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- b) for the purpose of connecting equipment to BC Hydro equipment;
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BC Hydro is not liable for reliance on past versions of the Standard that may be stored electronically.

REVISIONS: UPDATED LEGAL ACKNOWLEDGEMENT FORM. FD MAR '16

DESIGNED J. AGNOLIN	RECOMMENDED  F. DENNERT	ACCEPTED  G. REIMER	ENGINEER OF RECORD 	NOTICE FROM THE EXECUTIVE VICE PRESIDENT TRANSMISSION AND DISTRIBUTION AND CUSTOMER SERVICE	
DISTRIBUTION STANDARDS 		ISSUED: MAR 2016 REPLACES: MAY 2004 ORIGINALLY ISSUED: NOV 1980		PAGE 1 OF 2	ES43/53/54/55/65 A1-01.01 ^R 4

Scope

This manual is one of a series containing standards for construction of the BC Hydro electrical distribution plant within the service area of BC Hydro. A new distribution plant shall be designed, constructed, owned, operated, maintained and repaired to these standards.

Purpose of Standards

BC Hydro objectives require standardization to:

- Ensure uniform safety requirements comply with BC statutes and regulations.
- Provide uniform system reliability.
- Provide uniform operating practices.
- Permit economic bulk purchasing of materials.
- Achieve optimum life cycle cost of plant construction.
- Effect efficient quality assurance.

Responsibility

The Distribution Standards Department prepares these standards and verifies that specified plant and procedures will perform adequately under all normally expected conditions encountered throughout the province of British Columbia. These standards are approved by Professional Engineers. It is the responsibility of BC Hydro Managers to ensure that the standards are followed unless abnormal conditions are encountered that require variations. These variations should be kept to a minimum and their performance shall be the responsibility of the Professional of Record in charge of the project, who will record and seal the variation based on satisfactory qualifications and experience to do so. As per the latest revision of the BC Hydro Distribution Owner's Engineer Guide, these variations must be accepted by BC Hydro's Owner's Engineer.

Use of Stock Materials

The electrical distribution plant covered by these standards is built using stock materials approved by a Professional Engineer as required by law. The use of non-stock materials for special and unusual situations must be approved by Distribution Standards or the BC Hydro Engineer responsible for the project.

Revisions to Manual

These standards are revised from time to time to improve the safety, performance, workability, cost effectiveness or appearance of the plant. The existing plant built to previous standards need not be updated unless so specifically advised by BC Hydro. When maintenance or other work, such as voltage conversion or conductor change is being done, updating plant to current standards is encouraged.

Mailing Addresses

The manual has been issued to a corporation or firm rather than to an individual. The corporation or firm is responsible for the safekeeping of the manual, and for keeping it current. Changes of address or in number of copies required must be reported promptly.

Suggestions for changes in the manual, or required changes of address may be made on the pre-addressed comment sheet included in the Manual and with each issue of revision.

REVISIONS: UPDATED LEGAL ACKNOWLEDGEMENT FORM. FD MAR '16

DESIGNED J. AGNOLIN	RECOMMENDED  F. DENNERT	ACCEPTED  S. REIMER	ENGINEER OF RECORD  F. U. DENNERT PROFESSIONAL ENGINEER BRITISH COLUMBIA	NOTICE FROM THE EXECUTIVE VICE PRESIDENT TRANSMISSION AND DISTRIBUTION AND CUSTOMER SERVICE		
DISTRIBUTION STANDARDS BC Hydro		ISSUED: MAR 2016 REPLACES: MAY 2004 ORIGINALLY ISSUED: NOV 1980		PAGE 2 OF 2	ES43/53/54/55/65 A1-01.02	R 4



Information Bulletin:

Revised ES54 S2-01 Secondary Three-Phase Services 120/208 V and 347/600 V up to 1600 A Private Property Installation

1.0 Items Covered

ES54 S2-01 R9 Secondary Three-Phase Services 120/208 V and 347/600 V up to 1600 A Private Property Installation

This advisory and above listed standard can be found at bchydro.com/distributionstandards.

2.0 Overview

ES54 S2-01 has been revised to revision 9. The intent of the changes is to minimize common variance requests frequently addressed by distribution engineers and to partially align the requirements of this standard with the latest revisions of ES54 S0 and S1 standards. A more extensive revision to ES54 S2-01 is forthcoming that will fully align with ES54 S0 and S1.

This advisory describes the latest revisions to ES54 S2-01 R9:

- Changed content in the revised standard is marked by green vertical revision lines in the left margin.
- This advisory is referenced by number in the Revision Notes section in the revised standard; and
- ES54 S2-01 R9 has been released and posted online. The previous revision of the standard (ES54 S2-01 R8) is appended to this advisory for reference to help make it easier to understand the changes.

Changes in ES54 S2-01 R9 are described in the following table.

Page	Section	Changes
1	References	Removed ES54 H1-01, ES54 H2-04, ES54 S3-03, ES54 S3-04, ES54 U4, and ES54 W. Added ES53 S1-01, ES53 Z8-03, ES54 S0-02, ES54 S0-04, and ES54 S0-05.
2	1	Removed requirement for grounding stud
2	2.1	Removed notes a to d which are covered in ES54 S0-04
2	2.2	Removed notes a to l and added reference ES54 S0-05

Page	Section	Changes
2	Table 1	Revised minimum height from 1500mm to 1400mm to align with ES54 S1-04
3	2.3	Removed contents of note 2.3 and added reference ES54 S0-05 which cover the same requirements
3	2.4	Removed contents of note 2.4 and added reference ES54 S0-04 which cover the same requirements
3	2.5	Removed contents of note 2.5 and added reference ES54 S0-04 which cover the same requirements
3	2.6	Removed contents of 2.6 and added reference ES54 S0-04 which cover the same requirements
3	2.7	Removed contents of 2.7 and added reference ES54 S0-04 which cover the same requirements
3	2.8	Removed contents of 2.8 and Table 2 and added references ES54 S0-04 and ES53 S1-01 which cover the same requirements
3	4	Removed bonding requirements between pull box and wireway cubicle
4 through 10 and 12	Figures 1 through 7 and 9	Changed cable clamps to cable channel
5	Figure 2	Removed grounding stud from neutral bus. Replaced fuse with circuit breaker to align with ES54 S0-04 interrupting capacity requirements.
6	Figure 3	Removed grounding stud from neutral bus. Replaced fuses with circuit breakers to align with ES54 S0-04.
7	Figure 4	Removed grounding stud from neutral bus and revised grounding details to align with ES54 S1-04 revenue metering compartment
8	Figure 5	Removed grounding stud from neutral bus
9	Figure 6	Removed grounding stud from neutral bus
10	Figure 7	Added detail 1 for accommodating 2X2 service ducts in utility wire way
11	Figure 8	Removed grounding stud from neutral bus. Revised neutral bus height from 1500 mm to 1400 mm. Revised spacing between service ducts to 50 mm minimum. Added minimum dimension of service ducts to top of wire way cubicle to 200 mm. Added Table 3 for dimensions to service ducts and cable clamps based on conductor size. Changed cable clamps to cable channel.
12	Figures 9 and 10	Revised neutral bus height from 1500 mm to 1400 mm and removed grounding stud from neutral bus. Removed bus spacing dimensions and referenced CSA requirements.
13	Figure 11	Removed minimum depth dimension of BC Hydro service ducts
15	Figure 13	Removed minimum depth dimension of BC Hydro service ducts and referenced ES54 S0-05

3.0 Action

The effective date for ES54 S2-01 R9 is June 30, 2024. Applications for work approved by the local BC Hydro design office on or after June 30, 2024, shall meet the requirements of ES54 S2-01 R9. Work approved prior to June 30, 2024, may comply with ES54 S2-01 R9 or may choose to comply with R8.

Designers, Engineers, and Civil Inspectors

Designers and engineers should familiarize themselves with the revisions in ES54 S2-01 R9.

Customers and Customer Representatives

Customers and customer representatives, including electricians, project managers, consultants, and contractors should familiarize themselves with the revisions in ES54 S2-01 R9. Please direct any questions or concerns to your local BC Hydro representative. The revised standard has been posted for information and awareness only. R9 become effective June 30, 2024.

4.0 Distribution Standards Contact

Customers and customer representatives please direct any questions or concerns to your local BC Hydro representative.

BC Hydro employees and contractors please direct any questions or concerns related to the standards to distribution.standards@bchydro.com.

5.0 Approval

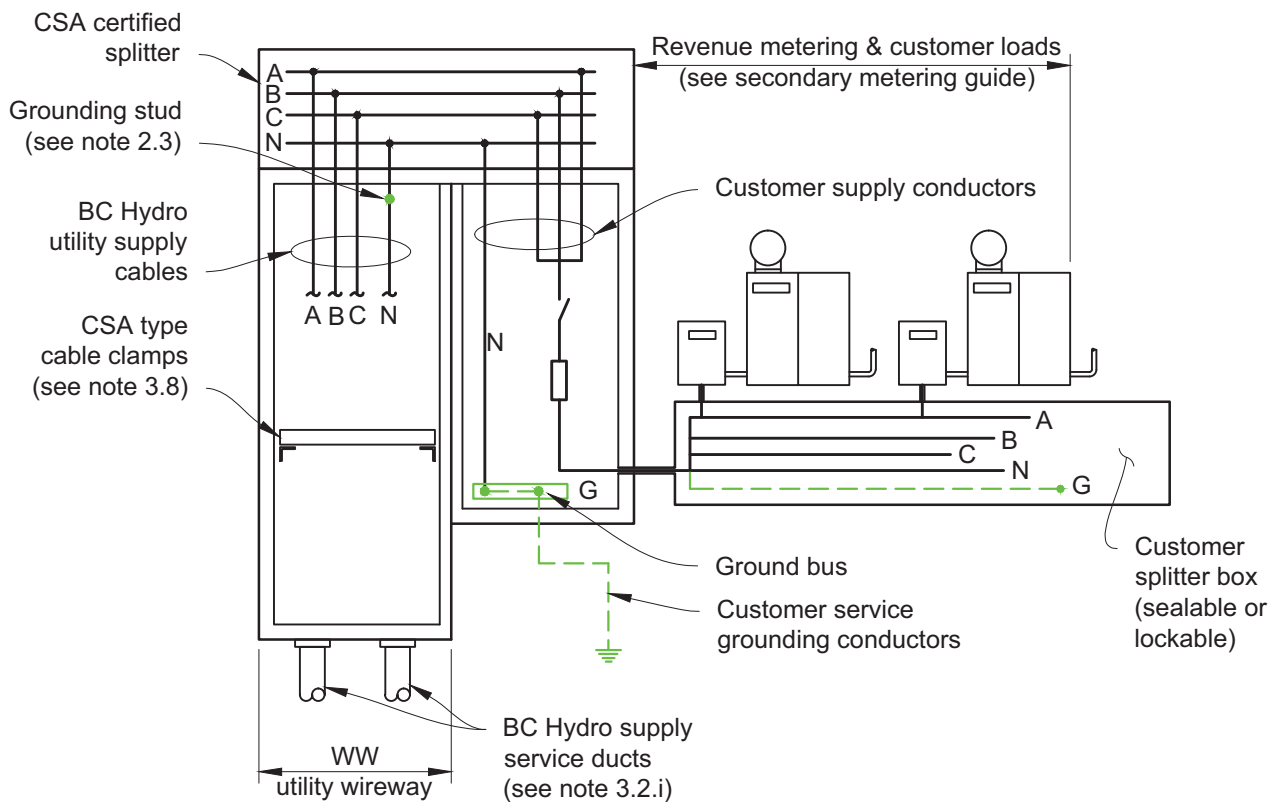
Recommended		Reviewed		Approved	
					
C. Picassi		M. Stevens		H. Giesbrecht	
Date:	2024-02-05	Date:	2024-02-05	Date:	2024-02-05

(*) All 347/600 V 200 A services meter sockets shall be cold style metering regardless of available fault level.

Single 200 A Three-Phase Service for 120/208 V Fault Level < 10kA

DESIGNED 	RECOMMENDED 	ACCEPTED 	ENGINEER OF RECORD 	SECONDARY THREE-PHASE SERVICES 120/208 V AND 347/600 V UP TO 1600 A PRIVATE PROPERTY INSTALLATION	
M. KELVIN	C. PICASSI	F. DENNERT		PAGE 1 OF 18	ES54 S2-01.01
DISTRIBUTION STANDARDS 			ISSUED: OCT 2018 REPLACES: FEB 2017 ORIGINALLY ISSUED: JUN 1987		R 8

REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK

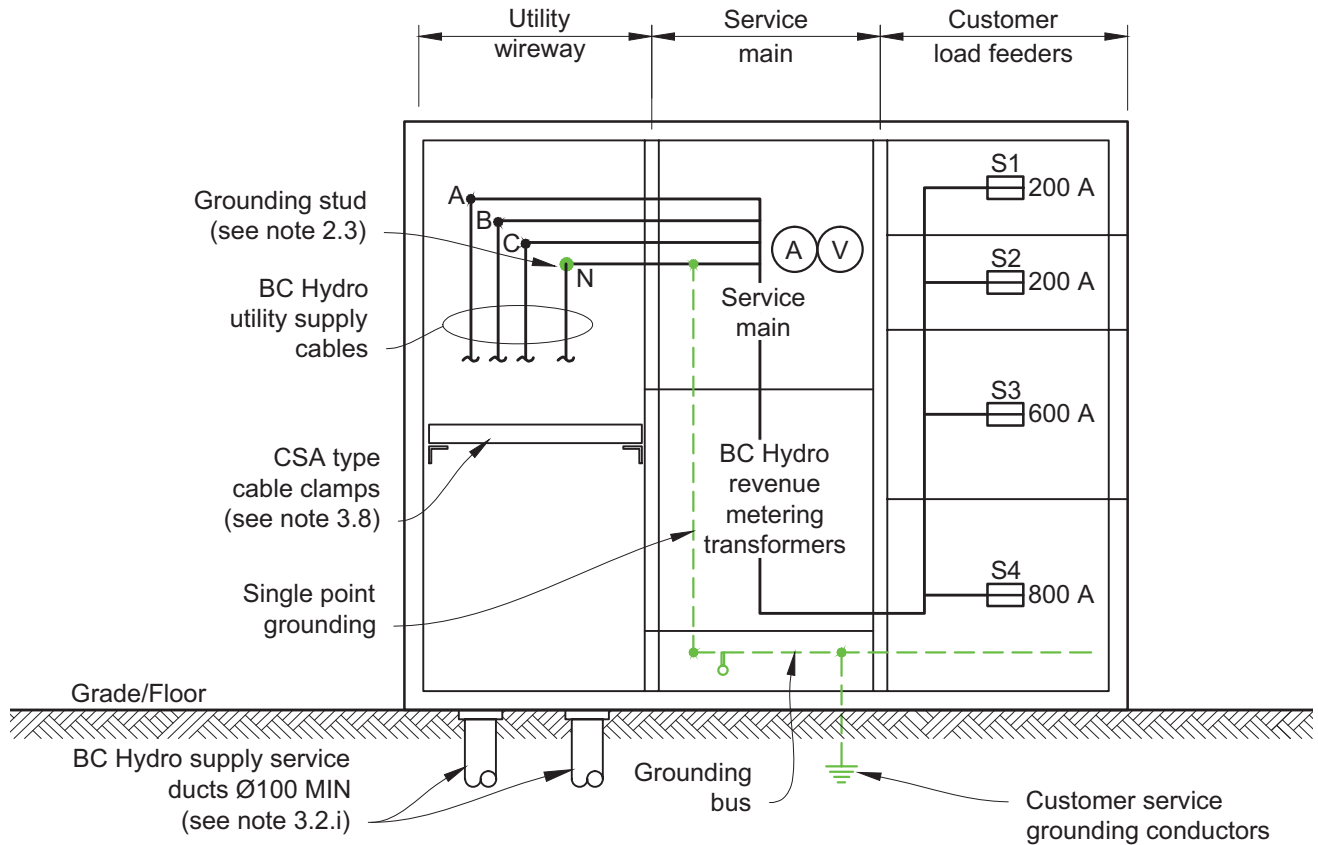


Grade/ Floor

**Schematic Diagram - Multiple Main Splitter Box
Three-Phase Up to 1600 A - Field Assembled**

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DISTRIBUTION STANDARDS 		ISSUED:OCT 2018 REPLACES:FEB 2017 ORIGINALLY ISSUED:JUN 1987		PAGE 2 OF 18	ES54 S2-01.02	R 8

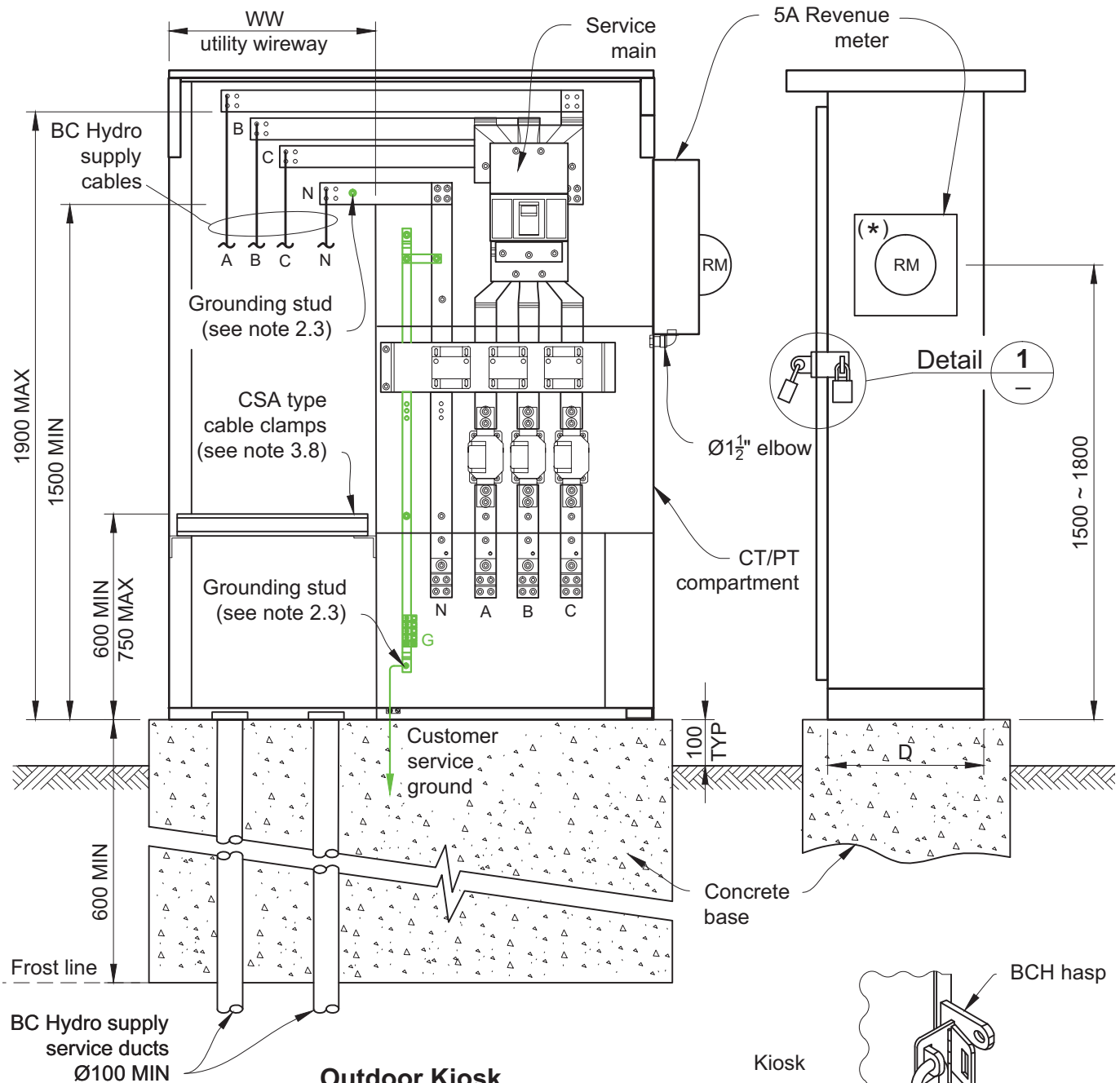
REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK



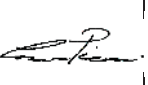
**Schematic Diagram - Service Switchboard
Up to 347/600 V, 1600 A - Field Assembled**

DESIGNED  M. KELVIN	RECOMMENDED  C. PICASSI	ACCEPTED  F. DENNERT	ENGINEER OF RECORD  2018-11-06	SECONDARY THREE-PHASE SERVICES 120/208 V AND 347/600 V UP TO 1600 A PRIVATE PROPERTY INSTALLATION	
DISTRIBUTION STANDARDS 		ISSUED:OCT 2018 REPLACES:FEB 2017 ORIGINALLY ISSUED:JUN 1987		PAGE 3 OF 18	ES54 S2-01.03
					R 8

REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK



(*) Customer could apply for special permission to mount revenue meter inside the kiosk enclosure - refer to Revenue Metering Guide.

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SECONDARY THREE-PHASE SERVICES
120/208 V AND 347/600 V UP TO 1600 A
PRIVATE PROPERTY INSTALLATION

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Table 1
Size of Pull Boxes and Wireways Installed in a Building
at Service Entrance Equipment or Mid-Cable Run

Main Switch/ Breaker Size	Minimum Pull Box Size (mm)					Minimum Wireway Bottom Entry Size (mm)		Minimum Height (H)***
	Duct Size and Qty**	Side & Top Entry		Rear Entry				
		Width (W)	Depth (D)	Width (W)	Depth (D)	Width (WW)	Depth (D)	
Up to 200A	1 x 4"	800	500	500	800	300*	300	1500
400 A	1 x 4"	800	500	500	800	300*	300	1500
600 A	2 x 4"	800	500	500	800	450	300	1500
800 A	2 x 4"	800	500	500	800	450	300	1500
1200 A	3 x 4"	800	500	500	800	600	450*	1500
1600 A	4 x 4"	800	500	500	800	750	450*	1500

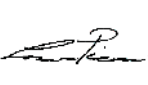
* 300 mm minimum wireway width acceptable for vertically staggered bus extensions.
 450 mm minimum wireway width required for horizontally staggered bus extensions.
 450 mm minimum wireway depth required for all 1200 A and 1600 A services.

** 900W x 1800H x 800D minimum size for any customer-owned mid-run pull boxes wall-mounted inside customer building.

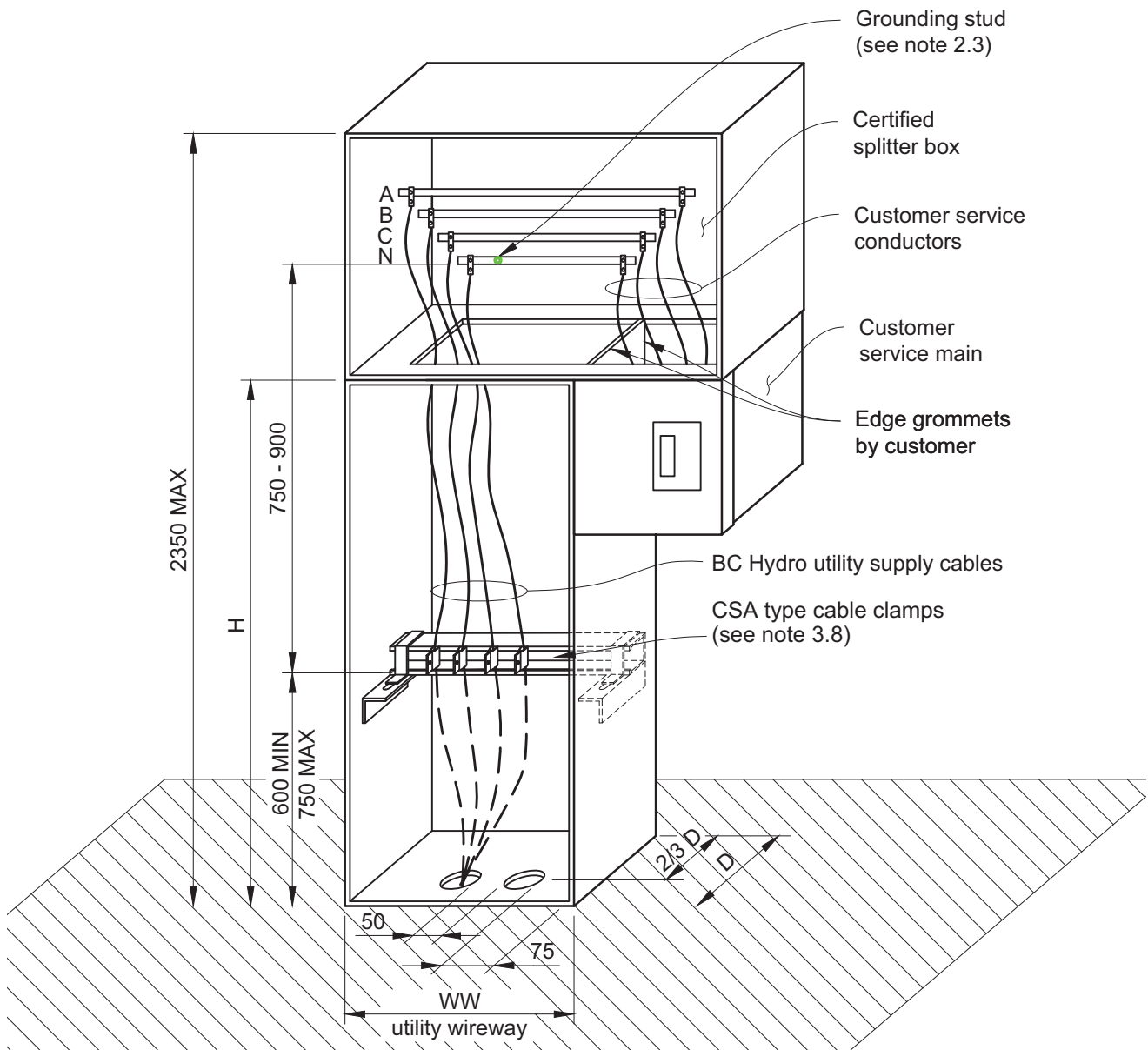
** 632 Box minimum size for mid-run pull boxes placed inside the building floor slab or in an outside yard – subject to BC Hydro Field Manager approval.

*** Minimum height refers to the height of pullbox, wireway or bottom of the lowest switchboard bus.

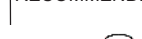
REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK

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DISTRIBUTION STANDARDS 			ISSUED: OCT 2018 REPLACES: FEB 2017 ORIGINALLY ISSUED: JUN 1987	PAGE 5 OF 18	ES54 S2-01.05 R 8

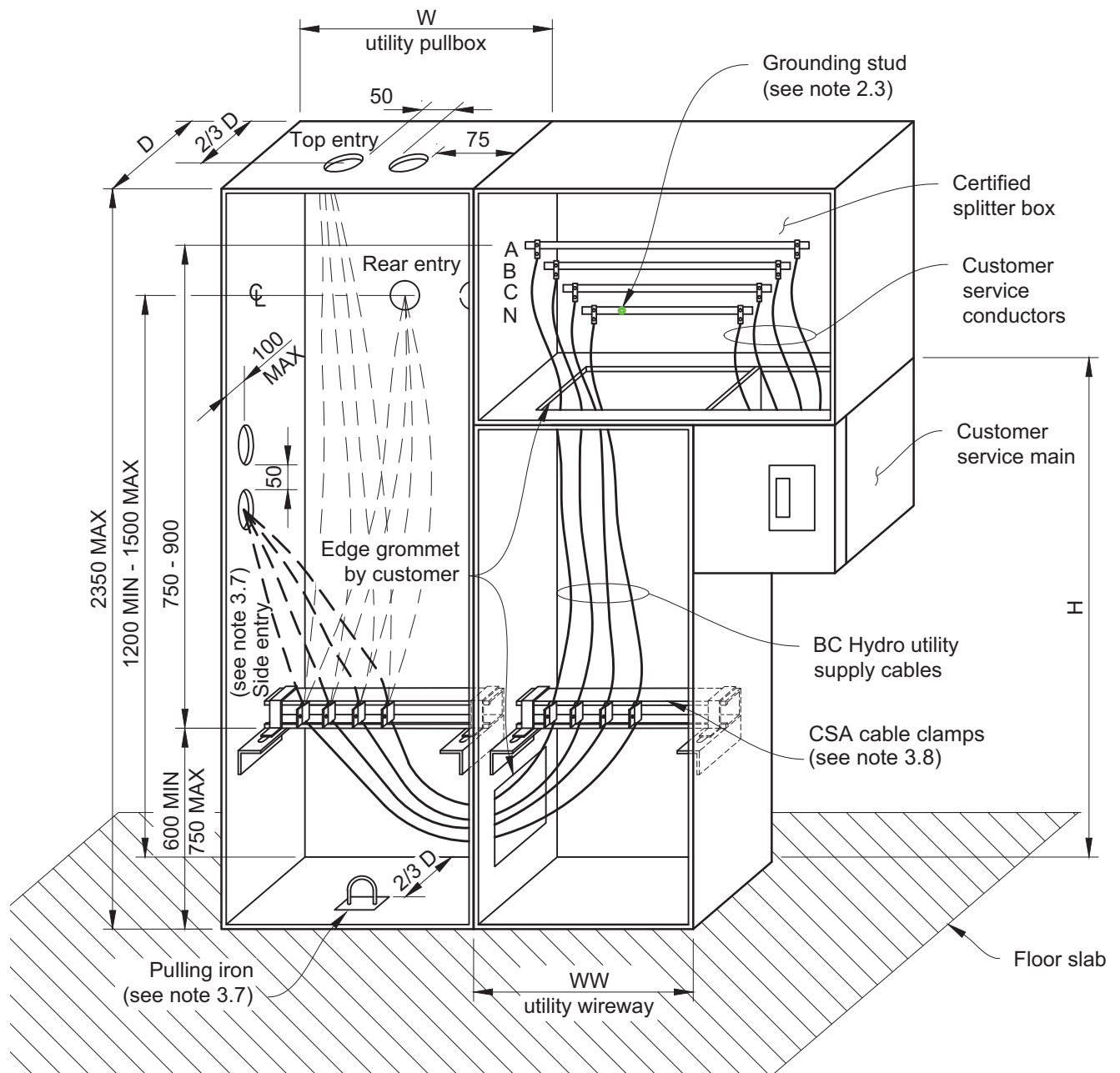
REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK



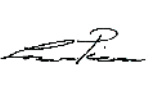
Customer Service Main - Field Assembled Bottom Entry

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DISTRIBUTION STANDARDS 		ISSUED:OCT 2018 REPLACES:FEB 2017 ORIGINALLY ISSUED:JUN 1987		PAGE 6 OF 18	ES54 S2-01.06
					R 8

REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK



Customer Service Main Top, Rear or Side Entry

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DISTRIBUTION STANDARDS BC Hydro		
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ENGINEER OF RECORD
 M. KELVIN 2018-11-06

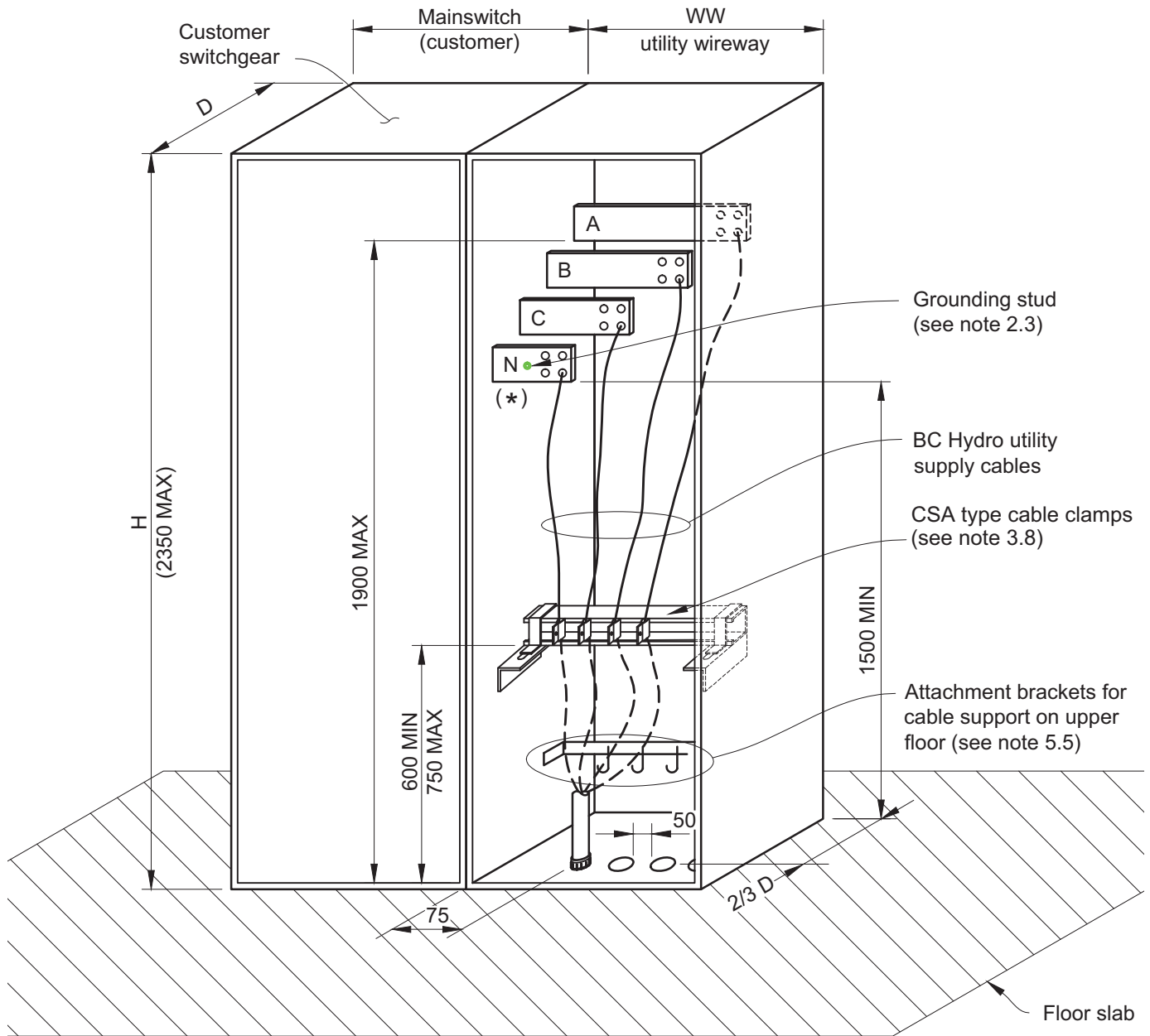
SECONDARY THREE-PHASE SERVICES
120/208 V AND 347/600 V UP TO 1600 A
PRIVATE PROPERTY INSTALLATION

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REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK

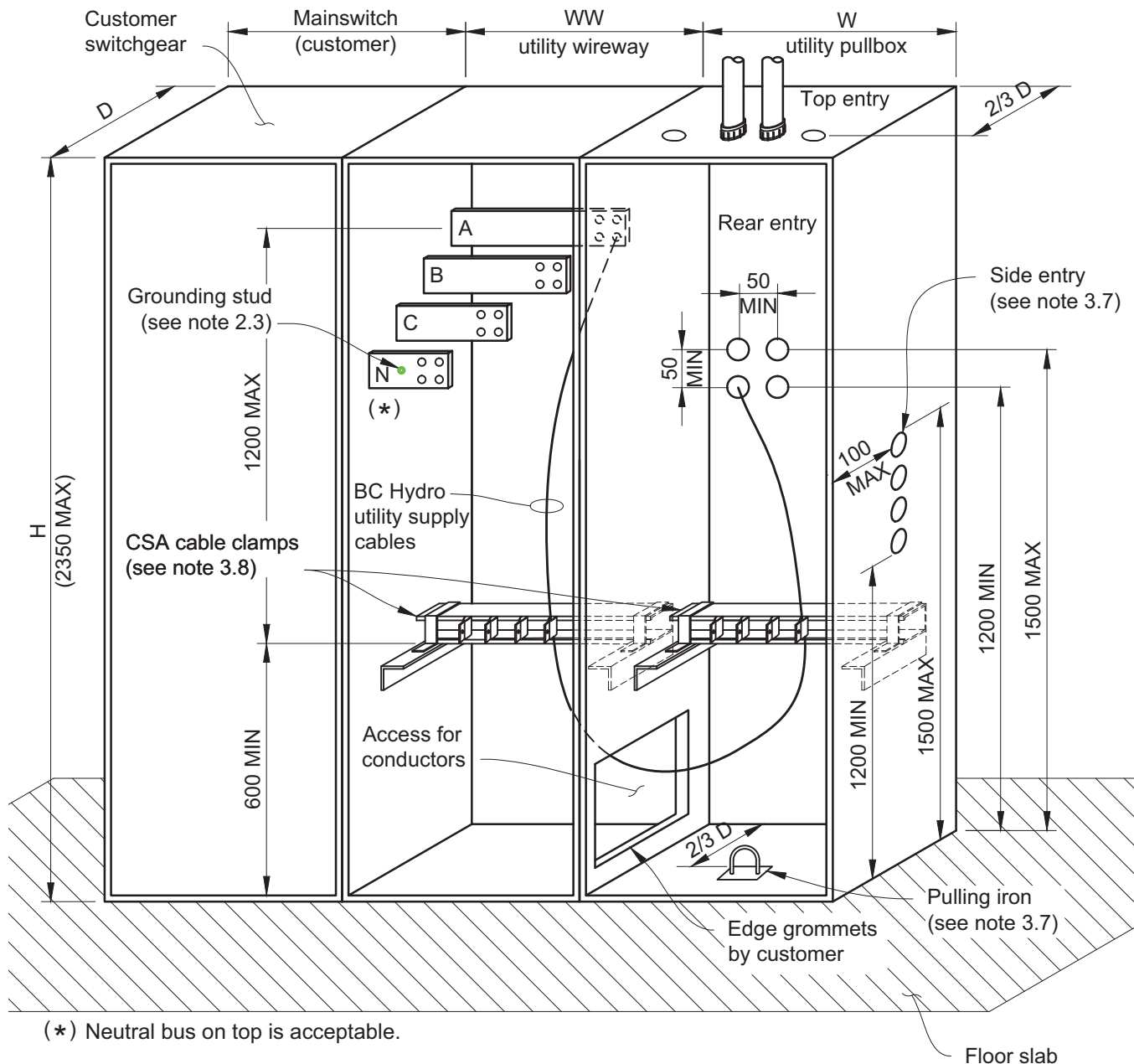


(*) Neutral bus on top is acceptable.

Customer Service Switchboard - Field Assembled Bottom Entry

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DISTRIBUTION STANDARDS 	ISSUED:OCT 2018 REPLACES:FEB 2017 ORIGINALLY ISSUED:JUN 1987			PAGE 8 OF 18	ES54 S2-01.08
					R 8

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Customer Service Switchboard Top, Rear or Side Entry

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DISTRIBUTION STANDARDS 		ISSUED: OCT 2018 REPLACES: FEB 2017 ORIGINALLY ISSUED: JUN 1987		PAGE 9 OF 18	ES54 S2-01.09 R 8

Technical drawing of a cable tray layout showing dimensions and components:

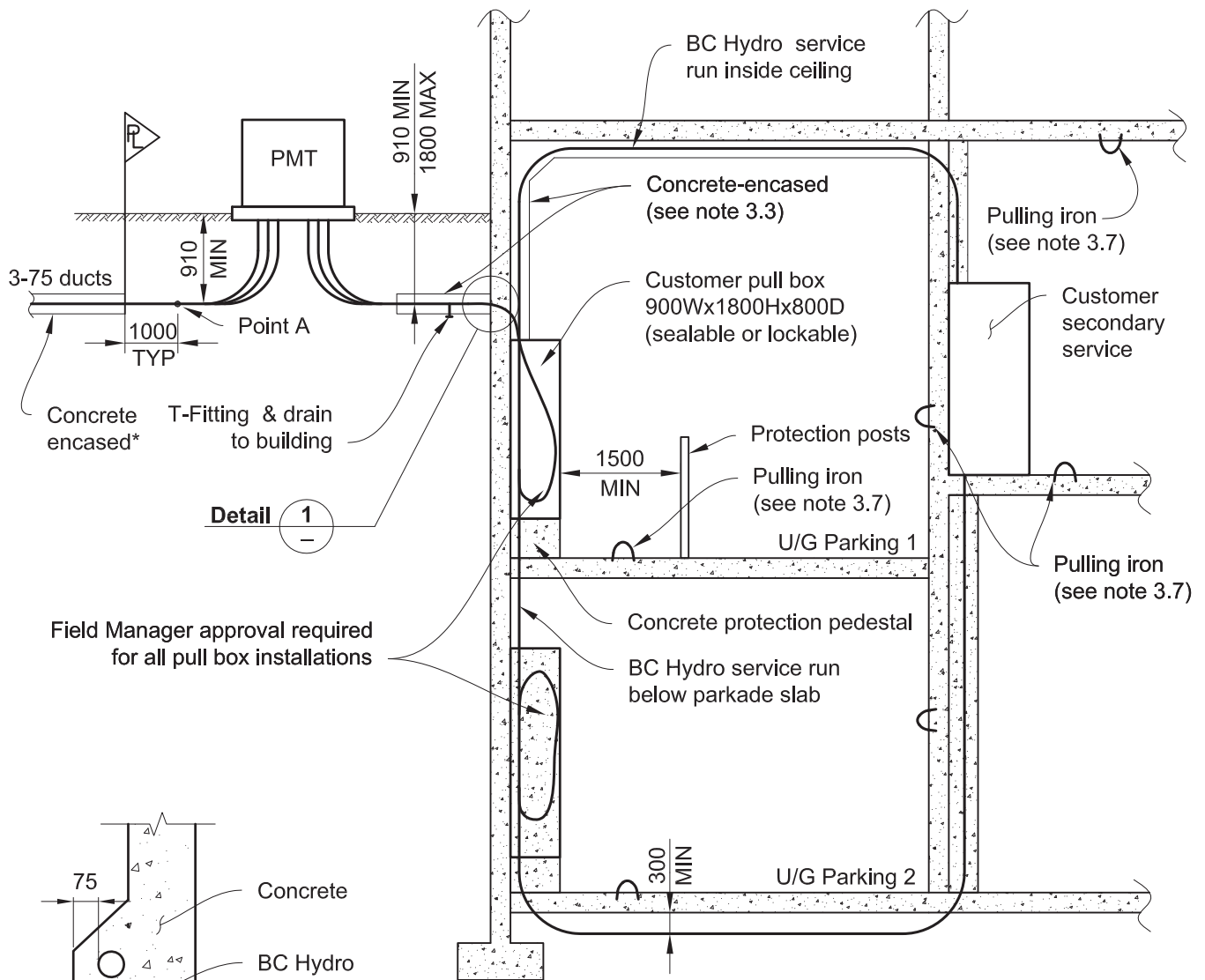
- Dimensions:**
 - Tray height: 1200 MAX
 - Tray width: 600 MAX
 - Clearance from floor to bottom of tray: 1500 MIN
 - Clearance from floor to top of tray: 1100 MIN
 - Clearance from floor to bottom of cable: 300 MIN
 - Clearance from floor to top of cable: 900 MIN
- Components and Labels:**
 - CSA type cable clamps (see note 3.8)
 - Pull box with staggered bus bars
 - Main switch
 - CT space
 - Floor
 - Bell ends
 - R910 or R1050 (radius of bend)
- Notes:**
 - ** Whenever bus bars are oriented perpendicular to those shown on details, the minimum spacing between side walls and bus bars must be maintained as shown.
 - Complete bend to vertical position. Concrete pedestal will be required for ducts buried less than 910 mm. Do not cut 90° bends.

Vertical Separation

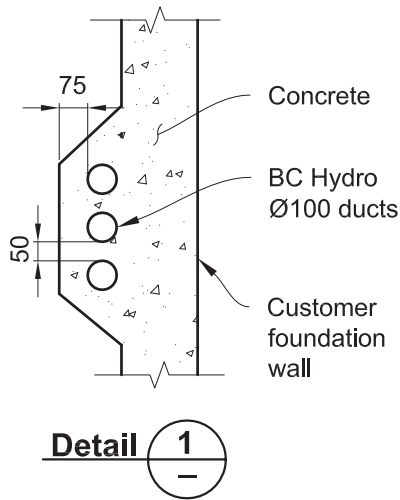
Horizontal Separation

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M. KELVIN	C. PICASSI	F. DENNERT				
DISTRIBUTION STANDARDS BC Hydro	ISSUED: OCT 2018 REPLACES: FEB 2017 ORIGINALLY ISSUED: JUN 1987		 2018-11-06	PAGE 10 OF 18	ES54 S2-01.10	R 8

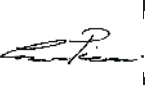
REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK



Typical Service Duct Profile



Service Duct Inside Wall
(See ES54 S3-04)

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DISTRIBUTION STANDARDS		
BC Hydro		

ISSUED: OCT 2018
REPLACES: FEB 2017
ORIGINALLY
ISSUED: JUN 1987

ENGINEER OF RECORD



2018-11-06

SECONDARY THREE-PHASE SERVICES
120/208 V AND 347/600 V UP TO 1600 A
PRIVATE PROPERTY INSTALLATION

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Technical drawing illustrating a cable pulling system for a switchgear, showing a side elevation and a detail view of the pulling iron.

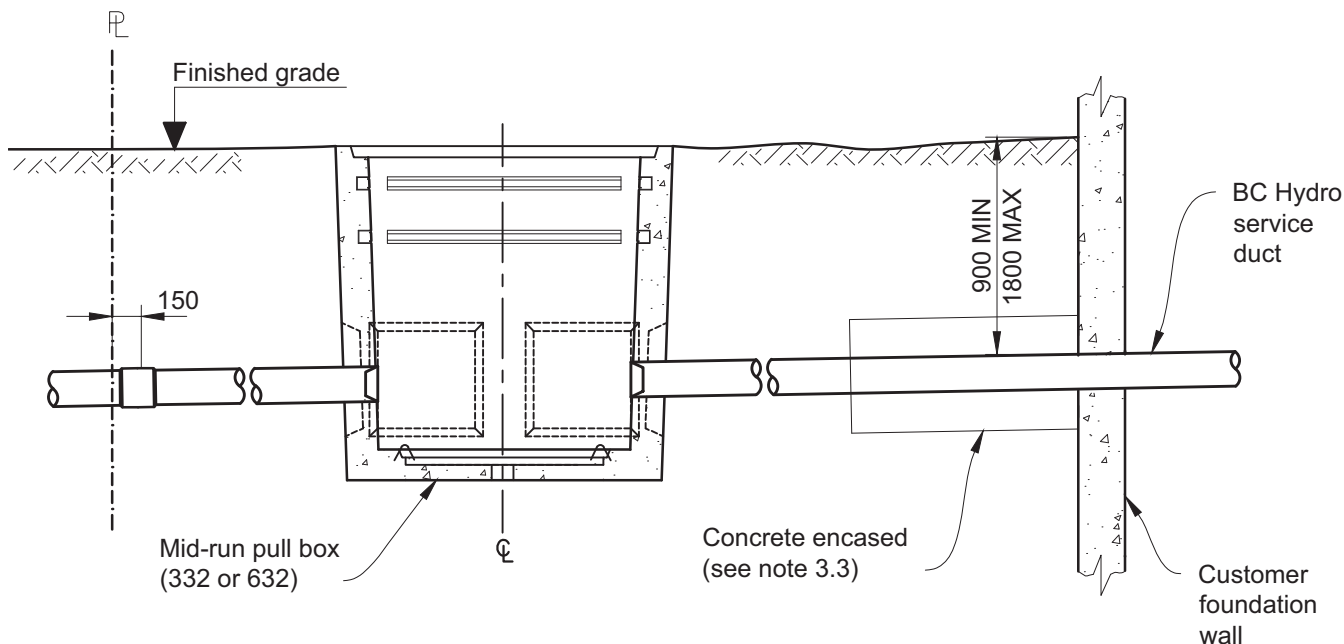
Side Elevation Details:

- BC Hydro pulling tripod:** Applies a force of 18 kN (TYP) to the cable.
- Cable guide sheave:** Guides the cable from the tripod.
- Removable pulling iron (Cat. ID: 420-0918):** Mounted on the ceiling, providing a 150 MIN clearance from the switchgear.
- Customer switchgear:** A rectangular unit with a height of 3000.
- Pulling line:** The cable being pulled through the system.
- Dimensions:**
 - P : Horizontal distance from the tripod to the cable guide sheave.
 - P : Horizontal distance from the cable guide sheave to the pulling iron.
 - D : Horizontal distance from the pulling iron to the switchgear.
 - $\frac{2}{3} D$: Horizontal distance from the switchgear to the bell ends.
 - 1500 MIN: Horizontal distance from the tripod to the pulling iron.
 - 3000: Height of the switchgear.
- Bell ends:** The end of the cable being pulled.

Detail 1 (Pulling Iron):

- Material: 22x33 Slot.
- Hole diameter: $\varnothing 22$.
- Overall width: 205.
- Overall height: 128.
- Top flange height: 152.
- Flange thickness: 12.
- Slot width: 33.
- Slot depth: 33.

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M. KELVIN	C. PICASSI	F. DENNERT	 2018-11-06	PAGE 12 OF 18	ES54 S2-01.12	R 8
DISTRIBUTION STANDARDS 		ISSUED: OCT 2018 REPLACES: FEB 2017 ORIGINALLY ISSUED: JUN 1987				



**Mid-Run Pull Box
Inside or Outside Building**

Notes

1 Scope

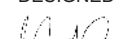
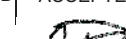
This standard details three-phase electrical services up to 1600 A for 120/208 V and 347/600 V supply.

2 Materials

2.1 All materials from the stub-off on private property shall be supplied and installed by the customer.

2.2 All materials installed on private property, including the meter socket, service panels and switchgear, shall be CSA certified. However, all material and electrical equipment, up to the utility's point of connection to customer-owned equipment, is exempt from the BC Electrical Safety Regulation including all grounding, duct work, etc. This equipment is not within the jurisdiction of electrical inspection authorities and permits are not required for this work.

2.3 Grounding stud shall be supplied as indicated and installed per manufacturer's instructions. The following grounding stud is acceptable to BC Hydro: HC-30029-2 fabricated by MacLean Power Systems.

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DISTRIBUTION STANDARDS 		ISSUED:OCT 2018 REPLACES:FEB 2017 ORIGINALLY ISSUED:JUN 1987		PAGE 13 OF 18	ES54 S2-01.13	R 8

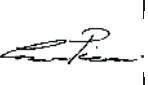
3 Installation Requirements

3.1 General

- All civil work and grounding installations shall be the responsibility of the customer.
- All civil and grounding installations shall comply with BC Hydro standards, the BCEC and applicable bulletins issued by the TSBC.
- The trench shall be in a direct line-of-sight from the property line stub-off to the service conduit entry into the building. The base of the trench shall be graded to the depth of the BC Hydro duct stub-off.
- The service location on the building shall be on the wall closest to Point A or within one metre back from that wall on either side.
- For building parkade vehicle access shall be 2100 mm minimum.
- No customer building elevators shall be as the only means of access by BC Hydro crew to perform utility work or to carry out their duty in its function as utility per BC Electrical Safety Regulation.

3.2 Service in Duct

- The **customer shall couple their duct** onto the BC Hydro duct stub-off at Point A, except as stated in note 3.2 (c), and discard any markers and/or duct caps.
- If the **length of service run** between Point A and the meter socket enclosure exceeds 50 m, a pull box may be required by the BC Hydro Designer with approval by the Field Manager.
- If the **aggregate bends of service duct** installed on private property to the meter socket exceed 135°, a pull box may be installed in consultation with the BC Hydro Designer.
- The **minimum radius** of any service duct bend shall be 900 mm.
- The customer is responsible for the installation of adequate service duct drainage per the BCEC, because large BC Hydro service cables may act as water conduit. BC Hydro crew shall seal service duct after installing service cables. Customer is responsible for sealing customer ducts to prevent ingress of dangerous earth gases.
- A #8 minimum diameter polypropylene **pull string** shall be installed in the service duct and tied securely at the meter socket enclosure and to the string in the BC Hydro duct stub-off. **If no string** is found in the stub-off, the customer shall **notify BC Hydro** for further instructions.
- Throughout its length, the service duct shall be kept free of any obstructions and foreign material, including sand and gravel. The duct shall be proved by **mandrelling before the final connection** is made to the BC Hydro duct and before a pull string is installed.

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- h. The service duct shall be protected from damage caused by settlement of the foundation and excavation backfill. To minimize settlement and subsequent damage to service duct and service cables, select backfill shall be used per Section W and compacted in 150 mm layers.
- i. Underground service duct shall be installed outside building foundation walls and run on the surface of finished building walls. Service duct installed inside a building, or inside building walls, shall be encased in concrete 75 mm minimum thickness.

3.3 Wall Entry

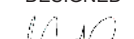
- a. At locations where service ducts enter into a building foundation wall and at locations where differential settlements are expected to occur, the customer shall ensure a smooth transition to avoid any damage to the service ducts and service cables caused by differential settlement. BC Hydro designer may request the customer to specify estimated settlement of the building and the required service cable slack. The customer shall submit an engineered design of the concrete encased duct and rebar reinforced wall entry for acceptance by BC Hydro designer.

3.4 Pull Boxes - General

- a. The term "pull box" describes the compartment necessary for cable installation crews to safely and effectively pull in the required cable. Pull boxes shall be required at all service entrance equipment locations, except for meter bases and switchgear rated 200 A and less.
- b. Mid-run pull boxes located outside a building shall be a BC Hydro equivalent 632 or 332 Box, as determined by the BC Hydro Designer and approved by the local Field Manager.
- c. Mid-run pull boxes, wall-mounted inside a building, shall be 900W x 1800H x 800D mm minimum.
- d. Pull boxes must be **located** in consultation with BC Hydro Designer and approval by the local Field Manager. A minimum 1.5 m clearance shall be provided for working space in front - to accommodate pulling equipment and the BC Hydro crew.

3.5 Pull Boxes Located at the Service Entrance of Wireways

- a. Wireways can be either top, bottom, back or side entry, and have either a wireway or integral pull box. The requirements outlined herein apply to all service entry assemblies except where noted.
- b. **Suitable cable supports** shall be provided in all wireways and pullboxes as per paragraph 3.8.
- c. **Bus bars** shall be extended into the wireway, and shall be staggered and separated horizontally or vertically as shown in various details on page 10.
- d. **Service entry ducts** shall be placed within the wireway, pullbox or cable entrance compartment.
- e. **Wireway and pullbox dimensions** shall be in accordance with Table 1 on page 5.

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3.6 Utility Wireway

CAUTION: Due to liability and restricted access, BC Hydro will no longer terminate utility supply cables directly onto a customer-owned service main switch or breaker lugs.

All customer-owned three-phase services, except for the 200 A 120/208 V meter socket, require a separate utility compartment for securing and terminating BC Hydro supply cables. All supply lugs within the BC Hydro utility wireway shall be tunnel type, clearly visible and shall be vertically oriented to permit direct conductor access for termination

Note: 1.5 m minimum clearance shall be provided in front of all wireways and pullboxes.

3.7 Pulling Irons

Availability of pulling equipment varies across BC Hydro's service area and may change over time. Pulling irons, when required, are installed to ensure that service supply cables may be pulled in safely and without damage to the cables or to the customer's equipment. Page 12 shows a pulling iron position on the floor to rig the pull when a pulling tripod with capstan shall be used.

The customer shall provide engineered threaded inserts or attachments to the building structure for BC Hydro removable pulling irons as determined by BC Hydro designer. The customer shall supply and install bolts and all hardware deemed necessary by the customer's engineer and shall be left threaded in place for use by BC Hydro during cable pulling crew.

Expected maximum pulling line tensions shall be supplied by the BC Hydro designer. For secondary service supply cables, maximum pulling line tensions should be less than 18 kN. However, for some special installations, higher pulling tensions may be allowed if within the capacity of local BC Hydro pulling crew – subject to approval of the local BC Hydro Line Manager.

For side entry utility pull boxes and wireways, cable positioning sheaves may be large (400 mm to 675 mm) to meet large service cable bending radius. For such installations, the wireway or pull box shall be large enough to rig a suitable cable guide sheave for each of the cable runs, without requiring removal of or other conflict with another existing service supply cable previously installed.

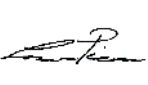
3.8 Cable Clamps

Cable clamps for the support of BC Hydro service cables shall be CSA type, 600 V class, separately mounted for the support of individual service cable.

The cable clamps shall have integral cushioning layer to protect the cable insulation from damage caused by thermal cycling of load demand.

The cable clamps shall be installed in 1-5/8" x 1-5/8" C-channel mounted on a slotted adjustable angle bracket, suitable for facing either outward or upward. Slotted angles shall provide back/forth adjustment of the C-channel within 100 mm of front or the back the enclosure.

REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK

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The customer shall supply all threaded hardware and components required for the support of BC Hydro service cables – refer to ES54 S3-03.06 standard.

4 Information to be Supplied by Customer

The customer shall submit for approval by BC Hydro copies of the proposed duct service run from the property line to the point of utility connection, containing the following information:

- a. All duct lengths and degrees of all duct bends.
- b. The location and size of all pull boxes and the service entrance enclosure, as well as the position of incoming and outgoing service duct at each pull box - in both plan view and profile.

The customer shall also submit all information about other adjacent utilities - existing or proposed, located in the vicinity of the proposed BC Hydro service ducts.

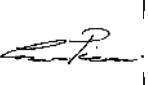
5 Restrictions

1. Service duct entry from the top and bottom, back or side.
2. See Table 1 in ES54 S2-01.05 for pull box dimensions.
3. The maximum installation capacity for a pole dip supply configuration is 800 A, consisting of two runs of 500 kcmil cables. Underground supply 1600 A services shall be limited to those installations which can be supplied from pad-mounted transformers.
4. The maximum installation capacity for 1600 A underground secondary supply service comprises four runs of 500 kcmil cables.
5. For upper level installations, customer shall provide means for cable restraining grip support in the wireway compartment - refer to ES54 S2-01.8.
6. Customer shall ensure that proper bonding is installed between the pullbox and wireway cubicles.
7. Utility wireways and pullboxes shall be reserved for utility purposes only and restricted access for utility personnel.

Reference Document

Secondary Metering "Secondary Voltage Revenue Metering 750 V and Less"
DI S10-4 Electric Service Connections - Voltages

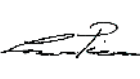
REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK

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Reference Standards

ES54 U4	Construction in Unstable Ground
ES54 H2-04	Concrete Encasement Reinforcing Details
ES54 H1-01	General Trenching Details, URD and UD Installations
ES54 Section F	Transformer Pads and Vaults
ES54 Section B	Pull/Splice, Service and Junction Boxes
ES55 D3	Cable Pulling
ES53 U1-01	Cable and Conductor Data, New Construction
ES53 S2-01	Secondary Services, Three-Phase to 1600 A, 208 V and 600 V, Service Entrance Enclosure Details
ES54 Section W	Construction Specifications

REVISIONS: R.8 -NEW OUTDOOR KIOSK, TABLE 1 REVISED, MACHINED GROUND STUD AND CABLE CLAMPS ADDED. OCT '18 MK

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