Schedule 18

Appendix 18C - Drafting Requirements

SECTION A. DEFINITIONS

A.1 Definitions

A.1.1 Capitalized terms used in this Appendix 18C have the meanings given in Schedule 18 – Technical Requirements or the Design Build Agreement.

SECTION B. GENERAL REQUIREMENTS

B.1 Standards Documentation

B.1.1 All drawings and models shall comply with this Appendix 18C and all requirements as noted in Appendix 18D– City Standards.

B.1.2 Exceptions to the documents listed in Section B.1.1 are presented in Table 1.

Table 1: Standard Documentation Exceptions

Document	Section	Exception
WSTP Architectural Design Guideline	5.2	The format for 3D representations within the drawing set shall follow Section E.12.
WSTP Structural Design Guideline	5.2	
WSTP Building Mechanical Design Guideline	6.2.11.4	
WWD Electrical Design Guide	18.2	

B.1.3 Applicable drawings shall comply with the WWD Computer Assisted Drafting (CAD)-Geographic Information System (GIS) Standards in https://winnipeg.ca/waterandwaste/dept/cad_gis.stm

B.1.4 Design Builder shall provide a BIM Execution Plan demonstrating their understanding of the drafting requirements and standards documentation.

SECTION C. DRAWING SET

C.1 General Requirements

C.1.1 Design Builder shall provide a complete set of drawings as outlined in Schedule 18 – Technical Requirements and Schedule 18 – Technical Requirements – Appendix 18N – Design Report Requirements. The drawing set shall be sorted by Area Code, then by discipline.

C.1.2 Design Builder shall provide as part of each drawing submission, a complete index of drawings in Microsoft Excel (XLS) format. The index shall have filters enabled to facilitate retrieval of information and shall include the following:

(a) Area Code;

(b) process code;

(c) discipline;

(d) drawing title; and

(e) drawing number.

C.1.3 Design Builder shall provide a comprehensive set of legends and lists of abbreviations applicable to each discipline for each drawing submission.

C.2 Drawing Numbering

C.2.1 Drawing numbering shall be in accordance with the *WSTP Project Document Numbering Standard* in Appendix 18D – City Standards.

C.2.2 Drawing numbers shall be assigned to eliminate gaps and holes in the drawing numbering sequences. Sequence numbers, as defined in the *WSTP Project Document Numbering Standard* in Appendix 18D – City Standards, shall be the lowest possible available number unless otherwise directed by the City.

C.2.3 To prevent duplication of existing drawing numbers, Design Builder shall initially contact the City Representative to request the drawing starting number for each Area Code and discipline.

C.2.4 Design Builder shall arrange a meeting with the City Representative to facilitate efficient use of the *WSTP Project Document Numbering Standard*.

C.2.5 Prior to each Design Submittal, Design Builder shall submit an index of drawings in accordance with Schedule 5 – Review Procedure and receive an endorsement of "Received" or "Observations". The index of drawings shall follow the requirements outlined in Section C.1.2.

C.2.6 Design Builder shall have a drawing associated with each drawing number. Drawing numbers with no corresponding drawing will not be accepted. Design Builder may need to renumber drawings as the Project progresses to avoid drawing number gaps in Record Drawings and As-Built Construction Drawings. Design Builder acknowledges that the drawing numbers may not be finalized until after Substantial Completion.

C.3 Drawing Titles

C.3.1 The drawing title shall follow a five-line format, and shall be completed as follows:

Line	Content	Notes
1	Facility Name	North End Sewage Treatment Plant
2	Project Title	Headworks Facilities Project
3	Area	For example: Area D – Anaerobic Digestion
4	Type of Arrangement	For example: General Arrangement, Single Line Diagram. The *WTSP Project Document Numbering Standard* (Appendix 18 D – City Standards) should be used as a guide.

Line	Content	Notes
5	Drawing Content	Include equipment identifiers as applicable. For example: AHU-E6250 Bank 1 Air Handler
6	Drawing Content	See Section C.3.2.

C.3.2 The drawing description shall be generated with consideration of being searchable for use by plant staff. Design Builder shall utilize equipment identifiers and consistent naming of equipment and processes.

C.4 Design Package Identification

C.4.1 As outlined in Schedule 18 – Technical Requirements Section C Design Requirements, Design Builder may submit multiple 60% Design Submittals, divided into logical design packages. Each of these design packages shall be clearly demarcated on the drawings using a combination of colours and symbols as described in **Table 2**. These colours shall remain consistent for all subsequent design package submissions.

Table 2: Design Package Identification

Design Package	Colour Value (RGB)	Examples	Symbol
1	51, 204, 51		1
2	102, 153, 255		2
3	204, 102, 255		3
4	255, 153, 102		4
5	0, 128, 0		5
6	0, 102, 153		6
7	102, 0, 204		7
8	255, 0, 0		8

C.4.2 Design Builder shall include a design package identification legend in the drawing set.

C.4.3 Where the contents of a drawing pertain to one design package only, design package identification shall meet the following criteria:

(a) drawing elements shall not be colour coded; and

(b) Design Builder shall include a stamp on the drawing stating: “This drawing in its entirety pertains to design package X.”

C.4.4 Where the contents of a drawing pertain to multiple design packages, design package identification shall meet the following criteria:

(a) on plans, sections, details and 3D views, Design Builder shall apply solid, coloured hatching to all drawing and model objects per **Table 2**;

(b) on schematics and diagrams, Design Builder shall apply colours to the lines and symbols per **Table 2**; and

(c) Design Builder shall utilize identification symbols where necessary to provide additional clarity.

C.4.5 Design Builder shall maintain design package identification on the drawings until a package is submitted for construction.

C.4.6 Issued for Construction drawings shall meet the following criteria:

(a) Design Builder shall conform the drawings by removing the colour coding for the design package being issued;

(b) Design Builder shall maintain all symbols applied to the drawing for the package being issued, with the colour removed; and

(c) Design Builder shall maintain all symbols and colour coding for all other design packages depicted on the drawing.

C.4.7 Where changes are required to a drawing that has been Issued for Construction, the following revision requirements apply:

(a) changes pertaining to items that have been conformed and issued for construction are to be clouded per Section D.2; and

(b) changes pertaining to items that have not been conformed do not require clouds or revision triangles.

SECTION D. DELIVERABLES

D.1 General Requirements

D.1.1 Issued for Construction drawings shall be conformed per Section C.4.6.

D.1.2 Design Builder shall provide a complete set of drawings in AutoCAD DWG format with the As-Built Submittal. The drawing set shall meet the following requirements:

(a) Any drawings converted to AutoCAD DWG format shall retain the same level of quality as was present in the native files. All referenced files are to be bound into the individual drawing files as AutoCAD blocks, not bound references.

(b) All drawings shall comply with the layer naming format described in Section F.

(c) Drawings generated in AutoCAD Civil 3D do not need to be reduced to regular AutoCAD linework.

(d) All final drawings shall be packaged in a single sheet per AutoCAD file.

D.1.3 Design Builder shall provide the federated model with the 60% Design Submittal, 90% Design Submittal, and the IFC Submittal to aid the City in reviewing the reports.

D.1.4 Design Builder shall provide all 3D models in native format and with the As-Built Submittal. Models shall meet the following criteria:

(a) models shall not be purged of any data, views, sheets or other information pertaining to the project prior to submittal; and

(b) models shall reflect all changes made to the design during construction, following the requirements outlined in Section G.1.4.

D.2 Revisions

D.2.1 The revision number shall be incremented with every revision in accordance with the *WSTP Project Document Numbering Standard* in Appendix 18D – City Standards. The issued for construction revision shall have a 00 revision number.

D.2.2 Design Builder shall show changes in each revision by clouding the change and placing a triangle revision symbol with the revision number inside it adjacent to the change.

D.2.3 For each revision, Design Builder shall delete previous revision clouds and symbols.

D.3 Modification to Existing Drawings

D.3.1 Wherever Design Builder modifies the Existing Infrastructure, Design Builder shall modify or delete existing drawings as follows;

(a) Design Builder shall show modifications to existing drawings by adjusting the existing revision number;

(b) drawings that are no longer in use shall be modified by marking them as obsolete;

(c) Design Builder acknowledges that not all existing drawings are in CAD files and recreation of the drawing in CAD or in 3D may be required; and

(d) 3D modeling of existing Infrastructure will be undertaken per Section G.2.

SECTION E. DRAWINGS

E.1 General Requirements

E.1.1 Drawings shall be of high-quality, both in terms of visible and internal layout and configuration.

E.1.2 All lines and text shall be exactly aligned where appropriate, including schematic drawings. Design Builder shall utilize snap or other systems to ensure alignment.

E.1.3 Lines and text shall be completely vertical or horizontal where appropriate. Design Builder shall utilize snap or “ortho” systems to avoid non-vertical or horizontal lines.

E.1.4 Snap shall be utilized for schematic-style drawings, including process & instrumentation diagrams (P&IDs). Utilize reasonable snap settings (e.g. 1 or 2 mm). Small snap settings that limit the benefit of the snap settings are not permissible.

E.2 File Format

E.2.1 All drawing files shall be saved in a current AutoCAD version format.

E.2.2 All final drawings shall be packaged in a single sheet per AutoCAD file.

E.3 Layout

E.3.1 Paper space and model space shall be used, with the title block inserted in paper space at 1:1 scale and the drawing drawn in model space.

E.3.2 Drawings shall be based upon a metric A1 size, except as follows:

(a) instrument loop diagrams shall be based upon 11” x 17” (ANSI B) drawing size.

E.3.3 Views placed on a drawing shall be aligned horizontally and vertically on the sheet wherever possible.

E.4 Title Block

E.4.1 Design Builder shall utilize title blocks, as provided by the City after the Effective Date.

E.4.2 The title block format shall not be changed, except to include Design Builder’s logo within the appropriate area.

E.4.3 The path, date and time last modified text in the bottom left corner of the title block shall be maintained.

E.5 Units

E.5.1 Metric units shall be used for paper space and model space, as well as all drawing symbols (blocks).

E.5.2 Units of measurement shall be as per **Table 3**.

Table 3: Units of Measurement

Measurement Type	Units	Format
Distance (site plans, plan / profiles, civil details)	Decimal meters	1.0
Distance (general arrangements, details)	Millimeters	1000
Angles	Degrees	22.5°
Elevations	Decimal meters	100.000

E.5.3 All elevations shall be shown relative to sea level.

E.5.4 All dates shall be in YYYY-MM-DD format.

E.6 Scale

E.6.1 All CAD models and drawings shall be prepared at full scale. Scaling shall be accomplished via the paper space.

E.7 Lettering and Fonts

E.7.1 Lettering and fonts shall be as per Table 4.

Table 4: Lettering and Fonts

Style Name	Text Height	Width Factor	Font Name	Use Description
TEXT6-0MM	6 mm	0.8	Arial	For drawing numbers.
TEXT5-0MM	5 mm	0.8	Arial	For note titles, key equipment identifiers, etc.
TEXT3-0MM	3 mm	0.8	Arial	For general text and completing title blocks, secondary subtitles, notes and general text.
TEXT2-5MM	2.5 mm	0.8	Arial	For title block label text, P&ID tag bubbles, and equipment descriptions.
TEXT2-0MM	2.0 mm	0.8	Arial	For use in specific diagram and schematic symbols. The use of 2.0 mm text should be limited.

E.7.2 Text placement within the drawings shall comply with the following:

(a) text spacing from lines and objects shall be consistent;

(b) text shall not overlap lines or objects;

(c) text leaders shall be utilized where appropriate to clarify the object that the text is associated with; and

(d) text leaders shall not cross other leaders or dimension lines.

E.8 Dimension Style

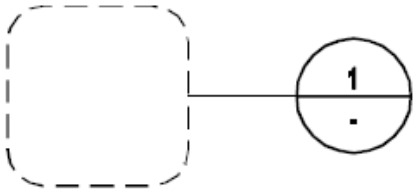
E.8.1 Design Builder shall utilize the dimension style as per Table 5.

Table 5: Dimension Style

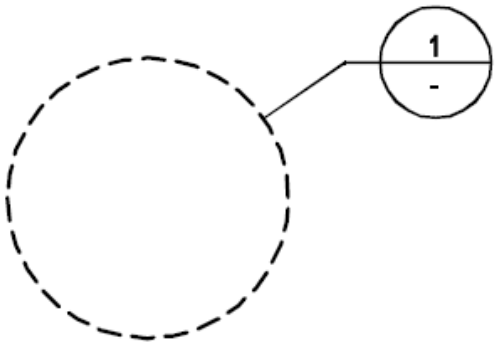
Style Name	Text Height	Width Factor	Font Name	Arrow Style	Arrow Size
DIM2-5MM	2.5 mm	0.8	Arial	Arrow	3 mm

E.9 General Symbols

E.9.1 Detail callouts shall be in one of the formats below:

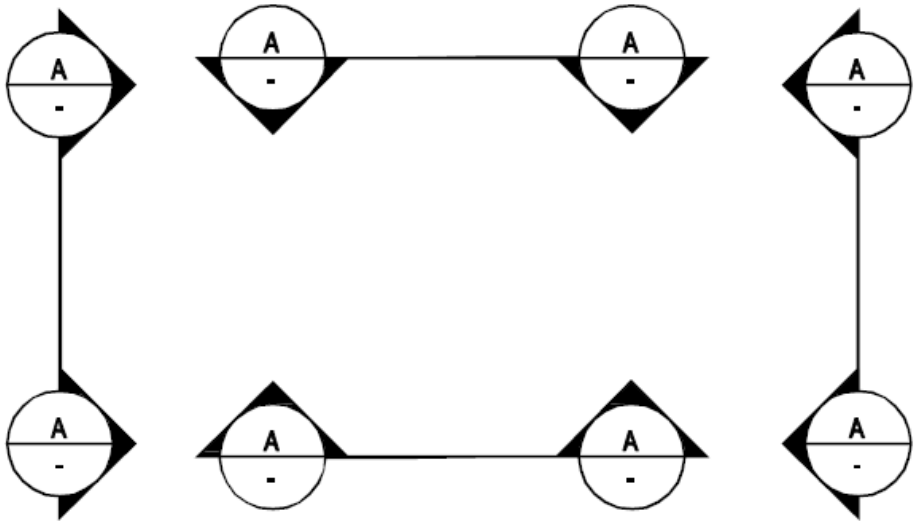


or

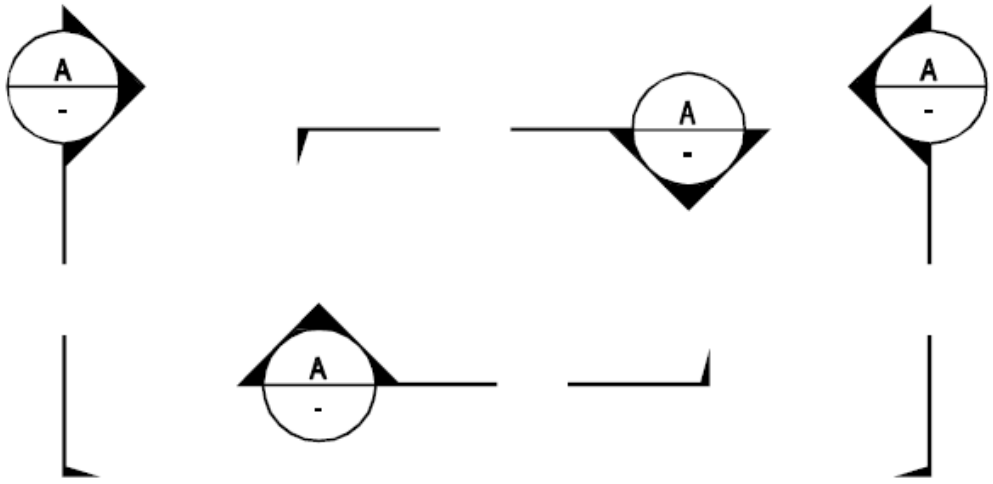


E.9.2 Section marks shall be in the format below:

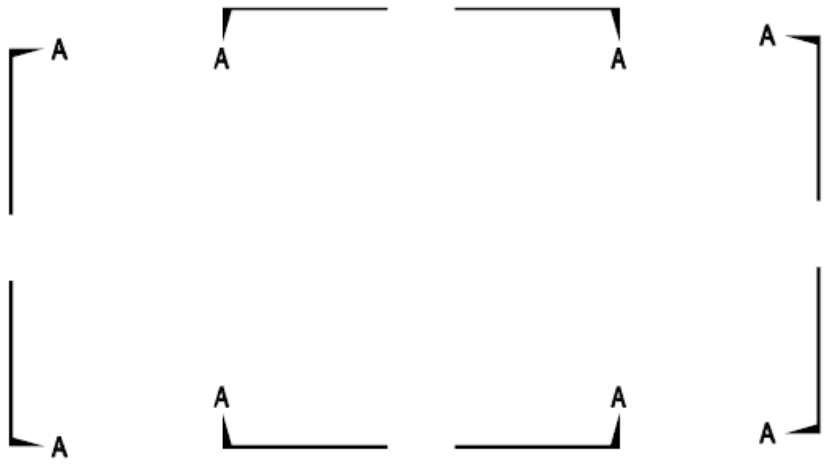
(a) sections cutting through the entire view:



(b) partial sections, cutting only a portion of the view:



(c) sections within standard details only:



(d) grid bubbles shall be in the format below:

(e) revision triangles shall be in the format below:

E.10 Equipment Identifiers and Descriptions

E.10.1 Equipment identifiers shall always be referenced. In no event shall equipment be described or referenced without the identifier.

E.10.2 All existing equipment shall be re-identified utilizing the *WWD Identification Standard.*

E.10.3 Equipment identifiers shall be located prior to the description. For example:

P-E5211
Sanitary Grinder Pump 1

E.10.4 Where an existing asset is re-identified, ensure that the equipment identifier also includes the previous equipment identifier in parenthesis, after the new equipment identifier. For example:

MCC-G7111
(was MCC-G1)
Grit 600V MCC Bank 1

E.11 Typical Details

E.11.1 Design Builder shall not use typical drawings, details or schematics to represent similar units with different equipment identification as defined in Section E.10. Each identified piece of equipment must be detailed separately.

E.12 3D Representations

E.12.1 Design Builder shall provide 3D views of all congested areas where plan and section views are insufficient to convey the design intent.

E.12.2 3D views shall be shown shaded and in colour as a minimum.

E.12.3 A model of a person shall be included in 3D views to provide context.

SECTION F. AUTOCAD LAYERS

F.1 Application

F.1.1 Design Builder shall use the layer naming system in all drawings for all disciplines.

F.2 Layer Naming

F.2.1 Layer names shall utilize the following convention:

Discipline Code		Major Group		Minor Group (Optional)
X	-	XXXX	-	XXXX

F.2.2 Design Builder shall use the discipline codes outlined in the *WTSP Project Document Numbering Standard* in Appendix 18D – City Standards.

F.2.3 Design Builder shall utilize the major group code to indicate the major component, assembly, or construction system. Design Builder shall utilize four characters for major group codes. Examples of major group codes are shown in Table 4.

F.2.4 Design Builder shall utilize the minor group code to further break down the major group. Examples of minor group codes are shown in Table 5.

F.2.5 Examples of layer naming are shown in Table 6.

Table 6: Layer Major Group Code Examples

Major Group Code	Description
TEXT	Used for text, e.g. headings, notes, descriptions or any text except tags
IDEN	Used for identification of labels or tags

Major Group Code	Description
DIMS	Used for dimensions
LINE	Used for drawing process lines
LITE	Used for drawing lights
POWR	Used to draw any element for electrical power
GRID	Used to draw grid lines
SLAB	Used to draw slabs
ANNO	Miscellaneous; doesn't have a category or can have multiple components
XXXX	Customized to suit user's needs

Table 7: Layer Minor Group Code Examples

Minor Group Code	Description
MAJR	Used for major process
MINR	Used for minor process
JBOX	Used for a junction box
NEWW	Used to show new work
EXST	Used to show existing
FUTR	Used to show future
DEMO	Used to show existing to be demolished
XXXX	Customized to suit user's needs

Table 8: Layer Naming Examples

Layer Name	Line Type	Description
A-LINE-MAJR	CONTINUOUS	Major process line
A-LINE-MINR	CONTINUOUS	Minor process line
A-LINE-PNEU	PNEUMATIC	Pneumatic signal
A-LINE-ELEC	DASHED	Electrical signal
A-LINE-ELCB	ELECBIN	Electrical binary signal
A-TEXT-6-0M	CONTINUOUS	6.0 mm high text
A-TEXT-5-0M	CONTINUOUS	5.0 mm high text
A-TEXT-3-0M	CONTINUOUS	3.0 mm high text
A-TEXT-2-5M	CONTINUOUS	2.5 mm high text
A-IDEN	CONTINUOUS	Labels or tags
A-ANNO-NEWW	CONTINUOUS	New
A-ANNO-EXST	DASHED	Existing

A-ANNO-FUTR	CENTER	Future
A-ANNO-DEMO	CONTINUOUS	Existing to be demolished

F.3 Layer Colours and Line Type Thickness

F.3.1 Where drawings are configured to utilize AutoCAD CTB files, the CTB files shall be as provided by the City at Design Builder's request. The City has the following two files available:

(a) COW_STANDARD: utilized for full-scale printing/plotting.

(b) COW_STANDARD_50%: utilized for printing/plotting larger drawings onto reduced size paper.

F.3.2 The thickness of each line shall be determined by associating a colour with a line weight in the plot style table (CTB file or pen assignments).

F.3.3 All drawing elements not included in the Works shall be printed/plotted in grey, screened at 60%.

SECTION G. 3D MODELS

G.1.1 Design Builder shall undertake the design utilizing a 3D capable software solution that meets the following requirements:

(a) relational database with object-oriented capabilities;

(b) capable of 3D, parametric modeling;

(c) fully integrated to support all design disciplines;

(d) supports metadata associated with model elements; and

(e) allows exchange of information between the component parties and other software solutions utilizing industry foundation classes.

G.1.2 All selected software solutions shall be capable of exporting to AutoCAD DWG format while maintaining drawing quality.

G.1.3 Design Builder shall provide a federated model comprising:

(a) existing grade, finished grade and paving elements;

(b) all aboveground structures and utilities; and

(c) all underground tunnels, galleries, piping, ductbank and utilities.

G.1.4 Design Builder shall provide individual 3D models for each facility, comprising all disciplines and their associated components.

G.1.5 All 3D models shall be developed to the minimum level of detail requirements described in **Table 9**, where:

(a) 100 indicates no 3D geometry and limited information;

(b) 200 indicates that elements consist of generalized systems with approximate quantities, sizes, shapes, locations and orientation;

(c) 300 indicates that elements are accurate and coordinated, and suitable for cost estimation and regulatory compliance checks;

(d) 350 indicates that elements are modeled as a specific system, object or assembly in terms of shape, location and orientation, and interfaces with other building systems;

(e) 400 indicates that elements are accurate and coordinated with sufficient detail for fabrication; and

(f) 500 indicates that elements are modeled precisely as they have been installed and associated data is suitable for the operation and maintenance of the facility.

Table 9: Level of Detail for 3D Models

Discipline	**Level of Detail**				
	30%	**60%**	**90%**	**IFC**	**As-Built**
Automation	100	200	200	200	200
Building / Architectural	200	200	300	300	350
Civil	100	200	300	300	300
Electrical	100	200	300	300	400
Mechanical	100	200	300	300	300
Process	200	200	300	350	400
Structural	200	200	300	350	350

G.1.6 All 3D models shall be developed primarily as a visualization tool to help with providing clarity during design and construction so that the communication of ideas, particularly to those groups not familiar with interpreting two dimensional drawings, is enhanced. Accordingly, Design Builder shall:

(a) use an active 3D model for all design meetings and design reviews (in addition to paper documents); and

(b) use colour to distinguish zones, ratings, systems, and other features of the design to support the communication of the design and provide clarity of intent. [NTD during Development Phase: coordinate with package colouring –

ideally design colours and package colour coding should be able to be switched back and forth depending on the need]

G.2 Existing Infrastructure

G.2.1 Design Builder shall provide 3D models of Existing Infrastructure that has been modified, to a level of detail of 200 for all disciplines. See Section G.1.5.

G.2.2 Design Builder shall clearly differentiate between existing and new elements.

SECTION H. SPECIFIC DRAWING REQUIREMENTS

H.1 Civil Drawings

H.1.1 Design Builder shall follow the *WWD CAD/GIS Standard* for applicable civil drawings. https://winnipeg.ca/waterandwaste/dept/cad_gis.stm

H.1.2 For other civil drawings, follow other City department standards as required.

H.2 Architectural Drawings

H.2.1 Design Builder shall include rendered 3D views of each facility exterior, including site features and neighbouring buildings.

H.2.2 Design Builder shall follow the *WWD Identification Standard* in Schedule 18 – Technical Requirements – Appendix 18D – City Standards for building level designations and room numbering convention.

H.3 Process Flow Diagrams

H.3.1 Design Builder shall provide:

(a) 3 process flow diagrams (PFDs) illustrating flow through the entire treatment process, with one PFD for each stream: liquids, sludge, and foul air. Show connections to the Existing Infrastructure.

(b) a minimum of one PFD per Area Code illustrating the flow through that area.

H.4 Process & Instrumentation Diagrams

H.4.1 Design Builder shall provide a comprehensive set of P&IDs for the Infrastructure, including tie-ins, utilizing an intelligent P&ID software solution capable of the following:

(a) capturing and reporting drawing element data; and

(b) ability to export to AutoCAD format per Section D.1.

H.4.2 The P&IDs shall be developed such that the following reports can be generated directly from the software:

(a) equipment list, in accordance with the Process Mechanical Design Guide;

(b) valve list, in accordance with the Process Mechanical Design Guide;

(c) instrument list, in accordance with the *WWD Wastewater Treatment Facilities Automation Design Guide* in Schedule 18 – Technical Requirements – Appendix 18D – City Standards; and

(d) systems to be incorporated into the P&IDs shall include the following:

(i) all treatment process systems;

(ii) flushing water and its derivatives;

(iii) potable water and its derivatives;

(iv) compressed air and its derivatives; and

(v) all building mechanical systems.

H.4.3 P&IDs shall not use typical drawings or details per Section E.11.

H.4.4 Drawings shall be oriented such that major processes flow primarily from left to right, and secondarily from top to bottom. Where practical, show minor processes flowing from left to right and from top to bottom.

H.4.5 Design Builder shall provide major process design criteria on the drawings.

H.4.6 For equipment on drawings, Design Builder shall indicate the following:

(a) equipment identifier (including old identifier as applicable, see *WWD Identification Standard* in Schedule 18 – Technical Requirements – Appendix 18D – City Standards);

(b) equipment description; and

(c) key equipment ratings, including capacity, motor power and other key ratings.

H.4.7 Design Builder shall provide equipment identifiers for valves and dampers; however, shall not show descriptions or ratings for valves and dampers unless the valve/damper is very significant to the process.

H.4.8 Design Builder shall not include manufacturer/model information on the P&IDs.

H.4.9 Design Builder shall show all instrumentation on the P&IDs.

H.4.10 Design Builder shall show all hardware interlocks between instruments and equipment.

H.4.11 Design Builder shall show key software control loop interactions, such as where the output of one control loop sets the setpoint for another. However, Design Builder shall not show all software interlocks.

H.4.12 Where transmitters have an associated high-high, high, low, or low-low alarm in the PCS, Design Builder shall show it next to the right side of the corresponding PCS function block in accordance with ISA 5.1.

H.4.13 Design Builder shall show minor instruments, which are packaged as part of an equipment package, as a small circle with the text inside based upon the function designation in accordance with the *WWD Identification Standard* in Schedule 18 – Technical Requirements – Appendix 18D – City Standards. Where the circles cannot fit within the equipment symbol, Design Builder shall show the circles adjacent and touching the symbol. Examples include:

(a) show hand-off-remote switches on the door of a motor starter assembly as a "HS" in circle, with "HOR" text above;

(b) show an integral temperature gauge in an air handler as a "TG" in a circle; and

(c) show limit switches provided as part of a valve assembly as "ZSC" and "ZSO" in two circles adjacent to the valve.

H.4.14 Design Builder shall show instrument air supply connections, where applicable.

H.4.15 Generally, Design Builder shall not show electric supply connections to equipment, unless required to clarify the process control.

H.4.16 Design Builder shall show all hardwired I/O using triangle symbols as shown in the sample drawings attached to the *WWD Identification Standard* in Schedule 18 – Technical Requirements – Appendix 18D – City Standards. Multiple signals may be shown on a single P&ID line, provided that they are of a common I/O type (DI, DO, AI, AO).

H.4.17 Design Builder shall show all networked connections between equipment shown on the P&IDs and the PCS. For example, Design Builder shall show network connections between intelligent motor starters and the associated PCS function tag.

H.5 Electrical Drawings

H.5.1 Electrical drawings shall comply with the content of, and generally conform to, the sample drawings attached to the *WWD Electrical Design Guide* in Schedule 18 – Technical Requirements – Appendix 18D – City Standards.

H.5.2 Electrical drawings shall not use typical drawings or details per Section E.11.

H.6 Automation Drawings

H.6.1 Automation drawings shall comply with the content of, and generally conform to, the sample drawings attached to the *WSTP Automation Design Guide* in Schedule 18 – Technical Requirements – Appendix 18D – City Standards.

H.6.2 Automation drawings shall not use typical drawings or details per Section E.11.

H.6.3 Control system architecture drawings shall:

(a) have a document type of “BDG” as per the *WTSP Project Document Numbering Standard* in Schedule 18 – Technical Requirements – Appendix 18D – City Standards;

(b) show all automation equipment and how they are interconnected; and

(c) show networking in a functional manner. Design Builder shall utilize common “bus-style” lines to represent networks. Design Builder shall not show every connection into a network switch via a separate line.

H.6.4 I/O module wiring diagrams shall have a document type of “CBD” as per the *WTSP Project Document Numbering Standard* in Schedule 18 – Technical Requirements – Appendix 18D – City Standards, provided the I/O module wiring diagrams are primarily associated with a specific cabinet/PLC panel.