

Section J - Joint Trenching

ES54 J0

Greenfield Design

J0-02 General Notes
J0-03 Agreement

ES54 J1

Greenfield Installations

J1-01 Public Corridor Layout
J1-02 Secondary Service Boxes
J1-03 Junction Boxes
J1-04 Transformer Pads

DESIGNED	RECOMMENDED	ACCEPTED	ENGINEER OF RECORD	JOINT TRENCHING GREENFIELD DESIGN TABLE OF CONTENTS	
 M. KELVIN	 L. STEVANOVIC	 F. DENNERT	 2017-02-15	PAGE 1 OF 1 ES54 J0-01 R 0	
DISTRIBUTION STANDARDS 			ISSUED: MAR 2016 REPLACES: N/A ORIGINALLY ISSUED: MAR 2016		

REVISIONS:

Scope

ES54 section J contains the requirements for shallow utilities in public corridors for “greenfield” developments. These requirements include the relative spacing and minimum clearances of the BC Hydro underground distribution system to other shallow utilities.

The scope of ES54 section J standards is limited to the installation of primary and secondary ducts, secondary service boxes, primary junction boxes, and transformer pads.

Application

ES54 section J standards contain typical details to form a design base of reference for joint trenching civil design and construction in public corridors. These standards are not mandatory and may not be applicable in all municipalities or jurisdictions. The designer is responsible for addressing unique locations and requirements of the authority having jurisdiction. If a project is not able to follow the typical joint trenching details contained in ES54 section J it shall be constructed to comply with other applicable sections of the BC Hydro ES54 civil standards.

The BC Hydro designer may apply section J standards for “brownfield” design and construction projects for the existing BC Hydro distribution system, subject to acceptance by the pertinent utility. In general, brownfield installations shall comply with all applicable ES54 civil standards.

Jurisdiction and Agreement

ES54 section J covers underground installations on public corridors shared by other shallow utilities, such as telephone, cable, and gas utilities. All utility installations in public corridors in greenfield construction shall comply with CSA 22.3 No. 7 *Underground systems* standards. Deviations from the CSA standards are allowed subject to the agreement of all signatory utilities, as per CSA 22.3 No. 7 section 6.1.

ES54 J0-03 contains a copy of the *Joint Trenching Requirements for Shallow Utilities Agreement* signed by the representatives of the shallow utilities, namely BC Hydro, FortisBC Gas, FortisBC Electrical, TELUS, Shaw Cable, and Eastlink. Although Eastlink did not sign the subject agreement, they participated in the preceding discussions and are party to the agreement. The agreement sets out the general requirements for joint trenching in greenfield construction. It shall be read in conjunction with the applicable utility standards and guidelines of the undersigned utilities.

The joint trenching agreement signed by shallow utilities does not cover the installation of deep utilities, such as water, drainage, and sewage. The horizontal clearance to deep utilities shall remain at 1000 mm according to CSA 22.3 No.7, or as varied by the local jurisdiction.

Public Corridor

The public corridor is the area serving the public located between private property lines, including roadways, lanes, sidewalks, boulevards, and the tree zone. ES54 J1-01 shows the relative spacing and burial depth of various utilities substantially in compliance with CSA 22.3 No. 7.

REVISIONS: R1 - REMOVED LOAD DUTY SELECTION TABLES. SEP 2021 CC

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BC Hydro Materials and Backfill

All underground ducting used by BC Hydro shall be CSA-certified PVC duct type DB2 or Sched40, according to CSA 22.2 No.211.1 and CSA 22.2 No.211.2. For further information on BC Hydro duct, and applicable material numbers for each component, duct spacers, and installation details, see ES54 section H.

BC Hydro has specific requirements for the type of backfill used and its classification. For further information see ES54 sections H and W.

Secondary Service Boxes

BC Hydro uses two types of secondary service boxes; round lightweight plastic and polymer concrete boxes, and precast concrete boxes. The lightweight plastic and polymer concrete boxes are round, relatively small, suitable for restricted spaces, and used for the supply of 120/240 V single-phase customers. See ES54 B0-02 for a summary of secondary service boxes based on load duty. For electrical equipment capacity and box selection criteria, see ES53 N3-01.

Joint trenching with other utilities around lightweight secondary boxes is relatively simple, as shown in ES54 J1-02, applicable for areas not accessible to traffic.

Joint trenching with other utilities around BC Hydro precast concrete boxes is more complicated, as shown in ES54 J1-03.

Medium Voltage Junction Boxes

ES54 B0-02 shows a selection summary for medium voltage splice and pull boxes based on load duty. For electrical equipment capacity and installation details, see ES53 section D.

For improved safety and operational efficiency, avoid roadway placement of lane duty vaults except for in lanes and parking areas.

As previously explained for the installation of secondary boxes, joint trenching with other utilities around BC Hydro precast junction boxes requires detailed placement, as shown in ES54 J1-03.

Transformer Pads

Precast concrete transformer pads are BC Hydro standard stock and vary in size and type depending on installation requirements and the size of the pad-mounted transformer.

Flat precast concrete pads are the preferred choice for level grade and areas having a low groundwater table. Each flat transformer pad has a duct window for duct termination and counterpoise connection, based on the specific duct layout.

Pyramid precast concrete pads are used for low-profile pad-mounted transformer (LPT) installation on sloping terrain, in high snowfall and freezing level areas, and in high groundwater table areas. See ES54 section F for more information on transformer pads and ground rod and counterpoise installation.

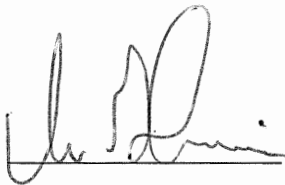
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Joint trenching with other utilities around BC Hydro precast transformer pads requires a detailed layout installation drawing, as shown in ES54 J1-04. To accommodate the installation of gas lines, BC Hydro requires the installation of 5" diameter PVC duct Sched40 below the counterpoise. Telephone and cable utilities install all their cables inside the PVC duct and do not require the installation of additional sleeves to run below the BC Hydro counterpoise.

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JOINT TRENCHING REQUIREMENTS FOR SHALLOW UTILITIES

NOVEMBER 2014



BC HYDRO REPRESENTATIVE

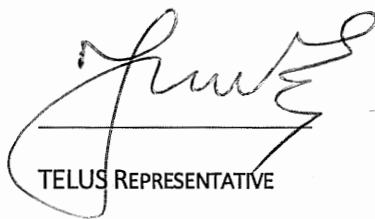
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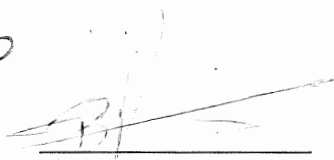
FORTISBC ELEC. REP.



FORTISBC GAS REP.



TELUS REPRESENTATIVE



SHAW CABLE REP.



EASTLINK REPRESENTATIVE

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DISTRIBUTION STANDARDS BC Hydro			ISSUED: MAR 2016 REPLACES: N/A ORIGINALLY ISSUED: MAR 2016	PAGE 1 OF 5	ES54 J0-03 .01 R 0

REVISIONS:

OVERVIEW

This document contains the design and installation requirements for utility pipe or duct within the same trench. It applies to new construction, customer build subdivisions where the intent is for the utility to take over ownership of the assets upon completion of the project. The above signed agree that this guide represents their minimum requirements for this class of customer.

This document is substantially based on rules and recommendations contained in CSA C22.3 No.7 Underground Systems. All deviations and variances from this standard have been agreed upon by the undersigned utilities.

In addition to the requirements by the undersigned utilities, all customer build installations for utility take over are subject to the requirements of the authorities having jurisdiction of the site. Moreover, all construction shall be carried out by the licensed contractors accredited by the applicable utility as well authority having jurisdiction, in good standing and having a valid operating permit.

This document sets out general requirements for joint trenching on customer build projects and shall be read in conjunction with applicable utility standards or guidelines of the undersigned utilities for the purpose of detailed design, construction work and equipment installation. The design and construction group shall follow all applicable design, construction and asbuilt procedures not mentioned in this document as required by each utility.

For further information, please contact the following persons:

BC Hydro: Mark Kelvin, 778-452-6844

FortisBC Gas: Matt Yasinchuk, 604-293-8545

FortisBC Elec.: David Walden, 250-469-8069

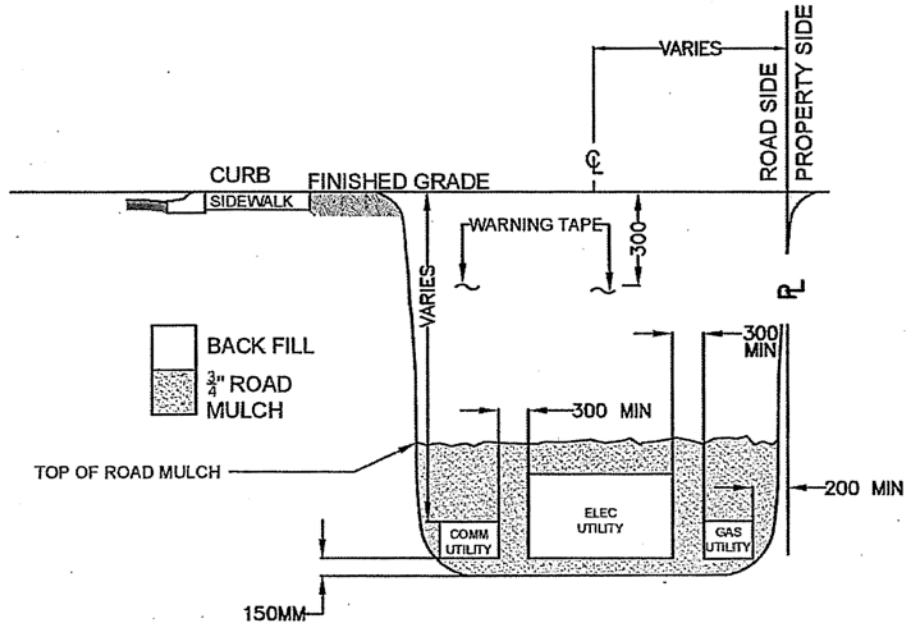
TELUS: Valeriu Juverdeanu, 604-453-2405

Shaw Cable: Bill Peyton, 250-979-6566

Eastlink: _____

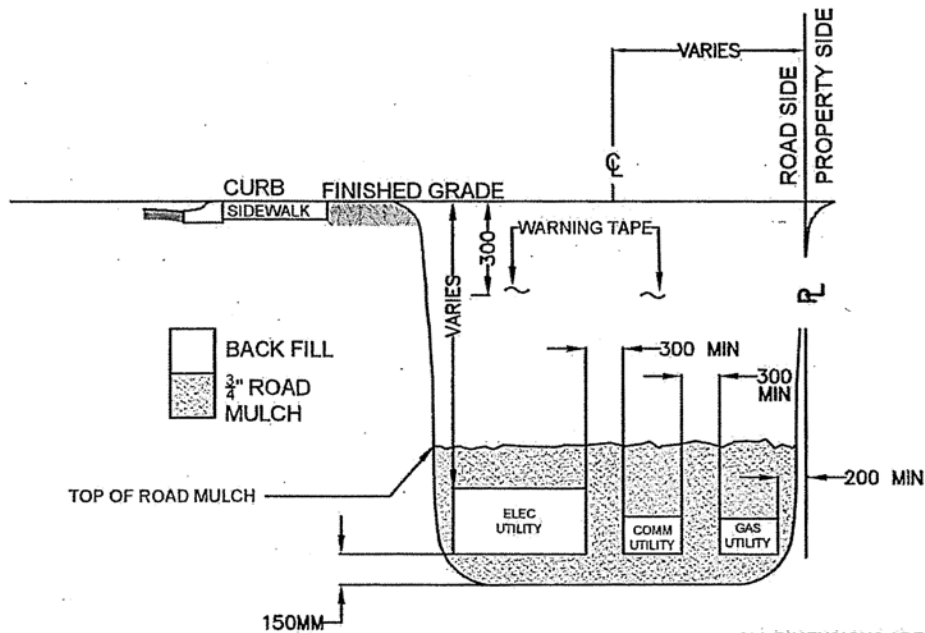
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JOINT TRENCH MAINLINE DETAIL (FORTISBC ELECTRIC SERVICE TERRITORY)



- ALL DIMENSIONS ARE IN MM
- SIZE AND QUANTITY OF PIPES
ARE DEFINED IN THE DESIGN PACKAGE

JOINT TRENCH MAINLINE DETAIL (BC HYDRO SERVICE TERRITORY)



- ALL DIMENSIONS ARE IN MM
- SIZE AND QUANTITY OF PIPES
ARE DEFINED IN THE DESIGN PACKAGE

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	Ⓟ BC Hydro							

1. GENERAL

- 1.1. No shallow utilities should extend under road surface except at road crossings.
- 1.2. No shallow utilities should extend into private property without a statutory right of way (SRW).
- 1.3. Trench must be smooth and level to minimize mechanical stress on pipe/duct.
- 1.4. Removable spacers shall be used to control movement of pipe when backfilling. Spacers shall be removed after backfilling.
- 1.5. Pipe or duct crossings must be perpendicular.
- 1.6. Gas pipe shall not be installed under sidewalks
- 1.7. Warning tape shall be 300mm below finished grade to indicate electrical and communication facilities. Refer to the applicable utility standard for colour and material type.

2. DEPTH AND COVER

- 2.1. Trench depth is to be determined from finished grade.
- 2.2. Duct or pipe depth at crossings can be reduced by the separation distance specified in Section 4.
- 2.3. 150mm of road mulch shall surround the utility facilities unless noted otherwise.
- 2.4. Road mulch shall be Type 1, 20mm sieve per MMCD Section 31-05-17-2.7 Granular Pipe, Bedding and Surround Material.
- 2.5. 900mm shall be the gas pipe depth.
- 2.6. 900mm shall be the electrical duct depth. Variance to this is permitted with approval from the related utility.
- 2.7. 760mm shall be the minimum communication pipe depth.

3. MINIMUM HORIZONTAL SEPARATIONS

- 3.1. 200mm from property line to gas pipe
- 3.2. 300mm from electrical duct and ground rods to gas pipe (CSA C22.3 No.7).
- 3.3. 300mm from electrical duct to communication duct (CSA C22.3 No.7).
- 3.4. 300mm separation between communication companies.

4. MINIMUM VERTICAL SEPARATIONS AT CROSSINGS

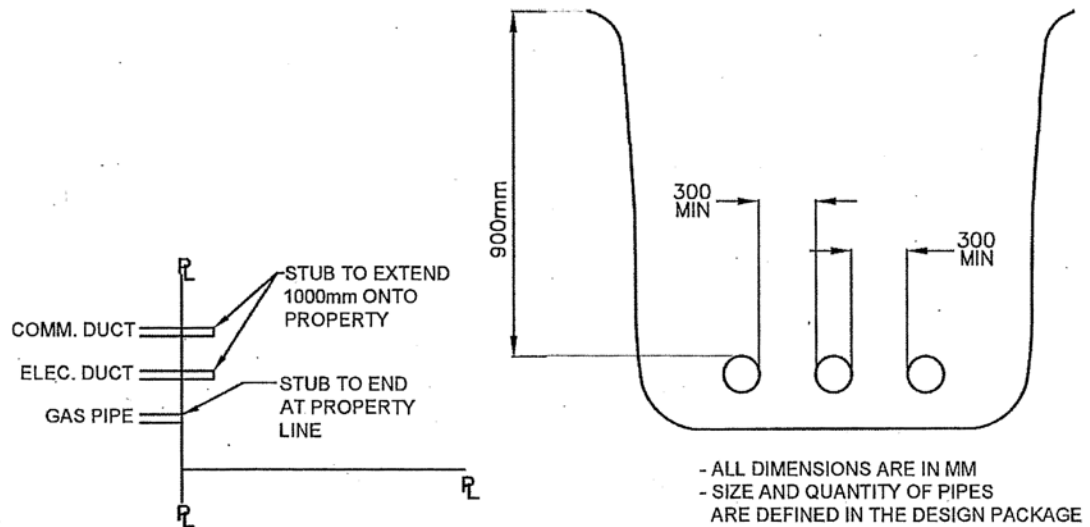
- 4.1. All crossings must have a spacer bag placed between facilities. The spacer bag shall be filled with road mulch and be thick enough to maintain 150mm separation. At crossings the depth of the affected facility may be reduced by the distance listed in 4.2, 4.3 & 4.4.
- 4.2. 150mm between communication and electrical ducts when crossing (CSA C22.3 No.7).
- 4.3. 150mm between gas pipe and communication duct when crossing.
- 4.4. 150mm between gas pipe and electrical duct when crossing.
- 4.5. Gas pipe shall cross above electric and communication duct.

5. ROAD CROSSING REQUIREMENTS

- 5.1. The following section outlines requirements for road crossings and shall be followed in addition to the requirements laid out in the previous sections.
- 5.2. Road crossings shall be perpendicular to the roadway.
- 5.3. Seal both ends of the pipe/duct before backfilling to prevent contaminants from entering the pipe/duct during construction.
- 5.4. Road mulch, as specified in section 2.4 of this document, shall be at least 300mm thick above the gas pipe when under a roadway.

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DETAIL OF SERVICE STUBS AT PROPERTY LINE FOR ALL SERVICE TERRITORIES

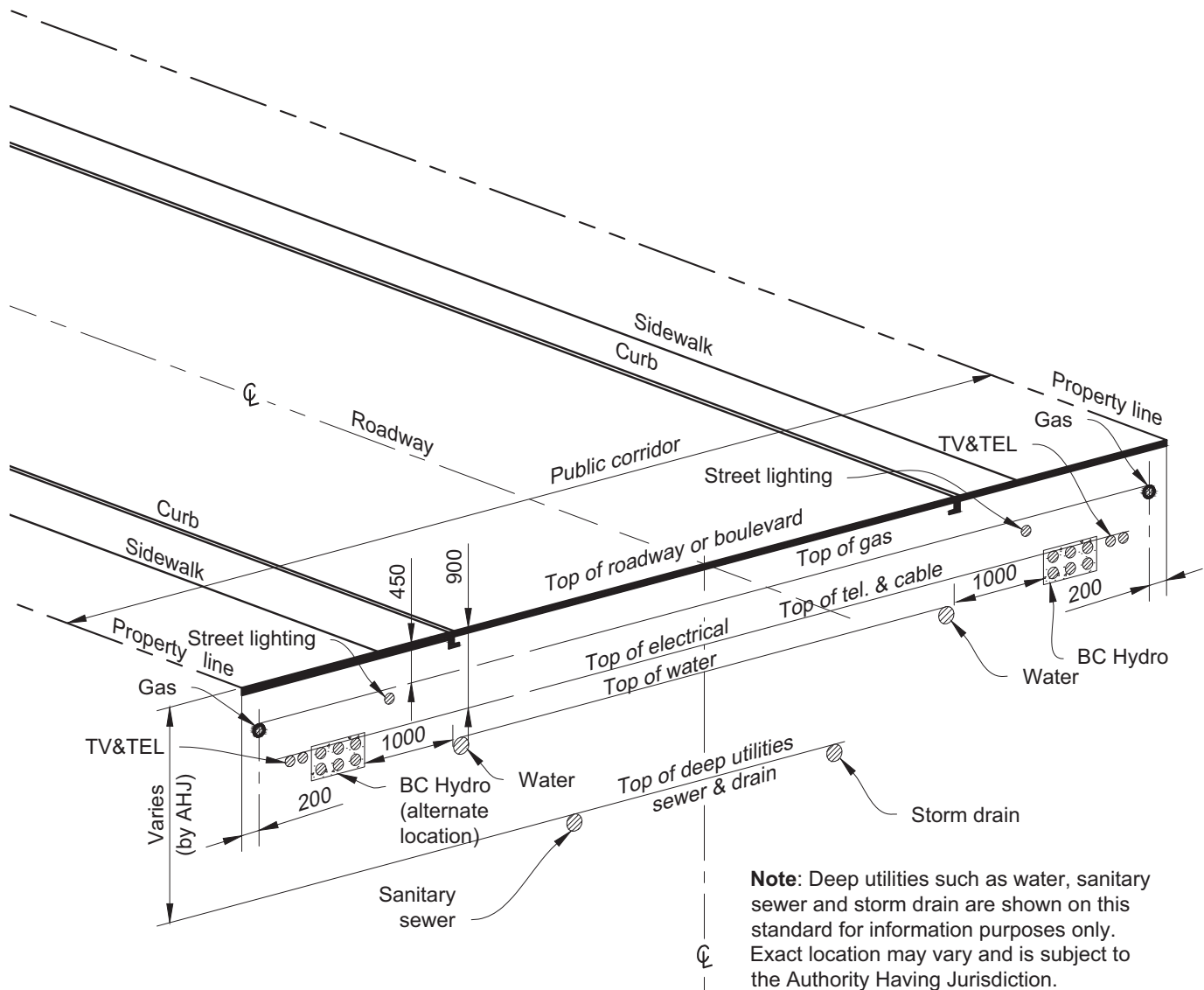


6. PROPERTY LINE SERVICE ENTRANCE

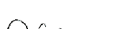
- 6.1. 900mm shall be the nominal depth of utility pipe/duct on customer property.
- 6.2. 900mm nominal depth may be reduced per section 4.1.
- 6.3. 300mm shall be the minimum distance between utility pipe/duct on customer property.
- 6.4. Electrical and communication duct shall stub 1000mm into the property.
- 6.5. Gas pipe shall stub at the property line.
- 6.6. Seal or terminate the pipe/duct stub as per the individual utility standards.

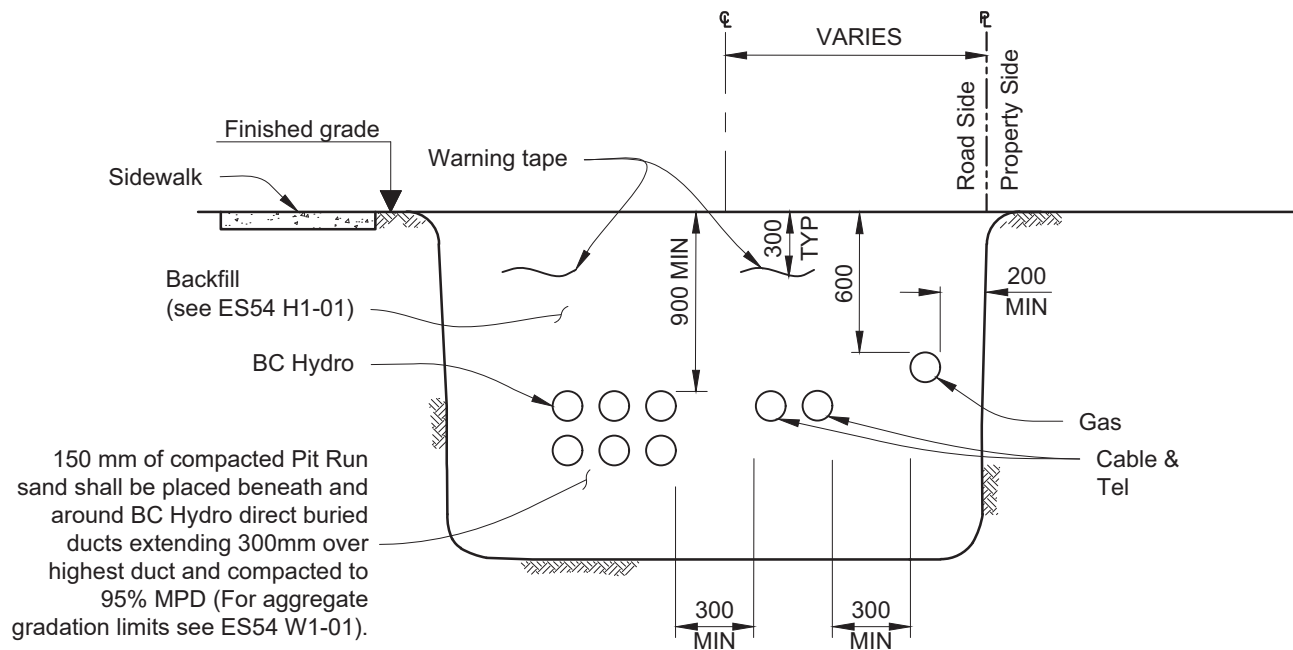
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REVISIONS: R1 - REMOVED STREET VIEW, ADDED JOINT TRENCH DETAIL, SEP 2021 CC



Joint Trenching Spatial Diagram

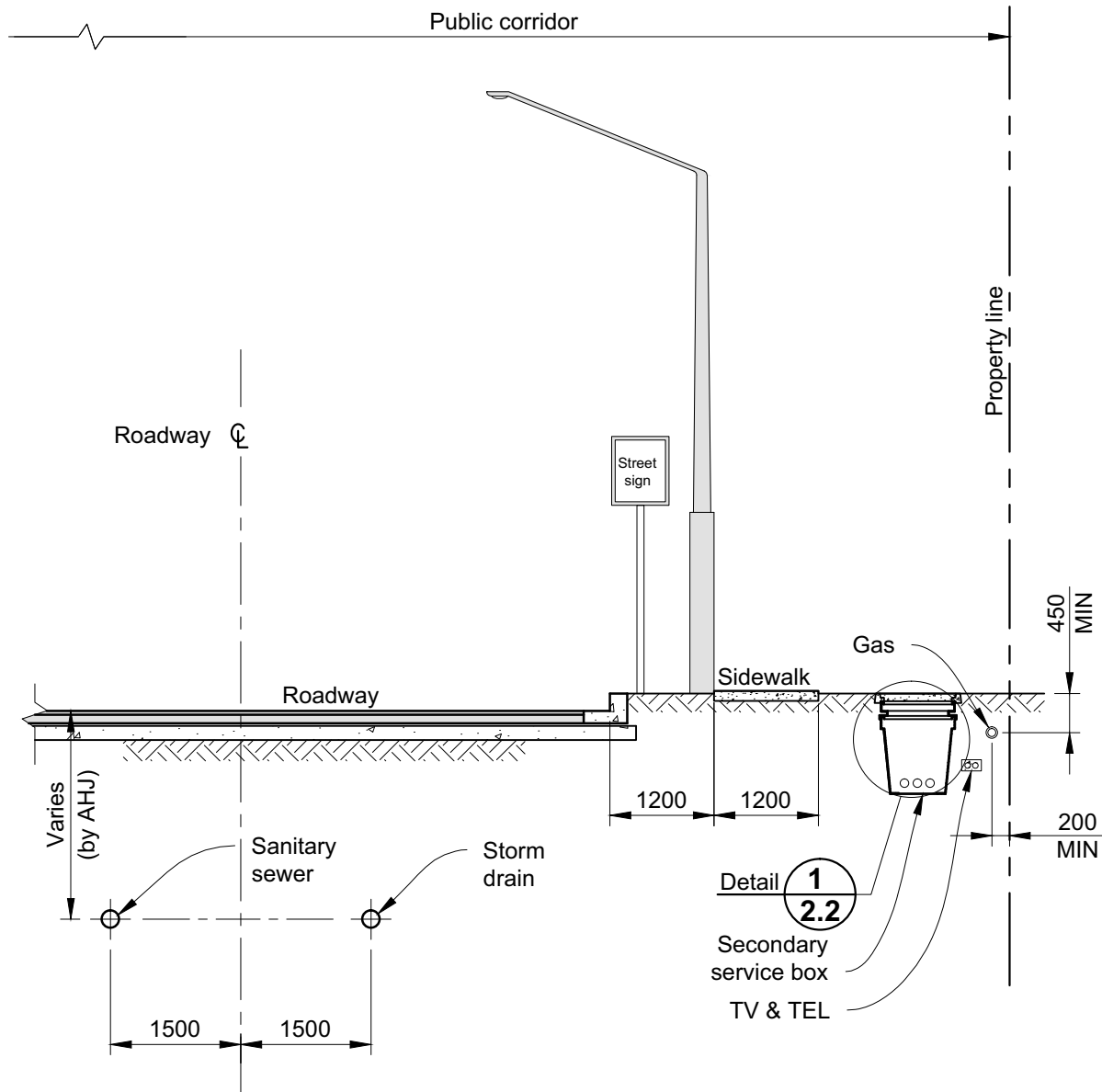
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DISTRIBUTION STANDARDS  BC Hydro		ISSUED: SEP 2021 REPLACES: MAR 2016 ORIGINALLY ISSUED: MAR 2016		PAGE 1 OF 2	ES54 J1-01.01	R 1



Shallow Utilities Joint Trench Direct Buried

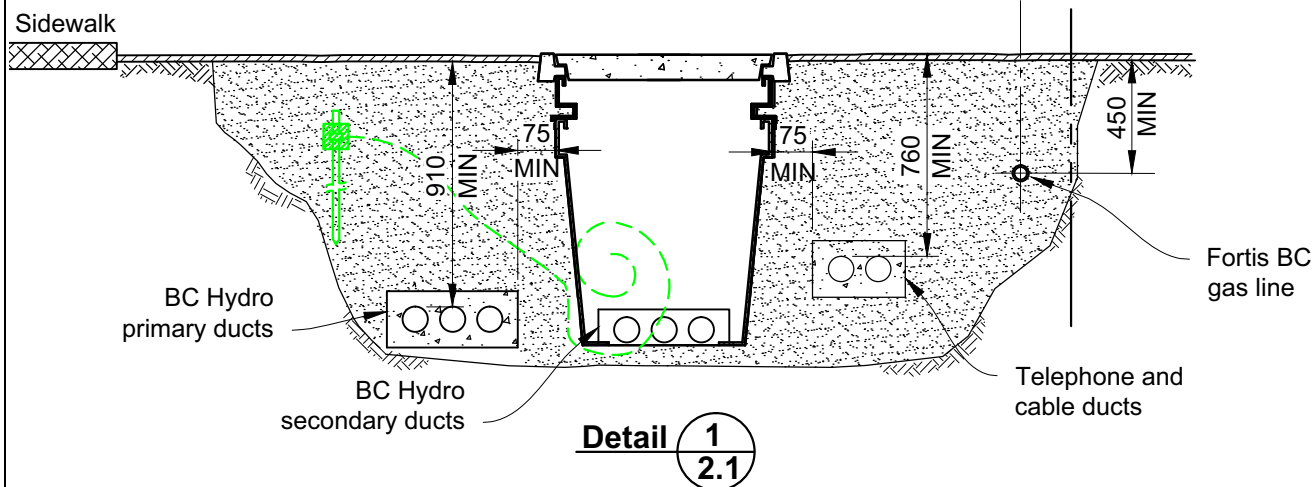
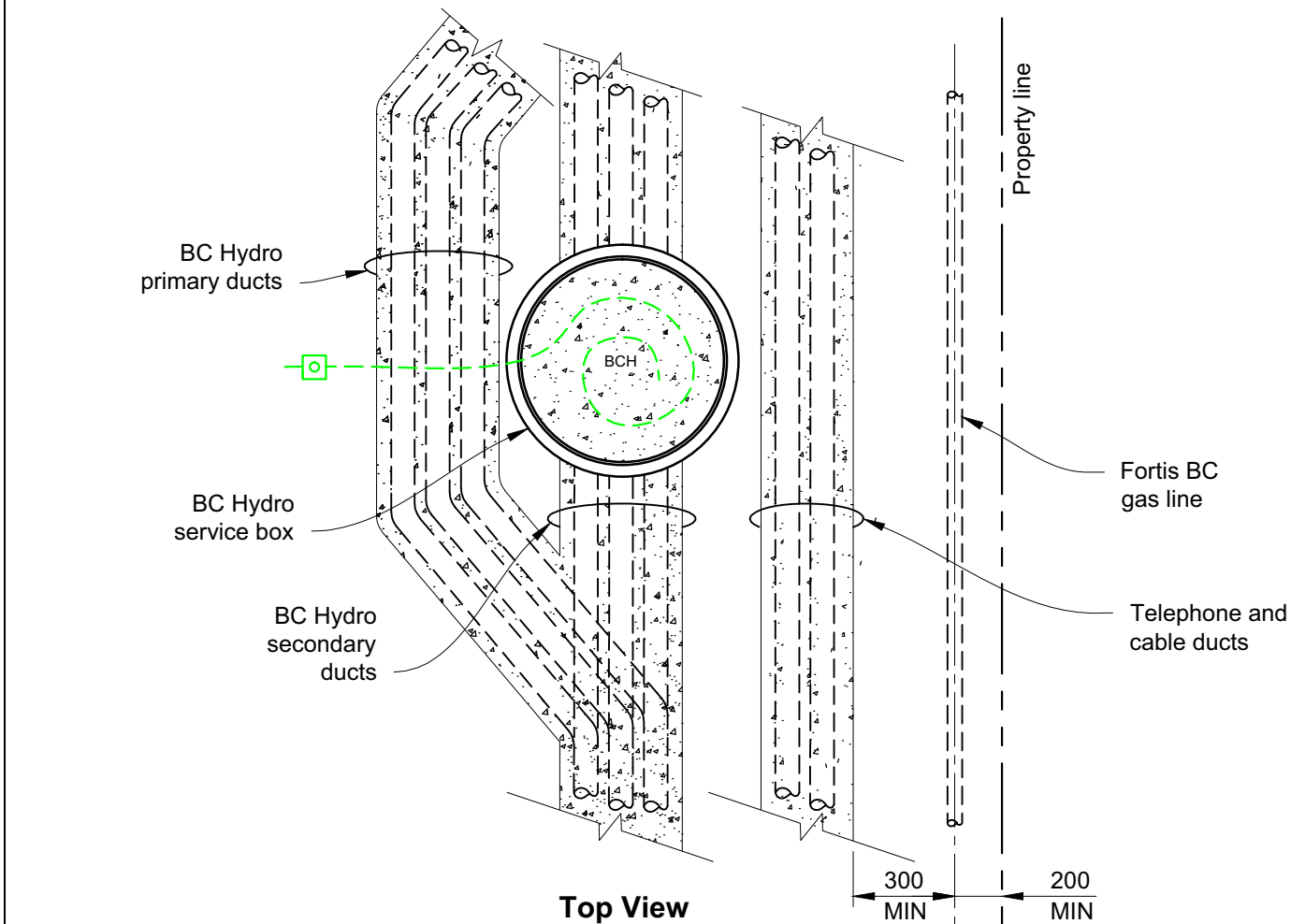
REVISIONS: R1 - REMOVED STREET VIEW, ADDED JOINT TRENCH DETAIL. SEP 2021 CC

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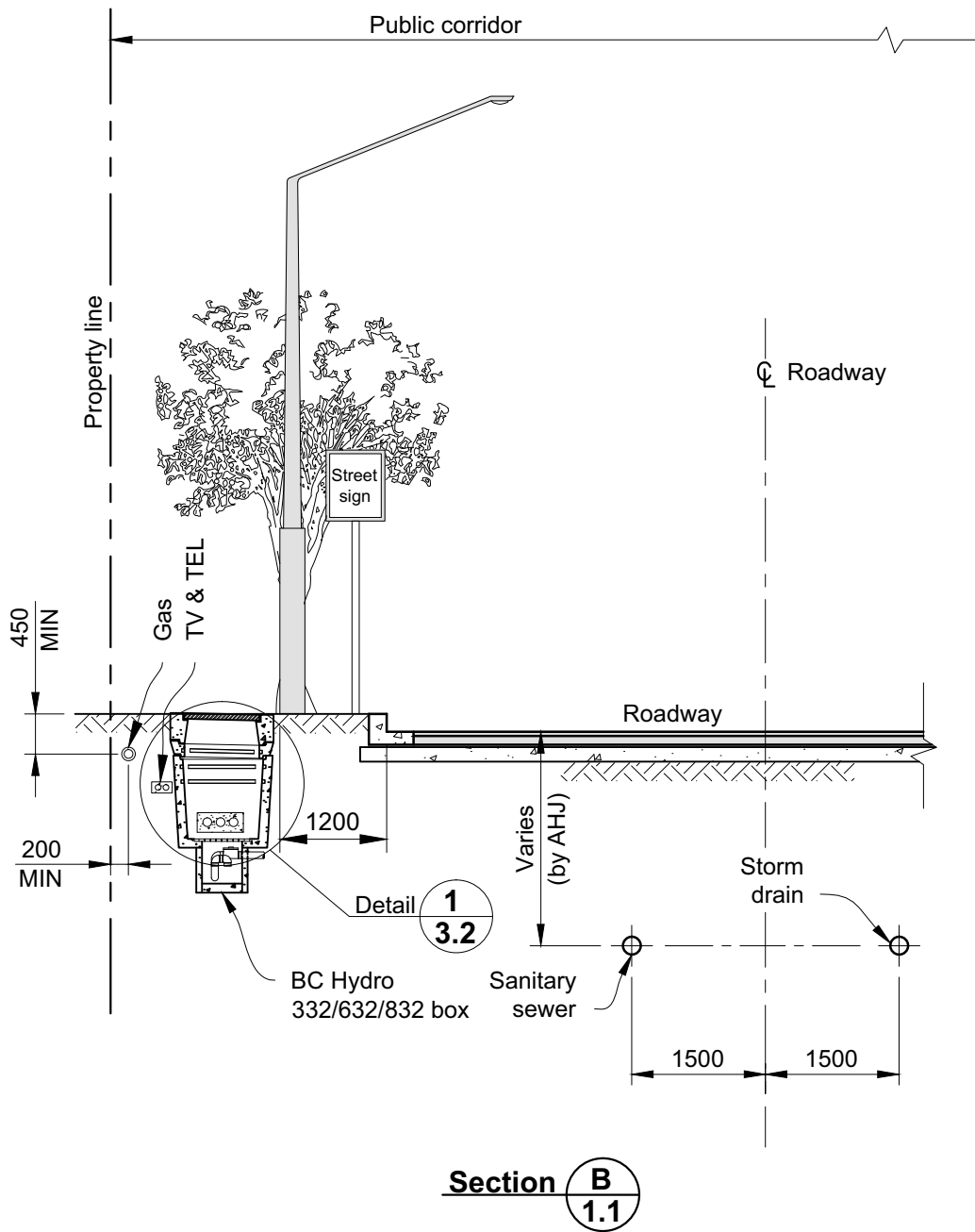
Section A
1.1

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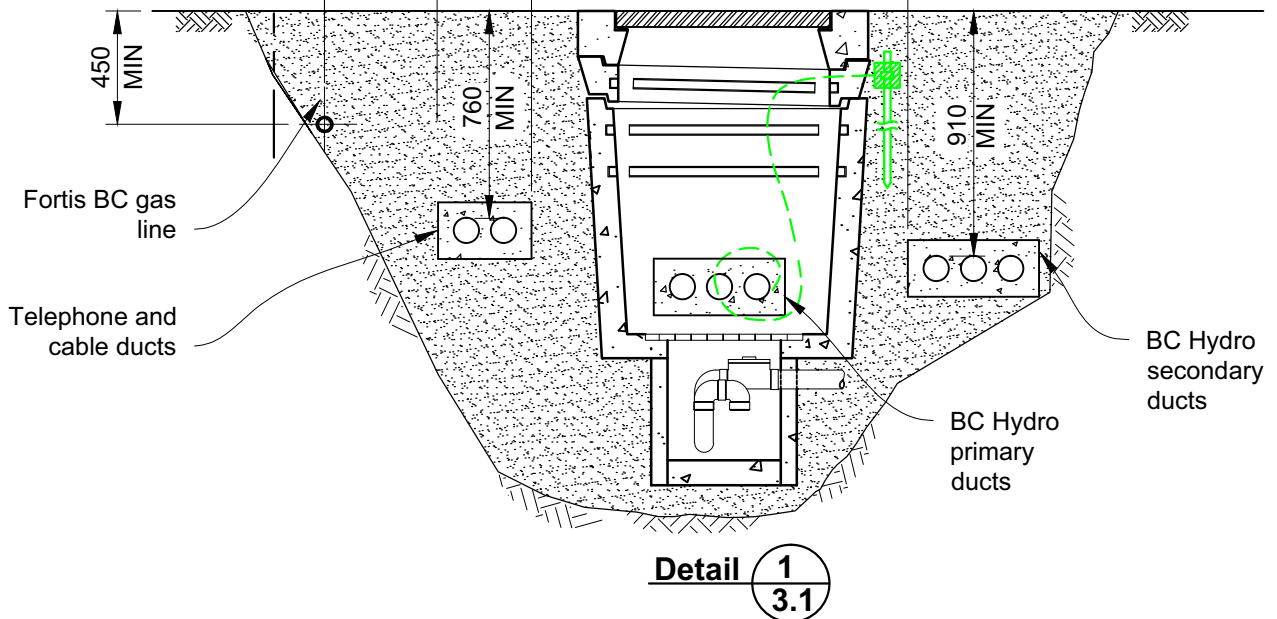
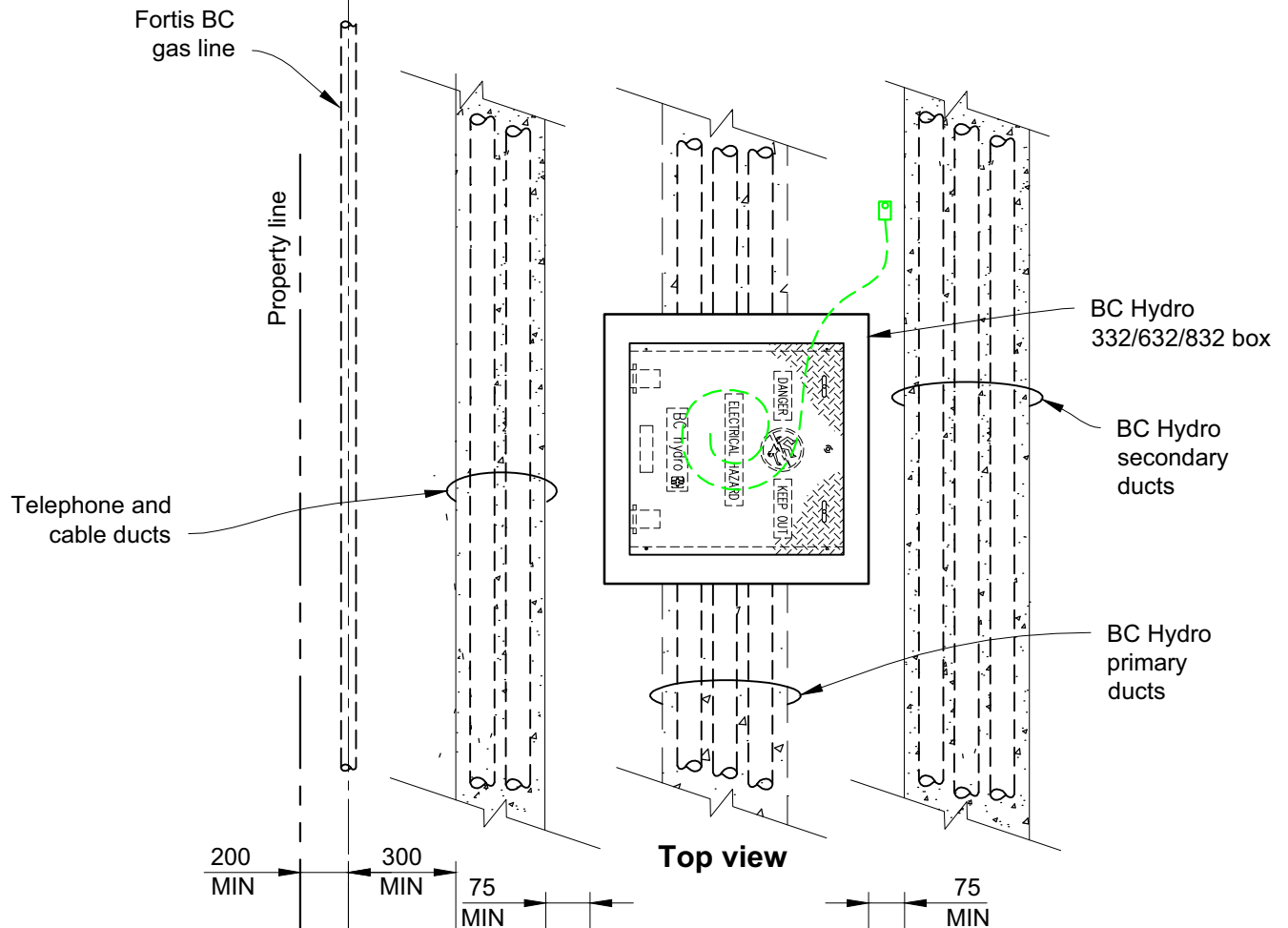


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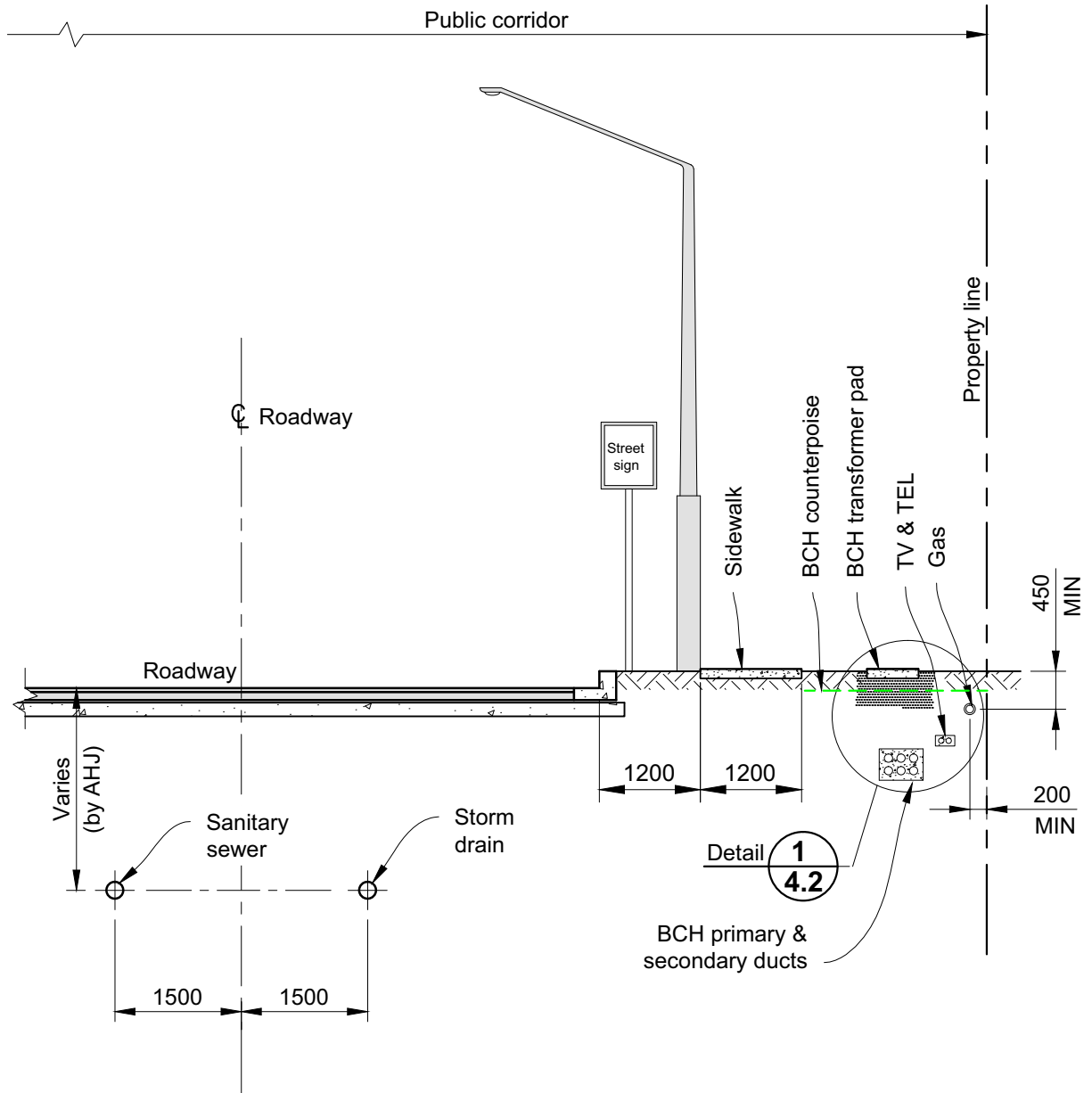
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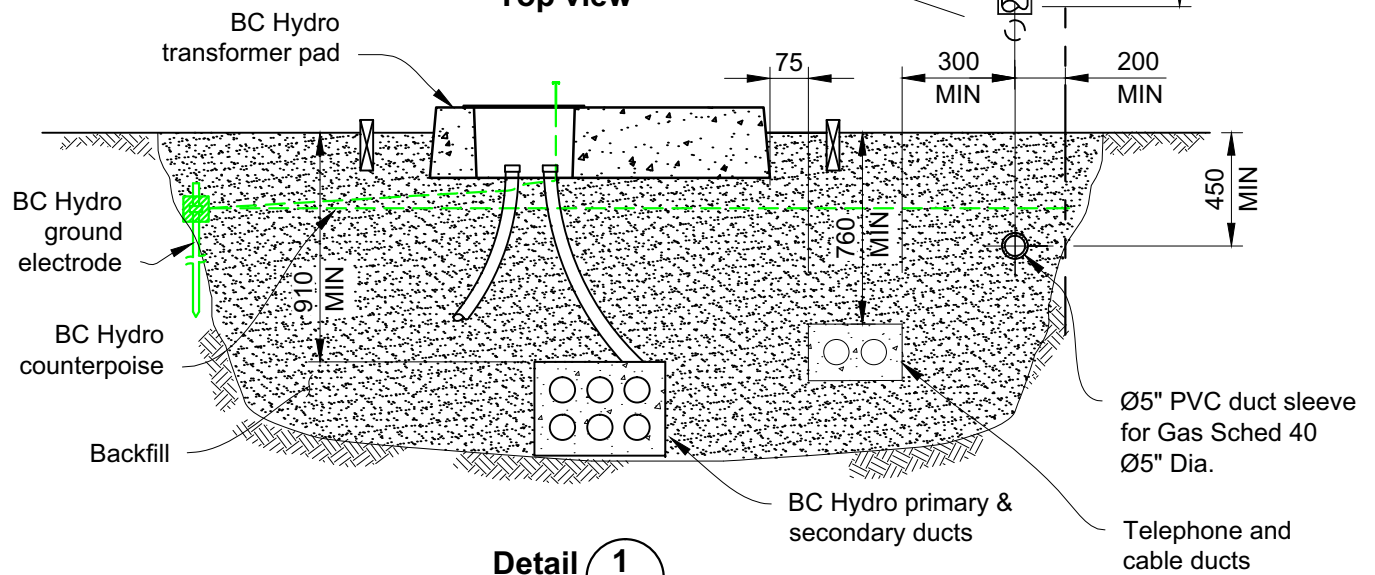
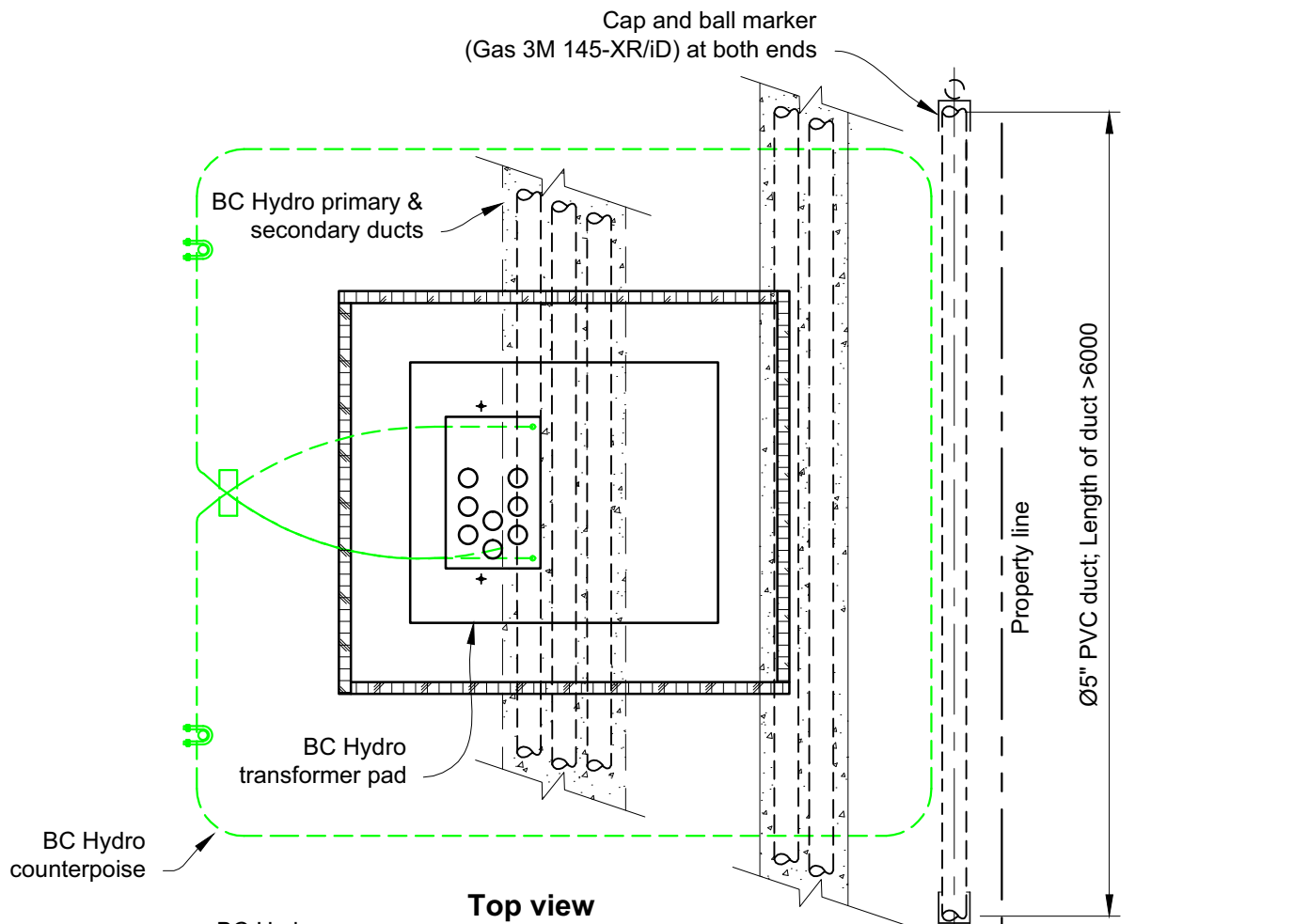


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Section C
1.1

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