

## Application

This standard describes requirements for customer-owned medium-voltage (primary) services for both live-front indoor and dead-front indoor configurations.

## Revision Notes

Edited note 22 for clarity. Added new notes 23 and 24. Removed neutral bus bar in Figure 4 and added revenue metering star point bus with removable bonding strap. Removed neutral bus bar in Figure 5. Removed neutral bus bar in Figure 6 and added more detail, including centre bus flag connection points and revenue metering star point bus. Removed neutral bus bar in Figure 8. Changes are marked by green vertical revision lines in the left margin. This revision released concurrently with Standards and Equipment Advisory Information Bulletin 2025-055 *Revised ES54 S3 Primary Services Private Property Installation Standards*.

## References

### BC Hydro Distribution Standards

|            |                                                          |
|------------|----------------------------------------------------------|
| ES54 S0-02 | Services General Notes                                   |
| ES54 S0-03 | Services General Notes Medium-Voltage (Primary) Services |
| ES54 S0-05 | Services General Notes Service Ducts and Trenches        |

### Other BC Hydro Documents

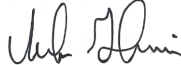
Requirements for Customer-Owned Primary Services Supplied at 4 kV to 35 kV – Primary Guide

### External Documents

|      |                                                                                                        |
|------|--------------------------------------------------------------------------------------------------------|
| BCEC | Canadian Electrical Code, Part I (CSA C22.1) adopted for BC and endorsed by Technical Safety BC (TSBC) |
|------|--------------------------------------------------------------------------------------------------------|

## Notes

- As the supply authority, BC Hydro restricts the point of connection location for underground indoor services. Locations within the customer's building shall meet the requirements of the Primary Guide section 3.4.
- Supply service cables installed with each phase in a separate duct shall be designed to prevent eddy current heating in ferrous components, including but not necessarily limited to ducts, attachments, and routing.
- The customer shall set BC Hydro cast iron marker plates (BC Hydro material no. 9601-7849) in the walls, floors, or ceilings to indicate the location of concrete-encased service ducts for high-voltage service supply cables, per BCEC Rule 36-100 (4).
- The customer shall install BC Hydro cable pulling irons (BC Hydro material no. 420-0916) as indicated, reinforced with 2-20M rebar, 1000 mm long, inside a minimum 300 mm-thick concrete wall or floor.
- The customer shall consult the BC Hydro designer for acceptance of mid-run pull boxes. Mid-run pull boxes shall be avoided wherever reasonably practicable and shall be subject to approval by the local field manager or delegate. The service connection shall be a continuous run from BC Hydro's system to the point of

|                                 |                                                                                     |                                                                                                                                                                   |                                                                                                                   |               |
|---------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------|
| Designed:<br>B. Linforth        |  | Professional of Record<br><br>2025-12-18<br><br><br>Permit to Practice 1002449 | Primary Services Indoor Switchgear<br>Private Property Installation                                               |               |
| Checked:<br>M. Kelvin, P. Eng   |  |                                                                                                                                                                   |                                                                                                                   |               |
| Reviewed:<br>M. Stevens, P. Eng |  | Issued: 2025-12-19<br>Effective: 2026-06-19                                                                                                                       | DISTRIBUTION<br>STANDARDS<br> | ES54 S3-03 R4 |
| Approved:<br>M. Stevens, P. Eng |  |                                                                                                                                                                   |                                                                                                                   |               |

connection, without any cable joints or other cable accessories installed on the customer's premises. Pull boxes shall not contain cable accessories. See the Primary Guide section 8.3.4 for other specific requirements.

6. 1500 mm of unobstructed access is required to all removable covers and doors of supply service equipment, including supply service mid-run pull boxes, removable cable guards, and supply authority and joint-access compartments.
7. Service duct shall be routed so supply service cables enter the BC Hydro pull pit from the top (top-entry). Alternate side-entry routing of service ducts may be allowed by the BC Hydro designer if approved by the BC Hydro local field manager or delegate. Requirements for alternate positioning of pulling irons, or for additional pulling irons to accommodate alternate side-entry, shall be determined by BC Hydro. If centreline height of side-entry service ducts is greater than 200 mm above the floor of the BC hydro pull pit, 1 $\frac{5}{8}$ " x 1 $\frac{5}{8}$ " c-channel shall be provided in the pull pit walls for BC Hydro installation of cable support and restraint accessories. The BC Hydro designer shall provide these specific requirements to the customer for inclusion in the design. These details shall be shown on the permit drawings.
8. A removable cable guard made of 6 mm thick aluminum shall be used for top entry into the BC Hydro pull pit to protect the supply service cables running vertically down the wall of the service vault. The cable guard may be designed in one or more sections, each with a mass not exceeding 18 kg. The cable guard shall be bolted in place and designed to allow safe and ergonomic removal by a maximum of two BC Hydro workers. The cable guard shall be completely removable using conventional trade tools. The cable guard shall be durably marked to indicate that it protects and covers high-voltage supply service cables and shall only be removed by BC Hydro (or the supply authority). Details shall be shown on the permit drawings.
9. BC Hydro pull pit checker plate covers shall be 6 mm thick aluminum with integral drop-down lifting handles. The maximum mass of removable panels shall be 18 kg and of hinged panels 36 kg. Minimum access with checker plates open or removed shall be 900 mm x 700 mm.
10. See the Primary Guide section 8.3.3 for additional BC Hydro pull pit requirements.
11. All supply authority areas and requirements constructed by the customer, including the BC Hydro pull pit, shall be designed and constructed to incorporate equipotential bonding for personnel safety and system reliability. This shall include all metallic accessories (e.g. pulling irons, c-channels, drain covers, guards). Grounding and bonding shall be engineered by the customer as part of the electrical service design to meet applicable BCEC requirements and intent.
12. Customers with building services located in high flood level areas may, in agreement with the BC Hydro designer, eliminate the cable pull pit located below the supply service cable compartment to avoid water accumulation inside the building. The customer shall install a BC Hydro standard mid-run pull box outside of the building for this type of service connection. For service ducts between this BC Hydro pull box and the service main:
  - a. Three-phase services using #1 AWG 25 kV or 4/0 AWG 25 kV supply service cables shall have a minimum of three service ducts, one for each supply service cable; or
  - b. Three-phase services using 500 kcmil 25 kV or 750 kcmil 25 kV supply service cables shall have a minimum of four service ducts, one for each supply service cable and one for the supply service neutral.The centre of each service duct shall be aligned directly underneath the contact surface of the corresponding service bus or service bushing due to elimination of the BC Hydro cable pull pit and resulting reduced cable training space within the utility service cable compartment. Failure to do so may prevent installation of the supply service cables by BC Hydro, incurring delays and requiring service duct reconfiguration by the customer. A service duct designated for the service neutral need not comply with this requirement. See ES54 S0-03 for minimum service duct well dimensions and for more information on pull box requirements.
13. Oil-filled and gas-filled equipment shall have a remote shunt-trip push button hardwired to the service main trip coil to immediately trip the service. The push button shall be located outside the service vault at a readily accessible location and shall be equipped with a staple and hasp for the installation of a BC Hydro padlock only (dual access not permitted).

14. The cable support channel shall be configurable by the installer in either of the two orientations shown in Detail 3 (Figure 7) and shall be reconfigurable to either of the options during future cable replacement or other work. The assembly shall be adjustable by a minimum of +15 mm inward and -75 mm outward when the front edge of the channel is aligned with the plane of the service bus bar connection surface or the service bushing contact surface.
15. The minimum clearance between adjacent high-voltage bus bars (service phase buses) for live-front configurations shall be 300 mm. The minimum clearance between a service phase bus and any adjacent grounded surface, including the compartment door when open or closed, shall be 225 mm. The grounding stud shall be considered part of the service phase bus it is attached to for the purpose of establishing minimum clearances. It shall be possible to fully close and secure the supply service cable compartment with safety working grounds installed.
16. See the Primary Guide section 9.1 for physical security requirements for mid-run pull boxes, supply service cable compartments, and switch compartments (where applicable).
17. See the Primary Guide for acceptable grounding ball studs.
18. See ES54 S0-02 and S0-03 for general notes related to medium-voltage (primary) services.
19. See ES54 S0-05 for trenching and service duct requirements.
20. Figures 1 through 7 show live-front service equipment. Both live-front and approved dead-front type equipment may be acceptable for indoor installations. See Figure 8 for specific dead-front requirements. See the Primary Guide for approved dead-front service equipment and other requirements. The illustrations of customer-owned dead-front equipment may resemble a specific manufacturer's equipment. They are intended to show typical equipment configuration and specify BC Hydro minimum requirements. Multiple dead-front service equipment designs have been evaluated and accepted by BC Hydro. The configuration of some acceptable service equipment may differ from what is shown in this standard, but all acceptable service equipment is considered functionally equivalent to BC Hydro. See the Primary Guide section 9.1.9 for a list of acceptable customer-owned dead-front primary service equipment.
21. All illustrations not to scale.
22. 2000 mm horizontal clearance is required between the centre of the closest supply service duct and the centre bus flag located in the supply service cable compartment. This clearance is not required for supply service ducts side entry into the cable pull pit.
23. The entrance to the supply service cable compartment from the cable pull pit shall remain clear and unobstructed for cable installation, alignment, and to hang freely to the floor. Floor slab or other structures shall not project more than 50 mm into the cable compartment base frame.
24. Revenue meter (RM in Figures 4 and 6) star point bus support insulators shall be a rated 600 V minimum.

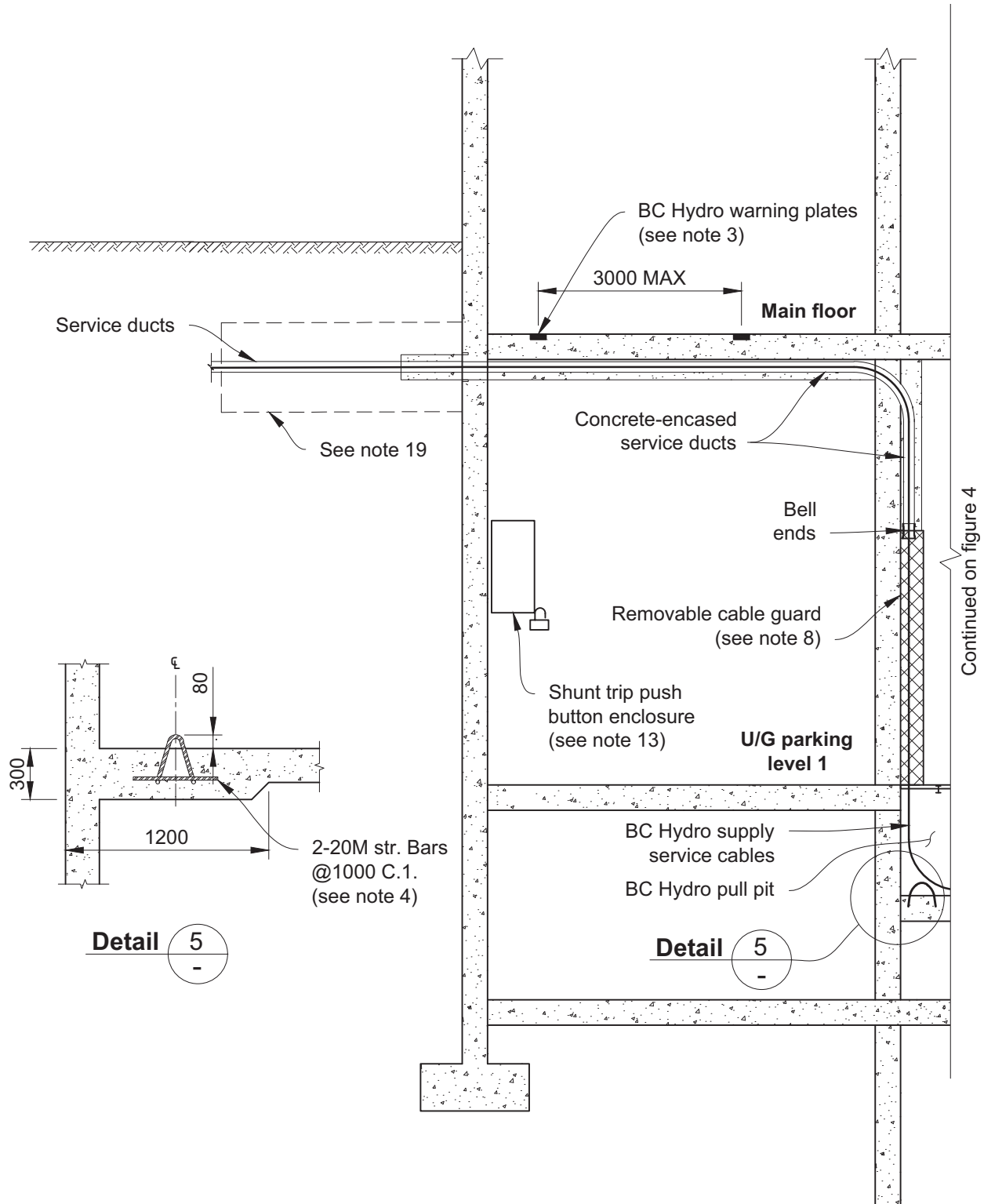
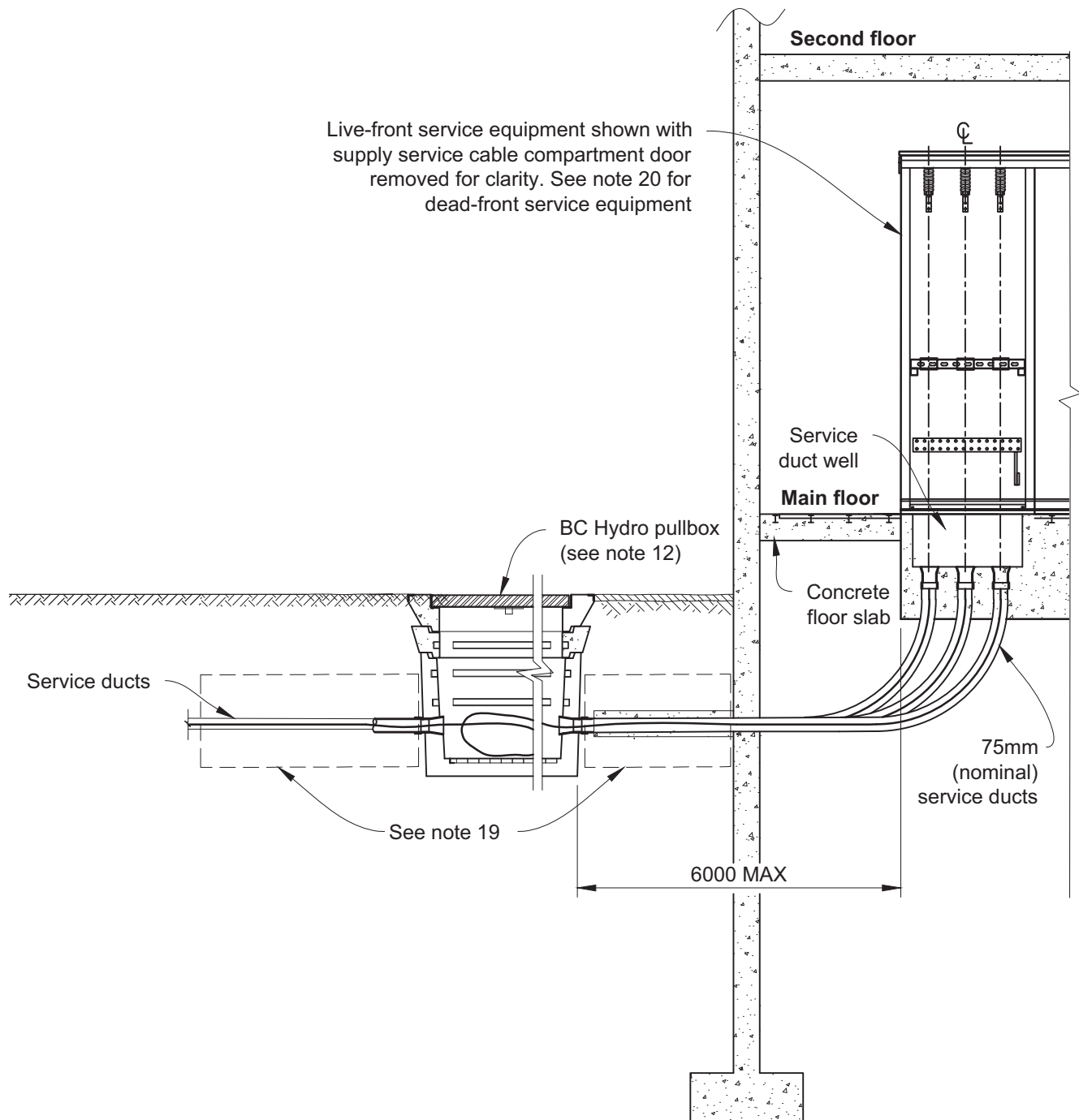
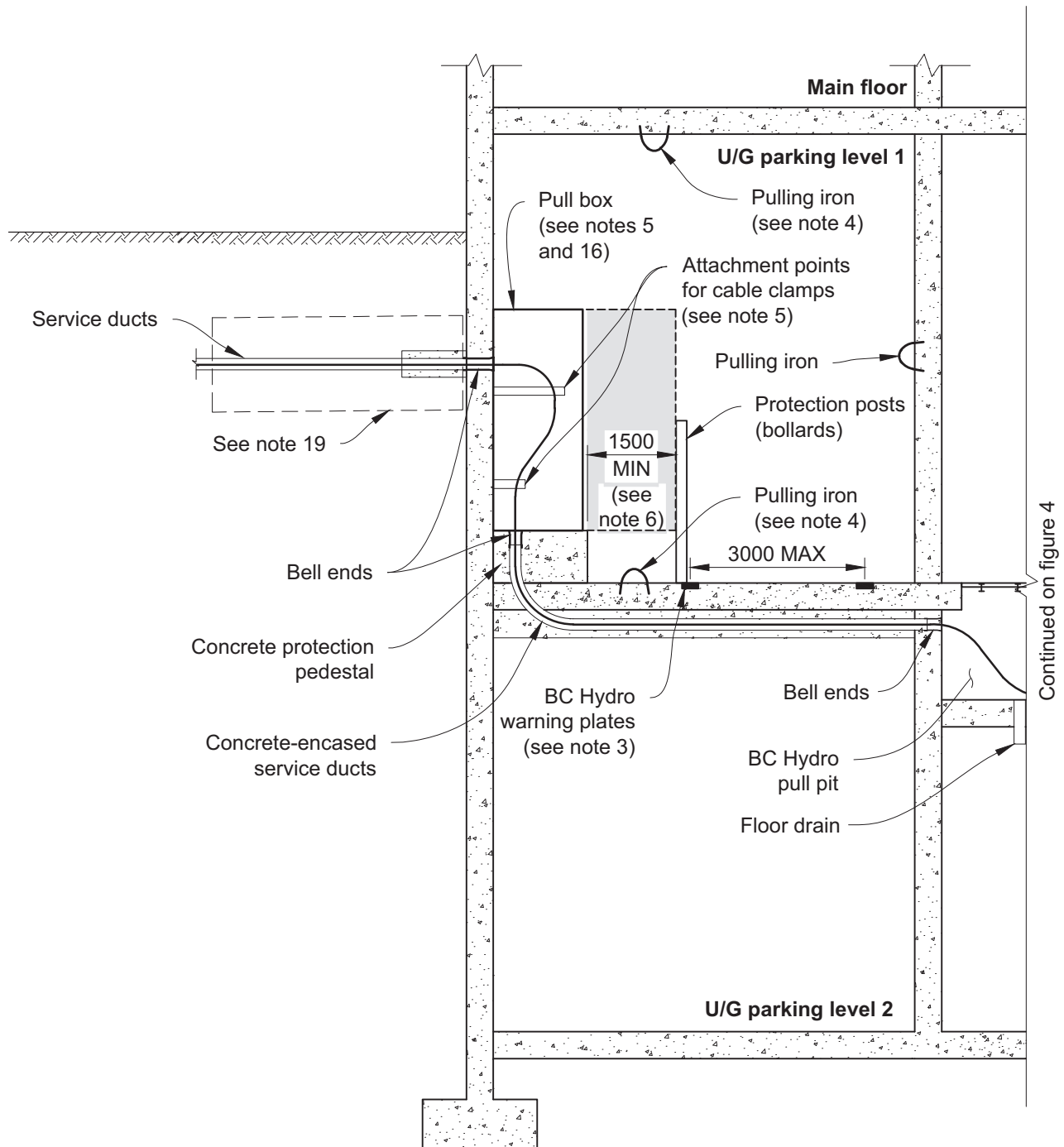


Figure 1 – Typical service duct profile (BC Hydro preferred, see note 7)



**Figure 2** – Typical service duct profile and service vault for high flood-level buildings (see note 12)



**Figure 3** – Typical service duct profile (not preferred, BC Hydro approval required, see note 7)

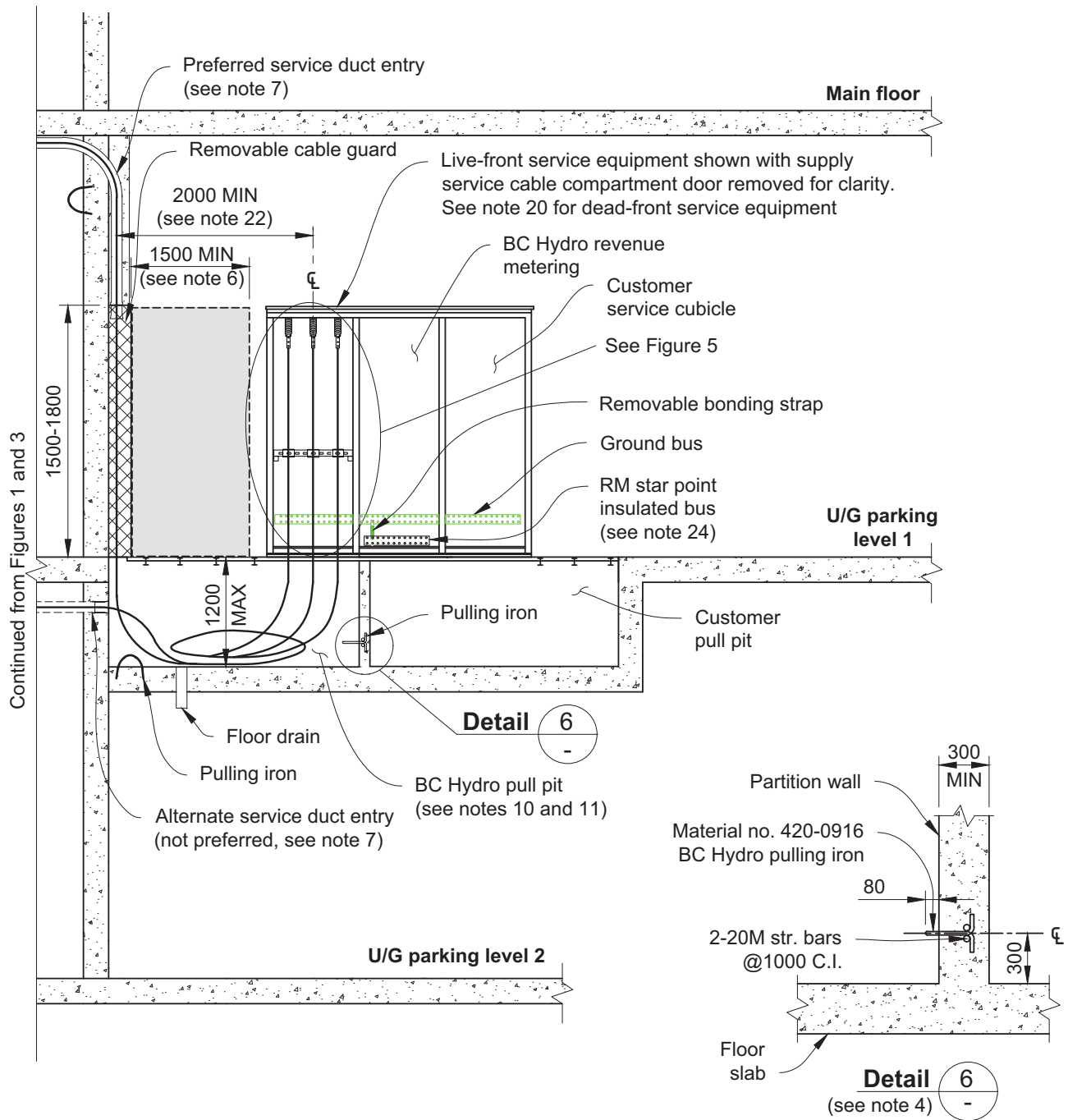
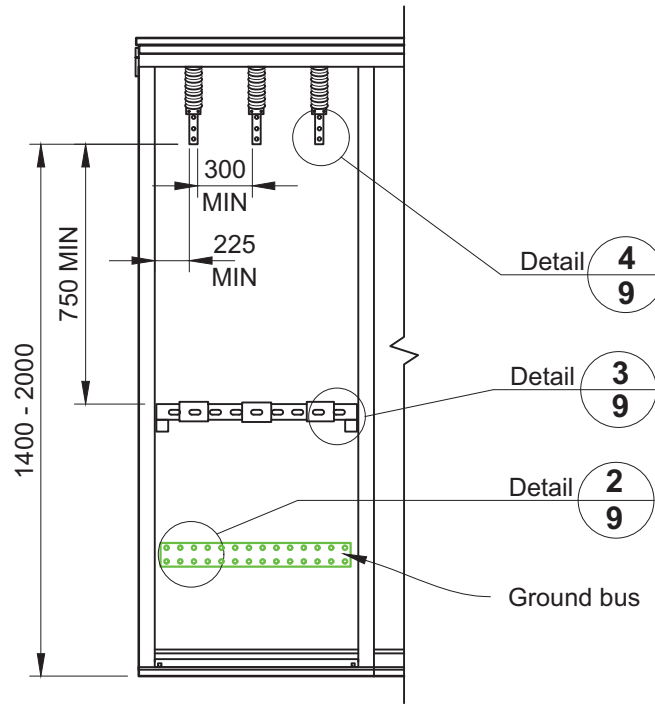
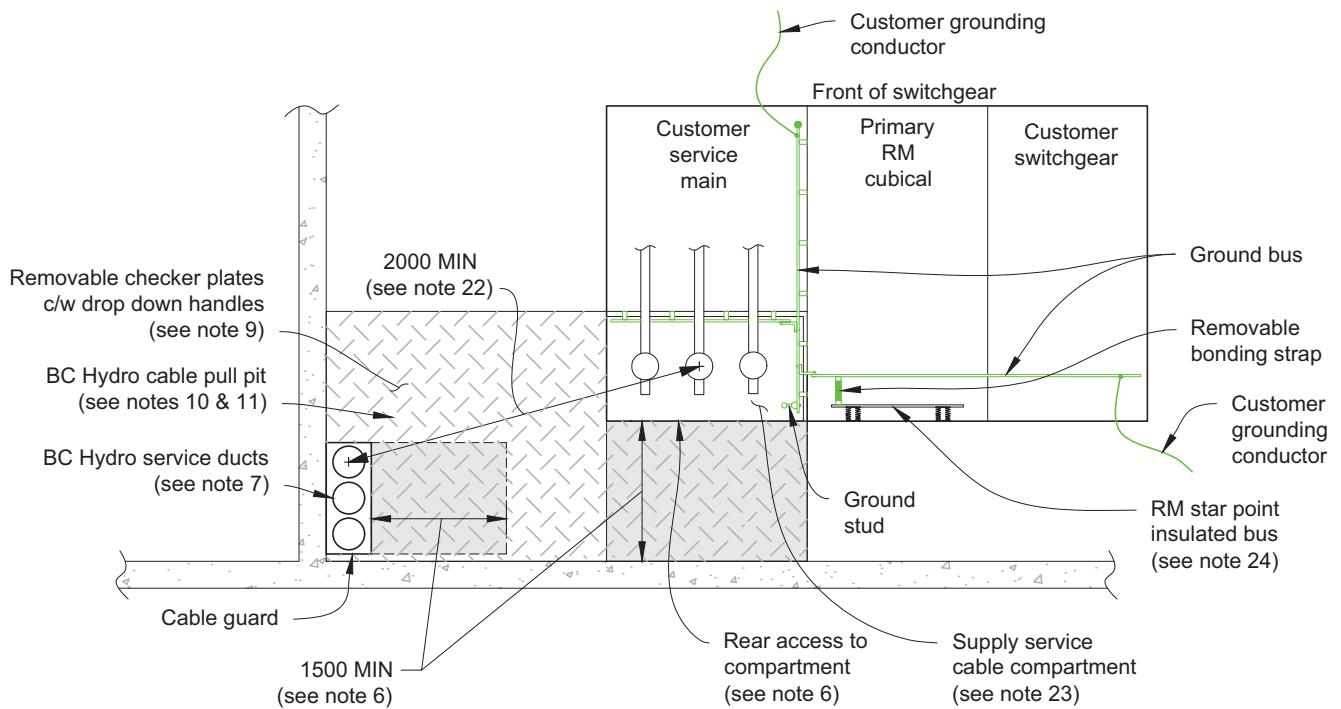


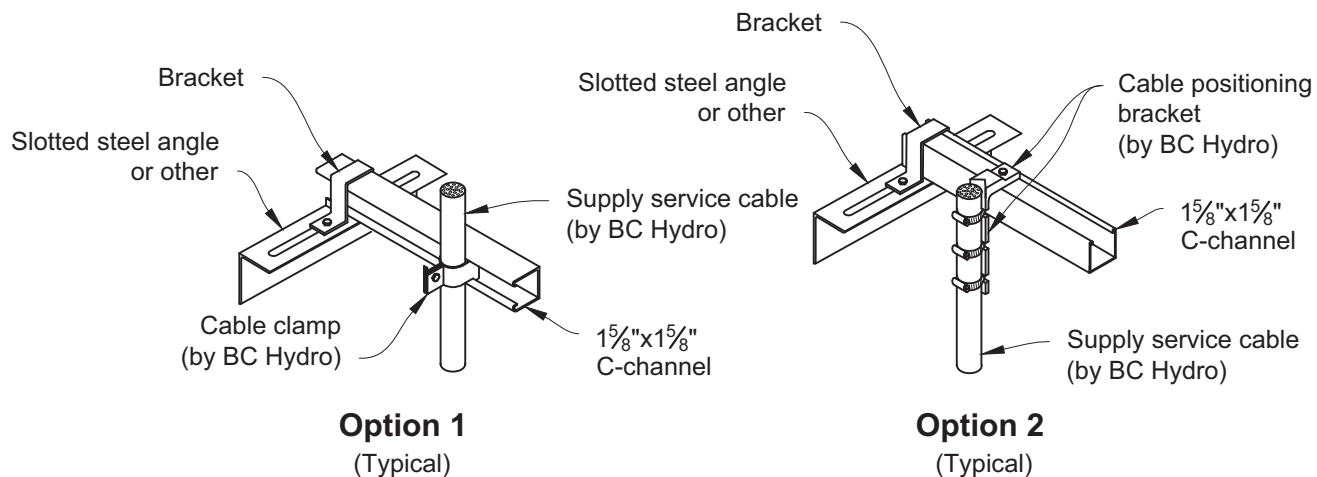
Figure 4 – Typical pull pit service vault



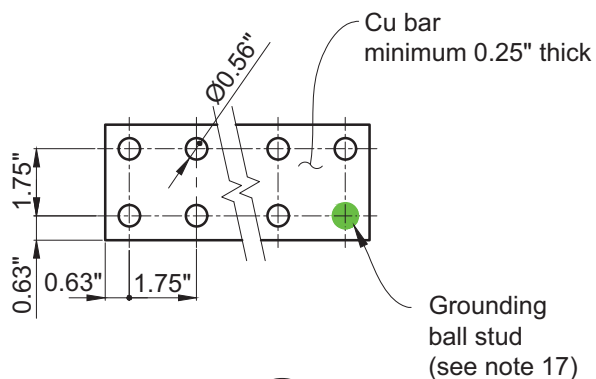
**Figure 5** – Supply service cable compartment (see note 15)



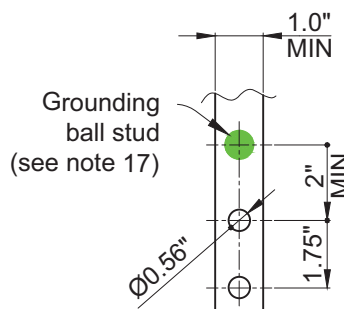
**Figure 6** – Typical pull pit service vault, plan view



**Detail 3**  
(see note 14) **8,10**

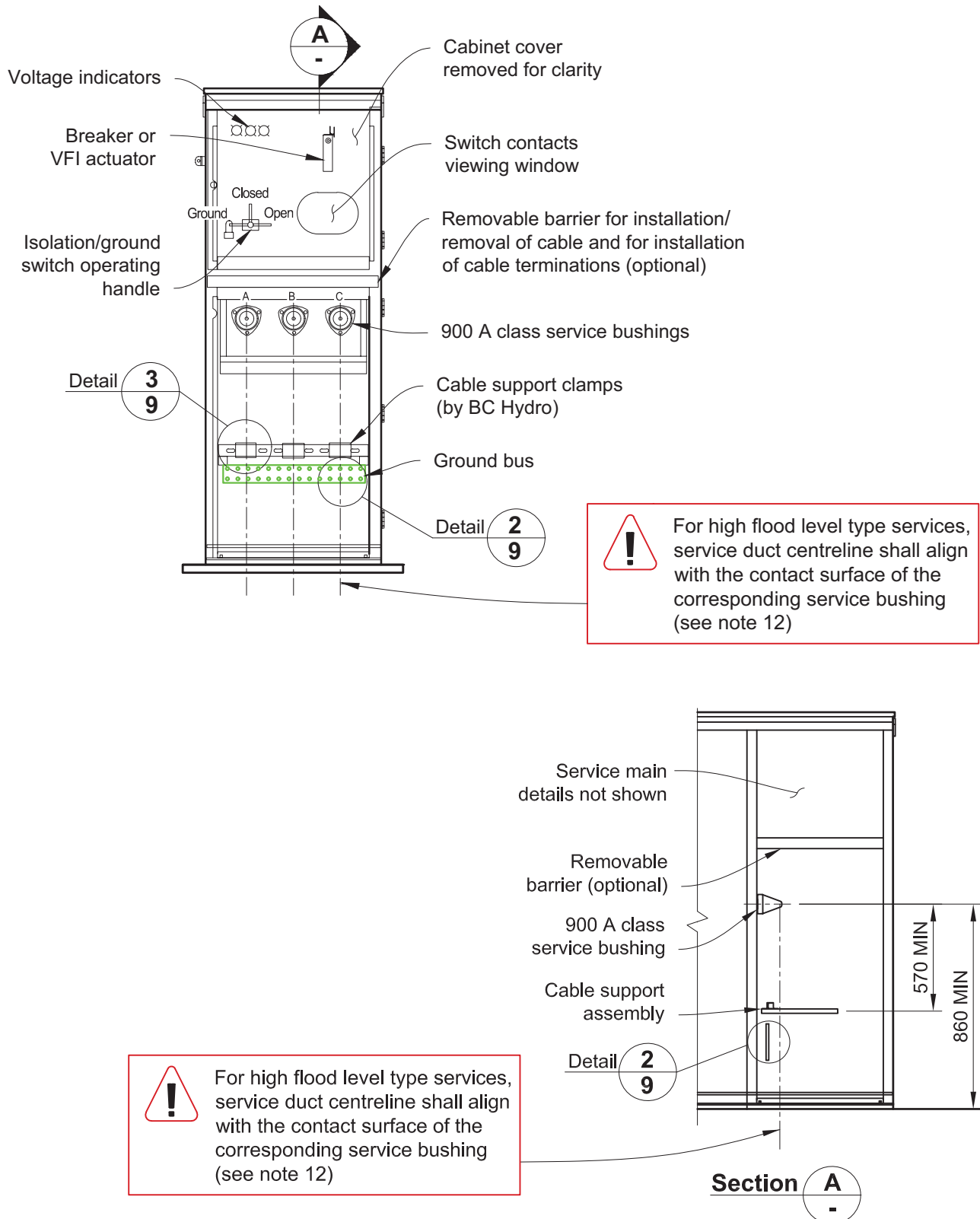


**Detail 2**  
**8,10**



**Detail 4**  
**8**

**Figure 7 – Details 2, 3, and 4**



**Figure 8 – Typical dead-front service main (see note 20)**