Appendix A Specific Submission Requirements

A-1 NEA-CBPU and PUB-WRN Submission Requirements

The individual section below covers the specific presentation requirements necessary for each of the drawing views submitted to CBPU and PUB at the various stages below:

1. Development Control;
2. Building Plan on Pollution Control;
3. Building Plan on Environmental Health;
4. Detailed Plan on Sewerage Works (Proposed Sewer/ Sewer Diversion Works/abandoned sewers and pumping mains/grouting of abandoned sewers and pumping mains/Sewage treatment plant/holding tanks, etc);
5. Detailed Plan on Sanitary Works (for Sanitary Plumbing & Drainage System/ Sewer Connection);
6. Detailed Plan on Sewerage M&E Works;
7. Detailed Plan on Drainage Works – Main Development Submission;
8. Detailed Plan on Drainage Works – Proposed Roadside Drain/ Culvert;
9. As-built Plan for TOP/CSC – Proposed Sewer/ Pumping Mains/ Sewer/ Pumping Main Diversion Works; abandoned sewers and pumping mains/grouted abandoned sewers and pumping mains/Sewage Treatment Plants/Holding Tank, etc.;
10. As-built Plan for TOP/CSC – Sanitary Works (Sanitary Plumbing & Drainage System/ Sewer Connection);
11. As-built Plan for CSC – Proposed Roadside Drain/ Culvert;
12. As-built Plan for CSC – Pumped Drainage System at Basement;
13. As-built Plan for CSC – Internal Drain with Deviations;
14. Certified Survey Plan for CSC – Development in the vicinity of/ affected by Drainage Reserve; and
15. URA Approved Sub-division Plan for CSC – for Site affected by Drainage Reserve.

Please note that symbols, layers, drafting conventions, line types and colours should follow the **Singapore Standard CP83: Code of Practice for Construction computer aided design (CAD).**

1. General Requirements for all CBPU/ PUB-WRN Submissions

QPs are to take note of the requirements below for all CBPU/ PUB-WRN submission:

a. Site Plan: Include the connection to main pipe
b. Drawing scale of Site Plan:Use either 1:500, 1:1000 (do not use odd scale)
c. Key plan/Location plan to show surrounding site and location

2. Development Control

2.1. Site Plan View

In specific, all key plan, location plan and site plan of development control shall show the following:

2.1.1. Key Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings within 1km radius shall be shown.

2.1.2. Location Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings and MRT tracks, within a 100m radius shall be shown.

2.1.3. Site Plan

Site plan shall show the following:

a. Layout of the site with boundary lines verged in **RED**. Road name , town subdivision, mukim and lot numbers and areas (m^2)
b. Outline of buildings or structure;
c. Building setback from MRT track;
d. Existing sewers (including DTSS tunnels), pumping mains and sewerage facilities, including their sizes, as reflected in Sewerage Interpretation Plans, within 25m (for sewers) or 36m (for DTSS tunnels) of development boundary; Outline of the Sewer Protection zone (25m from sewers or 36m from DTSS tunnels).
e. Outline of sewer setback distance from sewers or pumping mains and clear horizontal distance between structures or buildings and the sewers;
f. Bin centre location and vehicular access;
g. Existing Drainage reserves line with dimensions, entrance culverts or roadside drains;

h. Proposed, proposed abandon sewers and sewer connection line or pumping mains or drains, sewer or pumping main diversion work (including their sizes), holding tank or sewage treatment plant or sewage pump sump;
i. Existing or proposed internal drains serving the development site from summit points to its outlet connection to the existing or proposed roadside drain or outlet drain; and
j. Road reserves line with dimensions, road levels or ground levels including the existing road levels or ground levels at the outlet discharge point of internal drains.

2.2. Floor Plan View

In specific, all basement, 1st storey and higher storey plan of development control shall show the proposed platform levels for all areas, room's tag and the following:

2.2.1. Basement Plan

a. For industrial development, use of floor space for industrial processes or activities;
b. Provision for pollution control equipment;
c. Toilets/sanitary facilities, refuse chute chambers, car washing bays, garage gully and oil interceptor;
d. Food shops and grease traps;
e. Provision for pump sewerage system, if used water is generated;
f. All entrance or openings to the basement, platform levels, cut-off drains, crest levels, threshold levels and drainage pump system; and all adjacent road levels (both at the front and the back of site) or ground levels.
g. Areas open to sky to be served by pumped drainage system; and
h. Bin centre and vehicular access to the bin centre.

2.2.2. First Storey Plan

a. For industrial development, use of floor space for industrial processes or activities;
b. Provision for pollution control equipment;
c. Bin centre and vehicular access to the bin centre;
d. Location of refuse chute chambers;
e. Existing, proposed and proposed abandon sewers, pumping mains, sewer connection, including all their sizes, manholes, discharge chambers, their top and invert levels, and their setback from buildings or structures;

f. Sewer and Manhole ID for existing or proposed abandon sewer / pumping main/ manhole
g. Adjacent lots and existing sewer/sanitary drain lines from adjacent lots,
h. Overhanging structures or roof eaves above existing or proposed sewer or pumping main;
i. The last inspection chamber, pipe size，the top and invert of the last IC and connecting manhole;
j. Reinforced concrete trench for sewer that do not meet building setback requirement;
k. Drainage reserve and its alignment and width;
l. Common drains and its alignment and flow of existing common drain within the development site, layout of internal drainage system and discharge point to the public drains and the drain size;
m. Proposed or existing platform level, adjacent road/ground levels at the outlet discharge points of internal drains;
n. Road reserves line with dimensions;
o. Link to MRT station and /or existing building link to MRT station, if any;
p. Proposed ramp and boundary fence or walls.

2.2.3. Second Storey to Highest Storey Plan (for industrial buildings only)

a. For industrial development, use of floor space for industrial processes or activities; and
b. Provision for pollution control equipment.

2.3. Roof Plan View

In specific, the roof plan of development control shall show the following:

a. For industrial buildings, location of flue gas stacks and chimneys;
b. Provision for pollution control equipment;
c. Private roof terraces, gardens, common areas, common staircases;
d. Refuse chute, refuse chute ventilation openings, maintenance access to the refuse chute; and
e. Roof gutter or scupper drains (if any), parapet walls and railings.

2.4. Elevation View

In specific, the elevation view of development control shall show the following:

a. For industrial buildings, location of flue gas stacks and chimneys;
b. Provision for pollution control equipment;
c. Building height;

d. Sewer setback from building or structures; Clear horizontal and vertical distances between the building or structure and the sewers or pumping mains
e. Location of reinforced concrete trench;
f. Refuse chute ventilation openings, roof gutter or scupper drains (if any), parapet walls, railings;
g. Bin centre and its height;
h. Drainage reserve, common drains, roadside or external drains, existing and proposed boundary fence or walls; and
i. Structures closer than 2.0m from the edge of the Drainage Reserve.

3. Building Plan on Pollution Control

3.1. Site Plan View

In specific, all key plan, location plan or site plan of pollution control shall show the following:

3.1.1. Key Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings within 1km radius shall be shown.

3.1.2. Location Plan or Site Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings and MRT tracks, within a 100m radius shall be shown.

3.2. Floor Plan View

In specific, all basement, 1st storey and higher storey plan of pollution shall show the following:

3.2.1. Basement Plan

a. All details or processes inside the basement of the building;
b. Trade effluent drainage or piping system to collect and convey trade effluent generated;
c. Location of trade effluent treatment plant;
d. Location of trade effluent sampling sump or system and the connection to the internal sanitary drainage system;

e. Open process areas which may cause contamination to rain water and system to collect contaminated rain water and system of treatment before discharge to open drain;
f. Types and locations of fuel burning equipment;
g. Locations of air pollution control equipment;
h. Containment facility for storage tanks;
i. Locations of toxic industrial water treatment and disposal facilities;
j. Containment facilities for generator; and
k. Car washing bays, garage gully or oil interceptor.

3.2.2. First Storey Plan

a. All details or processes inside the first storey of the building;
b. Trade effluent drainage or piping system to collect and convey trade effluent generated;
c. Location of trade effluent treatment plant;
d. Location of trade effluent sampling sump or system and the connection to the internal sanitary drainage system;
e. Location of Last Inspection Chamber (includes pH monitoring and discharge control system);
f. Open process areas which may cause contamination to rain water and system to collect contaminated rain water and system of treatment before discharge to open drain;
g. Types and locations of fuel burning equipment;
h. Locations of air pollution control equipment;
i. Containment facility for storage tanks;
j. Locations of toxic industrial water treatment and disposal facilities;
k. Containment facilities for generator; and
l. Air intake or exhaust points for mechanical ventilation system.

3.2.3. Second Storey to Highest Storey Plan

a. All processes or activities inside the second to highest storey of the building;
b. Trade effluent drainage or piping system to collect and convey trade effluent generated;
c. Location of trade effluent treatment plant;
d. Location of trade effluent sampling sump or system and the connection to the internal sanitary drainage system;
e. Open process areas which may cause contamination to rain water and system to collect contaminated rain water and system of treatment before discharge to open drain;
f. Types and locations of fuel burning equipment;

g. Locations of air pollution control equipment;
h. Containment facility for storage tanks;
i. Locations of toxic industrial water treatment and disposal facilities; and
j. Air intake or exhaust points for mechanical ventilation system.

3.3. Roof Plan View

In specific, the roof plan of pollution control shall show the following:

a. Location of chimneys for the dispersion of flue gases;
b. Types and locations of fuel burning equipment;
c. Stacks for the dispersion of exhaust gases;
d. Cooling towers location and its overflow or drain-off point; and
e. Locations of air pollution control equipment.

3.4. Elevation View

In specific, the elevation of pollution control shall show the following:

a. Flue gas stacks and chimneys;
b. Types and locations of fuel burning equipment;
c. Building height;
d. Air pollution control equipment; and
e. Trade effluent treatment plant and toxic industrial water treatment and disposal facilities.

4. Building Plan on Environmental Health

4.1. Site Plan View

In specific, all key plan, location plan and site plan of environmental health shall show the following:

4.1.1. Key Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings within 1km radius shall be shown.

4.1.2. Location Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings and MRT tracks, within a 100m radius shall be shown.

4.1.3. Site Plan

Layout of the site with boundary lines verged in **RED**.

a. Neighbouring buildings;
b. Neighbouring clean and light industrial buildings (if any) within 50m setback distance;
c. Overhead MRT within 35m setback distance from building or structure; and
d. Bin centre and access, swimming pool and restaurant/foodshops.

4.2. Floor Plan View

In specific, the basement, 1st storey and higher storey floor plan of environmental health shall show the following:

4.2.1. Basement Plan

a. Refuse chute chambers and sanitary facilities or toilets; and
b. Food shops.

4.2.2. First Storey Plan

a. MRT setback lines and distance;
b. Bin centre and access;
c. Swimming pool, open spa or jacuzzi;
d. Refuse chute chambers and sanitary facilities or toilets;
e. Food shop and its kitchen or food preparation area, outdoor refreshment area (if any) and washing area, sanitary pipes, drip tray, double floor slab, hood and flue system and grease trap; and
f. Common drain.

4.2.3. Second Storey to Highest Storey Plan

a. Swimming pool and restaurant;
b. Refuse chute chambers and sanitary facilities or toilets; and
c. Food shop and its kitchen or food preparation area and washing area, overhead sanitary pipes in food shop kitchens, drip tray, double floor slab, hood and flue system.

4.3. Roof Plan View

In specific, the roof plan of environmental health shall show the following:

a. Location and ventilation openings for refuse chutes, common areas, maintenance access to refuse chutes;
b. Roof gutter or scupper drains (if any), parapet walls or railing, permanent and safe access to the roof gutters or roof scupper drains; and

c. Kitchen exhausts for foodshops.

4.4. Elevation View

In specific, the elevation view of environmental health shall show the following:

a. Refuse chutes and their ventilation openings, roof gutters or scupper drains (if any), parapet walls, railings;
b. Building height;
c. Bin centre; and
d. Proposed boundary fence or walls and common drain.

5. Detailed Plan on Sewerage Works (Proposed Sewer/ Sewer Diversion Works, abandoned sewers and pumping mains/grouting of abandoned sewers and pumping mains/Sewage treatment plant/holding tanks, etc)

5.1. Site Plan View

In specific, all key plan and site plan of proposed sewer or sewer diversion works shall show the following:

5.1.1. Key Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings within 1km radius shall be shown.

5.1.2. Site Plan

Layout of the site with boundary lines verged in **RED** and outline of building and structure.

a. Proposed or existing or proposed abandon sewer or pumping main or diversion and their setback distance from building or structures or Drainage Reserve or neighbouring lot;

b. Reinforced concrete trench with removable slabs (*annotated on the plan*) for existing or proposed sewer under building or structures or with insufficient setback from building or structures;
c. Pipe sizes, invert and top levels of all manholes including the connecting manhole(s); and

d. Provision of or existing pump sump or holding tank or sewage treatment plant.

5.2. First Storey Floor Plan View

In specific, the 1st storey floor plan of proposed sewer or sewer diversion works shall show the outlines of building or structure and the following:

a. Proposed or existing or proposed abandon sewer or pumping main or diversion, and their setback distance from building or structures or Drainage Reserve or adjacent lot;
b. Reinforced concrete trench with removable slabs (*annotated on the plan with width and length dimension*) for existing or proposed sewer under building or structures or with insufficient setback from building or structures;
c. Pipe sizes, gradients, materials, invert and top levels of all the manholes including the connecting manhole(s);
d. Provision of pump sump or holding tank or sewage treatment plant; and
e. Proposed ramp, boundary fence or walls.

5.3. Elevation View

In specific, the elevation view of sewer or sewer diversion works shall show the following:

a. Headroom for overhanging structures or roof eaves above existing or proposed sewer or pumping main;
b. Pipe size and invert levels of the existing or proposed sewer or pumping mains and their setback distance from building or structures;
c. Reinforced concrete trench with removable slabs (*annotated on the plan with width and depth dimension*) for existing or proposed sewer under building or structures or with insufficient setback from building or structures;
d. Pipe sizes, invert and top levels of all the manholes including the connecting manhole(s);
e. Building height;
f. Proposed boundary fence or walls; and
g. Pump sump or holding tank or sewage treatment plant.

5.4. Longitudinal Section View

In specific, the section view of sewer or sewer diversion works shall show the following:

a. All existing or proposed manholes and sewers or pumping mains and its materials, pipe sizes, distance, gradient and invert or top levels of manhole with tumbling bay or backdrop connections (if any);
b. Method of laying and pipe haunching/bedding details;
c. Horizontal and vertical clearance distances of underground services or structures from sewers or pumping mains, and
d. Headroom clearance of overhanging or overhead structures and their horizontal clearance distance from sewers or pumping mains.

4.5 Cross-sectional view

In specific, the cross section view shall show or indicate the followings.

a. all technical details and dimensions of pump sump, holding tank or sewage treatment plant, deep manhole (>6m) with backdrop or vortex connections.

b. detail capacity sizing calculation for holding tank or sewage treatment plant.

6. Detailed Plan on Sanitary Works (for Sanitary Plumbing & Drainage System/ Sewer Connection)

6.1. Site Plan View

In specific, all key plan and site plan of sanitary plumbing and drainage system or sewer connection shall show the following:

6.1.1. Key Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings within 1km radius shall be shown.

6.1.2. Site Plan

Layout of the site with boundary lines verged in **RED**.

a. Outline of building or structure
b. Sewer connection and its pipe size, the invert and top levels of last inspection chamber and the connecting manhole;
c. Existing or proposed sewer or pumping main and their setback distance from building or structures, pipe sizes, invert and top levels of manholes;
d. Reinforced concrete trench with removable slabs (*annotated on the plan*) for existing or proposed sewer under building or

structures or with insufficient setback from building or structures; and

e. Provision of or existing pump sump or holding tank or sewage treatment plant.

6.2. Floor Plan View

In specific, the basement, 1st strorey and higher storey floor plan of sanitary plumbing and drainage system or sewer connection shall show the following:

6.2.1. Basement Plan

a. All sanitary appliances or fittings and internal sanitary plumbing and drainage system connected to the 1st storey inspection chambers or the sewerage system;
b. Pipe sizes, gradients, materials, invert and top levels of the sumps/chambers and inspection chambers;
c. Declaration of all pipe sizes and materials used for sanitary appliances (eg. discharge pipe, urinal pipe, vent pipe, discharge stack, etc);
d. Provision of Sewerage pumping system;
e. Eating establishments/food shops and its kitchen or food preparation areas and grease trap or sewage divertor, if any.
f. Potable water tank,
g. Overhead sanitary pipes in food shops' kitchens or potable water tank;
h. Toilets/sanitary facilities, refuse chutes, and washing areas; and
i. Platform levels

6.2.2. First Storey Plan

a. All sanitary appliances or fittings or soil and vent stack(s) and their connection to inspection chambers;
b. Internal sanitary drainage system and its connection to existing or proposed sewer or manhole;
c. Pipe sizes, gradients, materials, invert and top levels of the sumps/chambers and inspection chambers;
d. Declaration of all pipe sizes and materials used for sanitary appliances (eg. discharge pipe, urinal pipe, vent pipe, discharge stack, etc);
e. Double floor slab (including access opening) for sanitary pipes sited over bedroom, living room, dining room and kitchen area;
f. Reinforced concrete trench with removable slabs (*annotated on the plan with width and length dimension*) for existing or proposed sewer under building or structures or with insufficient setback from building or structures;

g. Existing & proposed sewer or pumping main and their sizes, setback from building or structure;
h. Invert and top levels of all the manholes including the connecting manhole(s);
i. Adjacent lot and existing sewer/sanitary drainlines from adjacent lots,
j. Provision of pump sump or holding tank or sewage treatment plant.
k. Eating establishments/food shops and its kitchen or food preparation areas and grease trap or sewage divertor, if any.
l. Potable water tank, and
m. Overhead sanitary pipes in food shops' kitchens or potable water tank.
n. Toilets/sanitary facilities refuse chutes/bin centres, and washing areas.
o. Existing sanitary drainlines that would be retained;
p. Proposed ramp, boundary fence or walls;
q. Length of branch drainline from WC to the Inspection Chamber; and
r. Platform levels.

6.2.3. Second Storey to Highest Storey Plan

a. All sanitary appliances or fittings or soil and vent stack(s) and internal sanitary plumbing and drainage system;
b. Eating establishments/food shops and its kitchen or food preparation areas and grease trap or sewage divertor, if any;
c. Overhead sanitary pipes in food shops' kitchens or potable water tank;
d. Toilets/sanitary facilities, refuse chutes/bin centres and washing areas;
e. Length of WC's discharge pipe to the discharge stack; and
f. Double floor slab (including access opening) for sanitary pipes sited over bedroom, living room, dining room and kitchen area.

6.3. Roof Plan View

In specific, the roof plan of sanitary plumbing and drainage system or sewer connection shall show the following:

a. Termination of sanitary ventilation stacks;
b. Roof garden and window openings of penthouse units (indicated with distance from the ventilation stack to the window opening); and
c. Potable water tank, if any.

6.4. **Schematic Diagram for Sanitary Plumbing and Drainage system**

In specific, the schematic diagram of sanitary works shall show all the sanitary plumbing and drainage system in the premises.

6.5. Elevation View

In specific, the elevation view of sanitary plumbing and drainage system or sewer connection shall show the following:

a. Sanitary plumbing and drainage system within the premises connected to the sewerage system;
b. Sewer connection and its pipe size, the last inspection chamber and the connecting manhole;
c. Pipe size and invert or top levels of existing or proposed sewer or pumping main, and the setback distance from building or structures;
d. Reinforced concrete trench with removable slabs (with width and depth dimension); and
e. Pump sump, sewage ejector tank, holding tank or sewage treatment plant.
f. Building height;
g. Sewer setback from building or structures; horizontal and vertical clearance distances between the building or structure/substructure and the sewers or pumping mains
h. Headroom for overhanging structures or roof eaves above existing or proposed sewer or pumping main; and
i. Proposed ramp, boundary fence or walls;
j. Potable water tank
k. Height of stack terminated on roof/roof garden

7. Detailed Plan on Sewerage M&E Works

7.1. Electrical Floor Plan View

In specific, the electrical drawings must be endorsed by LEW/ Electrical QP and shall include the following:

a. Electrical Single Line Diagram;
b. Electrical Control Schematic Diagram;
c. Electrical Panel Diagram;
d. Float Switches or Electrodes Level Arrangement Diagram and the description of their operations; and
e. Statement of declaration by the LEW / Electrical QP.

7.2. Mechanical Floor Plan and Section View

In specific, the mechanical floor plan and sectional view must be endorsed by Mechanical QP and shall show the following:

a. Dimension, size and material used for the equipments;
b. Pipe material and size;
c. Discharge point of the pump system;
d. Make and model of pump;
e. Centre line of RSJ (lifting equipment);
f. Ventilation system;
g. Indicate the end point of vent pipe connection;
h. Indicate the inflow pipe;
i. Location of control panel;
j. Kerb round the pit opening (if the pump system is not in a room);
k. Detail calculation for the sizing of the pumps with catalogue and pump curve; and
l. Statement of declaration by the Mechanical QP.

8. Detailed Plan on Drainage Works – Main Development Submission

8.1. Site Plan View

In specific, all location plan and site plan of drainage works for main development submission shall show the following:

8.1.1. Location Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings and MRT tracks, within 100m radius shall be shown.

8.1.2. Site Plan

Boundary of development site shall be edged in **RED**

a. Proposed platforms levels and road or ground levels at the outlet discharge point of the internal drains;
b. Drainage reserves and common drains, which shall also be dimensioned;
c. Lots or plot number of development;
d. The alignment, type, size and flow direction of the existing roadside drain or outlet drain adjacent to the development site and existing common drain, if any;
e. Internal drains incorporating flow direction and outlet discharge points connecting to the existing drains; and

f. If the development site is affected by common drain, the following requirements are to be endorsed on site plan:
    i. Surface runoff from the proposed site and all neighbouring lots shall continue to be allowed to discharge through the common drain within the premises; and
    ii. The owner shall be responsible for the maintenance of the common drain within their premises.

8.2. Floor Plan View

In specific, the basement and 1st storey floor plan of drainage works for main development submission shall show or indicate the following:

8.2.1. Basement Plan

a. Cut-off drains;
b. Crest level of entrances and openings comply with "Code of Practice on Surface Water Drainage" and to indicate on plan;
c. Pumped drainage system complies with "Code of Practice on Surface Water Drainage" to indicate on plan;
d. Proposed basement platform level, fronting and adjacent road levels of development;
e. Details of pumped drainage system shall be submitted separately for PUB C&W Department's record;
f. The areas in meter square (m^2) which are exposed to ingress of rainwater; and
g. Underground linkage to MRT Station or underground linkage to development having underground linkage to MRT Station.

8.2.2. First Storey Plan

a. Proposed platforms levels for all areas;
b. Drainage reserves which shall also be dimensioned;
c. Site boundary;
d. Road widening line and road levels;
e. Runoff from neighbouring lot and type, size of the common drain affected by the development;
f. Proposed or existing drainage provided for runoff from neighbouring lot;
g. Internal drains incorporating flow direction and outlet discharge points connecting to the external drains;

h. Outlets discharge points of the proposed or existing internal drains connecting to the existing or proposed drains; and
i. Threshold level for all entrances or openings to the basement or proposal linkage to underground MRT Station.

9. Detailed Plan on Drainage Works – Proposed Roadside Drain/ Culvert

9.1. Site Plan View

All location plan and site plan of drainage works for proposed roadside drain or culvert shall show or indicate the following:

9.1.1. Location Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings and MRT tracks, within 100m radius shall be shown.

9.1.2. Site Plan

Boundary of development site shall be edged **RED**.

a. Alignment and extent of proposed drain;
b. Highlight the proposed drain;
c. Summit point and direction of flow of proposed drain;
d. Width and type of proposed drain;
e. Road reserve or widening line or boundary line;
f. Drainage reserve lines with dimensions (if applicable);
g. Invert levels, top levels and road or ground levels;
h. Size and spacing of grating covers for closed drain; and
i. Drop inlet chambers and scupper drains.

9.2. Floor Plan View

In specific, the 1st storey floor plan of drainage works for proposed roadside drain or culvert shall show or indicate the following:

a. Alignment and extent of proposed drain;
b. Highlight the proposed drain;
c. Summit point and direction of flow of proposed drain;
d. Width and type of proposed drain;
e. Road reserve or widening line or boundary line;
f. Drainage reserve lines with dimensions (if applicable);
g. Invert levels, top levels and road or ground levels;
h. Size and spacing of grating covers for closed drain; and

i. Drop inlet chambers and scupper drains.

9.3. Cross Sectional View

In specific, the cross section of drainage works for proposed roadside drain or culvert shall show the following:

a. Boundary line or road reserve line and drainage reserve line, if applicable;
b. Clear width, minimum and maximum depth;
c. Type and size of Dry Weather Flow channel;
d. Type of safety railings, if applicable;
e. Thickness of walls, top and base slab;
f. Reinforced details and grade of concrete;
g. 300mm thick false bottom;
h. Weepholes, hardcore backing and geotextile;
i. Lean concrete and hardcore sub base;
j. Aluminum rungs, if applicable;
k. Cross fall of benching;
l. Cross section of ramp within maintenance access, if applicable;
m. Steel posts and chains across maintenance access, if applicable; and
n. Details of box drain connections within drainage reserve, if applicable.

9.4. Longitudinal Section View

In specific, the longitudinal section of drainage works for proposed drain/ culvert shall show the following:

a. Existing and proposed invert levels;
b. Soffit, coping, ground and road levels;
c. Extent, size and type of proposed drain or culvert;
d. Gradient and direction of flow of proposed drain or culvert;
e. Clear depth and chainages; and
f. Size and type of existing drain at both ends of the proposed drain or culvert.

Slab Crossing Over Existing Drain shall show the following:

a. Cross section of proposed slab over drain;
b. Dimension clearance between cope of drain and soffit of slab;
c. Dimension clearance between pile cap or footing and drain-wall;
d. Endorsement on maintenance and removal of slab by owner as and when required by PUB;
e. Safety railings, if applicable;
f. Boundary line or road widening line;

g. Concrete paving on ground below the slab;
h. Cross fall of concrete paving; and
i. Show location of slab crossing on site or 1st storey plan.

10. As-built Plan for TOP/CSC – Proposed Sewer/ Pumping Mains/ Sewer/ Pumping Main Diversion Works/abandoned sewers and pumping mains/grouting of abandoned sewers and pumping mains/Sewage treatment plant/holding tanks, etc

10.1. Site Plan View

In specific, all key plan and site plan of TOP/CSC sewer or pumping mains or sewer or pumping main diversion works with deviations shall show the following:

10.1.1. Key Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings within 1km radius shall be shown.

10.1.2. Site Plan

Layout of the site with boundary lines verged in **RED**.

a. New or existing sewer or pumping main or diversion, and their setback distance from building or structures or Drainage Reserve or neighbouring lot;
b. Sewer and Manhole ID for existing sewer/pumping main;
c. Reinforced concrete trench with removable slabs (*annotated on the plan*) for existing or proposed sewer under building or structures or with insufficient setback from building or structures;
d. Invert and top levels of all the manholes including the connecting manhole(s);
e. Abandoned sewers/pumping mains and grouted abandoned sewers/pumping mains;
f. Provision of pump sump or holding tank or sewage treatment plant;
g. Temporary Benchmark (TBM);
h. Party maintaining; and
i. Grid coordinates on the SVY21 datum (Nothing and Easting) of manholes.

10.2. First Storey Floor Plan View

In specific, the 1st storey floor plan of TOP/CSC sewer or pumping mains or sewer or pumping main diversion works with deviations shall show the following:

a. New or existing sewer or pumping main or diversion, and their setback distance from building or structures or Drainage Reserve or adjacent lot;
b. Sewer and Manhole ID for existing sewer/pumping main;
c. Reinforced concrete trench with removable slabs (*annotated on the plan with width and length dimension*) for existing or new sewer under building or structures or with insufficient setback from building or structures;
d. Pipe sizes, gradients, materials, invert and top levels of all the manholes including the connecting manhole(s);
e. Abandoned sewers/pumping mains and grouted abandoned sewers/pumping mains;
f. Provision of pump sump or holding tank or sewage treatment plant;
g. Temporary Benchmark (TBM);
h. New ramp, boundary fence or walls; and
i. Grid coordinates on the SVY21 datum (Nothing and Easting) of manholes.

10.3. Elevation View

In specific, the elevation view of TOP/CSC sewer or pumping mains or sewer or pumping main diversion works with deviations shall show the following:

a. Headroom for overhanging structures or roof eaves above existing or proposed sewer or pumping main;
b. Existing or New Sewer or pumping mains setback distance from building or structures;
c. Reinforced concrete trench with removable slabs (*annotated on the plan with width and depth dimension*) for existing or new sewer under building or structures or with insufficient setback from building or structures;
d. Pipe sizes, invert and top levels of all the manholes including the connecting manhole(s);
e. Building height;
f. New boundary fence or walls; and
g. Pump sump or holding tank or sewage treatment plant.

10.4. Longitudinal Section View

In specific, the longitudinal section view of TOP/CSC sewer or pumping mains or sewer or pumping main diversion works with deviations shall show the following:

a. All existing or new manholes and sewers or pumping mains, pipe sizes, material, pipe depth, gradient and platform levels, invert levels of tumbling bay or backdrop connections to manholes;
b. Pipe haunching/bedding details and type of foundation;
c. Method of construction (jacking, open cut, etc); and
d. Headroom clearance of overhanging or overhead structures.
e. Horizontal and vertical clearance distances of underground services or structures from the sewers or pumping mains

Note: *Legend for sewers or pumping mains or drainlines as follows.*

Colour	Usage
Magenta	Deviations (Compared to Building Plan)
Cyan	Existing (Compared to Building Plan)
Yellow	Demolished or Abandoned sewers or drainlines (Compared to Building Plan)

11. As-built Plan for TOP/CSC – Sanitary Works (Sanitary Plumbing & Drainage System/ Sewer Connection)

11.1. Site Plan View

In specific, all key plan and site plan of TOP/CSC sanitary works with deviations shall show the following:

11.1.1. Key Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings within 1km radius shall be shown.

11.1.2. Site Plan

Layout of the site with boundary lines verged in **RED**.

a. Outline of building or structure
b. Sewer connection and its pipe size, material, the invert and top levels of last inspection chambers and the connecting manhole;
c. Existing sewer or pumping main and their setback distance from building or structures; pipe sizes, invert and top levels of manholes including the connecting manholes;
d. Sewer and Manhole ID for existing sewer/pumping main;
e. Abandoned sewers/pumping mains;
f. Reinforced concrete trench with removable slabs (*annotated on the plan*) for existing or proposed sewer under building or

structures or with insufficient setback from building or structures;

g. New sewer or diversion and their setback from building or structure, adjacent lot, Drainage Reserve, and Road Reserve;
h. Provision of pump sump or holding tank or sewage treatment plant; and
i. Party maintaining.

11.2. Floor Plan View

In specific, the basement, 1st storey and higher storey floor plan of TOP/CSC sanitary works with deviations shall show the following:

11.2.1. Basement Plan

a. All sanitary appliances or fittings and internal sanitary plumbing and drainage system connected to the 1st storey inspection chambers or the sewerage system;
b. Pipe sizes, gradients, materials, invert and top levels of the sumps/chambers and inspection chambers;
c. Toilets/sanitary facilities, refuse chute chambers, car washing bays and garage gully;
d. Sewerage pumping system;
e. Platform levels;
f. Eating establishments/food shops and its kitchen or food preparation areas and grease trap or sewage divertor, if any;
g. Potable water tank (if any), and
h. Overhead sanitary pipes in food shops' kitchens or potable water tank.

11.2.2. First Storey Plan

a. Platform levels
b. All sanitary plumbing and drainage system and their pipe size, gradients, materials within the premises connected to the sewerage system, sewer connection and its pipe size, the top and invert levels of all inspection chambers and the connecting manhole, invert levels of backdrop connection pipes to inspection chamber/manhole;
c. All sanitary appliances or fittings or sanitary plumbing system (soil and vent stacks) and their connection lines to inspection chambers;
d. Declaration of all pipe sizes and materials used for sanitary appliances (eg. discharge pipe, urinal pipe, vent pipe, discharge stack, etc);

e. Double floor slab (including access opening) for sanitary pipes sited over bedroom, living room, dining room and kitchen area;
f. Sanitary facilities or toilets; refuse chutes/bin centres and washing areas.
g. All existing or new sewers, diversion sewers or pumping mains and their sizes, gradients, and setback distances from building or structures; Invert and top levels of all the manholes including the connecting manhole(s); Adjacent lots and sewer/sanitary connection lines from adjacent lots, Drainage Reserve and Road Reserve
h. Sewer and Manhole ID for existing sewer / pumping main;
i. Reinforced concrete trench with removable slabs (*annotated on the plan with width and length dimension*) for existing or proposed sewer under building or structures or with insufficient setback from building or structures;
j. Eating establishments/food shops and its kitchen or food preparation areas and grease trap or sewage divertor, if any;
k. Potable water tank;
l. Overhead sanitary pipes in food shops' kitchens or potable water tank;
m. Provision of pump sump or holding tank or sewage treatment plant;
n. New ramp, boundary fence or walls;
o. Length of branch drainline to the Inspection Chamber

11.2.3. Second Storey to Highest Storey Plan

a. All sanitary appliances and fittings, soil and vent stacks and sanitary plumbing and drainage system connected to the inspection chambers and sewerage system at 1st storey;
b. Double floor slab (including access opening) for sanitary pipes sited over bedroom, living room, dining room and kitchen area;
c. Sanitary facilities or toilets, washing areas;
d. Eating establishments/food shops and its kitchen or food preparation areas and grease trap, if any;
e. Overhead sanitary pipes in food shops' kitchens or potable water tank; and
f. Length of WC's discharge pipe to the discharge stack

11.3. Roof Plan View

In specific, the roof plan of TOP/CSC sanitary works with deviations shall show the following:

a. Sanitary pipes and potable water tank; and

b. Termination of Vent stacks, roof garden and window openings of penthouse units (with dimension from the vent stack to the opening of window).

11.4. Schematic Diagram for Sanitary Plumbing and Drainage system.

In specific, the schematic diagram of TOP/CSC sanitary works with deviations shall show all the sanitary plumbing and drainage system in the premises.

11.5. Elevation View

In specific, the elevation view of TOP/CSC sanitary works with deviation shall show the following:

a. All sanitary appliances or fittings, soil and vent stacks and the sanitary plumbing and drainage system within the premises connected to the sewerage system;
b. Double floor slab for sanitary pipes sited over bedroom, living room, dining room and kitchen area;
c. Sewer connection and its pipe size, the last inspection chamber and the connecting manhole;
d. Platform levels;
e. Existing or Proposed sewer or pumping main, pipe sizes, gradients, and horizontal and vertical clearance distances between the building or structure/substructure and the sewers or pumping mains
f. Building height; headroom for overhanging structures or roof eaves above existing or proposed sewer or pumping main;
g. Reinforced concrete trench with removable slabs;
h. Pump sump or holding tank or sewage treatment plant;
i. Proposed ramp, boundary fence or walls;
j. Potable water tank (if any); and
k. Height of vertical stack terminated on roof / roof garden

11.6. Summary tables indicating the numbers of the sanitary appliances (water closets, urinals, bidets and slop sinks) installed at each units in the premises or lots of the development

Note: *Legend for sewers or pumping mains or drainlines as follows.*

Colour	Usage
Magenta	Deviations (Compared to Building Plan)
Cyan	Existing (Compared to Building Plan)
Yellow	Demolished or Abandoned sewers or drainlines (Compared to Building Plan)

12. As-built Plan for CSC – Proposed Roadside Drain/ Culvert

12.1. Site Plan View

In specific, the location and site plan of CSC proposed roadside drain or culvert shall show or indicate the following:

12.1.1. Location Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings and MRT tracks, within 100m radius shall be shown.

12.1.2. Site Plan

Boundary of development site shall be edged **RED**.

a. Alignment and extent of proposed drain;
b. Highlight the proposed drain;
c. Summit point and direction of flow of proposed drain;
d. Width and type of proposed drain;
e. Road reserve or widening line or boundary line;
f. Drainage reserve lines with dimensions (if applicable);
g. Invert levels, top levels and road or ground levels;
h. Size and spacing of grating covers for closed drain; and
i. Drop inlet chambers and scupper drains.

12.2. First Storey Floor Plan View

In specific, the 1st storey floor plan of CSC proposed roadside drain or culvert shall show or indicate the following:

a. Alignment and extent of proposed drain;
b. Highlight the proposed drain;
c. Summit point and direction of flow of proposed drain;
d. Width and type of proposed drain;
e. Road reserve or widening line or boundary line;
f. Drainage reserve lines with dimensions (if applicable);
g. Invert levels, top levels and road or ground levels;
h. Size and spacing of grating covers for closed drain; and
i. Drop inlet chambers and scupper drains.

12.3. Cross Sectional View

In specific, the cross section of CSC proposed roadside drain or culvert shall show the following:

a. Boundary line or road reserve line and drainage reserve line, if applicable;
b. Clear width, minimum and maximum depth;
c. Type and size of Dry Weather Flow channel;
d. Type of safety railings, if applicable;
e. Thickness of walls, top and base slab;
f. Reinforced details and grade of concrete;
g. 300mm thick false bottom;
h. Weepholes, hardcore backing and geotextile;
i. Lean concrete and hardcore sub base;
j. Aluminium rungs, if applicable;
k. Cross fall of benching;
l. Cross section of ramp within maintenance access, if applicable;
m. Steel posts and chains across maintenance access, if applicable; and
n. Details of box drain connections within drainage reserve, if applicable.

12.4. Longitudinal Section View

In specific, the longitudinal section of CSC proposed roadside drain or culvert shall show the following:

a. Existing and proposed invert levels;
b. Soffit, coping, ground and road levels;
c. Extent, size and type of proposed drain or culvert;
d. Gradient and direction of flow of proposed drain or culvert;
e. Clear depth and chainages; and
f. Size and type of existing drain at both ends of the proposed drain or culvert.

Note: *Legend for proposed roadside or culvert as follows:*

Colour	Usage
Magenta	Deviations (Compared to Building Plan)
Cyan	Existing (Compared to Building Plan)
Yellow	Demolished or Abandoned sewers or drainlines (Compared to Building Plan)

13. As-built Plan for CSC – Pumped Drainage System at Basement

13.1. Floor Plan View

In specific, the basement and 1st storey plan of CSC pumped drainage system shall show or indicate the following:

13.1.1. Basement Plan

a. Storm water pump, storm water storage tank; and
b. Pipeline running from basement to outlet at 1st storey surface drain.

13.1.2. First Storey Plan

a. Pipeline running from basement to outlet at 1st storey surface drain.

13.2. Elevation View

In specific, the elevation view of CSC pumped drainage system shall show the following:

a. Storm water pump, storm water storage tank; and
b. Pipeline running from basement to outlet at 1st storey surface drain.

Note: *Legend for proposed roadside or culvert as follows:*

Colour	Usage
Magenta	Deviations (Compared to Building Plan)
Cyan	Existing (Compared to Building Plan)
Yellow	Demolished or Abandoned sewers or drainlines (Compared to Building Plan)

14. As-built Plan for CSC – Internal Drain with Deviations

14.1. Site Plan View

In specific, the location and site plan of CSC internal drain with deviations shall show or indicate the following:

14.1.1. Location Plan

a. Boundary of development site shall be edged **RED**; and
b. Outline of neighbouring development plots or buildings and MRT tracks, within 100m radius shall be shown.

14.1.2. Site Plan

a. Internal drain deviations from the approved plan.

14.2. Floor Plan View

In specific, the basement and 1st storey plan of CSC internal drain with deviations shall show or indicate the following:

14.2.1. Basement Plan

a. Internal drain deviations from the approved plan.

14.2.2. First Storey Plan

a. Internal drain deviations from the approved plan.

Note: *Legend for proposed roadside or culvert as follows:*

Colour	Usage
Magenta	Deviations (Compared to Building Plan)
Cyan	Existing (Compared to Building Plan)
Yellow	Demolished or Abandoned sewers or drainlines (Compared to Building Plan)

15. Certified Survey Plan for CSC – Development in the Vicinity of/ Affected by Drainage Reserve

15.1. Site Plan View

In specific, the site plan of certified CSC survey plan shall show or indicate the following:

a. Proposed structure or foundation which is less than 300mm away from the Drainage Reserve; and
b. Lots numbers of the drainage reserve, if affected.

15.2. Cross Section View

In specific, the cross section view of certified CSC survey plan shall show or indicate the followings.

a. Proposed structure or foundation which is less than 300mm away from the Drainage Reserve.

16. URA Approved Sub-division Plan for CSC – for Site Affected by Drainage Reserve

16.1. Site Plan View

In specific, the site plan of URA approved sub-division plan for CSC shall show or indicate the followings.

a. Sub-division Plan with separate lot number; and
b. Certified Survey Plan (CP) with separate lot number.

17. Other 2D Drawing File Format

Requested 2D drawing file format such as .dwg/.dgn and others for the particular views shall be submitted upon approval of the project.