1 *XHTML-Print/CSS Print Profile Guidelines for*
2 *PrintEnhanced:1*

3 **For UPnP™ Version 1.0**
4 **Status:** *Design Complete Version 1.0*
5 **Date: May 4, 2005**

6

7 This document is being made available to UPnP™ Forum Members pursuant to the UPnP™
8 Forum Membership Agreement. UPnP™ Forum Members have rights and licenses defined by
9 Section 3 of the UPnP™ Forum Membership Agreement to use and reproduce this document.
10 All such use is subject to all of the provisions of the UPnP™ Forum Membership Agreement.

11 THE UPNP FORUM TAKES NO POSITION AS TO WHETHER ANY INTELLECTUAL
12 PROPERTY RIGHTS EXIST IN THE PROPOSED DCPS, IMPLEMENTATIONS OR IN ANY
13 ASSOCIATED TEST SUITES. THE PROPOSED DCPS, STANDARDIZED DCPS,
14 IMPLEMENTATIONS AND ANY ASSOCIATED TEST SUITES ARE PROVIDED "AS IS"
15 AND "WITH ALL FAULTS". THE UPNP FORUM MAKES NO WARRANTIES, EXPRESS,
16 IMPLIED, STATUTORY, OR OTHERWISE WITH RESPECT TO THE PROPOSED DCPS,
17 STANDARDIZED DCPS, IMPLEMENTATIONS AND ASSOCIATED TEST SUITES,
18 INCLUDING BUT NOT LIMITED TO ALL IMPLIED WARRANTIES OF
19 MERCHANTABILITY, NON-INFRINGEMENT AND FITNESS FOR A PARTICULAR
20 PURPOSE, OF REASONABLE CARE OR WORKMANLIKE EFFORT, OR RESULTS OR
21 OF LACK OF NEGLIGENCE.

22 © 2005 Contributing Members of the UPnP™ Forum. All Rights Reserved.

23 ## 1.1. Contributors

24 The following is a list of active contributors of this document.

25

26 **Shivaun Albright,** *Working Committee Chair*
27 **Atsushi Nakamura,** *Editor*

28

29 Dean Anderson
30 Lee Farrell
31 Melinda Grant
32 Junzo Ikuta
33 Hideyuki Kuwano
34 Yohei Maekawa
35 Hideki Morozumi
36 Kazuyuki Murata
37 Fumio Nagasaka
38 Kenji Sakuda
39 Mike Stiltz
40 Akira Suzuki
41 Yiruo Yang

42

1.2. **Contents**

123

2. Overview and Scope

2.1. Objectives

This document provides guidelines for PrintEnhanced:1 Print Service developers and Control Points and other content authors with the following objectives :

- Enable an improved level of output consistency on print media among printing devices which support XHTML-Print and CSS Print Profile .

- Suggest methods for content authors to avoid ambiguities within the current W3C specifications referenced by the PrintEnhanced:1 service.

- Provide guidance to Print Service developers in areas of ambiguity.

- Provide leveragable samples for content authors to build from.

2.2. Organization

To achieve the above objectives, the document is organized into the following sections:

- *Clarification and Interpretation Guidelines for XHTML-Print* [XHTML-PRINT] */CSS Print Profile* [CSSPP]*Content parsing and Layout:*
  - Guidelines on how PrintEnhanced:1 compliant printers should interpret XHTML-Print [XHTML-PRINT] and CSS Print Profile [CSSPP] expressions that are ambiguous and may lead to varying outputs
- *XHTML-Print /CSS-Print Usage Guidelines*
  - Guidelines on how XHTML-Print[XHTML-PRINT] and CSS Print Profile [CSSP] contents intended for output from PrintEnhanced:1 compliant printers should be created in order to achieve output consistency among various printers.
- *Sample Template XHTML-Print* [XHTML-PRINT] */CSS Print Profile* [CSSPP] *source and corresponding expected output for several simple photo layout contents.*

146
147
148
149
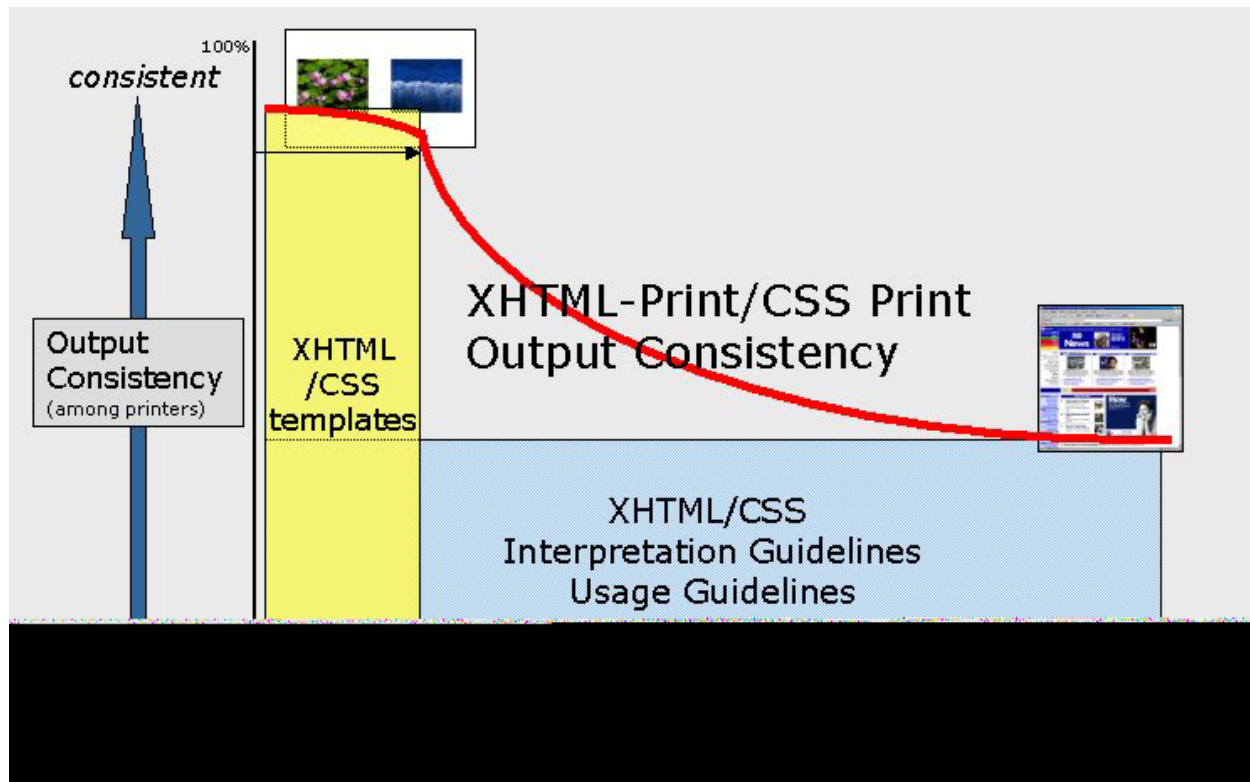
150   Output of XHTML and CSS to paged media, such as printed-paper is different from display on screen media in that
151   pagination is considered. This, with the fact that some ambiguity exists in the interpretation of XHTML and CSS is
152   thought to lead to various inconsistent outputs among output devices (i.e. printers), which is unexpected. The
153   interpretation guidelines and usage guidelines in this document will assure a certain level of output consistency
154   among printers, regardless of layout complexity of the content. In addition, use of sample templates for simple
155   photo layouts will serve as reference to both printer implementations and content authors to achieve a high level of
156   consistency.

157   ## 2.3.   Conventions

158   ### 2.3.1. Assumptions for Source Examples

159   All examples assume default values as recommended for the Printer's default style sheet in Section 8.5 of [CSSPP]
160   unless otherwise stated.

161

162 # 3. Guidelines

163 ## 3.1. References

164 This section lists the references that this document refers to and the tag inside square brackets that is used for each
165 such reference:

166 [DEVICE] - UPnP Device Architecture, version 1.0. http://www.upnp.org/download/UPnPDA10_20000613.htm

167 [PE1] - PrintEnhanced:1 Service Template Version 1.0
168 http://www.upnp.org/standardizeddcps/documents/Service_PrintEnhanced_v1_050504.pdf

169 [XHTML-PRINT] – XHTML-Print, W3C Candidate Recommendation, 20 January 2004. Available at:
170   http://www.w3.org/TR/2004/CR-xhtml-print-20040120

171 [CSSPP] – CSS Print Profile, W3C Candidate Recommendation, 25 January 2004. Available at:
172   http://www.w3.org/TR/2004/CR-css-print-20040225

173 [CSS3_PM] - CSS3 Paged Media Module, W3C Candidate Recommendation, 25 February 2004. Available at:
174   http://www.w3.org/TR/2004/CR-css3-page-20040225/

175 [CSS2_1] – CSS 2.1 Candidate Recommendation, 25 February 2004. Available at:
176   http://www.w3.org/TR/2004/CR-CSS21-20040225/
177
178 [LINE_BREAK]- Line Breaking Properties, Unicode Standard ANNEX #14. Available at:
179   http://www.unicode.org/reports/tr14/

180

181 ## 3.2. Interpretation Guidelines and Clarifications

182 This section provides guidelines and clarifications for PrintEnhanced:1 compliant printer implementations,
183 especially where the W3C reference specifications are ambiguous or allow varying interpretations that can lead to
184 visibly different output

185 It is strongly recommended that printers follow the informative guidelines provided in Section 8.5 of [CSSPP] in
186 establishing default style sheet values.

187 In addition, PrintEnhanced:1 printer implementations should comply with the following guidelines in order to
188 achieve greater output consistency.

189 ### 3.2.1. Establishing the Default Page Box

190 When an @page 'size' attribute is specified, the content area of the infinitely sized canvas is constrained as
191 indicated by the page size. When the @page 'size' attribute is not specified, it is recommended that the canvas size
192 is constrained as though

193   @page { size: auto; }

194 were specified.

195 This establishes a default page box the same size as the target page sheet.   The resulting page area is the initial
196 containing block. The page area is the page box minus the page margins.

197 ### 3.2.2. Mapping the Page Box to the Page Sheet

198 The current CSS specifications do not specify how the page box is mapped to the target page sheet. This document
199 recommends the following guidelines:

200 #### *3.2.2.1. Page Size: auto*

201 When the size of the page box is established with the value 'auto', the page box should exactly overlay the target
202 page sheet; *i.e.,* the edges of the page box and the edges of the target sheet are aligned.

203 #### *3.2.2.2. Origin*

204 If there is no ancestor with a 'position' of 'absolute', 'relative' or 'fixed', the origin with respect to the positioning of
205 elements is the upper-left corner of the page box.

206 While this is unambiguous for single-page documents, CSS is ambiguous when the document contains more than
207 one page. See Section 3.2.5 for further details.

208 #### *3.2.2.3. Mapping a Page Box to a Larger Page Sheet*

209 When the size of the page box is smaller than the size of the physical page sheet, the printer may (in order of
210 preference):

211   1. Prompt the user to provide media the size of the page box.

212   2. Center the page box on the page sheet without scaling.

213   3. Position the top and left edges of the page box at the top and left edges of the page sheet.

214   4. Uniformly scale the page box up as much as possible to fit the page sheet while preserving the
215   aspect ratio of the page box.

216   5. Non-uniformly scale the page box to take up the entire page sheet.

217

218 #### *3.2.2.4. Mapping a Page Box to a Smaller Page Sheet*

219 When the size of the page box is larger than the size of the physical page sheet, the printer may (in order of
220 preference):

221   1. Prompt the user to provide media the same size as the page box.

222   2. Scale the page box down to fit the page sheet.

223   3. Crop the portions of the page box which do not fit on the page sheet, centering the page box with
224   respect to the page sheet.

225 Crop the portions of the page box which do not fit on the page sheet, aligning the top and left edges of the page box
226 and the page sheet.

227 ### 3.2.3. Padding and Borders

228 As defined in CSS, padding and border widths are NOT included in the content width /height.
229
230 #### *Source*

```
231
232  <html xmlns="http://www.w3.org/1999/xhtml">
233  <head>
234  <title>New XHTML file Padding and Borders</title>
235  <style type="text/css">
236  @media print {
237    @page { size:A4 portrait;}
238  }
239  </style>
240  </head>
241  <body>
242  <p style="width:80mm; height:50mm;
243  border-style: solid; border-width:1.0mm; padding:4.0mm 0mm; text-align:
244  center;">
245  --Text A--
246   </p> </body>
247  </html>
248
```

249   *Note*

250   The content, padding and borders are represented according to the figure below.

251

252
253
254
255
256
257
258
259
260   *Expected Layout*
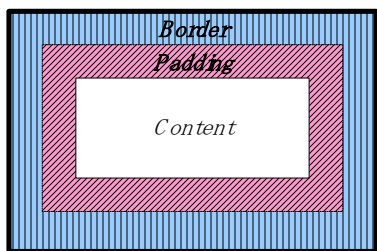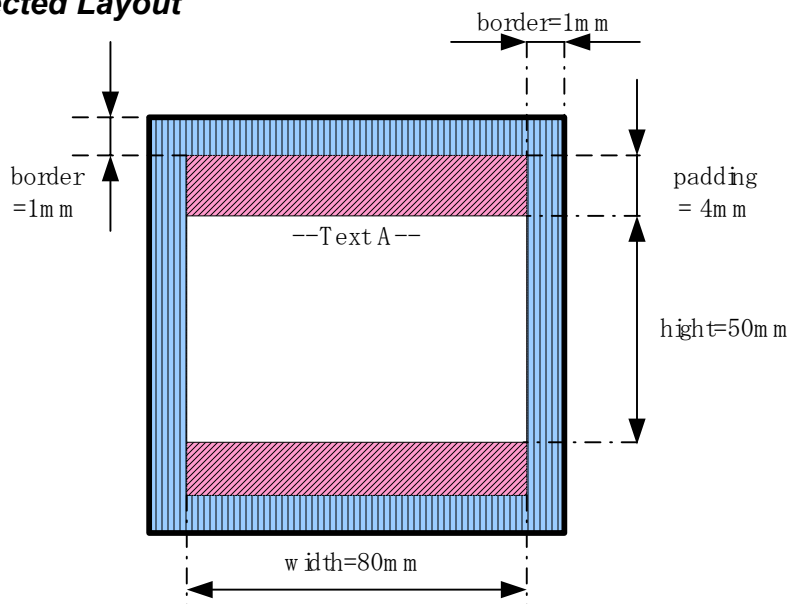
275   ## 3.2.4. Units of Measure

276   Printers implement a wide range of resolutions and pixel depth. To improve consistency of printed output, and for
277   compliance with the recommendation in Section 4.3.2 of [CSS2_1], it is recommended that Printers implement the
278   pixel unit of measure as approximately 1/96 inch, or 0.26 mm, unless dimensions are otherwise specified.

279 ## 3.2.5. Absolute Positioning and the Origin

280 From Cascading Style Sheets Level 2 Revision 1 [CSS2_1], Section 10.1: 'In paged media, an absolutely positioned
281 element is positioned relative to its containing block ignoring any page breaks (as if the document were continuous).
282 The element may subsequently be broken over several pages.'

283 Therefore, in the absence of an ancestor with a 'position' of 'absolute', 'relative' or 'fixed', the origin for any
284 absolutely positioned content within a document would seem to be the origin of the first page of the document.

285 However, Section 13.2 of [CSS 2_1] says "the edges of the page area act as the initial containing block..." One
286 might expect that pages subsequent to the first page of a document would establish new "initial containing blocks".
287 Indeed, what other reasonable interpretation can be made? Since absolute positioning is done relative to the
288 containing block, this would seem to imply the origin should reset to the top of the next page upon a page break.

289 The W3C CSS WG needs to resolve or clarify this ambiguity. Until such time, this Guideline makes no
290 recommendation as to which interpretation a printer should make. Rather, Section 3.3.3 strongly cautions content
291 authors to avoid these ambiguous scenarios.

292 ## 3.2.6. Page Break

293 This section describes the recommended behaviors of PrintEnhanced:1 printers for page break control

294 ### 3.2.6.1. Condition on Implicit Page Break in the Normal Flow

295 The printer should not break the current page until content is seen which is placed on the subsequent page.

296 ### 3.2.6.2. 2. Suppressing the First and/or Last Blank Page that Occurred by Forced Page Break

297 If a document uses a common forced page break style on all pages including the first and/or last pages (to make the
298 document source simple), user agents may suppress the first and/or last blank page that occurs by the forced page
299 break.

300 ## 3.2.7. Contents Outside the Page Box

301

302 • Contents, or portions of contents that overflow horizontally out of the page box should not be printed.
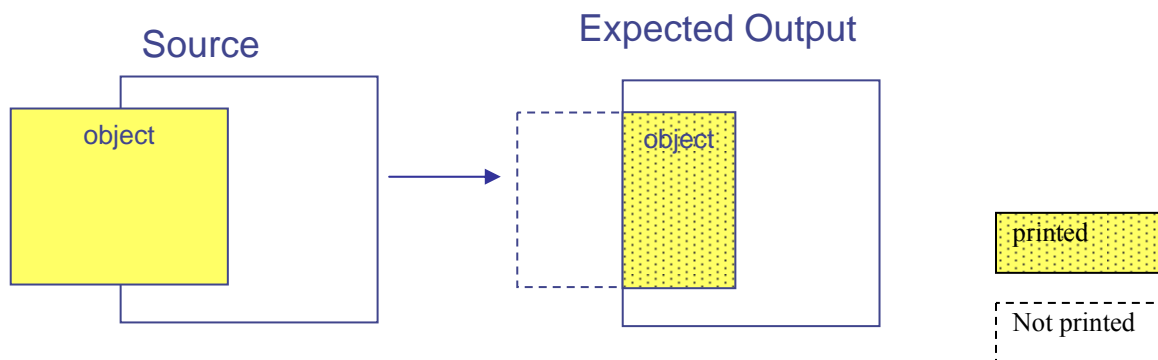
303
304 • Contents, or portions of contents that overflow above (vertically negative out of) the page box should not be
305 printed.
306

Source

Expected Output

object

object

printed

Not printed

307
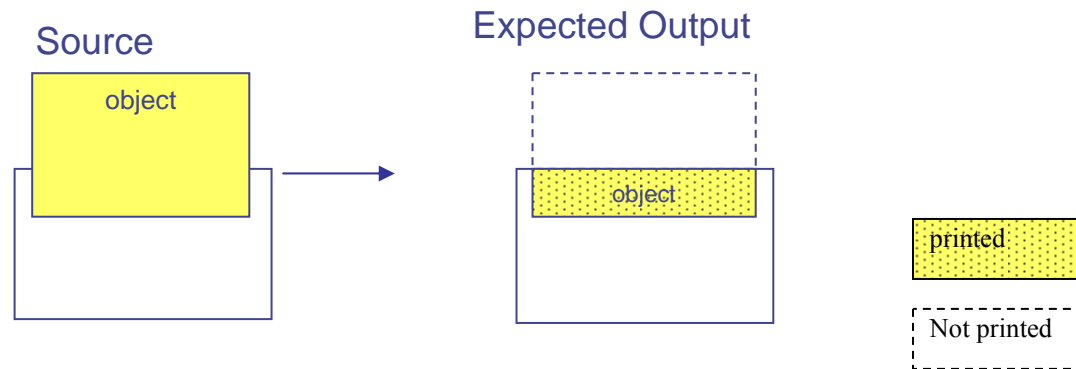
3.2.8. Images

3.2.8.1. Image Rendering Resolution

310 When size information is not provided for an image (*i.e.,* neither height nor width is specified, or they are both set to
311 'auto'), it is recommended that the image is printed at about 96 dpi, or about 5 dots per mm. (This is consistent with
312 the resolution used for computer displays, and will promote consistency in output across displays and printers.)

3.2.8.2. Image Rotation

314 Use of the JFIF APP0 marker and the EXIF APP1/APP2 markers to determine image orientation are deprecated;
315 any rotation information in such markers should be ignored. The CSS3 Paged Media Module [CSS3_PM] image-
316 orientation property should be used instead.

3.2.8.3. Image Across Pages

318 When an image extends beyond the bottom of a page, and it is not positioned (that is, it is statically positioned in the
319 normal flow), the image should NOT be divided, but should be placed on the next page. When the image is
320 positioned (that is, its position property is absolute, fixed, or relative), three possible outputs are allowed due to
321 ambiguity in [CSS 2_1].

322

Source   Expected Output

(static positioning)

Page 1

printed

image

Page 2   Not printed

Possible Output 1   Possible Output 2   Possible Output 3

(absolute positioning)   (absolute positioning)   (absolute positioning)

Page 1

image   Image 1/2

                 Image 2/2   image

                                Page 2

323
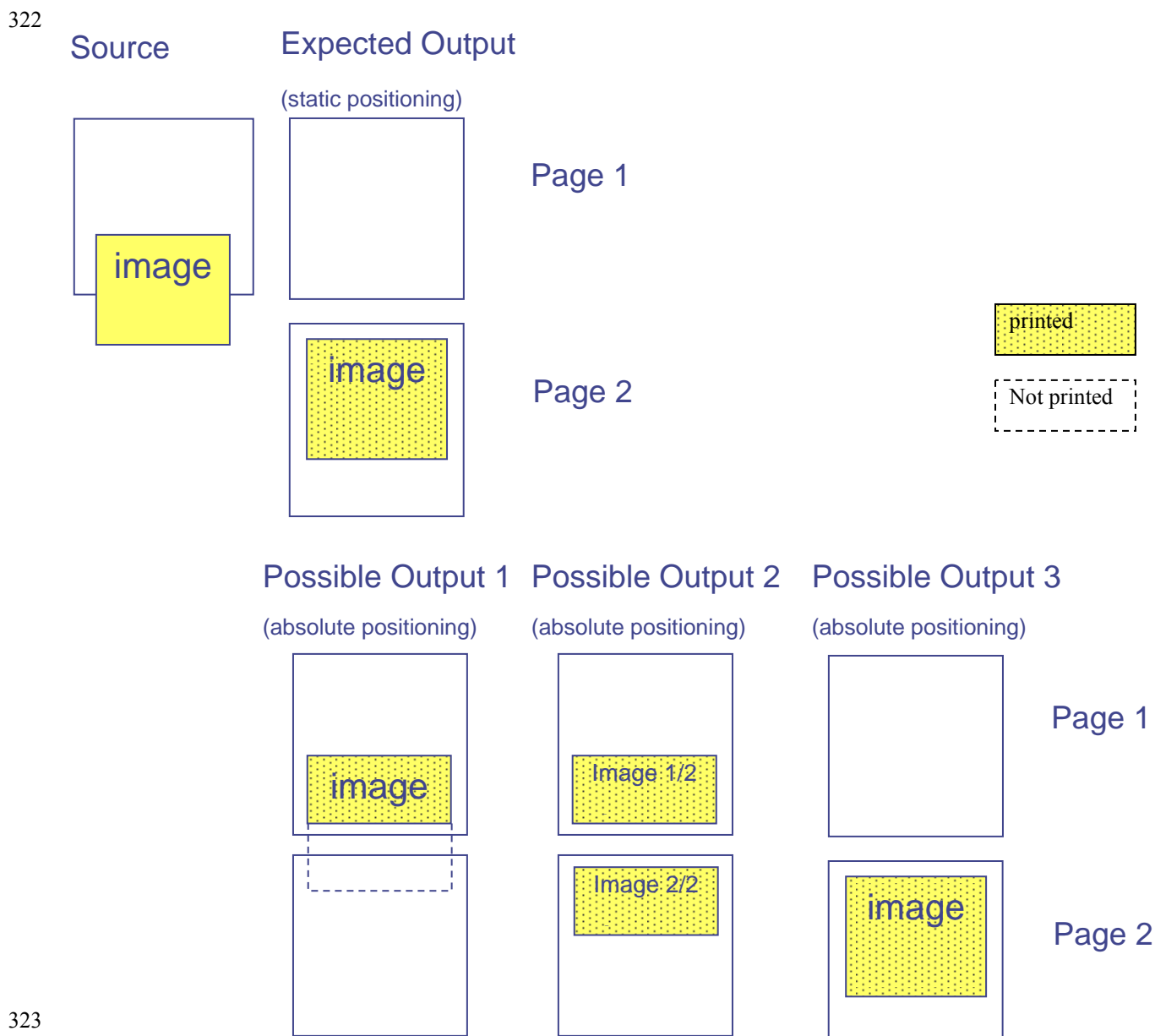
3.2.8.4. Images in Table Cells

324

325 When an image is laid out inside a table cell, the following guidelines apply:

326   1.   If an 'image-orientation' is specified, the image is first rotated accordingly. After rotation, the 'width'
327   property corresponds to the size of a row of pixels, while the 'height' property corresponds to the size of a
328   column of pixels.
329   2.   If both 'width' and 'height' properties specify a length, the image is scaled to the indicated height and
330   width and centered within the table cell. If portions of the image extend beyond the content area of the
331   table cell, the 'overflow' property determines whether those portions are displayed or cropped.
332   3.   If either the 'width' or the 'height' property specifies a length (but not both; the other property is absent or
333   'auto'), the indicated aspect of the image is scaled to the specified dimension, and the other aspect of the
334   image is scaled so that the intrinsic aspect ratio of the source image is preserved.
335   4.   If neither the 'width' nor the 'height' property specifies a length, the intrinsic size and aspect ratio of the
336   source image should be preserved. If the intrinsic size is not known, and in the absence of any other

337   'clues' as to the intended output size, it is recommended that the image is rendered at approximately 96
338   pixels per inch or 0.26 mm.

339 3.2.9. Layer Control

340 This section describes the recommended behaviors of PrintEnhanced:1 printers for layer control**.**

341 *3.2.9.1. Static Positioning*

342 In the normal flow, the block boxes can be positioned to overlap by specifying the "margin-top, margin-left margin-
343 bottom, margin-right" property. When block boxes visually overlap, those appearing later in the source should be
344 painted nearer to the user and, those appearing earlier in the source should be painted further from the user.

345

346 *3.2.9.2. Absolute Positioning*

347 The block boxes can be positioned to overlap by specifying the "top, left, bottom, right" property. When block-
348 boxes visually overlap, those appearing later in the source should be painted nearer to the user and, those appearing
349 earlier in the source should be painted further from the user.

350

351 3.2.10. Text Across Pages

352 A text box laid out according to the normal flow which extends beyond the bottom of the page box should be
353 divided between line boxes to fill the first page. Which line boxes of the paragraph are on the current page and
354 which are on the next page is determined by the widows and orphans properties. With absolute positioning, two
355 possible outputs are allowed due to ambiguity in [CSS 2_1].
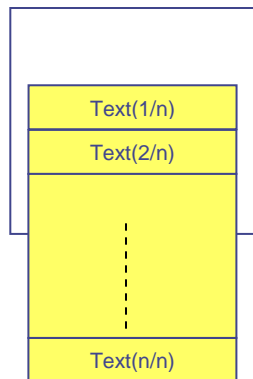
356
357
358

Source   Expected Output

(static positioning)

Page 1

Text(1/n)
Text(2/n)

Text(1/n)

Text(n/n)

Text(n/n)

Page 2
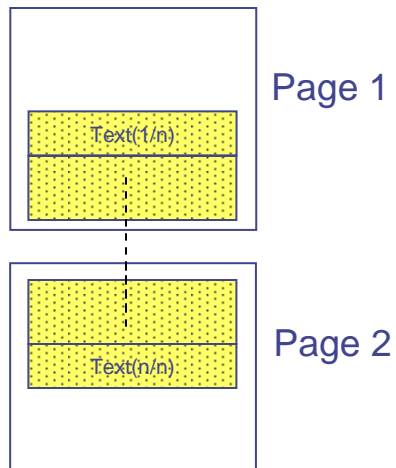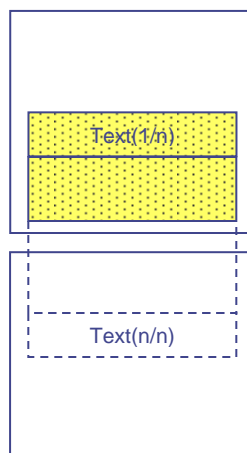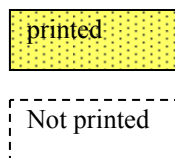
Possible Output 1   Possible Output 2

(absolute positioning)   (absolute positioning)

Page 1

Text(1/n)   Text(1/n)

printed

Text(n/n)

Not printed   Text(n/n)

Page 2

359
360
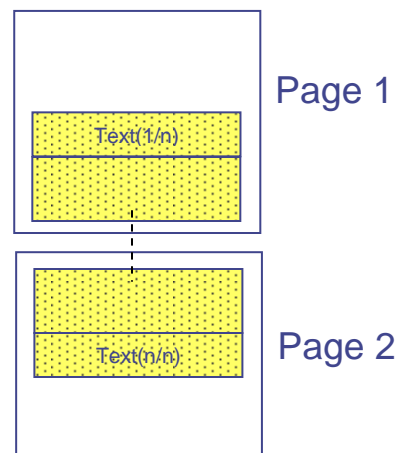
3.2.11. Character Sets and Fonts

361

3.2.11.1.   Character Repertoire

362

363 PrintEnhanced:1 compliant printers should support Basic Latin (U+0000-U+007F) and Latin-1 Supplement
364 (U+0080-U+00FF) characters of the set ISO/IEC 10646. When PrintEnhanced:1 printers encounter characters that
365 are recognized but not renderable, they should substitute another rendering that gives the same meaning, or provide
366 a way to indicate that normal rendering has not been successful.

3.2.11.2.   Font Family

367

368 If PrintEnhanced:1 printers support extended character repertoires, then "serif", "sans-serif" and "monospace" font
369 families should also include the extended characters.

370 ### 3.2.12. Word Wrap and Line Breaks

371 ### *3.2.12.1.* *Word Wrap*

372 • Complete words that won't fit on the current line should be wrapped onto the next line.
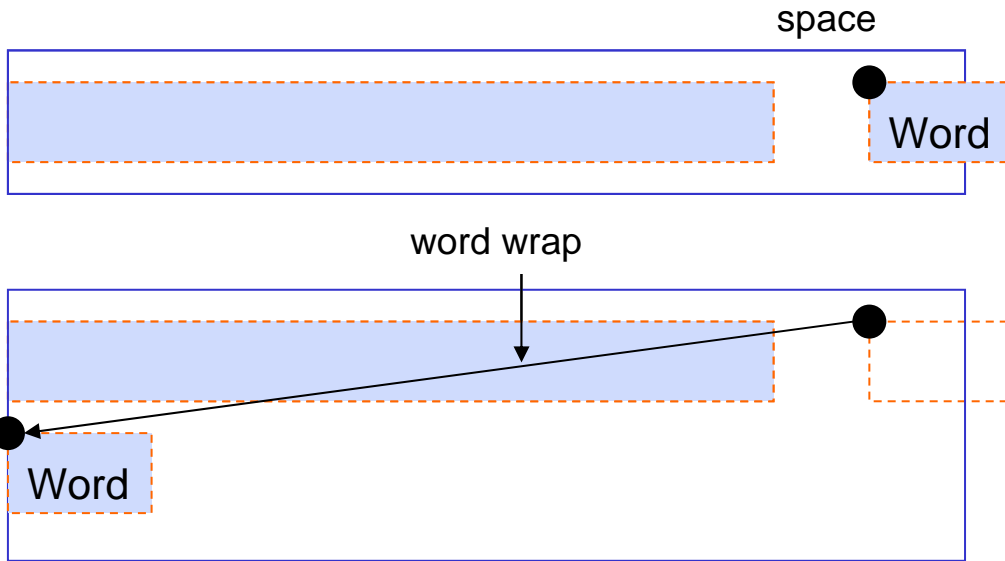
373
374
375 See Section 9.4.2 of CSS 2.1 [CSS2_1] for exceptions and further details.

376
377 • Shortened words, such as "what's", should be processed as one word.

378 ### *3.2.12.2.* *Line Break*

379 Spaces and hyphens should be treated as a line break opportunity, and line breaks should not occur within a word.
380

381 The following algorithm is provided as an example of one optional approach to determine line breaking.

382 • Any of the following characters shown in the following tables, if appearing at the end of a word should not
383 wrap to the next line.

384 • Any of the following single characters shown in the following tables if immediately preceding an associated
385 word should not be split from that word for word wrap purposes. The character should be wrapped along with
386 the word.

387 • Handling of repetitive use of the characters shown in the following tables will be implementation dependent,
388 and out of scope of this guideline.

389 **Characters that Should NOT be Placed on Top of the Line**

390 Category-1; Global

Unicode code point	U+0021	U+0029	U+002C	U+002E	U+003A	U+003B	U+003F	U+005D	U+007D
Character	!	)	,	.	:	;	?	]	}

391

392

393   Category-2; Regional

394   *Japanese language*

Unicode code point	U+FF61	U+FF63	U+FF64	U+FF9E	U+FF9F	U+3001	U+3002	U+FF0C
shift-jis	A1	A3	A4	DE	DF	8141	8142	8143
Character	。	」	、	゛	゜	、	。	，
Unicode code point	U+FF0E	U+FF1A	U+FF1B	U+FF1F	U+FF01	U+309B	U+309C	U+FF40
shift-jis	8144	8146	8147	8148	8149	814A	814B	814D
Character	．	：	；	？	！	゛	゜	｀
Unicode code point	U+30FD	U+30FE	U+309D	U+309E	U+3005	U+FF09	U+3015	U+FF3D
shift-jis	8152	8153	8154	8155	8158	816A	816C	816E
Character	ヽ	ヾ	ゝ	ゞ	々	）	〕	］
Unicode code point			U+FF5D	U+3009	U+300B	U+300D	U+300F	U+3011
shift-jis			8170	8172	8174	8176	8178	817A
Character			｝	〉	》	」	』	】

395

396   **Characters that Should Not be Placed at the End of the Line**

397   Category-1; Global

398

Unicode code point	U+0028	U+005B	U+007B					
character	(	[	{					

399

400   Category-2; Regional

401   *Japanese language*

Unicode code point	U+FF62	U+FF08	U+3014	U+FF3B	U+FF5B	U+3008	U+300A	U+300C
shift-jis	A2	8169	816B	816D	816F	8171	8173	8175
Character	「	（	〔	［	｛	〈	《	「

Unicode code point	U+300E	U+3010						
shift-jis	8177	8179						
Character	『	【						

402

3.2.12.3. Other Suggested References

404 The *Unicode Standard Annex #14 Line Breaking Properties* [LINE-BREAK] provides a comprehensive treatment
405 of line breaking recommendations, for best practice and further references. However, it is to be expected that many
406 PrintEnhanced:1 printers will not implement line break algorithms requiring linguistic analysis or large pair-based
407 tables.

408

3.2.13. Forms

410 PrintEnhanced:1 compliant printers should comply with the following guidelines in interpreting and rendering the
411 following form elements.

3.2.13.1. Text Area Element

413 ● Scrollbars may or may not be printed for text area elements.
414 ● A slider should be printed if the text area contents overflow the input field and overflow='hidden'.
415 ● The text area may be enlarged to encompass overflow contents when overflow='visible'.
416 ● A slider should NOT be printed if the contents of the text area do not overflow from the input field.
417 ● A slider should NOT be printed if there are no contents in the text area
418 ● The design and layout of the scroll bar is implementation dependent.
419

A portion of it will be printed.
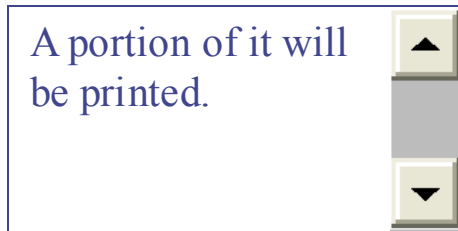
An example of a text area output where the text does not overflow from the textarea.

If the designated text area is too small to represent all the content, a portion of it will not be printed.
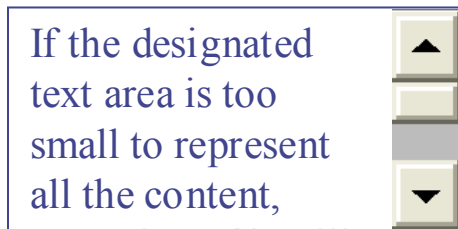
An example of a text area output where the text overflows from the textarea.
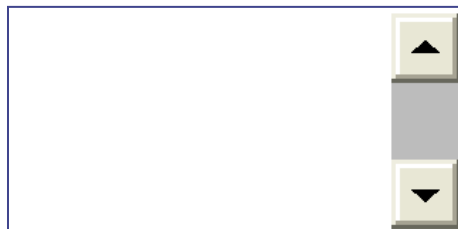
An example of a text area output where there is no text in the textarea.

420
421

3.2.13.2.   *Select Element*

423 ● A Down-Arrow may or may not be printed if the size attribute is unset or set as 1.
424 ● A Scroll bar may or may not be printed if the size attribute set as greater than 1.
425 ● A Slider should be printed if the number of option elements is greater than the value of set attribute.
426 ● The design and layout of the scroll bar is implementation dependent.
427 ● The first selected element should be printed.
428

Source

Size attribute not set

```
<select>
<option>Object1</option>
</select>
```

Size attribute set to 1

```
<select size="1">
<option>Object1</option>
</select>
```

Size attribute set to greater than 1

```
<select size="2">
<option>Object1</option>
<option>Object2</option>
</select>
```

Number of option elements are greater than size attribute value

```
<select size="2">
<option>Object1</option>
<option>Object2</option>
<option>Object3</option>
</select>
```

Expected Output

429

---

430   *3.2.13.3.*   ***Input Element***

431   Input fields with a type attribute of "password" should be filled with " * "(asterisks) if the value attribute is present.

432   The number of asterisks should equal the number of Unicode characters in the value, not the number of bytes.

433

434   3.3.   Usage Guidelines

435   This section provides guidelines on how XHTML-Print [XHTML-PRINT] and CSS Print Profile [CSSP] contents
436   intended for output from PrintEnhanced:1 compliant printers should be created in order to achieve output
437   consistency among various printers. Though the guidelines do not have to be applied to contents with non-print
438   media as it's primary intended output, its strongly recommended to follow these guidelines in authoring contents
439   that prioritize output consistency on paged media.

440   3.3.1. Media Information

441   Contents intended for printing should specify media information in it's style sheet by the use of @media print{}.

442   3.3.2. Paging

443   Paged media differ from screen media in that it introduces the concept of pagination. Contents intended for
444   PrintEnhanced:1 compliant printers should be conscious of page media by following the guidelines below. Though
445   contents that do not include page information, or are intended for screen media only can be printed, they may
446   exhibit less output consistency among printers.

447   *3.3.2.1. @page Size*

448   In order for the printer to recognize the intended page size of the content, @page size information should always be
449   included in the contents. The page size property is essential for printers to maintain the intended output design,
450   since the contents structures typically have strong relationships with media size.

451   *3.3.2.2. Page Break Control*

452   There are two models of use which should be carefully considered when constructing XHTML and CSS content
453   intended for printing: one where the Printer is primarily in control of the placement of page breaks, and the other
454   where the Content Author is primarily in control. Each has its merits and disadvantages.

455   *3.3.2.2.1.   Implicit (Printer) Control*

456   When it is important that all the content be printed, but it is not important that the content is laid out in a certain
457   fashion, it is best to by and large use static positioning, and let the Printer decide how to lay out the contents and
458   where to put page breaks. This model is also preferable when the contents contain mixed fonts and various point
459   sizes of text that flows across pages. In this case it's better to let the printer do the page breaks, attending to widows
460   and orphans and putting the breaks between line boxes as required by CSS2.1. In this scheme, page-break-* would
461   be used sparsely for stylistic reasons, such as to ensure that major headings start at the top of the page, or page
462   breaks are avoided inside list item elements. Although the exact layout of the document will vary from printer to
463   printer, this approach will yield pleasing results from most all printers.

464   *3.3.2.2.2.   Explicit Control*

465   When it is important that contents are laid out in a very specific and deterministic manner, page break information
466   should be explicitly provided for contents intended for inclusion in one page. The use of page-break-before, page-
467   break-after, page-break- inside, and named pages [CSS3_PM] is recommended to inform the printer of paging
468   information. Note that these properties only apply to block elements.

469   *3.3.2.3. Page Size Change within a Document.*

470 Changing the page size or orientation within a single html element is allowed. The example below intends to show
471 that a document can have more than one page-configuration and, alteration of the media-size within the document
472 results in page-break. This is achieved by defining different @page guidelines for each page size or orientation to be
473 used within the document source.

474 ●   If a block box with inline content has a 'page' property that is different from the preceding block box with
475   inline content, then one or two page breaks are inserted between them, and the boxes after the break are
476   rendered on a page box of the named type.

477 ●   @page rules apply to pages, not to elements, and so inheritance does not apply as pages do not have children.

478 ●   @page rules *do* cascade however, as several different rules may match the same page, and their declarations
479   will need to be ordered by specificity / priority.

480 ●   While a preceding block element has the @page value, "initial value" is applied to the subsequent element and
481   if they are different; then a page break should be generated.

482

483 Example 1: Page Size Change

484

485 Description

486 In this example, the generation of the fourth page deserves some additional explanation:

487   •   The <h2> element of class 'newpage-1' generates a new page (the second page), because of the
488   explicit 'page-break-before' in the newpage-1 selector:
489   "h2.newpage-1 {page-break-before: always;}"

490   •   The <h2> element of class 'newpage-2' generates another new page (the third page), because the page
491   property overrides the initial value of A4 portrait with a value of A4 landscape; the 'newpage-2'
492   contents are therefore placed on a landscape page:
493   "h2.newpage-2 {page: a4-landscape;}"

494   •   The page attribute for the final <h2> element cascades back to the page size and orientation that were
495   in effect before the <h2> of class 'newpage-2' (since the scope of that element has closed), *i.e.,* A4
496   portrait, causing another page break and generating the fourth page.

497
498   Source
499
500   ```
        <html xmlns="http://www.w3.org/1999/xhtml">
501   <head>
502   <title>Page Size Change within a Document</title>
503   <style type="text/css">
504   @media print {
505   @page {size:A4 portrait;}
506   @page a4-landscape {size:A4 landscape;}
507   h2.newpage-1 {page-break-before:always;}
508   h2.newpage-2 {page:a4-landscape;}
509   }
510   </style>
511   </head>
512
513   <body>
514   <h2>Section-1: Portrait Page</h2>
515   <p>page one contents</p>
516   <h2 class="newpage-1">Section-2: Portrait Page</h2>
517   <p>page two contents</p>
518   <h2 class="newpage-2">Section-3: Landscape Page</h2>
519   <h2>Section-4: Portrait Page</h2>
520   <p>page four contents</p>
521   <p>(Page three has no content other than the Section heading.)</p>
522   </body>
523   </html>
        ```
524
525     Expected Output
526
527     Section-1: Portrait Page
528     page one contents
529                                 h2.newpage-1 { page-break-before:always; }
530     Section-2: Portrait Page
531     page two contents
532                                 h2.newpage-2 { page:a4-landscape; }
533     Section-3: Landscape Page
534
535                                 **<h2>: @page { size: A4 portrait; }**
536     Section-4: Portrait Page
537     page four contents
538     (Page three has no content other than the Section heading.)

539     Example 2: Nested element

540     Source

541     ```
        <html xmlns="http://www.w3.org/1999/xhtml">
        ```

```
542    <head>
543    <title>3.3.2.3 Page Size Change within a Document</title>
544    <style type="text/css">
545    @media print {
546    @page {size:A4 portrait;}
547    @page a4-landscape {size:A4 landscape;}
548    h2.newpage-1 {page-break-before:always;}
549    div.newpage-2 {page:a4-landscape;}
550    }
551    </style>
552    </head>
553    <body>
554    <h2>Section-1: Portrait Page</h2>
555    <p>page one contents</p>
556    <h2 class="newpage-1">Section-2: Portrait Page</h2>
557    <p>page two contents</p>
558    <div class="newpage-2">
559    <h2>Section-3: Landscape Page</h2>
560    <p>page three contents</p>
561    <p> Named page's property of the parent is inherited to the nested element:
562    "page:a4-landscape"</p>
563    </div>
564    <h2>Section-4: Portrait Page</h2>
565    <p>page four contents</p>
566    </body>
567    </html>
568
```

569 Expected Output

571 Section-1: Portrait Page

572 page one contents

573 h2.newpage-1 { page-break-before:always; }

574 Section-2: Portrait Page

575 page two contents

576 **div.newpage-2 { page:a4-landscape; }**

577 Section-3: Landscape Page

Nested children: <div>'s named page

578 page three contents

579 Named page's property of the parent is inherited to the nested element: "page:a4-landscape

580 <h2>: @page { size: A4 portrait }

581 Section-4: Portrait Page

582 page four contents

584 Example 3: Not-Nested element

585 Source

586 `<html xmlns="http://www.w3.org/1999/xhtml">`
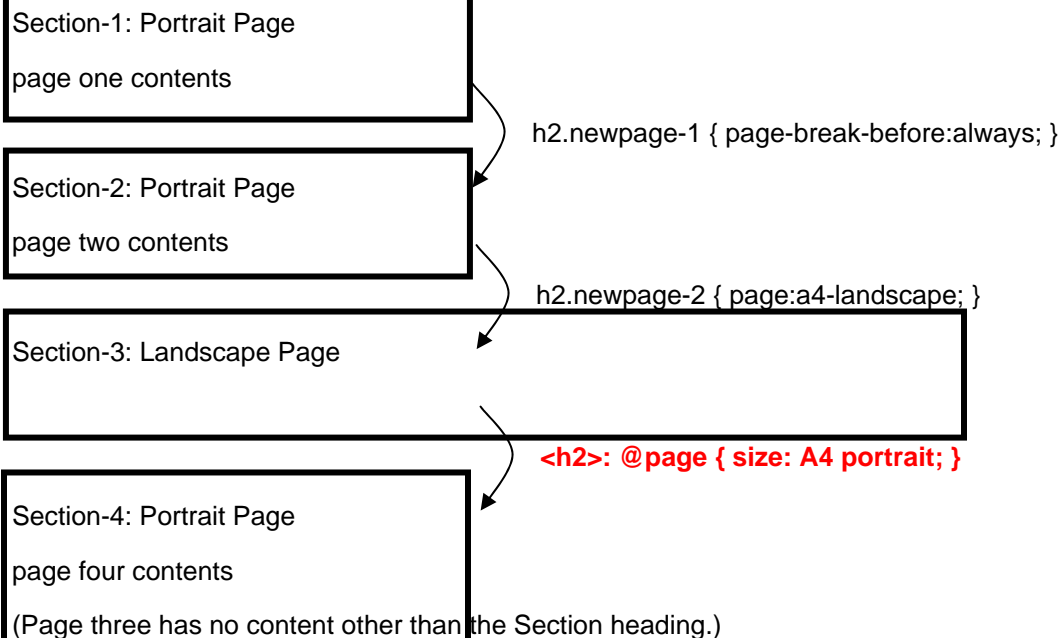
```
587   <head>
588   <title>3.3.2.3 Page Size Change within a Document</title>
589   <style type="text/css">
590   @media print {
591   @page {size:A4 portrait;}
592   @page a4-landscape {size:A4 landscape;}
593   h2.newpage-1 {page-break-before:always;}
594   *.newpage-2 {page:a4-landscape;}
595   }
596   </style>
597   </head>
598   <body>
599   <h2>Section-1: Portrait Page</h2>
600   <p>page one contents</p>
601   <h2 class="newpage-1">Section-2: Portrait Page</h2>
602   <p>page two contents</p>
603   <h2 class="newpage-2">Section-3: Landscape Page</h2>
604   <p class="newpage-2">page three contents</p>
605   <p class="newpage-2">all non-nested elements should have a common @page
606   property</p>
607   <h2>Section-4: Portrait Page</h2>
608   <p>page four contents</p>
609   </body>
610   </html>
611
```

612   Expected Output

613

614   **Section-1: Portrait Page**

615   page one contents

616   h2.newpage-1 { page-break-before:always; }

617   **Section-2: Portrait Page**

618   page two contents

619   **<h2>: *.newpage-2 { page:a4-landscape; }**

620   **Section-3: Landscape Page**

621   page three contents   Same as 'named page' : *.newpage-2

622   all non-nested elements should have a common @page property

623   <h2>: @page { size: A4 portrait }

624   **Section-4: Portrait Page**

625   page four contents

626

627

628   **3.3.3. Pixels**

629   *3.3.3.1. Unit of Measure*

630   Printers are expected but not required to implement the pixel unit of measure as approximately 1/96 inch or .26 mm.
631   Unless there are good reasons to use the pixel length, consideration should be given to use a measure guaranteed to
632   be consistent across user agents, such as the millimeter.

633   *3.3.3.2. Image Resolution*

634   It is strongly recommended that either height or width or both are specified for image size. (The XHTML-Print
635   specification allows printers to omit images when no size information is provided.) When no size information is
636   provided, or both height and width are set to 'auto', printers are expected but not required to render images at about
637   96 dpi or 5 dots per mm.

638   **3.3.4. Positioning (absolute positioning / static positioning)**

639   The following should be taken into consideration when creating XHTML-Print / CSS Print contents intended for
640   output from PrintEnhanced:1 compliant printers.

641

642   •   Absolute positioning should ONLY be used for contents that are sure to fit within the current page box. Avoid
643   the use of absolute positioning unless positioning is carefully considered to fit within the specified page size.
644   •   Contents that may not fit in one page should be laid out by one of the following methods:
645   ➢   Paginate by explicitly using page-breaks and named pages, in case of using absolute positioning.
646   ➢   Use static positioning for layout.
647   •   Contents creation that does not consider pagination should use static positioning.
648   •   Objects should not be positioned either entirely or partly outside of the page box, unless cropping of the
649   overflowed content is intended. In this case, the overflow property should be set to 'hidden'.
650   •   If content authors apply forced page-break style to every page, the style may generate either an empty start
651   page or an empty end page. To avoid this inconsistency, content authors should:
652   ➢   Avoid making documents that begin with a FORCED page break
653   ➢   Avoid making documents that end with a FORCED page break

654

655   •   The following CSS styling is recommended to establish a div which maps to the page area. Elements can then
656   be positioned relative to the div, which is equivalent to positioning relative to the page area:

657   Source

```
658   html, body { height: 100%; }
659   div.page-div {width: 100%; height: 100%; position: relative; page-break-
660   after: always; overflow: hidden;}
661   div.page-div-end {width: 100%; height: 100%; position: relative; overflow:
662   hidden;}
```

663
664

665   The following example makes use of the CSS recommended above. There is no ambiguity in the expected
666   output:

667   Source

668
```
669   <html xmlns="http://www.w3.org/1999/xhtml">
670   <head>
671   <title>page-div</title>
672   <style type="text/css">
```

```
673        @media print {
674        @page {size:auto;}   /*  or whatever size is desired */
675        }
676        html, body { height: 100%; }
677        div.page-div {width: 100%; height: 100%; position: relative; page-break-
678        after: always; overflow: hidden;}
679        div.page-div-end {width: 100%; height: 100%; position: relative; overflow:
680        hidden;}
681        p.textbox1 {position: absolute; left: 10mm; top: 10mm;}
682        p.textbox2 {position: absolute; left: 10mm; top: 20mm;}
683
684        </style>
685        </head>
686
687        <body>
688          <div class="page-div">
689        <p class="textbox1">contents page1</p>
690          </div>
691        <div class="page-div-end">
692          <p class="textbox2">contents page2</p>
693          <p> static position </p>
694          </div>
695        </body>
696        </html>
697
```

698   Expected Output:

699

700   (0,0)   (0,0)

701

702
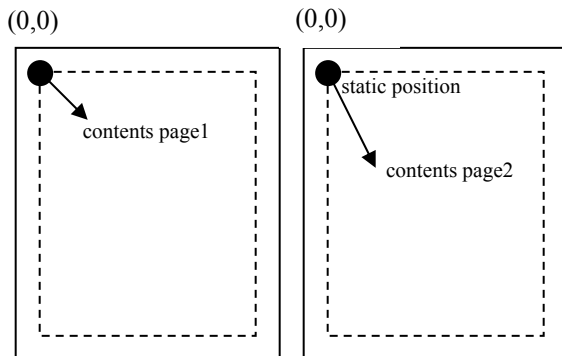
703 ## 3.3.5. Images

704 ### *3.3.5.1. Image Size and Page Size*

705 Consideration is recommended for the relationship between the size of the image and the page size. The size of the
706 image should be within the size of the page size specified by @page unless it is intended that part of the image
707 should be cropped (*i.e.,* not printed). Output consistency is not assured for images that exceed the page size.

708 When part of the image should be cropped, it is important that the overflow property be set to 'hidden', so that the
709 printer understands it need not take steps to display the overflowed content.

710 For example, when the intrinsic aspect ratio of an image differs from the aspect ratio of the destination media, and
711 the Content Author wishes to generate full-bleed output of the image, the width or the height of the image object
712 may intentionally exceed the width or height of the page sheet. (Explanation is given in section 3.4, and examples
713 are given in section 3.4.3.1.3 and 3.4.3.2.1) Information on full bleed can also be referenced in sections 3.2.2 f) and
714 3.8.6 of PrintEnhanced:1 [PE1].

715

716 ### *3.3.5.2. Image Rotation*

717 The following should be taken into consideration when creating XHTML-Print / CSS Print Profile contents that
718 include image rotation.
719 ● Image rotation should be specified using CSS3 rotation mechanisms. Do not rely on the EXIF App markers to
720 rotate images.
721 Ex. CSS - img { image-orientation:90deg; width: W; height: H; }
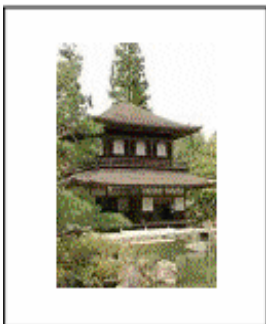
722 Source image (input)   expected result (output)

723

724

725
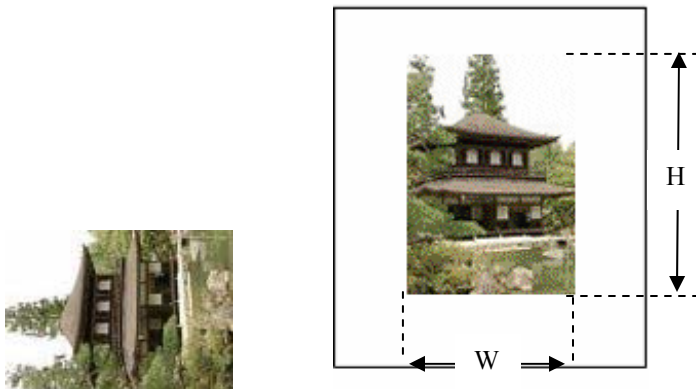
726 Rotate the image clockwise by 90-degree increments (90,180,270) relative to the orientation of the page

727 ● If both CSS rotation property and EXIF App marker exist for a given image, CSS image rotation property will
728 take precedence over EXIF App markers

729 ● Whether the printer references the EXIF App markers for image rotation will be device/application dependent.

730

Orientation	source image	=90 deg
Portrait		
Landscape		

731 ### *3.3.5.3. URI of Images*

732 When an XHTML-Print file is sent using the HTTP POST method, either the base element should be provided if
733 relative URIs are used, or full URIs should be specified, in order to reference external objects.

734 The following example makes use of the base element recommended above. There is no ambiguity in the expected
735 output:

736 ## Source

```
737 <html xmlns="http://www.w3.org/1999/xhtml">
738 <head>
739 <title>URI of Images</title>
740 <base href="http://www.upnp.com/images/" />
741 </head>
742 <body>
743 <div><img src="hdtv320x180.jpg" alt="photo" /></div>
744 </body>
745 </html>
746
747 In the example above, given
748 <base href="http://www.upnp.com/images/" />
749 the IMG element
```

© 2002-2005 Contributing Members of the UPnP™ Forum. All rights Reserved.

```
750   <img src="hdtv320x180.jpg" alt="photo" />
751   refers to image
752   http://www.upnp.com/images/hdtv320x180.jpg
```

753   ### 3.3.6. Layer Control

754   Layered presentations using static positioning and absolute positioning are described below.

755   Static positioning: In the normal flow, the block boxes can be positioned to overlap by specifying the "margin-top,
756   margin-left margin-bottom, margin-right" property. When block boxes visually overlap, those appearing later in the
757   source should be painted nearer to the user and, those appearing earlier in the source should be painted further from
758   the user.

759   Absolute positioning: The block boxes can be positioned to overlap by specifying the "top, left, bottom, right"
760   property. When block-boxes visually overlap, those appearing later in the source should be painted nearer to the
761   user and, those appearing earlier in the source should be painted further from the user.

762   The next example shows a recommended method to overlap block boxes and related components. In this example,
763   the device will likely interpret the source code shown below as follows: First, the background-color of <body> is
764   painted on the canvas, followed by <div> block box, which contains image with background color. Then, <p> block
765   box, which includes inline (explicitly specified with <span>) text with border and background-color, is painted.
766   Expected output is illustrated below.

767
768   Source
769
```
770   <html xmlns="http://www.w3.org/1999/xhtml">
771   <head>
772   <title>Layer Control</title>
773   <style type="text/css">
774   @media print {
775   @page {size:A4 portrait;}
776   }
777   body{background-color:#87ceeb;}
778   div{width:80mm; height:50mm; background-color:green;}
779   img{width:78mm; height:48mm;}
780   p{margin-top:-1.5em; text-align:center;}
781   span{background-color:yellow; border:solid 1mm;}
782   </style>
783   </head>
784   <body>
785   <div><img src="hdtv320x180.jpg" alt="photo" />
786   <p><span>date&amp;time</span></p>
787   </div>
788   </body>
789   </html>
```
790
791
792   Expected Output
793
794

795

796 3.3.7. Elements that may Affect Output Consistency

797 The following should be taken into consideration when creating XHTML-Print / CSS Print Profile contents
798 intended for output from PrintEnhanced:1 compliant printers.

799 *3.3.7.1. Float*

800 Usage of the float element may affect output consistency. Its usage is not recommended in situations where
801 consistency across printers is critical.

802 *3.3.7.2. List-Style-Type / List-Style-Image*

803 Usage of the List-style-type and/or List-style-image element may affect output consistency. Its usage is not
804 recommended in situations where consistency across printers is critical.

805 *3.3.7.3. Risky Margin Settings*

806 Positioning content very near the edge of the page sheet may affect output consistency among printers, due to
807 differences in the printer's Non-Printable Areas. When output consistency is important, it is recommended that
808 content be placed at a reasonable distance from the page sheet edge.

809 The use of page margins provides an easy way to ensure statically positioned content follows this guideline.

```
810                    @page {
811                            margin: 10mm;
812                            }
```

813 Printers that follow the informative guidelines in Section 8.5 of [CSSPP] will by default establish a 10% page
814 margin.

815 However, when the page margins are used for headers and footers, the Content Author must take care to ensure the
816 header and footer contents are not placed within the Printer's Non-Printable Area.

817 *3.3.7.4. Relative Font Size*

818 Usage of relative font size may affect output consistency. Its usage is not recommended in situations where
819 consistency across printers is critical. Usage of absolute font size is recommended.

820 *3.3.7.5. Character Encoding(UTF-16)*

821 Contents creators should take in to account that printers may not support UTF-16. Usage of UTF-8 encoding is
822 recommended. For control points, PrintEnhanced:1 [PE1] defines a state variable :*DocumentUTF16Supported* that
823 can be used to determine UTF-16 support for the document format

824 *3.3.7.6. Forms*

825 It is important when designing forms that will be printed to consider the differences between printed output and
826 output displayed on a screen. The most likely usage scenario for printing forms is to create a record of a transaction.
827 In this case, it is important to explicitly control layout so that the printed output show which items were selected and
828 any text the user may have entered.

829 Text areas should be sized large enough to show all critical contents. Setting overflow to 'visible' will help ensure
830 all text that the user has entered is displayed on the printed page, but may lead to layout inconsistencies.

831 Select elements should be sized to allow all selected elements to be printed. Setting overflow to 'visible' will help
832 ensure all selected items will be displayed on the printed page, but may lead to layout inconsistencies.

833 ## 3.4.   Sample Templates

834 This section provides XHTML-Print [XHTML-PRINT] and CSS Print Profile [CSSPP] contents source and
835 corresponding expected output description for several simple photo-related layouts. The source is intended for use
836 as examples and reference and as a basis for modification. Be aware that the templates will not necessarily produce
837 the expected outputs when displayed on screen"

838 ### 3.4.1. Basic Layout Concept

839 The templates are categorized by 1) the number of images per page and 2) with borders (white space) or without
840 borders (full bleed). Bordered output is basically achieved by the image object(s) being positioned and sized within
841 a positive (non-zero) page margin, whereas output without borders (full bleed) are achieved by positioning the
842 object(s) on or outside the edge of a zero-margin page box, while sizing it equal to or greater than the page size.
843
844 ## Output with Borders Example

```
845 <?xml version="1.0" encoding="UTF-8"?>
846 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
847     "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
848 <html xmlns="http://www.w3.org/1999/xhtml">
849 <head>
850 <style>
851 @media print{
852 ......
853 @page{… margin:margin_Amm;}
854 ......
855 }
856 img.basic1{width:image_size_B; height:image_size_C;}
857
858 </style>
859 </head>
860 <body>
861 …
862 <img class="basic1" src="image1.jpg"/>
863 …
864 </body>
865 </html>
866
867
```

set page margin to value greater than zero to achieve white space

Object size should be within the page size

868
869

870   Image_size_B

871   Image1.jpg Image_size_C

872

873

margin_A

Page margin

Page media

874

875

876

Output without Borders (Full Bleed) Example

```
878  <?xml version="1.0" encoding="UTF-8"?>
879  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
880       "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
881  <html xmlns="http://www.w3.org/1999/xhtml">
882  <head>
883  <style>
884  @media print{
885  ……
886  @page{… margin:margin_Dmm;}
887  ……
888  }
889  div {position:absolute; top:E; left:F; }
890  img.basic2{width:image_size_G; height:image_size_H;}
891
892  </style>
893  </head>
894  <body>
895  …
896  <div>
897  <img class="basic2" src="image2.jpg"/>
898  </div>
899  …
900  </body>
901  </html>
```

902

903

904

905

906

.898 </html> ng2j98 1 Tf3.335598 lww.w3.org/1999/xhtml">

913
914
915
916 The basic idea shown above can be applied to various layouts as shown below, which some of which will be shown
917 in detail in the following sections.

918
919

3.4.2. Definition of Terms

921 ARp : Aspect ratio of paged media (height/width)

922 ARi : Aspect ratio of image data (pixels of a line / number of lines)

923   Note: Printer should assume square pixels in the image data, as typical image data consists of square pixels (i.e.
924 pixels with an aspect ratio of 1:1).

925

926 ### 3.4.3. One Image in One Page

927 *3.4.3.1. With Borders (with White Space)*

928 *3.4.3.1.1.   Borders on All Sides*

929 Note

930 ● The aspect ratio of the image is preserved.

931 ● The image is not cropped.

932 ● In order to achieve bordered output, @page margins of positive values should be specified.

933 Source

```
934 <?xml version="1.0" encoding="UTF-8"?>
935 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
936     "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
937 <html xmlns="http://www.w3.org/1999/xhtml">
938 <head>
939 <title>One Image in One Page</title>
940 <style type="text/css">
941 @media print{
942 @page{size:A4 landscape; margin:5mm;} /*set margin to value greater than
943 zero*/
944 }
945 body{padding:0mm; }
946 div{font: bold 36pt; text-align:center;}
947 img.frame11 {width:270mm; height:180mm;}
948
949 </style>
950 </head>
951 <body>
952 <div>Title<br /><img class="frame11" src="swimming.jpg" alt="swimming"  />
953 </div>
954 </body>
955 </html>
956
```

957 Output

958

959 *3.4.3.1.2.   Aligning the Horizontal Edge of the Image to the Horizontal Edge of the Page Media*
960 *Without Clipping*

961 Note

962 ● The aspect ratio of the image is preserved

963 ● Paper size is A4 landscape.

964 ● ARi <ARp

965 ● ARi of the image is 4/3

966 ● In order to achieve vertical zero margins, @page margins of zeros must be specified.

967

968 Source

```
969 <?xml version="1.0" encoding="UTF-8"?>
970 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
971     "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
972 <html xmlns="http://www.w3.org/1999/xhtml">
973 <head>
974 <title> Aligning the Horizontal Edge of the Image to the Horizontal Edge of
975 the Page Media Without Clipping</title>
976 <style type="text/css">
977 @media print {
978 @page {size:A4 landscape; margin: 0mm;}/*set the horizontal margin to zero*/
979 }
980 body {padding:0mm;}
981 img {height:210mm;} /* Be careful to preserve image aspect ratio */
982 div {margin-left:8.5mm;} /* margin-left can be an arbitrary value */
983
984 </style>
985 </head>
986 <body>
987 <div><img src="wavingocn.jpg" alt="photo" /></div>
988 </body></html>
989
```
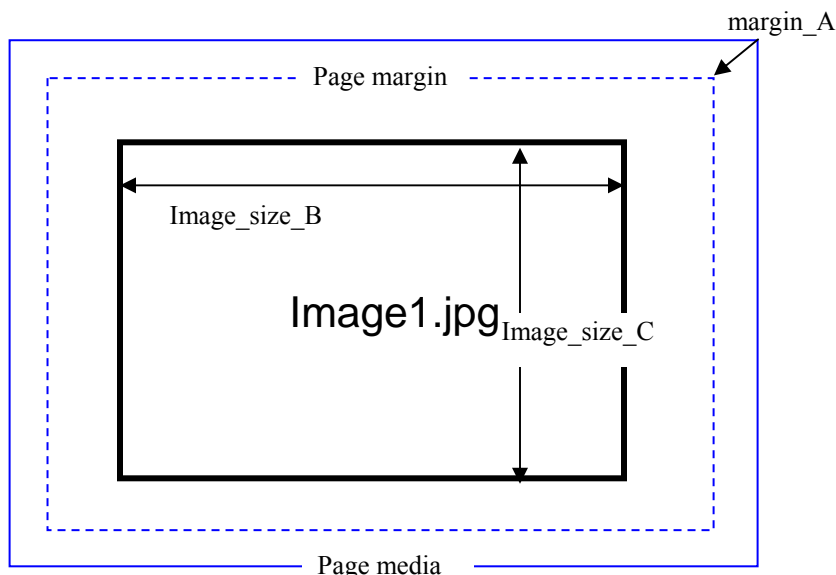
990 Output

991

8.5mm

280mm

210mm

297mm

996 ***3.4.3.1.3.   Case : Aligning the Vertical Edge of the Image to the Vertical Edge of the Page Media***
997 ***Without Clipping***

998 Note

999 ● The aspect ratio of the image is preserved

1000 ● Paper size is A4 landscape.

1001 ● ARi of the image is 16/9

1002 ● ARi >ARp

1003 ● In order to achieve vertical zero margins, @page margins of zeros must be specified.

1004 ● Padding is used as a positioning directive in this particular case. Note that margins are always transparent so
1005 the background of the elements show through, while padding areas are filled with the background specified to
1006 the padding.

1007 Source

```
1008 <?xml version="1.0" encoding="UTF-8"?>
1009 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
1010     "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
1011 <html xmlns="http://www.w3.org/1999/xhtml">
1012 <head>
1013 <title>Aligning the Vertical Edge of the Image to the Vertical Edge of the
1014 Page Media Without Clipping</title>
1015 <style type="text/css">
1016 @media print {
1017 @page {size:A4 landscape; margin: 0mm;}/*set the vertical margin to zero*/
1018 }
1019 body {padding:0mm;}
1020 img {width:297mm; } /* Be careful to preserve image aspect ratio */
1021 div { padding-top:21.47mm;} /* padding-top can be an arbitrary value */
1022
1023 </style>
1024 </head>
1025 <body>
1026 <div><img src="blueocn.jpg" alt="photo" /></div>
1027 </body>
1028 </html>
1029
```
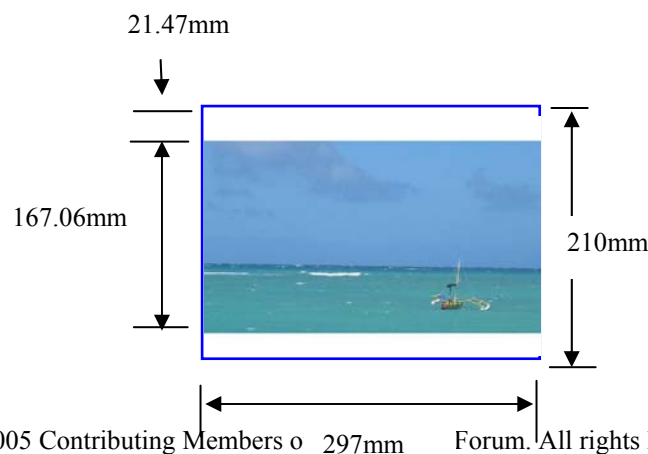
1030 Output

1037 *3.4.3.2. Full Bleed*

1038 *3.4.3.2.1.   Fitting/Full Bleed - Fitting the Vertical Edge of the Image on the Page Media (to*
1039   *Achieve Full Bleed)*

1040 Note

1041 ● The aspect ratio of the image is preserved

1042 ● ARi <ARp

1043 ● In order to achieve full bleed, @page margins of all zeros must be specified..

1044 ● In order to center the image, the image margin must be specified with a vertically negative value.

1045 ● In order to avoid the <div> container from flowing over to the next page instead of successfully cropping the
1046   portions vertically outside the page, absolute positioning should be applied to the <div>container

1047 Source

```
1048 <?xml version="1.0" encoding="UTF-8"?>
1049 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
1050      "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
1051 <html xmlns="http://www.w3.org/1999/xhtml">
1052 <head>
1053 <title>Fitting/Full Bleed – Fitting the Vertical Edge of the Image on the Page
1054 Media</title>
1055 <style type="text/css">
1056 @media print {
1057 @page {size:A4 landscape; margin:0mm;}
1058 }
1059 body{padding:0mm; width:100%; height:100%;}
1060 div {width:100%; height:100%; overflow: hidden;}
1061 p {position:absolute; margin:0mm; width:100%; height:1em; bottom:0.5em;
1062      font-size:36pt; color:white; text-align:center;}
1063 img {width:100%; margin-top:-6.375mm;}
1064
1065 </style></head>
1066 <body>
1067 <div>
1068 <img src="wavingocn.jpg" alt="photo" />
1069 <p>date&amp;time</p>
1070 </div>
1071 </body>
1072 </html>
1073
```
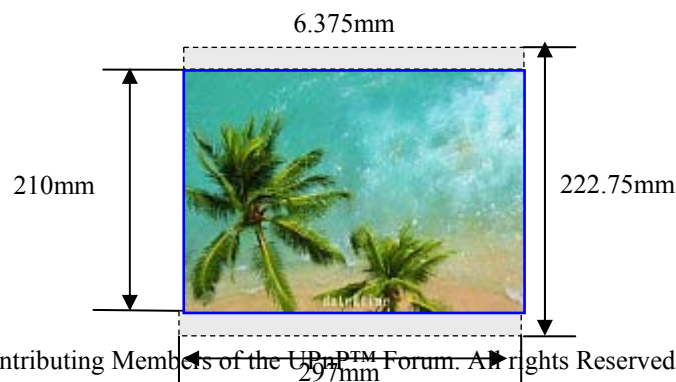
1074 Output

6.375mm

210mm   222.75mm

297mm

1080 *3.4.3.2.2.* *Fitting/Full Bleed – Fitting the Horizontal Edge of the Image on the Page Media (to*
1081 *Achieve Full Bleed)*

1082 Note

1083 ● The aspect ratio of the image is preserved

1084 ● ARi >ARp

1085 ● Text (Date) is overlaid above the image

1086 ● In order to achieve full bleed, @page margins of all zeros must be specified.

1087 ● In order to center the image, the image margin must be specified with a horizontally negative value.

1088 ● In order to avoid the <div> container from flowing over to the next page, the height of the image (<img>)
1089 should not exceed the page height.

1090 Source

```
1091   <?xml version="1.0" encoding="UTF-8"?>
1092   <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
1093       "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
1094   <html xmlns="http://www.w3.org/1999/xhtml">
1095   <head>
1096   <title>Fitting/Full Bleed, Fitting the Horizontal Edge of the Image</title>
1097   <style type="text/css">
1098   @media print {
1099   @page {size:A4 landscape; margin:0mm;}
1100   }
1101   body {padding:0mm; height:100%; width:100%;}
1102   img {width:373.3mm; height:210mm;}
1103   div {margin-left:-38.16mm;}
1104
1105   p {margin-top:-1.5em; margin-left:238.16mm; font-size:3em; color:white;}
1106   </style>
1107   </head>
1108
1109   <body>
1110   <div>
1111   <img src="blueocn.jpg" alt="photo" />
1112   <p>Jan. 1 2004</p>
1113   </div>
1114   </body>
1115   </html>
1116
```

1117 Output

1123 *3.4.3.2.3.* *Fitting/Full Bleed – Cropping the Horizontal Edges of the Image on the Page Media*
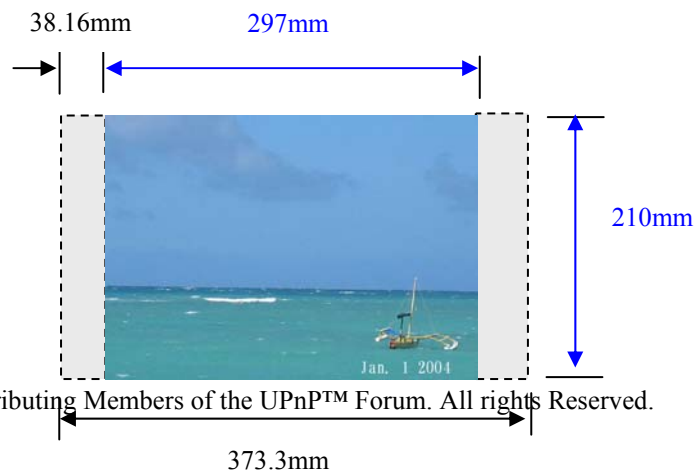1124 *(to Achieve Full Bleed)*

1125 Note

1126 ● The aspect ratio of the image is preserved

1127 ● ARi >ARp

1128 ● Text (Date) is overlaid above the image

1129 ● In order to achieve full bleed, @page margins of all zeros must be specified.

1130 ● In order to center the image, the image margin must be specified with a horizontally negative value.

1131 ● In order to crop both sides of the image, "overflow : hidden" must be set to the div container.

1132

1133 Source

```
1134  <?xml version="1.0" encoding="UTF-8"?>
1135  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
1136      "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
1137  <html xmlns="http://www.w3.org/1999/xhtml">
1138  <head>
1139  <title>Fitting/Full Bleed, Cropping the Horizontal Edge of the
1140  Image</title>
1141  <style type="text/css">
1142  @media print {
1143  @page {size:A4 landscape; margin:0mm;}
1144  }
1145  body {padding:0mm; height:100%; width:100%;}
1146  img { height:100%; margin-left:-38.16mm;}
1147  div {height:100%; width:100%; overflow: hidden;}
1148  p {margin-top:-1.5em; margin-left:200mm; font-size:3em; color:white;}
1149  </style>
1150  </head>
1151  <body>
1152  <div>
1153  <img src="blueocn.jpg" alt="photo" />
1154  <p>Jan. 1 2004</p>
1155  </div>
1156  </body>
1157  </html>
1158
```

1159 Output

1160

1161

1162

1163

1164

1165

1166

1167

1168

1169

1170
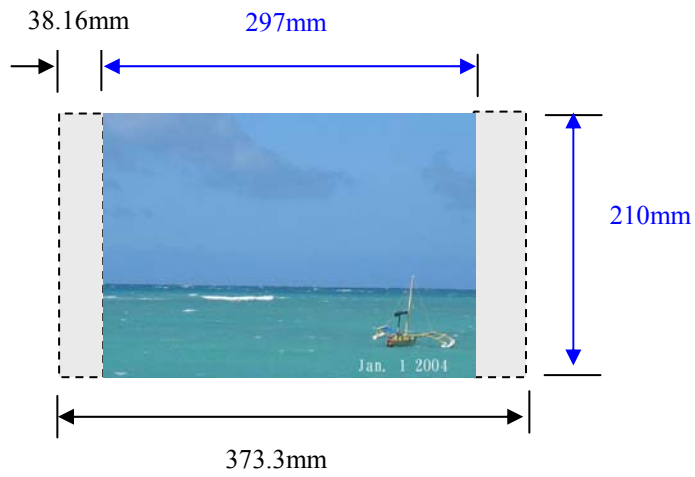
3.4.4. Two Images in One Page

1171

3.4.4.1. With Borders(with White Space)

1172

Note

1173

1174 • The aspect ratios of the images are preserved.

1175 • There is white area around each image.

1176 • Paper size is A4 portrait. (210mm x 297mm)

1177 • Page margin is 5mm (Page box size is 200mm x 287mm).

1178 • ARi of the upper image is 4/3.

1179 • ARi of the lower image is 16/9.

1180 • The images are not cropped.

1181 • The source code example uses absolute positioning.

1182 • It is possible to use static positioning with modification of the source structure instead of absolute positioning.

•

```
1215    </div>
1216
1217    <div class="frame21" id="div2">
1218    <img class="frame21" id="img2" src="bird.jpg" alt="bird" />
1219    </div>
1220    </body>
1221    </html>
1222
```

Output
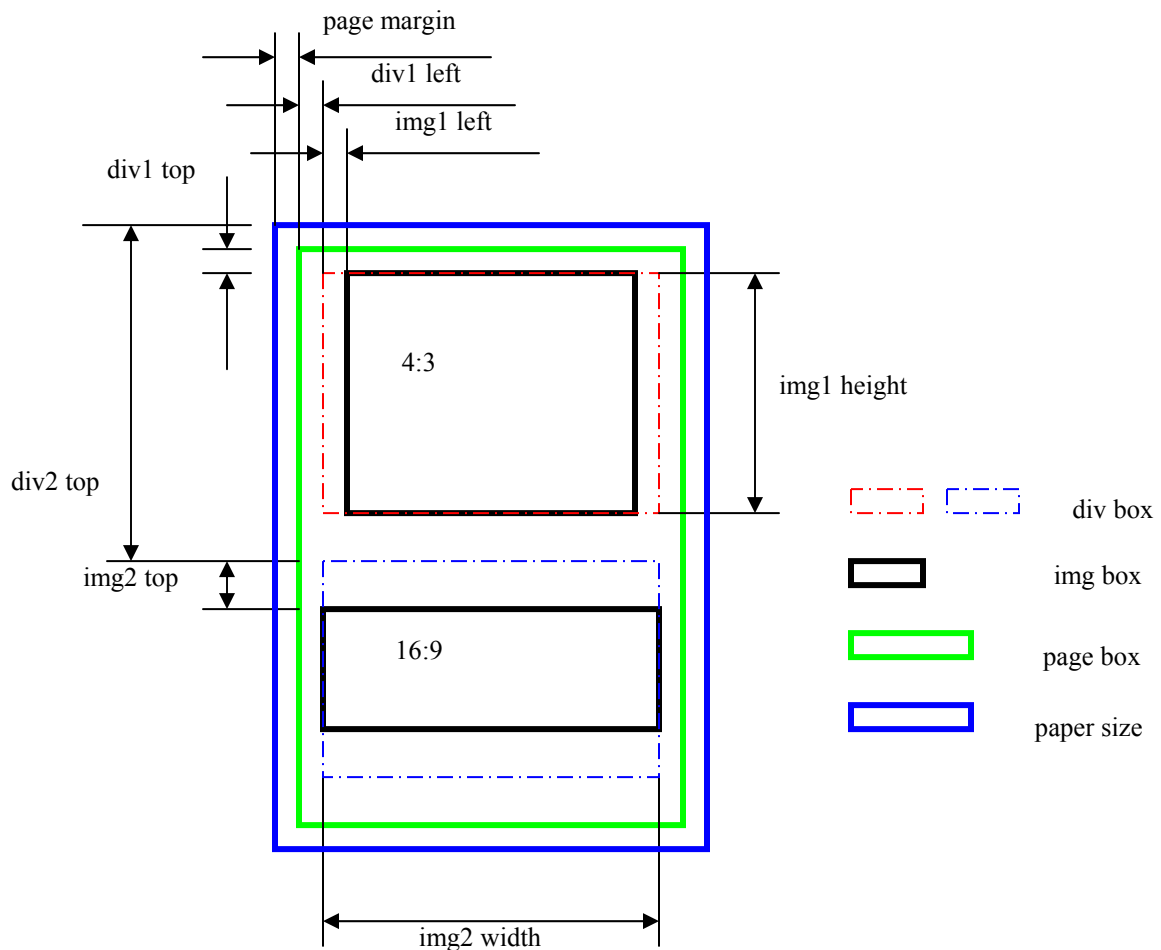
1256

1257 *3.4.4.2. Full Bleed*

1258 Note

1259 ● The aspect ratios of the images are preserved.

1260 ● Paper size is A4 portrait.

1261 ● Page margin is 0 (Page box size is 210mm x 297mm).

1262 ● ARi of the upper image is 16/9. (Right and left portions of the image are cropped)

1263 ● ARi of the lower image is 4/3. (Top and bottom portions of the image are cropped)

1264 ● Each image is rendered in half size of a paged media.

1265 ● Each image is cropped if ARi of the image was not equal to div.

1266 ● In order to avoid the <div> container from flowing over to the next page instead of successfully cropping the
1267 portions vertically outside the page, absolute positioning should be applied to the <div>container

1268 ● In order to achieve full bleed output, @page margins of all zeros must be specified.

1269 ● In order to crop the images, "overflow: hidden" should be use to crop outside of "div" box.

1270

1271 Source

```
1272  <?xml version="1.0" encoding="UTF-8"?>
1273  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
1274      "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
1275  <html xmlns="http://www.w3.org/1999/xhtml">
1276  <head>
1277  <title>Two Images in One Page Full Bleed</title>
1278  <style type="text/css">
1279  @media print {
1280  @page { size: A4 portrait; margin: 0mm;}
1281  }
1282  * { margin: 0mm;} /* Disabled default style sheet */
1283
1284  div.borderless21 { position: absolute; left: 0mm; height: 148.5mm; width:
1285  210mm; overflow: hidden;}
1286      /* image box is half of page box, and out of image box is hidden */
1287  img.borderless21 { position: absolute; }
1288
1289  #div1 { top: 0mm; }     /* upper image box top offset from page box */
1290  #div2 { top: 148.5mm; } /* lower image box top offset from page box */
1291
1292  #img1 { left: -27mm; top: 0mm; height: 148.5mm; }  /* left negative margin */
1293  #img2 { left: 0mm; top: -4.5mm; width: 210mm; }    /* top negative margin */
1294
1295  </style>
1296  </head>
1297  <body>
1298  <div class="borderless21" id="div1">
1299  <img class="borderless21" id="img1" src="bird.jpg" alt="bird" />
```

```
1300    </div>
1301    <div class="borderless21" id="div2">
1302    <img class="borderless21" id="img2" src="swimming.jpg" alt="swimming" />
1303    </div>
1304    </body>
1305    </html>
1306
1307    Output
```
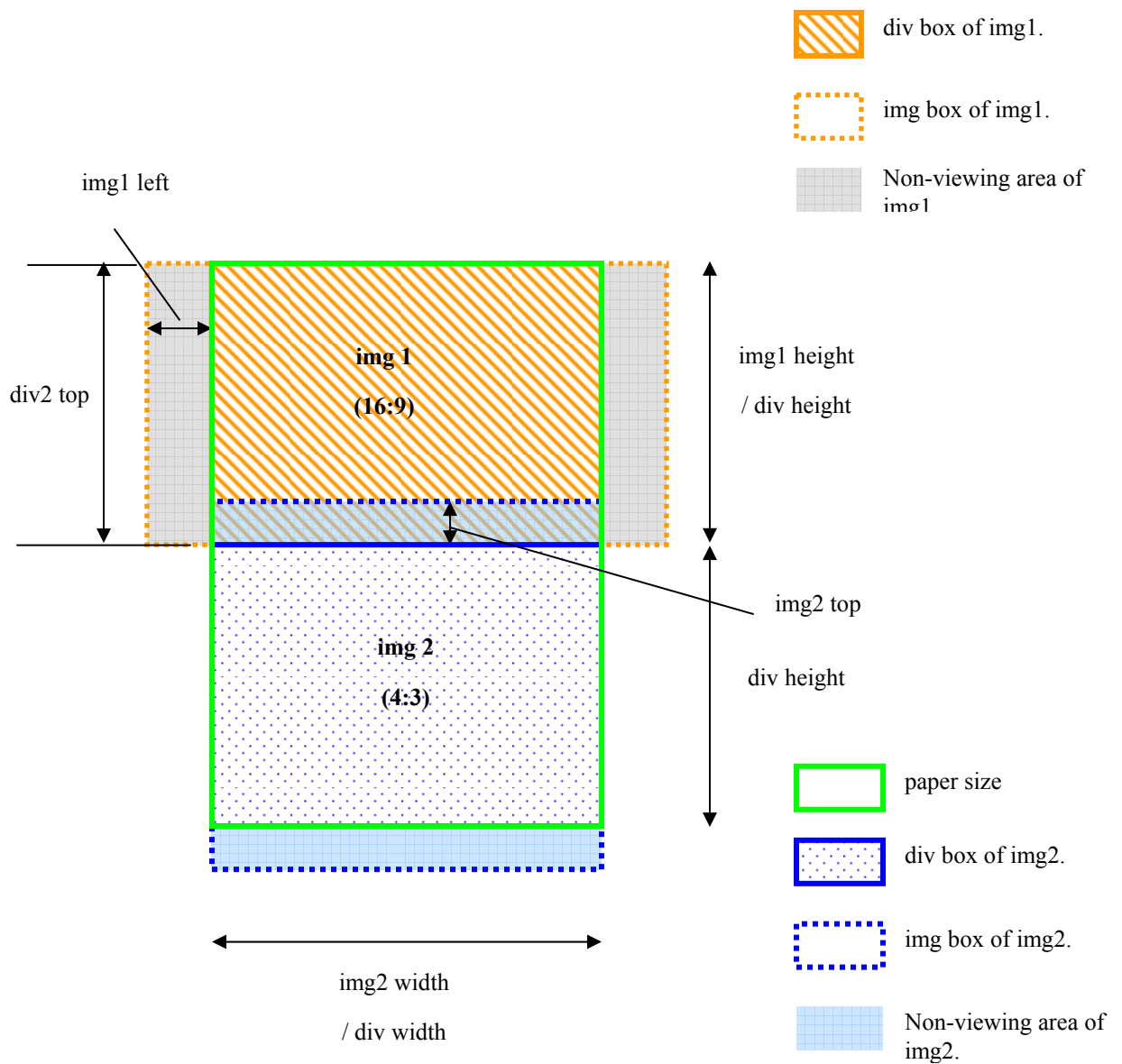
1336 ### 3.4.5. Four Images in One Page

1337 *3.4.5.1. With Borders (with White Space)*
1338 Note

1339 ● The aspect ratios of the images are preserved.

1340 ● There is white area around each image.

1341 ● Paper size is A4 landscape.

1342 ● Page margin is 5mm (Page box size is 287mm x 200mm).

1343 ● The images are not cropped to bleed fully in 4 predetermined areas on the paged media.

1344 ● ARi of the upper-left and lower-right images are 16/9.

1345 ● ARi of the upper-right and lower-left images are 4/3.

1346 ● .

1347 ● In order to avoid the <div> container from flowing over to the next page instead of successfully cropping the
1348 portions vertically outside the page, absolute positioning should be applied to the <div>container

1349 ● In order to achieve bordered output, @page margins of positive values should be specified.

1350

1351 Source

```
1352  <?xml version="1.0" encoding="UTF-8"?>
1353  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
1354      "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
1355  <html xmlns="http://www.w3.org/1999/xhtml">
1356  <head>
```

```
1379    #img3 { left: 0mm; top: -5.625mm; width: 135mm; }
1380      /* img3 top negative margin from div3 box & width (height is calculated ) */
1381    #img4 { left: -12.5mm; top: 0mm; height: 90mm; }
1382      /* img4 left negative margin from div4 box & height (width is calculated )*/
1383
1384    </style>
1385    </head>
1386    <body>
1387    <div class="frame41" id="div1">
1388    <img class="frame41" id="img1" src="img1.jpg" alt="img1" />
1389    </div>
1390    <div class="frame41" id="div2">
1391    <img class="frame41" id="img2" src="img2.jpg" alt="img2" />
1392    </div>
1393    <div class="frame41" id="div3">
1394    <img class="frame41" id="img3" src="img3.jpg" alt="img3″ />
1395    </div>
1396    <div class="frame41" id="div4">
1397    <img class="frame41" id="img4" src="img4.jpg" alt="img4" />
1398    </div>
1399    </body>
1400    </html>
```
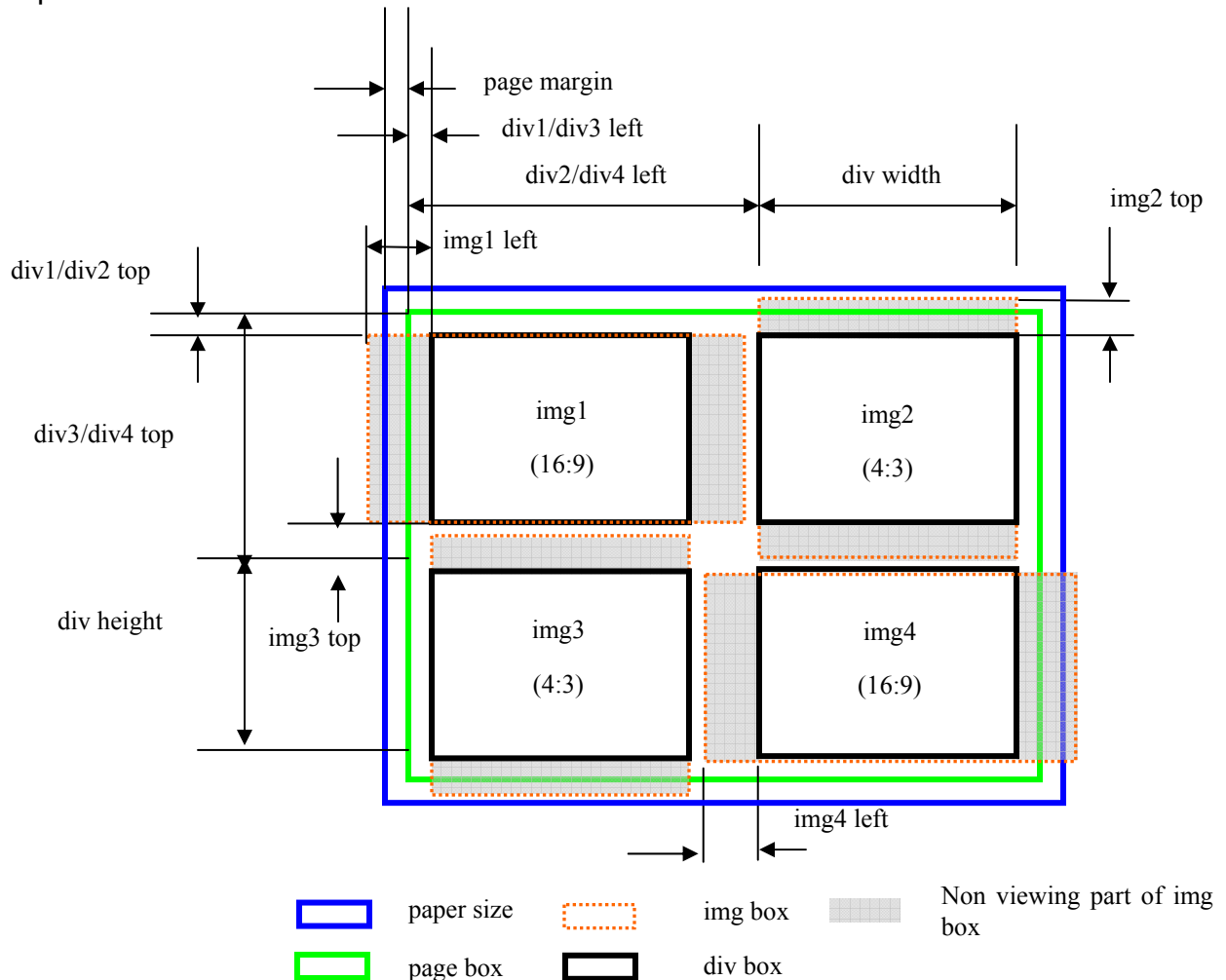
1401   Output

1429

1430   *3.4.5.2. Full Bleed*

1431   Note

1432   ● The aspect ratios of the images are preserved.

1433   ● Paper size is A4 landscape.

1434   ● Page margin is 0 (Page box size is 297mm x 210mm).

1435   ● Each image is rendered in quarter size of a paged media.

1436   ● Each image is cropped if ARi of the image was not equal to ARp .

1437   ● ARi of the upper-left and lower-right images is 16/9. (Right and left portions of the image are cropped)

1438   ● ARi of the upper-right and lower-left images is 4/3. (Top and bottom portions of the image are cropped)

1439   ● Date/Time is placed on the image.

1440

1441   ● In order to avoid the <div> container from flowing over to the next page instead of successfully cropping the
1442   portions vertically outside the page, absolute positioning should be applied to the <div>container

1443   ● In order to achieve full bleed output, @page margins of all zeros must be specified.

1444   ● In order to crop the images, "overflow: hidden" should be use to crop outside of "div" box.

1445

1446   Source

```
1447    <?xml version="1.0" encoding="UTF-8"?>
1448    <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
1449        "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
1450    <html xmlns="http://www.w3.org/1999/xhtml">
1451    <head>
1452    <title>Four Images in One Page Full Bleed</title>
1453    <style type="text/css">
1454    @media print {
1455    @page { size: A4 landscape; margin: 0mm;} /* fullbleed */
1456    }
1457    div.borderless41 { position: absolute; width: 148.5mm; height: 105mm;
1458    overflow: hidden; }  /* all div box is 1/4 paper-size(A4) & outside of div box
1459    is hidden */
1460    #div1 { top: 0mm; left: 0mm;       }    /* top-left image position (img1) */
1461    #div2 { top: 0mm; left: 148.5mm; }      /* top-right image position (img2)*/
1462    #div3 { top: 105mm; left: 0mm;       }  /* bottom-left image position (img3)*/
1463    #div4 { top: 105mm; left: 148.5mm; }    /* bottom-right image position (img4)
1464    */
1465    p.borderless41 { position: absolute; bottom: 0mm; left: 0mm; width: 148.5mm;
1466    height: 12mm; font-size: 24pt; text-align: center; }   /* date/time text box
1467    */
1468
1469    img.borderless41 { position: absolute; }
1470
1471    #img1 { left: -19.05mm; top: 0mm; height: 105mm; }
```

```
1472     /* img1 left negative margin from div1 box & height (width is calculated )
1473   */
1474   #img2 { left: 0mm; top: -3.1875mm; width: 148.5mm;}
1475     /* img2 top negative margin from div2 box & width (height is calculated ) */
1476   #img3 { left: 0mm; top: -3.1875mm; width: 148.5mm; }
1477     /* img3 top negative margin from div3 box & width (height is calculated ) */
1478   #img4 { left: -19.05mm; top: 0mm; height: 105mm; }
1479     /* img1 left negative margin from div4 box & height (width is calculated )
1480   */
1481
1482   </style>
1483   </head>
1484   <body>
1485   <div class="borderless41" id="div1">
1486   <img class="borderless41" id="img1" src="img1.jpg" alt="img1" />
1487   <p class="borderless41">2004/09/14</p>
1488   </div>
1489   <div class="borderless41" id="div2">
1490   <img class="borderless41" id="img2" src="img2.jpg" alt="img2" />
1491   <p class="borderless41">2004/09/15</p>
1492   </div>
1493   <div class="borderless41" id="div3">
1494   <img class="borderless41" id="img3" src="img3.jpg" alt="img3" />
1495   <p class="borderless41">2004/09/16</p>
1496   </div>
1497   <div class="borderless41" id="div4">
1498   <img class="borderless41" id="img4" src="img4.jpg" alt="img4" />
1499   <p class="borderless41">2004/09/14</p>
1500   </div>
1501
1502   </body>
1503   </html>
```

1504   Output

1505
1506
1507
1508
1509
1510
1511
1512
1513
1514
1515
1516
1517
1518
1519
1520
1521
1522
1523

1524

1525

1526

1527

1528

1529

1530

1531

1532

1533

1534

1535

1536

1537

1538

1539

1540

1541

img1 left

div width

div height

img3 top

img1

(16:9)

img2

(4:3)

img2 top

img3

(4:3)

img4

(16:9)

img4 left

date/time text box

paper size

img box

div box

Non-viewing area of img
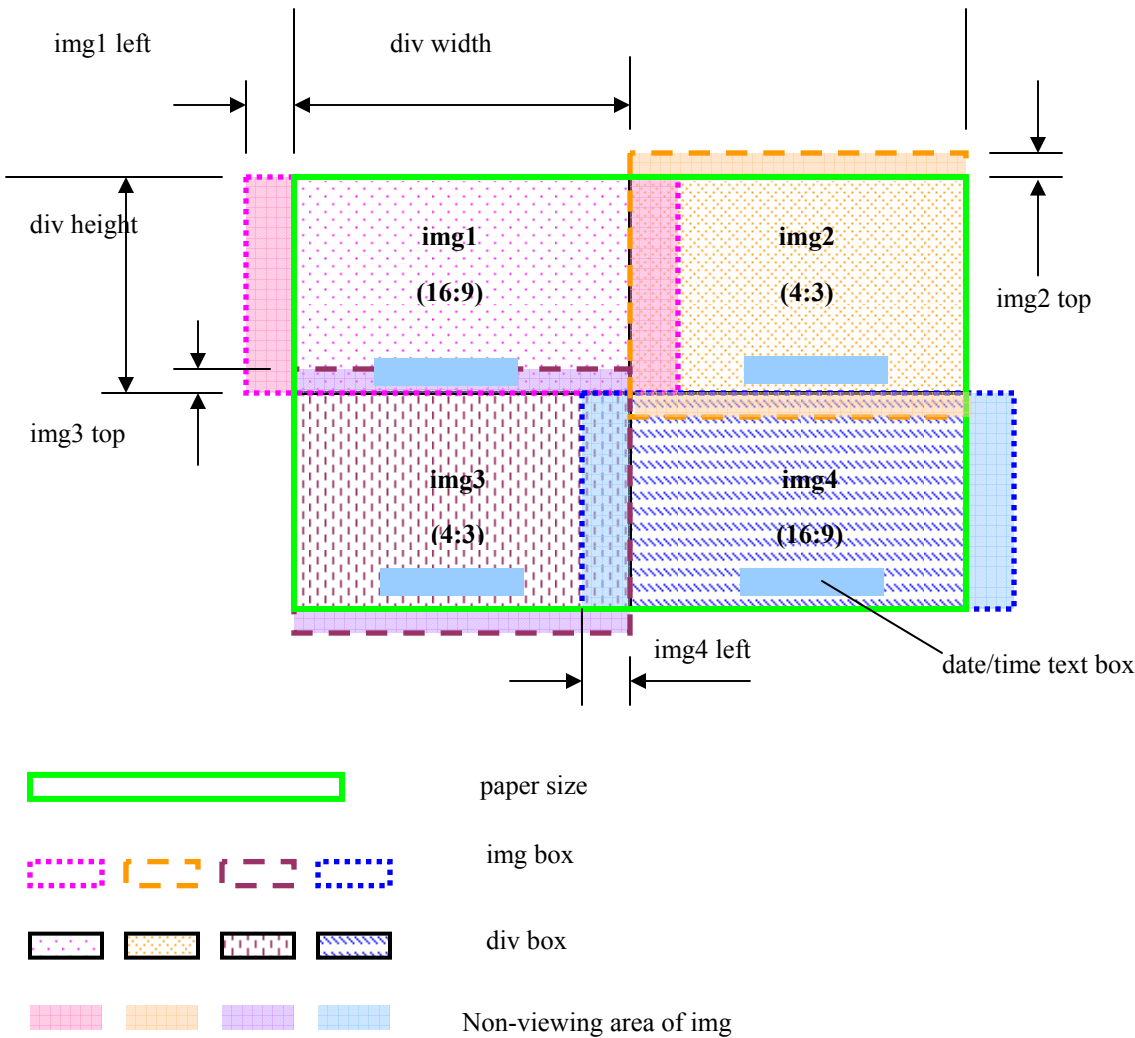
1542 **3.4.6. Index Printing**

1543 *3.4.6.1.1.* *Simple Index Page Using Tables*

1544 Note

1545 ● none

1546

1547 # Source

```
1548 <?xml version="1.0" encoding="UTF-8"?>
1549 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
1550     "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
1551 <html xmlns="http://www.w3.org/1999/xhtml">
1552 <head>
1553 <title>Simple Index Page Using Tables</title>
1554 <style type="text/css">
1555 @media print {
1556 @page {size:A4 portrait; margin:5mm;}
1557 }
1558 body {padding:0mm;}
1559 table {font-size:12pt; text-align:center;}
1560 caption {font-size:24pt;}
1561 img {width:40mm; height:30mm;}
1562
1563 </style>
1564 </head>
1565 <body>
1566 <table>
1567 <caption>index print</caption>
1568 <tr>
1569 <td><img src="beach02.jpg" alt="image 1-1" /><br />November 17</td>
1570 <td><img src="restaurant.jpg" alt="image 1-2"/><br />October 11</td>
1571 <td><img src="beach01.jpg" alt="image 1-3" /><br />November 13</td>
1572 <td><img src="swimming.jpg" alt="image 1-4" /><br />November 13</td>
1573 </tr>
1574 <tr>
1575 <td><img src="restaurant.jpg" alt="image 2-1" /><br />October 11</td>
1576 <td><img src="beach01.jpg" alt="image 2-2" /><br />December 11</td>
1577 <td><img src="swimming.jpg" alt="image 2-3" /><br />November 13</td>
1578 <td><img src="beach02.jpg" alt="image 2-4" /><br />November 13</td>
1579 </tr>
1580 </table>
1581 </body>
1582 </html>
```
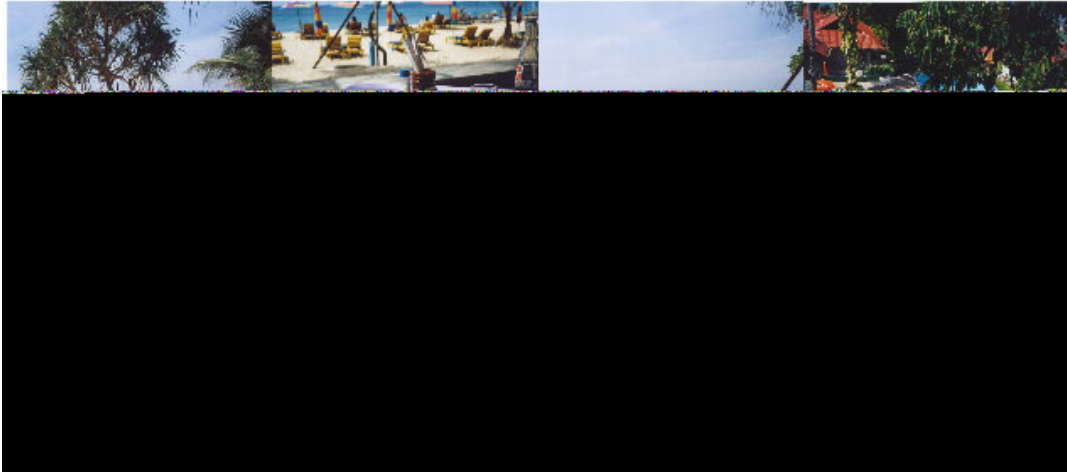
1583

1584 Output

1585

1586

1587

1588   *3.4.6.1.2.*   *Index page Without Using Tables*

1589   Note

1590   •   none

1591

1592   Source

1593
```
1594  <?xml version="1.0" encoding="UTF-8"?>
1595  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
1596      "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
1597  <html xmlns="http://www.w3.org/1999/xhtml">
1598  <head>
1599  <title>Simple Index Page Without Using Tables</title>
1600  <style type="text/css">
1601  @media print {
1602  @page {size:A4 portrait; margin-top:5mm; margin-left:16.5mm; margin-right:5mm;
1603  margin-bottom:5mm; }
1604  }
1605  body {padding:0mm;}
1606  h1{width:180mm; margin-top:0; font:bold 16pt serif; text-align:center;
1607  color:#ff9933;}
1608  p {height:47.5mm; color:blue; margin:0; padding:1mm; width:40mm; border:solid
1609  0.25mm;
1610      text-align:center; font:11.5pt serif; background:#ffffcc;}
1611  p.col1 {margin-top:2.5mm; margin-left:0mm;}
1612  p.col2 {margin-top:-50mm; margin-left:45mm;}
1613  p.col3 {margin-top:-50mm; margin-left:90mm;}
1614  p.col4 {margin-top:-50mm; margin-left:135mm;}
1615  img {width:40mm;}
1616
1617  </style>
1618  </head>
1619  <body>
1620  <h1>index print</h1>
1621
1622  <p class="col1"><img src="beach02.jpg" alt="image 1-1" title="May 7" /><br
1623  />November 17</p>
1624  <p class="col2"><img src="restaurant.jpg" alt="image 1-2" title="October 11"
1625  /><br />October 11</p>
1626  <p class="col3"><img src="beach01.jpg" alt="image 1-3" title="November 13"
1627  /><br />November 13</p>
1628  <p class="col4"><img src="swimming.jpg" alt="image 1-4" title="November 13"
1629  /><br />November 13</p>
1630
1631  <p class="col1"><img src="restaurant.jpg" alt="image 2-1" title="May 14" /><br
1632  />October 11</p>
1633  <p class="col2"><img src="beach01.jpg" alt="image 2-2" title="December 11"
1634  /><br />December 11</p>
1635  <p class="col3"><img src="swimming.jpg" alt="image 2-3" title="November 13"
1636  /><br />November 13</p>
1637  <p class="col4"><img src="beach02.jpg" alt="image 2-4" title="November 13"
1638  /><br />November 13</p>
1639  </body>
1640  </html>
```

1641

1642 Output

1643

1644

1645