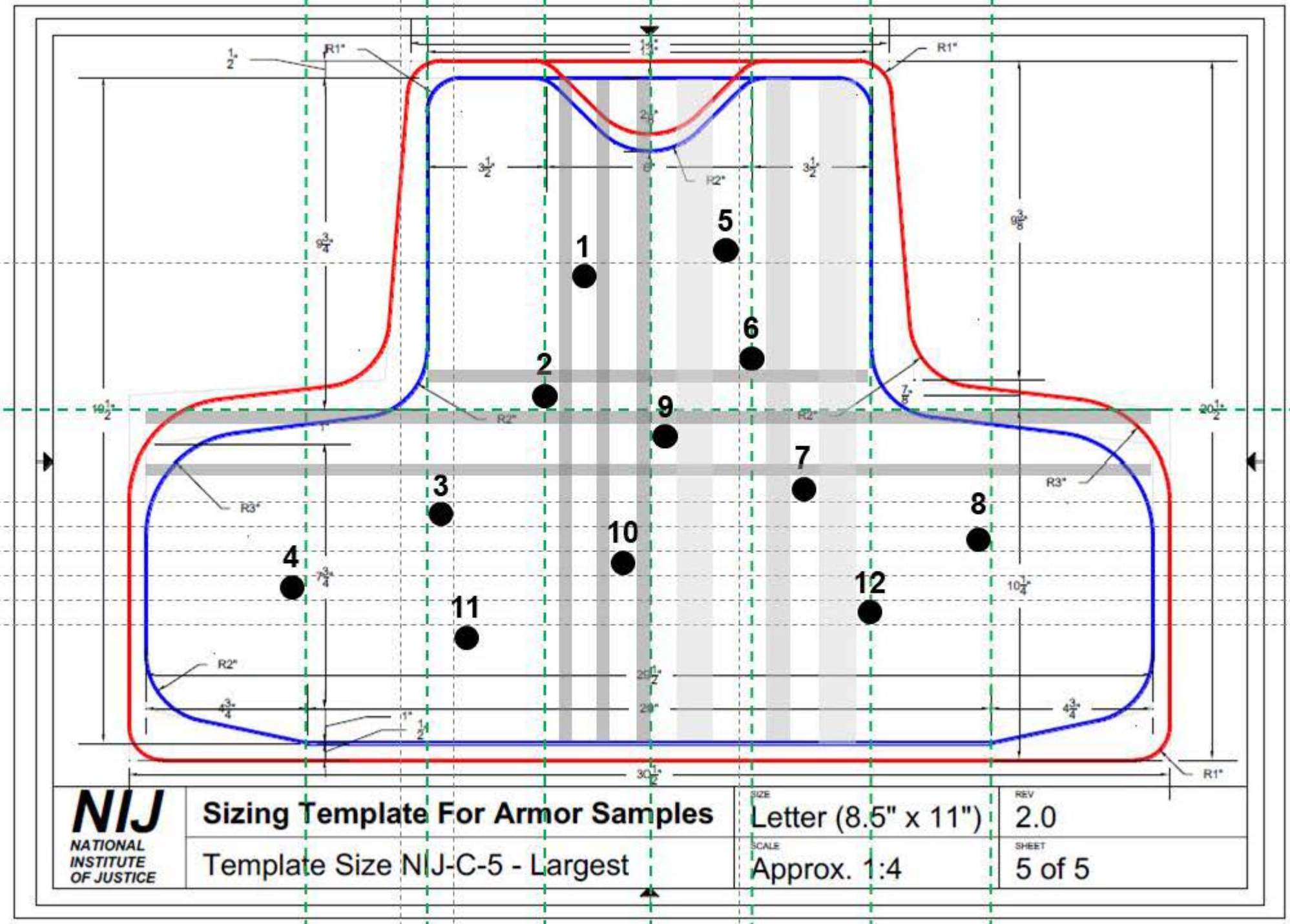

Shot 1
(even)
Shot 1
(odd)
Shot 2
(odd)
Shot 3
(even)
Shot 2
(even)
Shot 3
(odd)
R1"
R2"
20"
30½"
NIJ
NATIONAL INSTITUTE OF JUSTICE
Sizing Template For Armor Samples
Template Size NIJ-C-5 - Largest
SIZE
Letter (8.5" x 11")
REV
2.0
SCALE
Approx. 1:4
SHEET
5 of 5

Fig. X.3.


R1"
R2"
R3"
1
2
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NIJ
NATIONAL INSTITUTE OF JUSTICE
Sizing Template For Armor Samples
Template Size NIJ-C-5 - Largest
SIZE
Letter (8.5" x 11")
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SHEET
5 of 5

Fig. X.4.

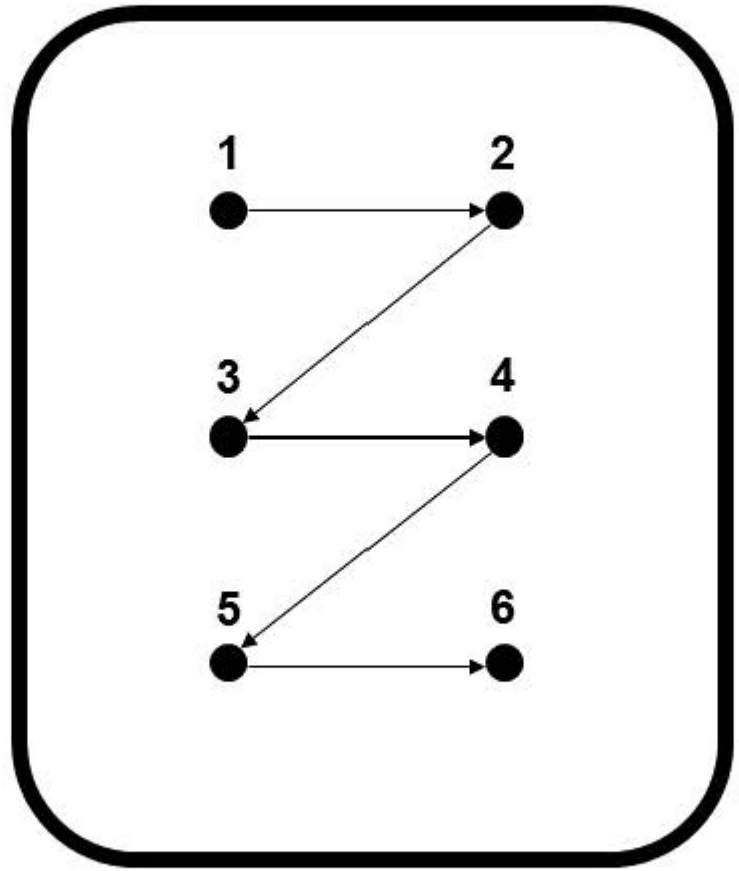

Fig. X.5.

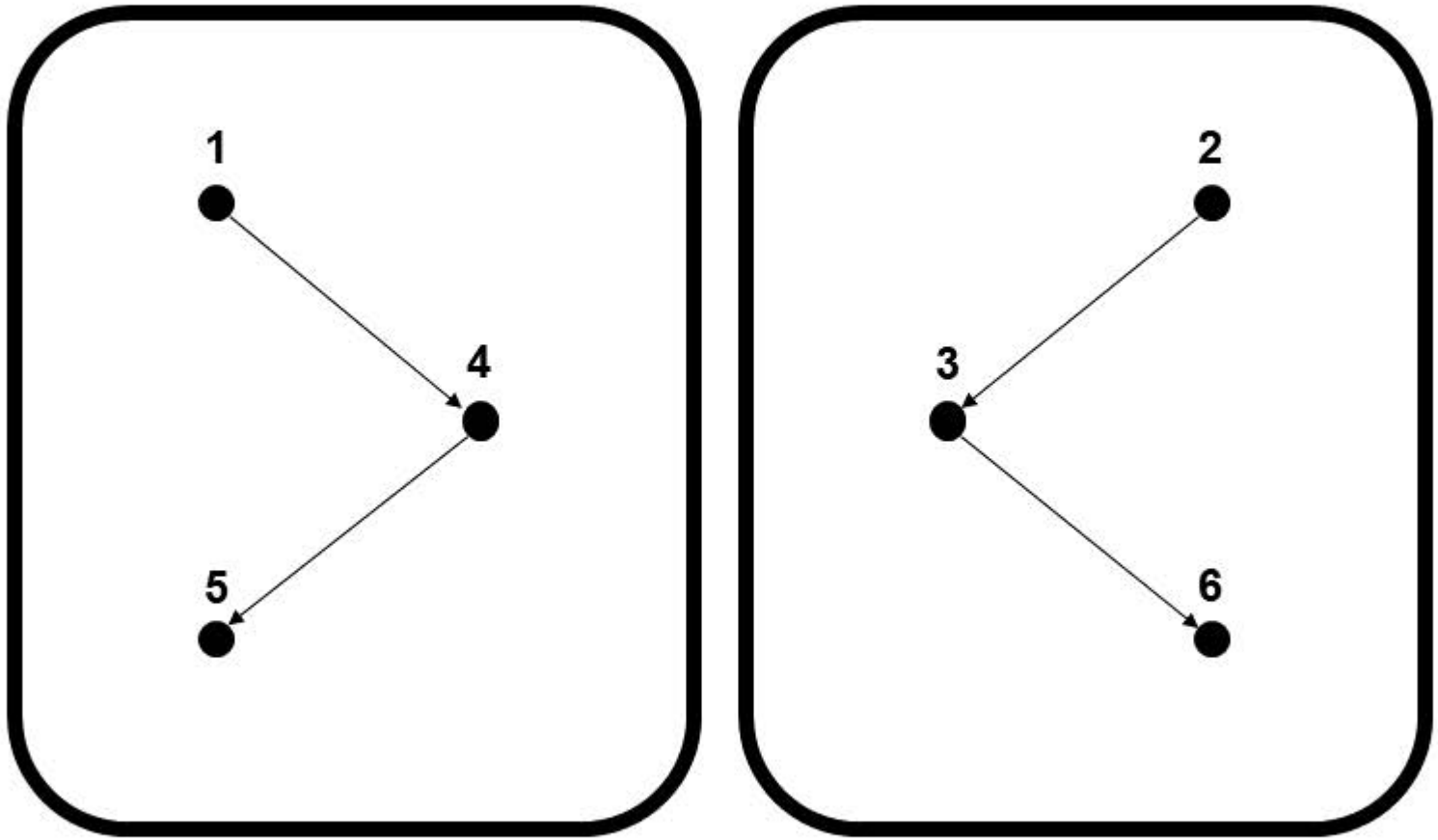

Fig. X.6.