



## ITAIPU HYDROELECTRIC POWER PLANT

### BASIC GUIDELINES FOR PREPARATION / REVISION AND PRESENTATION OF TECHNICAL DOCUMENTS

| 2                                                                                                                                                                          | Annexes IA and IB incorporated into the text. Annex IID, IIE, IIK excluded. General revision of the text excluding parts I, II and III. | AFONSECA PEDROVIL | 22/05/15 |
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| TECHNICAL DIRECTORATE                                                                                                                                                      |                                                                                                                                         | 2710-20-15200-I   | R2       |

## SUMMARY

|          |                                                                                                               |           |
|----------|---------------------------------------------------------------------------------------------------------------|-----------|
| <b>1</b> | <b>OBJECTIVE .....</b>                                                                                        | <b>3</b>  |
| <b>2</b> | <b>GENERAL CONDITIONS .....</b>                                                                               | <b>3</b>  |
| 2.1      | CLASSIFICATION .....                                                                                          | 3         |
| 2.2      | DOCUMENT IDENTIFICATION .....                                                                                 | 3         |
| 2.3      | DIGITAL IDENTIFICATION .....                                                                                  | 4         |
| 2.4      | DRAWING TYPES .....                                                                                           | 5         |
| 2.5      | MEANS FOR IMPLEMENTING .....                                                                                  | 5         |
| 2.6      | FORMAT AND PRESENTATION .....                                                                                 | 7         |
| 2.7      | LEGEND BOX .....                                                                                              | 8         |
| 2.8      | VERTICAL SPACE ABOVE THE LEGEND BOX .....                                                                     | 8         |
| <b>3</b> | <b>REQUIREMENTS FOR PREPARATION OF CIVIL PROJECT DRAWINGS .....</b>                                           | <b>8</b>  |
| 3.1      | GENERAL ARRANGEMENT DRAWINGS .....                                                                            | 9         |
| 3.2      | MOLD DRAWINGS .....                                                                                           | 9         |
| 3.3      | ARMATURE DRAWINGS .....                                                                                       | 10        |
| 3.4      | CIVIL INSTRUMENTATION DRAWINGS AND STEEL STRUCTURES .....                                                     | 10        |
| 3.5      | BUILT-IN DRAWINGS .....                                                                                       | 11        |
| 3.6      | ARCHITECTURAL DRAWINGS .....                                                                                  | 11        |
| <b>4</b> | <b>REQUIREMENTS FOR PREPARATION OF DOCUMENTS FOR ELECTRICAL/ ELECTRONIC / ELECTROMECHANICAL PROJECT .....</b> | <b>11</b> |
| 4.1      | INTERCONNECTION DIAGRAMS OF ELECTRICAL EQUIPMENT .....                                                        | 11        |
| 4.2      | LOGIC DIAGRAMS .....                                                                                          | 12        |
| 4.3      | LIST OF POINTS .....                                                                                          | 12        |
| 4.4      | LIST OF CABLES .....                                                                                          | 12        |
| 4.5      | MATERIALS LIST .....                                                                                          | 12        |
| 4.6      | OTHER DOCUMENTS .....                                                                                         | 13        |
| <b>5</b> | <b>REQUIREMENTS FOR PRESENTATION OF TECHNICAL TEXTUAL DOCUMENTS .....</b>                                     | <b>13</b> |
| 5.1      | FORMAT AND TAPYNG .....                                                                                       | 13        |
| 5.2      | MARGINS AND SPACES .....                                                                                      | 13        |
| 5.3      | DOCUMENT SECTIONS .....                                                                                       | 13        |
| 5.4      | PAGING, HEADER AND FOOTING .....                                                                              | 14        |
| 5.5      | COVER .....                                                                                                   | 14        |
| 5.6      | SUMMARY .....                                                                                                 | 14        |
| 5.7      | TABLES .....                                                                                                  | 14        |
| 5.8      | ILLUSTRATIONS .....                                                                                           | 15        |
| 5.9      | ADDITIONAL REFERENCES .....                                                                                   | 15        |
| 5.10     | DOCUMENTARY REFERENCES .....                                                                                  | 15        |
| 5.11     | TERMS AND DEFINITIONS .....                                                                                   | 16        |
| 5.12     | ANNEXES .....                                                                                                 | 16        |
| <b>6</b> | <b>SUPPLY AND PROCESSING OF DOCUMENTS .....</b>                                                               | <b>16</b> |
| 6.1      | FORMS .....                                                                                                   | 16        |
| 6.2      | PROCESSING .....                                                                                              | 17        |

|          |                                                             |           |
|----------|-------------------------------------------------------------|-----------|
| <b>7</b> | <b>APPROVAL, REVIEW AND CANCELLATION OF DOCUMENTS .....</b> | <b>17</b> |
| 7.1      | APPROVAL .....                                              | 17        |
| 7.2      | REVIEW.....                                                 | 18        |
| 7.3      | CANCELLATION .....                                          | 18        |
|          | <b>ADDITIONAL REFERENCES .....</b>                          | <b>19</b> |
|          | <b>DOCUMENTARY REFERENCES .....</b>                         | <b>20</b> |
|          | <b>ANNEXES .....</b>                                        | <b>21</b> |

## 1 OBJECTIVE

This specification sets the requirements for preparation, review and submission of drawings and other technical documents related to engineering services, such as studies, basic engineering, detailed engineering and supply of systems, equipment and materials.

## 2 GENERAL CONDITIONS

Technical documents should be written in Portuguese, Spanish or English. On existing document reviews the original language must be maintained.

The units for the physical quantities must be in accordance with the - International System of Units (SI).

The documents are classified by the characteristics listed below.

### 2.1 CLASSIFICATION

As its contents, each document can be classified as:

- a) drawing,
  - dimensional;
  - plant, cut, view;
  - detail;
  - diagram, scheme;
  - flowchart;
  - list;
  - others;
- b) textual,
  - schedule;
  - descriptive memorial;
  - studies and criteria;
  - memory calculation;
  - catalog;
  - report;
  - instruction manual;
  - specification;
  - others;
- c) spreadsheets,
  - cable list;
  - bill of materials;
  - connection table;
  - others.

### 2.2 DOCUMENT IDENTIFICATION

All technical documents to be supplied to ITAIPU should receive an alphanumeric registration identification to sort your filing. THE CONTRACTOR shall

receive the basic subject codes (1), document type (2) and sequential numbers (3) for that record.

The registration number of the technical documents is composed of five parts:

|     |   |   |   |   |     |   |   |   |     |   |   |   |   |   |     |   |     |   |   |   |
|-----|---|---|---|---|-----|---|---|---|-----|---|---|---|---|---|-----|---|-----|---|---|---|
| 9   | 9 | 9 | 9 | - | X   | X | X | - | X   | X | X | X | X | - | X   | - | X   | X | X | X |
| (1) |   |   |   |   | (2) |   |   |   | (3) |   |   |   |   |   | (4) |   | (5) |   |   |   |

where:

- (1) composed of four numeric characters from 0000 to 9999, which is the subject base referred to the document;
- (2) consisting of two or three characters, numeric or alphanumeric, which provides the document type;
- (3) consists of five characters, numeric or alphanumeric, which provides the sequential numbering for each basic subject and for each document type and identifies the originator of the document entities;
- (4) composed of an alphabetic character that determines the language of the document being referred to as "P" in Portuguese, "E" for Spanish, "I" for English and "O" for Other;
- (5) consisting of up to four alphanumeric characters indicating the document revision number (see 7.2).

## 2.3 DIGITAL IDENTIFICATION

The elaborated technical documents should also be submitted electronically, watching for this, as described below record.

[SUBJECT BASE][DOCUMENT TYPE][USED][LANGUAGE](SHEET)[REVIEW].[EXTENSION]

Documents produced in text editors or spreadsheets, regardless of the total number of sheets that make up these documents and recorded in a single digital file, should adopt the criterion of single sheet document, the code must be identified by the number (1) in field sheet.

Example: formation of digital code: 6160DC16502P(1)R0.DWG

Textual documents comprising multiple files, prepared in different software (word processors, spreadsheets, CAD, photos, etc.), should also be identified by numbering your pages. Where containing unnumbered pages, the identification shall be made by keywords (COVER, INDEX, ANNEX I, PICTURE1, etc.), which allow visually the location of the requested page.

Example: formation of digital code: 38706009001P(COVER)R0.XXX

## 2.4 DRAWING TYPES

The drawings of the studies and basic designs and / or executives should be essentially four types:

a) Informative Drawing (DI)

These documents must be used for an exchange of ideas between the designer and ITAIPU, for the representation of existing elements in the work, for the presentation of studies, alternatives, test results or exploitation, drafts, etc.

Original drawings of the information that will be used in the preparation of construction drawings and specification drawings must be submitted for approval by ITAIPU.

b) Construction Drawing (DC)

Document for the details of the project and should contain all the information necessary to perform the services in accordance with the specifications.

At the end of the project, the construction drawings must be reviewed "as built".

c) Specification Drawing (DE)

The specification drawings should be basic drawing that will determine the essential requirements to be followed by the Proponents in preparing their bids for the supply of equipment, system or building a work.

In order to allow proponents to draw up a satisfactory proposal, specification drawings must be sufficiently detailed.

d) Supplier Drawing (DF)

Document issued by the supplier of materials, equipment, instruments or systems with the information needed for installation / implementation of services according to specifications.

At the end of the project, the supplier drawings must be reviewed "as built".

## 2.5 MEANS FOR IMPLEMENTING

This item sets some rules to perform two-dimensional drawings with CAD application assistance (Computer Aided Design).

Table 1 shows the relationship between the height of the text and the values of the rulers. The source text is to be adopted "Romans" and the emphasis should be via keyboard. The text height should always be the same regardless of the scale of the drawing.

Table 1 - Dimensions of characters

| Height (mm) | Pens Nº color  | Equivalent ruler Nº |
|-------------|----------------|---------------------|
| 1.2         | 02 – “YELLOW”  | 50                  |
| 1.5         | 02 – “YELLOW”  | 60                  |
| 2.0         | 03 – “GREEN”   | 80                  |
| 2.5         | 03 – “GREEN”   | 100                 |
| 3.0         | 04 – “CYAN”    | 120                 |
| 3.5         | 04 – “CYAN”    | 140                 |
| 4.0         | 05 – “BLUE”    | 175                 |
| 4.5         | 05 – “BLUE”    | 200                 |
| 5.0         | 06 – “MAGENTA” | 240                 |

The types of details, dimensions and text must be written in distinct levels of work. After the "Layer 0" and before "Layer 01", the image of each picture must have levels of work required for the representation. The main working levels are suggested in Table 2.

Table 2 - Representation - work levels

| Work Level   | Color   | Representations                                                                                                |
|--------------|---------|----------------------------------------------------------------------------------------------------------------|
| Format       | “White” | Margin, Frame, rectangle with ITAIPU and CONTRACTOR's logo                                                     |
| Electric     | “White” | Diagram, circuit, conductor, insulator, equipment and electrical component                                     |
| Mechanical   | “White” | Structure, pole, tower, frame, duct, pipe, machine and mechanical device                                       |
| Civil        | “White” | Topographic view, building, dam, structure, concrete, masonry, soil                                            |
| Architecture | “White” | Landscaping, interior layout, decoration                                                                       |
| Quotas       | “White” | Line, symbol, numerical value and size unit or elevation quota                                                 |
| Hachures     | “White” | Differentiation between materials or components                                                                |
| Legend       | “White” | Title, date and drawing number. Note general information, key references and plant located near the right bank |
| Text         | “White” | Numbering of the components. Note and table with the figure section view, detail                               |
| Box          | “White” | Intended to contain insertions of the blocks                                                                   |
| Amoebas      | 01      | For marking areas to be reviewed (comments)                                                                    |

Within each level of work for representation, the graphic detail must comply with rules and technical drawing standards. Each width of the lines must have a "Layer" duly marked with number and color, as shown in Table 3.

Table 3 - "LAYER" for presentation

| Configuring Pens / Position in the Plotter (mm) |         |            |           |          |          |             |       |       |        |
|-------------------------------------------------|---------|------------|-----------|----------|----------|-------------|-------|-------|--------|
| (PENS)                                          | 01      | 02         | 03        | 04       | 05       | 06          | 08    | 09    | 10     |
|                                                 | COR-RED | COR-YELLOW | COR-GREEN | COR-CYAN | COR-BLUE | COR-MAGENTA | COR-B | COR-9 | COR-10 |
| (PLOTTER)                                       | .15     | .20        | .25       | .35      | .50      | .65         | .80   | .90   | 1.0    |

## 2.6 FORMAT AND PRESENTATION

Documents destined to ITAIPU should follow the A series formats defined in ABNT NBR 10068 and must comply with the following standards listed:

- a) drawings in general: in A4 or larger formats, as shown in Table 4;
  - b) lists in general: in A4 or A3 formats;
  - c) schedule: A3 or A4 format or as specific software;
  - d) memory calculation, specifications, reports, instruction manual in A4 format;
  - e) accessories catalog, component drawings, standard details and the usual documents of the CONTRACTOR can be presented in the original pattern.
- These documents should receive a cover page according to Annex C model.

ITAIPU can provide images containing models of formats for submission of drawings and technical documents.

Table 4 - Dimensions of the sheets for drawings

| Type     | Format A Series | Dimensions of the sheet | Margin left | Others margins |
|----------|-----------------|-------------------------|-------------|----------------|
| Normal   | A4              | 210 x 297               | 25          | 7              |
| Normal   | A3              | 297 x 420               | 25          | 7              |
| Normal   | A2              | 420 x 594               | 25          | 7              |
| Normal   | A1              | 594 x 841               | 25          | 10             |
| Enlarged | A1 + 25%        | 594 x 1,050             | 25          | 10             |
| Normal   | A0              | 841 x 1189              | 25          | 10             |

## 2.7 LEGEND BOX

All technical documents must contain a box for the legend, containing all the information necessary for its accurate identification and interpretation. The formats and the legend arrangement shall be as specified below:

- a) Designers: the legend boxes to A4 size and larger are provided in Annex A and the A3 and larger, in Annex B;
- b) Manufacturers: the legend boxes for A4 size are listed in Annex C and D and for A3 size and larger in Annex E.

## 2.8 VERTICAL SPACE ABOVE THE LEGEND BOX

The vertical space above the legend box to A3 size and larger must be used in accordance with Annex K, to just:

- a) key plant view;
- b) symbols;
- c) notes;
- d) reference drawings;
- e) reference to lists of materials, irons and cables;
- f) graph scale (when it goes for all the drawing).

When the details involve more than one sheet, only the first of the series (sheet 1 of n sheets) has this reserved space. In the other sheets the mentioned space can be used for detailing and should be free a small area above the stamp to graphic scale indication and the following note:

"Note: For notes and references, see drawing No. .... "

In typical or standardized drawings there is no need of key plant view, since the location will be given in the general arrangement drawings, mold, etc ..., therefore, the vertical space above the legend box may be used for details.

## 3 REQUIREMENTS FOR PREPARATION OF CIVIL PROJECT DRAWINGS

In all civil drawings, except for armature drawings, all measures should be given in meters. The measures should have two decimal places, where a normal accuracy is sufficient, and three decimal places if high accuracy is required.

The scales to be used in civil drawings shall be chosen according to the picture to be represented, taking into view the drawing clarity, taking into account that the drawings A1 size can undergo reductions in their size, of 50%. The civil drawings are subdivided in the following mentioned specialities.

### 3.1 GENERAL ARRANGEMENT OF DRAWINGS

In general drawings all those drawings that present various components together or design features of elements of the same type to form a whole should be included. They can also be classified as general drawings those one that enclosed treatments and construction principles that apply equally to any structure of the work, even though they are designed specifically for each structure.

### 3.2 MOLD DRAWINGS

The drawings of concrete details (mold drawings) must contain all necessary information for the preparation of molds and for the implementation of concrete, including:

- a) concrete type specified;
- b) reference to built-in parts;
- c) 1°, 2°, 3° stages of concrete piling;
- d) joints location;
- e) required chamfers in the concrete edges.

Optionally, the types of finish required on the various surfaces of the concrete shall be indicated. This indication however, is mandatory in architectural drawings (see 3.6).

When the molds' detail to be drawn is small, in exceptional cases, it can be made in the same design, molds and reinforcement. In this case, the design must have the corresponding number to the molds.

In the mold drawings should be inserted special notes, warning all the restrictions that must be followed during construction, or before, the placement in load of structure.

In the drawings molds, the reference drawings should be deployed in drawings for consulting, complementary drawings and built-in drawings:

- a) in the first part, drawings for consultation must be related to those drawings that, at the discretion of the designer, may be of interest but are not absolutely necessary to launch the layers object of the drawing in question. For example, general arrangement drawing or drawings of adjacent layers;
- b) in the second part, additional drawings must be necessarily related to all drawings necessary for the correct construction according to the conceptual structure of the project, as
  - auxiliary molds;
  - armature;
  - pre molded;
- c) in the third part, built-in drawings, must be related all tubes drawings, conduits, equipment, grounding grid, instruments and other ancillary parts embedded in concrete that have not already been illustrated in the molds drawings.

If there are no drawings related to one or more items listed above, it should be noted next to the item the words "Not applicable".

### 3.3 ARMATURE DRAWINGS

The armature drawings must include all information necessary for the proper execution and positioning of the armor at the 1: 100 or 1:50 and, if necessary, details on a larger scale.

You can use the system of "standardized bar", available to the CONTRACTOR in ITAIPU files, in which each different type of bar (different diameter bars or different folding) has its scaled indicated out of the drawing, in irons list (LF).

Armature drawings can be presented by applications (structural calculation software) provided that the following exceptions are met:

- a) the application must be consistent with AutoCAD;
- b) the format of the drawings and legend box must meet the standards set in these specifications;
- c) irons list can be incorporated into the design or issued separately.

Except for the bars' diameter, which should be set nominally in millimeters, all dimensions must be in centimeters and the dimensions of the elevations in meters.

The drawings must perfectly show the positions of the bars, their folds, partial and unit lengths. The reductions by radius of curvature for bending and hooks should be considered. The bars located in different points of the structure should be numbered with different positions, even if they have the same dimensions, diameters or shapes.

In the representation of the structures must portray the several layers of concrete with their respective numbering and elevations.

For each set of armor drawings related to the same subject or the same part of the project should be prepared only one list of irons.

The lists of irons must be filled with all the data for each type of bar, namely, position, quantity, diameter, unit lengths and totals, in addition to the steel types in the project (CA25, CA50, CA60, etc.). At the end of the list, the total weight should be indicated.

The cover sheet of list of irons issued separately must have their fields completed as subtitles of the reference drawings, and related to the first drawing of the series of all drawings whose armor is represented in this list of irons. The list of irons must be elaborated in A4 format and be according to the model in the Annexes F and I.

Normally each type of steel will have minimal adherence specified according to ABNT NBR 7480. Adherence indication in the drawings and lists of iron should only be necessary in special cases where steels are applied with adherence above the minimum.

### 3.4 CIVIL INSTRUMENTATION DRAWINGS AND STEEL STRUCTURES

The instrumentation's drawings embedded metal parts or metal structures should be accompanied by their respective list of material, specifying in detail all the

elements, and shall inform details of finishing and coating, paint, among others.

### 3.5 BUILT-IN DRAWINGS

In the drawings of built-in pipes and conduits must keep a careful separation of the parts to be embedded in concrete of those completely exposed, with indication and specification in separate drawings. The titles of these drawings should refer to the comprehensive range of involved elevations and not only to the most representative elevation.

### 3.6 ARCHITECTURAL DRAWINGS

The drawings of architectural treatment should contain all plants, sections and elevations necessary to enable the full representation and indication of all materials and architectural details. Must be accompanied by their respective list of material.

They are part of the architectural treatment: doors, gates, windows, fences, railings, polished floors, floor coverings, walls, ceilings or linings, paintings and other elements which by their nature influence the aesthetic aspect of the work.

## 4 REQUIREMENTS FOR PREPARATION OF DOCUMENTS FOR ELECTRICAL/ELECTRONIC/ELECTROMECHANICAL PROJECT

### 4.1 INTERCONNECTION DIAGRAMS OF ELECTRICAL EQUIPMENT

The interconnection diagrams must be drawn up in A1 format and be as shown in Annex J. Alternatively, connection tables can be accepted, which must follow the criteria of the diagrams.

Each diagram should contain the terminal blocks of an equipment or group of related equipment represented by its terminal panel. If there is no representative terminal panel of the equipment, as power take-offs, engines etc., the equipment must be represented symbolically, but with the identification of its terminals.

The terminal blocks of tables and panels should preferably be represented in a single drawing, if not possible, due to the large amount of information, may be developed so many designs as you want.

In the interconnection diagrams should be included as reference the schematics diagrams (functional), the list of cables and internal wiring drawings of the corresponding manufacturer.

Below we list the main components that should be part of the interconnection diagrams:

- a) terminal blocks: all terminals blocks should be shown including those that are not being used. Terminal blocks should have the same identification shown by the equipment manufacturer's documents and whenever possible, the relative physical position must be obeyed;
- b) addressing lines: aims to provide fast cable addressing view. These lines

should provide the following information,

- Cable nº as the cable list;
- Number of interconnection drawing in which is the other end (in simplified form);
- Equipment acronym that lays the other end;

- c) cables: all conductors of each cable must be represented including the reserve conductors, avoiding the most of intersecting lines. The cables must be identified according to established coding in document 2711-10-0001-P. The *jumpers* necessary and interconnection cables must be shown, where possible, on the same side of the terminal blocks, as opposed to the internal wiring of the equipment.

## 4.2 LOGIC DIAGRAMS

The logic diagrams can be supplied from the tools of *software* manufacturer, since the document format is approved in advance by ITAIPU.

## 4.3 LIST OF POINTS

The structure and content of these documents are defined by ITAIPU for each project.

## 4.4 LIST OF CABLES (LC)

Each table must match a list of cables taking care not to repeat the information, except the cable number, in the two cable lists of equipment's end. In this case, one of the lists should make cross reference to the other, next to each cable with information already covered by this other list. The definition of sequential numbering range of the conductors will be provided by ITAIPU.

The cable list should be drawn up in A4 format and conform to the model in Annexes F and G.

## 4.5 LIST OF MATERIALS (LM)

For each drawing or set of drawings relating to a particular part of the project should be prepared, when necessary, a single list of materials.

The list of materials to be prepared in A4 format and conforms to the model example of Annexes F and H.

In the physical arrangement or of installation drawing, each item will be indicated by a number in a circle. These numbers will be the same of those indicated in the list of corresponding materials. In each list the numbers should be consecutive and start with 1 (one).

## 4.6 OTHER DOCUMENTS

Other engineering documents for imaging systems such as line diagrams, trifilar diagrams, functional diagrams and construction must comply with the instructions included in item 2 of this specification.

## 5 REQUIREMENTS FOR PRESENTATION OF TECHNICAL TEXTUAL DOCUMENTS

The technical textual document as calculation memory type, specifications, reports, manuals, etc. must be prepared according to the guidelines contained herein.

### 5.1 FORMAT AND TYPING

The paper size and typing of the document must comply with the following:

- a) format: A4 (297 mm x 210 mm);
- b) standard font: Arial;
- c) size: 12;
- d) style: normal.

### 5.2 MARGINS AND SPACES

The margins for the document must be:

- a) upper: 2.0 cm;
- b) lower: 2.0 cm;
- c) left: 2.5 cm;
- d) right: 2.0 cm.

The spaces to be used in the document are:

- a) tab: text input with 1.5 cm for all sections;
- b) space between lines: simple;
- c) space between paragraphs: simple;
- d) space between the section title and the beginning of the text: a blank line;
- e) space between sections: two lines in blank;
- f) alignment: justified.

### 5.3 DOCUMENT SECTIONS

The chapters of the document are called primary sections and can be divided into subsections. Must adopt progressive numbering with Arabic numerals. All sections should be aligned to the left.

The section titles should present a highlight in the document body, as follows:

|                         |           |                                     |
|-------------------------|-----------|-------------------------------------|
| a) primary sections     | 1         | <b>CAPITAL AND BOLD</b>             |
| b) secondary sections:  | 1.1       | <b>CAPITAL ONLY</b>                 |
| c) tertiary sections:   | 1.1.1     | <b>Initial Capitals and Bold</b>    |
| d) quaternary sections: | 1.1.1.1   | Initial Capitals and Normal         |
| e) quinary sections:    | 1.1.1.1.1 | <i>Initial Capitals and Italics</i> |

Each section can be divided into paragraphs sorted alphabetically by lowercase letters followed by parentheses. Depending upon the need, the points can be divided into sub-paragraphs. The subparagraph is indicated by a hyphen.

#### 5.4 PAGING, HEADING AND FOOTING

The document must have its pages numbered sequentially in Arabic numerals, from the first page of the text portion. The page number should be informed to the right footer with standard font and size 8, containing the number of the current page and the total number of pages of the document. The cover of the document is not counted and the previous pages to the text are counted, but are not numbered.

The document title should be informed in the heading in capital letters aligned to the right, default font and size 8 in all sheets that have paging. It should contain a horizontal bottom line with full trace.

The document number of ITAIPU, including the revision number, must be informed at the footer aligned left default font and size 8 in all sheets that have paging. It should contain a horizontal bottom line with full trace.

#### 5.5 COVER

The cover to be applied to textual technical documents must follow the guidelines in Annex L.

#### 5.6 SUMMARY

The summary is intended to provide an overview of the document and facilitate the location of affairs. The summary shall present all primary sections to the quinary sections, and must contain numeric indicative aligned to left with the section's titles aligned by the margin of the longer indicative title, and the algorism related to the page, separated by a dotted line

#### 5.7 TABLES

Tables should appear as close as possible to the text where it was first mentioned. The tables should be numbered consecutively with Arabic numerals following the word "Table", followed by a hyphen and title written with initial capital, initial centralized, single-spaced, default font, size 10 and at the top of the table.

The table must be made with double line edge style in the external border and header and single line inside, centered on the page.

Headings should be centered both horizontally and vertically. The table's contents can be centered, left justified, right justified or, as situations exemplified below. You can choose font sizes 10 to 12, since that is unique to the table as a whole.

Table 5 – Table example - Material consumption

| Material | Quantity  | Unit           |
|----------|-----------|----------------|
| Steel    | x.xxx     | t              |
| Cement   | y.yyy.yyy | kg             |
| Sand     | zzz       | m <sup>3</sup> |

## 5.8 ILLUSTRATIONS

For any type of illustration, its identification should be by designative word (pictures, charts, drawings, graphic, flow chart, photography, etc.). The illustration must be cited in the text and inserted as close as possible to the text to which it refers. It should follow the same orientation of numbering and formatting mentioned for the tables (see 5.7).

Example:                      Picture 1- Plant of sector "x"  
                                       Chart 1- Division of stages of the project

## 5.9 ADDITIONAL REFERENCES

Technical documents actually mentioned in the textual document and that establish valid rules and are essential for the perfect understanding of the document in preparation, should be part of a single list at the end of the document.

References should be aligned, only to the left margin, including the second line on, in order to individually identify each document. Should be typed single spaced and separated by a blank line.

The basic elements to be referenced are: author (s) or institution, title (caption, if any) in bold, edition, publisher and year of publication. For further guidance, follow NBR 6023.

For technical documents with numbering of ITAIPU, should be mentioned the document number, revision and the title in bold. For dated references (with review of indication), apply only the edition cited. For undated references (no review of indication), apply the most recent editions of the documents (including amendments).

Documents cited in this item should not be part of the 5.12 Annexes item.

## 5.10 DOCUMENTARY REFERENCES

It is an optional element of the textual document. In case you need to reference other documents, standards, books and publications used by the author, but were not cited directly in the text, but that you want to list as a reference or indication for consultation, should draw up a list of such documents in sequence to additional

references. These references must follow the format requirements as indicated in item 5.9.

### 5.11 TERMS AND DEFINITIONS

It is an optional element of the textual document. The words or technical terms of use restricted to the text of the subject and unusual or unknown, can be part of a list in alphabetical order of these words with their meanings or definitions. Must be located in own paged sheet, after the references and before the attachments, if any.

### 5.12 ANNEXES

It is a post-text element and an optional textual document. The notes must be incorporated into the content of the textual document and follow the progressive document pagination. The identification of the attachment must be in capital letters, followed by a hyphen, and title with initial capital letters and lowercase letters. If necessary, you can do the sequential ID to other elements of the same Annex including Arabic numerals after the indicative letter.

Example:                      ANNEX A – Title  
                                    ANNEX A1 – Title  
                                    ANNEX B – Title

## 6 SUPPLY AND PROCESSING OF DOCUMENTS

The Technical Specification lists the documents that must be provided by the CONTRACTOR. All documents submitted become the property of ITAIPU, and the same may be reproduced and distributed internally. After the warranty period for the product, these documents can be reviewed and modified under the responsibility of ITAIPU.

### 6.1 FORMS

The documents must be provided in the following terms and as indicated in Table 6:

- a) opaque sheet: the original documents must be provided in opaque white paper. These documents must be signed in blue ink by the heads of the CONTRACTOR;
- b) file electronically: the digital files of the documents must be provided in any electronic storage device can also be sent by e-mail, FTP (*File Transfer Protocol*) or through document management *software*. Files can be compressed for further extracting auto decompression. Drawings, lists and other scanned documents must be provided in PDF format with a resolution

of 300 dpi for black and white image to 200 dpi for color image. Each contract may stipulate the most appropriate means to send files.

The number of copies of documentation to be provided is defined in Table 6, which is for guidance. The Technical Specification can set different amounts.

Table 6 - Documents supply

| Document                                                                            | Supply                             | Quantity                      |
|-------------------------------------------------------------------------------------|------------------------------------|-------------------------------|
| Drawings in general<br>Lists in general<br>Instruction manual<br>Calculation memory | Digital file<br>White opaque sheet | 01<br>01 original             |
| Schedule<br>Specifications<br>PIT Plan                                              | Digital file<br>White opaque sheet | 01<br>01 original + 02 copies |

## 6.2 PROCESSING

The documents should deal between the CONTRACTOR and ITAIPU in terms and conditions set forth in the Technical Specification, the Contract or Purchase Order. The procedure may vary with the objectives of providing each document.

The CONTRACTOR shall deliver the original, copies and digital files together with a form type document delivery note, containing at least the following information:

- number and date of the delivery note;
- number of the Contract or Purchase Order;
- number, description and document review;
- purpose of the issue;
- number of copies.

## 7 APPROVAL, REVIEW AND CANCELLATION OF DOCUMENTS

### 7.1 APPROVAL

The documents must contain key information to allow the assessment of the product. After ITAIPU analysis, each document should receive one of the following opinions, by applying a stamp (14 x 7 cm) as Annexes C and E:

- approved: means the agreement with the document. The approval of ITAIPU does not relieve the CONTRACTOR of full responsibility for the content featured in the document;
- approved with comment: means ITAIPU accepted in part the content presented in the document, but corrections or modifications must still be made, or additional information must be provided. The partial approval of the document allows the CONTRACTOR further development of services or begin production except those discussed details;
- not approved: means ITAIPU does not agree with the document content,

and it should be completely modified or replaced;

- d) information: means ITAIPU considers the content of the document consists of catalog materials or standard components and does not require any degree of approval. These documents should serve to further consultation techniques. ITAIPU can order new documents if the information is deemed insufficient. All informative documents must have their registered number for filing to ITAIPU.

## 7.2 REVIEW

Revision is the set of changes made to a drawing or technical document already approved by ITAIPU. The review of content should be described briefly in the space provided for this purpose in the legend box, adding an indication affected by the review using the system of coordinates in the existing margin of the drawings, especially when revisions are small.

For drawings, the part should be reviewed surrounded by an irregular line, "cloud" or "amoeba" type, highlighting only the latest revision. The corresponding contours to previous reviews should be removed. The revision number is indicated in the legend box to the right of the drawing number.

The reviews should be presented in the fifth part of the alphanumeric code of the document (see 2.2), indicated by the letter "R" followed by the indication of the revision number, and should also contain an indicative letter of document issuance (example: XXXX-XXX-XXXXX-X-R1A). For the initial issue of the document always use "R0A" to indicate that the document is in situation analysis for approval.

Upon approval of the document by ITAIPU, the indicative letter of the issue must be eliminated, keeping only "R0". If the document is not approved or receive approval with comments (see 7.1), you should keep the letter. In this case, the contractor must meet the correction comments proposed by ITAIPU and forward the document at the top issue, "R0B" for a new analysis.

For the approval of the review "R1", for example, the procedure is the same way, with the document in issue "R1A" for further review and approval of ITAIPU to become "R1".

## 7.3 CANCELLATION

The cancellation of a drawing can be done only when it has been approved and issued by ITAIPU. If a drawing had never been approved and its issuance is no longer required, it will be simply canceled.

## **ADDITIONAL REFERENCES**

The following referenced documents are cited in the text of this specification. In case of divergence, it prevails the requirements set out in the Specifications, Contract or Purchase Order.

**BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. NBR6023: Information and documentation - references - preparation.**

**BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. NBR 7480: Steel for the armors for reinforced concrete structures - specification.**

**BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. NBR 10068: drawing sheet - layout and dimensions - standardization.**

**2711-10-0001-P: coding criteria for conductors and electric cable of the plant and priority area.**

## DOCUMENTARY REFERENCES

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 6492: representation of architectural projects.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 8196: technical drawing - Scales deployment.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 8402: technical drawing character execution - procedure.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 8403: application in drawings - types of lines - widths of the lines - Procedure.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 8404: indication of the state of surfaces in technical drawings - procedure.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 8993: conventional representation of threaded parts in technical drawings - procedure.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 10067: General principles of representation in technical drawings - procedure.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 10126: dimensioning in technical drawings.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 10582: sheet presentation for technical drawing - procedure.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 12298: representation of sectional area through hatching in technical drawing - procedure.**

BRAZILIAN ASSOCIATION OF TECHNICAL STANDARDS. **NBR 13142: technical drawing - copy folding.**

## ANNEX A – A4 format model for Designer use

|    |           |     |      |     |      |                                                                                                                          |  |
|----|-----------|-----|------|-----|------|--------------------------------------------------------------------------------------------------------------------------|--|
|    |           |     |      |     |      | SPACE RESERVED FOR THE N° OF THE DESIGNER                                                                                |  |
|    |           |     |      |     |      |                                                                                                                          |  |
|    |           |     |      |     |      | PROJ. _____ VERIF. _____ APROV. _____<br>DES. _____ VISTO _____ DATA _____                                               |  |
|    |           |     |      |     |      | SPACE RESERVED FOR THE LOGO OF THE DESIGNER                                                                              |  |
|    |           |     |      |     |      | BRASIL  PARAGUAI<br>ITAPU INSTITUTO |  |
|    |           |     |      |     |      |                                                                                                                          |  |
| Nº | DESCRIÇÃO | ASS | DATA | ASS | DATA | ITAPU BRASILEIRO VISTO _____<br>APROV. _____ DATA _____                                                                  |  |
|    | REVISÕES  |     |      |     |      |                                                                                                                          |  |
|    |           |     |      |     |      | DRAWING N° R                                                                                                             |  |
|    |           |     |      |     |      |                                                                                                                          |  |

| 13                                                                                                                                             | 14                        | 15                                               | 16            |
|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------------------------|---------------|
|                                                                                                                                                |                           | <b>SPACE RESERVED FOR THE N° OF THE DESIGNER</b> |               |
|                                                                                                                                                |                           |                                                  |               |
|                                                                                                                                                |                           | L<br>K                                           |               |
|                                                                                                                                                |                           |                                                  |               |
| D                                                                                                                                              |                           |                                                  |               |
|                                                                                                                                                |                           |                                                  |               |
| C                                                                                                                                              |                           |                                                  |               |
| Nº                                                                                                                                             | DESCRIÇÃO                 | ASSINATURA                                       | DATA          |
| <b>REVISÕES</b>                                                                                                                                |                           | <b>PROJETISTA</b>                                | <b>ITAIPU</b> |
| PROJ. _____                                                                                                                                    | VERIF. _____              | APROV. _____                                     |               |
| DES. _____                                                                                                                                     | VISTO _____               | DATA _____                                       |               |
| <b>SPACE RESERVED FOR THE LOGO OF THE DESIGNER</b>                                                                                             |                           |                                                  |               |
|  <b style="color: green;">ITAIPU</b> PARAGUAÍ<br>BINACIONAL |                           |                                                  |               |
|                                                                                                                                                |                           |                                                  |               |
| B<br>A                                                                                                                                         |                           |                                                  |               |
| ITAIPU BINACIONAL                                                                                                                              |                           | DRAWING Nº _____                                 |               |
| Aprov. _____                                                                                                                                   | Visto _____<br>Data _____ | R _____                                          |               |
| 13                                                                                                                                             | 14                        | 15                                               | 16            |

## ANNEX C – Cover sheet model for A4 format for Contractor use

|            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| FOLHA Nº   | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| REVISÃO Nº |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| FOLHA Nº   | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| REVISÃO Nº |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

|                                                                                                                                                   |                         |                           |             |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------------|-------------|
| APROVADO                                                                                                                                          | APROVADO<br>C/CORREÇÕES | NÃO APROVADO              | INFORMATIVO |
| VERIFICAÇÃO                                                                                                                                       |                         | APROVAÇÃO                 |             |
| _____/_____/_____<br>DATA                                                                                                                         |                         | _____/_____/_____<br>DATA |             |
| <p>A APROVAÇÃO DESTE DESENHO NÃO ISENTA<br/>O FABRICANTE DA SUA COMPLETA<br/>RESPONSABILIDADE PELO CUMPRIMENTO DAS<br/>OBRIGAÇÕES CONTRATUAIS</p> |                         |                           |             |
| DRAWING Nº                                                                                                                                        |                         | FL.                       | R           |

3cm

|    |           |            |      |
|----|-----------|------------|------|
| Nº | DESCRIÇÃO | ASSINATURA | DATA |
|    |           |            |      |
|    |           |            |      |
|    |           |            |      |

|                   |             |             |  |
|-------------------|-------------|-------------|--|
| REVISÕES          |             |             |  |
| CONTRATO Nº/OC Nº | PROJ. _____ | VISTO _____ |  |
|                   | DES. _____  | APROV _____ |  |
|                   | VERIF _____ | DATA _____  |  |

SPACE RESERVED FOR THE LOGO OF THE CONTRACTOR

|            |                                                                                     |        |          |
|------------|-------------------------------------------------------------------------------------|--------|----------|
| BRASIL     |  | ITAIPU | PARAGUAI |
| BINACIONAL |                                                                                     |        |          |

|                  |            |     |   |
|------------------|------------|-----|---|
| Nº OF CONTRACTOR | DRAWING Nº | FL. | R |
|------------------|------------|-----|---|

|                  |  |            |       |
|------------------|--|------------|-------|
|                  |  |            |       |
| N° OF CONTRACTOR |  | DRAWING N° | FL. R |

## ANNEX E – A3 format model and larger for Contractor use

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------|-------------------------|---------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------|--|--|--|------------|-----------|------------|------|----------|--|--|--|-------------------|--|-------------|-------------|--|--|------------|-------------|--|--|--------------|------------|-----------------------------------------------|--|--|--|--------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|------------------|--|------------|-------|---|
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14                      | 15                                                                                                                                                                                                                | 16          |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; text-align: center;">APROVADO<br/>VERIFICAÇÃO</td> <td style="width: 25%; text-align: center;">APROVADO<br/>C/CORREÇÕES</td> <td style="width: 25%; text-align: center;">NÃO APROVADO<br/>APROVAÇÃO</td> <td style="width: 25%; text-align: center;">INFORMATIVO</td> </tr> <tr> <td colspan="2" style="text-align: center;"> <div style="border-top: 1px solid black; width: 100%;"></div> <div style="border-top: 1px solid black; width: 100%;"></div> <div style="border-top: 1px solid black; width: 100%; text-align: center;">DATA</div> </td> <td colspan="2" style="text-align: center;"> <div style="border-top: 1px solid black; width: 100%;"></div> <div style="border-top: 1px solid black; width: 100%;"></div> <div style="border-top: 1px solid black; width: 100%; text-align: center;">DATA</div> </td> </tr> <tr> <td colspan="4" style="text-align: center;"> A APROVAÇÃO DESTE DESENHO NÃO ISENTA<br/>O FABRICANTE DA SUA COMPLETA<br/>RESPONSABILIDADE PELO CUMPRIMENTO DAS<br/>OBRIGAÇÕES CONTRATUAIS </td> </tr> <tr> <td colspan="2" style="text-align: center;">DRAWING N°</td> <td style="text-align: center;">FL.</td> <td style="text-align: center;">R</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                                                                                                                                                                                                                   |             | APROVADO<br>VERIFICAÇÃO | APROVADO<br>C/CORREÇÕES | NÃO APROVADO<br>APROVAÇÃO | INFORMATIVO | <div style="border-top: 1px solid black; width: 100%;"></div> <div style="border-top: 1px solid black; width: 100%;"></div> <div style="border-top: 1px solid black; width: 100%; text-align: center;">DATA</div> |  | <div style="border-top: 1px solid black; width: 100%;"></div> <div style="border-top: 1px solid black; width: 100%;"></div> <div style="border-top: 1px solid black; width: 100%; text-align: center;">DATA</div> |  | A APROVAÇÃO DESTE DESENHO NÃO ISENTA<br>O FABRICANTE DA SUA COMPLETA<br>RESPONSABILIDADE PELO CUMPRIMENTO DAS<br>OBRIGAÇÕES CONTRATUAIS |  |  |  | DRAWING N° |           | FL.        | R    | L        |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| APROVADO<br>VERIFICAÇÃO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | APROVADO<br>C/CORREÇÕES | NÃO APROVADO<br>APROVAÇÃO                                                                                                                                                                                         | INFORMATIVO |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
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| A APROVAÇÃO DESTE DESENHO NÃO ISENTA<br>O FABRICANTE DA SUA COMPLETA<br>RESPONSABILIDADE PELO CUMPRIMENTO DAS<br>OBRIGAÇÕES CONTRATUAIS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| DRAWING N°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                         | FL.                                                                                                                                                                                                               | R           |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |                                                                                                                                                                                                                   |             | K                       |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| <div style="border: 1px solid black; width: 100%; height: 100%; position: relative;"> <div style="position: absolute; top: 0; left: 0; right: 0; bottom: 0; text-align: center; vertical-align: middle;"> 3cm </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"></td> <td style="width: 65%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td style="width: 5%;"></td> <td style="width: 65%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td style="width: 5%;"></td> <td style="width: 65%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td style="width: 5%; text-align: center;">N°</td> <td style="width: 65%; text-align: center;">DESCRIÇÃO</td> <td style="width: 15%; text-align: center;">ASSINATURA</td> <td style="width: 15%; text-align: center;">DATA</td> </tr> <tr> <td colspan="4" style="text-align: center;">REVISÕES</td> </tr> <tr> <td colspan="2" style="text-align: center;">CONTRATO N°/OC N°</td> <td style="text-align: center;">PROJ. _____</td> <td style="text-align: center;">VISTO _____</td> </tr> <tr> <td colspan="2" style="text-align: center;"></td> <td style="text-align: center;">DES. _____</td> <td style="text-align: center;">APROV _____</td> </tr> <tr> <td colspan="2" style="text-align: center;"></td> <td style="text-align: center;">VERIF. _____</td> <td style="text-align: center;">DATA _____</td> </tr> <tr> <td colspan="4" style="text-align: center;">SPACE RESERVED FOR THE LOGO OF THE CONTRACTOR</td> </tr> <tr> <td colspan="4" style="text-align: center;"> BRASIL  ITAIPU PARAGUAI<br/>BINACIONAL </td> </tr> <tr> <td colspan="4" style="height: 100px;"></td> </tr> <tr> <td colspan="2" style="text-align: center;">N° OF CONTRACTOR</td> <td style="text-align: center;">DRAWING N°</td> <td style="text-align: center;">FL. R</td> </tr> </table> |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  | N°         | DESCRIÇÃO | ASSINATURA | DATA | REVISÕES |  |  |  | CONTRATO N°/OC N° |  | PROJ. _____ | VISTO _____ |  |  | DES. _____ | APROV _____ |  |  | VERIF. _____ | DATA _____ | SPACE RESERVED FOR THE LOGO OF THE CONTRACTOR |  |  |  | BRASIL  ITAIPU PARAGUAI<br>BINACIONAL |  |  |  |  |  |  |  | N° OF CONTRACTOR |  | DRAWING N° | FL. R | C |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| N°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | DESCRIÇÃO               | ASSINATURA                                                                                                                                                                                                        | DATA        |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| REVISÕES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| CONTRATO N°/OC N°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         | PROJ. _____                                                                                                                                                                                                       | VISTO _____ |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         | DES. _____                                                                                                                                                                                                        | APROV _____ |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         | VERIF. _____                                                                                                                                                                                                      | DATA _____  |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| SPACE RESERVED FOR THE LOGO OF THE CONTRACTOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| BRASIL  ITAIPU PARAGUAI<br>BINACIONAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |                                                                                                                                                                                                                   |             |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| N° OF CONTRACTOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                         | DRAWING N°                                                                                                                                                                                                        | FL. R       |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |                                                                                                                                                                                                                   |             | B                       |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |                                                                                                                                                                                                                   |             | A                       |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14                      | 15                                                                                                                                                                                                                | 16          |                         |                         |                           |             |                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                   |  |                                                                                                                                         |  |  |  |            |           |            |      |          |  |  |  |                   |  |             |             |  |  |            |             |  |  |              |            |                                               |  |  |  |                                                                                                                          |  |  |  |  |  |  |  |                  |  |            |       |   |

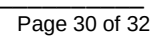
[illegible]

[illegible]

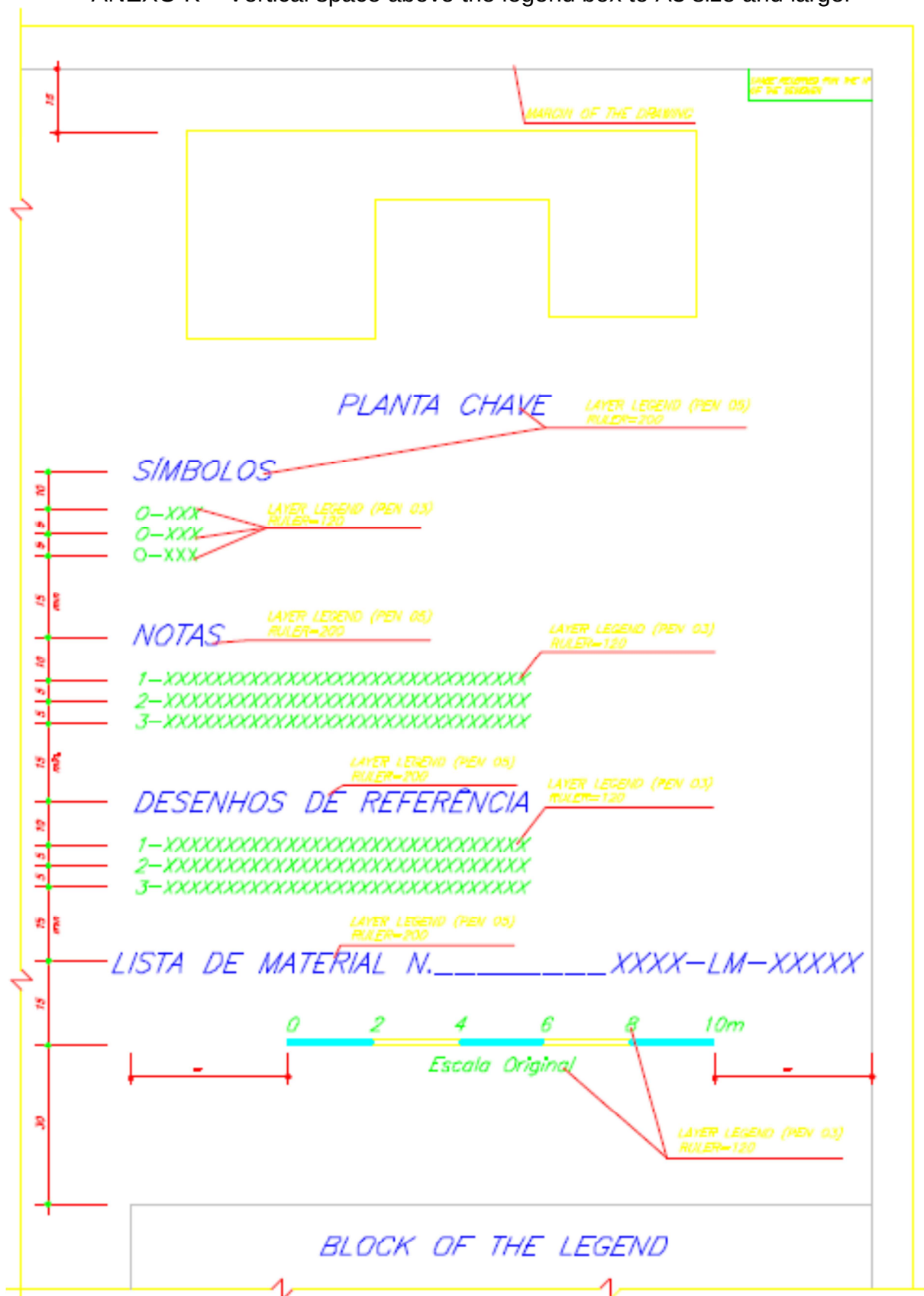
## ANNEX H – Material list model

| ITEM | QUANT. | UNID. | DESCRIÇÃO | LMUC OU<br>ESPECIF. N.º | O.C.N.º | SPACE RESERVED FOR THE LOGO OF<br>THE DESIGNER | BRASIL | ITAIPU<br>BINACIONAL | LISTA DE<br>MATERIAL | N.º ITAPU | FOLHA | REVISÃO |
|------|--------|-------|-----------|-------------------------|---------|------------------------------------------------|--------|----------------------|----------------------|-----------|-------|---------|
|      |        |       |           |                         |         |                                                |        |                      |                      |           |       |         |

[illegible]



## ANEXO K – Vertical space above the legend box to A3 size and larger



Page 32 of 32