



**CENTRE WELLINGTON HYDRO
LTD.**

METERING SPECIFICATIONS

EFFECTIVE:

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Preface

This specification prescribes the installation and equipment requirements for Centre Wellington Hydro Ltd. (CWH), metering. It is the Customer's and their Electrician/Contractor's responsibility to familiarize themselves with these specifications.

CWH reserves the right to refuse to energize any part of the electrical plant that does not conform to these specifications. CWH assumes no responsibility whatsoever for the cost of repairs or delays in energizing the system incurred as a result of disregarding these specifications.

The latest edition of the Ontario Electrical Safety Code shall apply unless otherwise stated in these specifications. The Customer and its agents are to familiarize themselves with, and abide by, all relevant Provincial Statutes and Municipal By-Laws. Such relevant regulations include in part, the Occupational Health and Safety Act and Regulations for Construction Projects. Also applicable are Township of Centre Wellington By-Laws.

CWH is regulated by the Ontario Energy Board (OEB) and complies with section 3 of the Distribution System Code, which outlines the requirements for connections and expansions.

Section 1 provides general CWH and customer responsibilities. Sections 2 and 3 provide general and more specific metering equipment and installation requirements. Also included are drawings and tables providing more detailed information. Additional metering requirements are listed in the OEB's Distribution System Code. Metered Market Participants in the Independent Electricity System Operator (IESO) administered wholesale market must meet or exceed all IESO metering requirements. For water meter remote readout provisions, contact the municipality.

In all cases, the Customer shall consult with CWH prior to the start of work to determine specific metering requirements. Meters will not be installed unless all applicable requirements have been met.

1. Responsibilities

1.1 Centre Wellington Hydro Ltd.

CWH shall supply and maintain revenue meters, instrument transformers, interconnecting wiring, ancillary devices, secondary wiring, seals, and other related equipment for revenue metering in a timely manner and in compliance with applicable legislation, CWH's Metering Specifications, and CWH's Conditions of Service.

1.2 The Customer

- 1.2.1 The Customer shall comply with these specifications for each type of electrical service listed, CWH's Conditions of Service and all applicable legislation.
- 1.2.2 Detailed power riser diagrams and drawings showing the metering provision and arrangement for all commercial services with mains in excess of 600A and/or 600V and services with meter centers shall be submitted to CWH for approval before building construction begins.
- 1.2.3 Prior to issuing a Service Order to have the metering equipment installed and the service energized, the property owner must contact CWH's Customer Service Department and sign the "CWH Service Agreement" form.

1.3 Costs

The cost of materials, labour, and associated equipment related to metering installations shall be paid for in accordance with applicable legislation and CWH's Conditions of Service.

2. General

2.1 Access

- 2.1.1 CWH shall have access to Customer property to install, read, and maintain its metering equipment, in accordance these requirements and Section 40 of the Electricity Act.
- 2.1.2 The Customer must provide or arrange free, safe and unobstructed access during regular business hours to any authorized representative of CWH for the purpose of meter reading, meter changing, or meter inspection. Where premises are closed during CWH's normal business hours, the Customer must, on reasonable notice, arrange such access at a mutually convenient time.
- 2.1.3 The Customer shall be responsible for supplying a key to CWH. CWH may request that the lock be keyed to CWH specifications. In specific instances and at the sole discretion of CWH, the requirement for an outside door may be waived.
- 2.1.4 If CWH staff must enter the building and access the electrical panel other than on the main floor, there must be a proper stairway with a handrail that leads to the location of the electrical panel.

- 2.1.5 No person, except those authorized by CWH, may remove, connect, or otherwise interfere with CWH's meters, wires, ancillary equipment or seals. The Customer will be responsible for the care and safekeeping of CWH meters, wires and ancillary equipment on the Customer's premises. For deliberate damage or negligence of CWH equipment, other than by ordinary wear and tear, wind or lightning; the Customer will be liable to pay to CWH the value of such equipment, or at the option of CWH, the cost of repairing the same.
- 2.1.6 An adequate working space in front of equipment, with a radius not less than 1m (39") and minimum ceiling height of 2.1m (83") for the full width of the installation shall be maintained at all times. The floor surface shall be solid and flat with no more than five (5°) degree slope. This space shall not be used for storage, etc. Noticeable, repetitive obstruction of this working space can be remedied by CWH notifying the Fire Department and Electrical Safety Authority.
- 2.1.7 Unobstructed working space in front of equipment shall be maintained, free from or protected against, the adverse effects of moving machinery, vibration, dust, moisture or fumes.
- 2.1.8 Metering equipment cannot be located in space that could become a confined space.
- 2.1.9 Any compartments, cabinets, boxes, sockets, or other work-space provided by the Customer for the installation of CWH's metering equipment shall be for the exclusive use of CWH. No equipment, other than that provided and installed by CWH, may be installed in any part of the CWH metering workspace.
- 2.1.10 Where excessive vibration may affect or damage CWH metering equipment, adequate shock absorber mounting suitable to CWH will be provided and installed by the Customer. The Customer or their contractor will contact CWH when there is the possibility that such conditions may occur.
- 2.1.11 Where there is the possibility of danger to CWH employees or damage to equipment from moving machinery, dust, fumes, moisture, vandalism etc., protective arrangements satisfactory to CWH and the Electrical Safety Authority shall be made.
- 2.1.12 All site installations will be considered as "Safe Work Site Areas". A safe work site area will be determined when the meter installer is on location. If a work site is deemed unsafe or there are safety concerns by the installer, there will be a delay in the installation of the meter.
- 2.1.13 If, in the opinion of CWH, building additions, alterations, fencing, tree growth or other obstruction, etc. render the meter inaccessible for reading and/or servicing, the meter will be relocated to a CWH approved location at the Customer's expense. Where such a condition exists, the Customer will be granted 30 days to relocate the meter or ensure suitable access.

2.2 Location

- 2.2.1 All meters and meter cabinets shall be mounted level in the horizontal and vertical planes.
- 2.2.2 Meters are to be mounted at a height of 1.6m (5'4") \pm 100mm (4") when measured from finished grade to the centre of the meter face/glass.

- 2.2.3 All outdoor single phase meter bases shall be mounted on the exterior of the building within 3m (10') of the front corner of the building. The front of the building is that side which is the closest point of supply as determined by Engineering Department.
- 2.2.4 No part of the meter base is permitted to be above central air conditioners, window wells or any obstacles that prevent access to meter.
- 2.2.5 No part of the meter base is permitted within 1m of a gas meter.
- 2.2.6 A temporary finished grade may be permitted only if the meter installer agrees the grade is acceptable and the surface area is safe to work on. This temporary grade condition must still meet the terms of section 2.2.2. This is only a temporary condition until final grading can be completed. The permanent finished grade should not be altered in any way after the meter has been installed.
- 2.2.7 Each detached, semi-detached or row housing unit (freehold or condominium) will be separately metered by a meter that is located outside. For condominium row housing, all meter bases for each block must be installed using CWH approved ganged meter bases located on one end of each block (as per the design drawing). The Customer is responsible for the extension of the unit services from the meter to the individual units. The individual units must be numbered and identified in accordance with Section 2.5 and Drawing "MS-1". Refer to Section 2.6 for further details on multi-unit metering.
- 2.2.8 All three phase metering installations shall be indoor.
- 2.2.9 If a metering centre is used, the minimum height allowed for the bottom row of meters is 610mm (24") and the maximum height allowed for the top row of meters is 1.7m (5'6") \pm 150mm (6") as shown in Drawing "MS-10C". Both dimensions are measured from finished floor elevation to the centre of the meter face/glass.
- 2.2.10 Metering cabinets, if required, shall be mounted at 1.83m (6') \pm 50mm (2") with the exception of a 1200mm x 1200mm x 300mm (48" x 48" x 12") meter cabinet which shall be mounted at 1.98m (6'6") \pm 50mm (2") from the finished floor elevation to the top of the metering cabinet. All cabinets to be mounted with the right door opening first.
- 2.2.11 The Customer's main switch shall be installed so that the top of the switch is 1.83m (6') or less from the finished floor elevation. The Customer's main switch shall permit the sealing and padlocking of the handle in the "open" position and the cover or door in the "closed" position.

2.3 Technical Requirements

- 2.3.1 Metering will typically be done on the low voltage side of the CWH or customer owned transformer (secondary metering). Primary metering may be provided at the discretion of CWH. For primary metering details, refer to Section 3.5.

- 2.3.2 In order to preserve the integrity and accuracy of CWH's metering systems, no devices other than those required for CWH's purposes shall be permitted to be connected to the metering circuits. Any metering or load control equipment required by the Customer must be connected to the Customer's own current and voltage transformers which must be installed on the load side of CWH's metering equipment. Any secondary arresters, power factor correction capacitors, ground fault indicator lights or other Customer equipment must also be connected on the load side of CWH's metering equipment. All Customer connections shall be made to the load side of CWH's metering.

- 2.3.3 Customer owned metering or load control equipment cannot be installed in the same metering cabinet or metering switchgear cell, as those of CWH.
- 2.3.4 The Customer is required to supply, install and maintain a CWH approved meter socket for the use of CWH's self-contained socket meters.
- 2.3.5 All meter bases must be equipped for terminations approved for CWH's copper or aluminum cables and be equipped with a security ring specified in Table 2.
- 2.3.6 Any conduits for the exclusive use of Utility shall have no more than three 90° degree bends. No fittings with removable covers are permitted. The customer or contractor shall install nylon or polyrope pull line in the conduit with an excess of 200mm (8") loop left at each end.
- 2.3.7 For overhead services, the meter base must meet the requirements of the Electrical Safety Authority.
- 2.3.8 For underground services, the meter base must meet the requirements of the Electrical Safety Authority and be on the approved CWH list. For the current list of approved meter bases for underground services refer to Table 1.
- 2.3.9 For three phase services, the customer is required to supply and install a 5 or 7-jaw, GSA approved meter socket. Where a neutral connection to the meter socket is required, it shall be not less than #12 AWG copper or equivalent and made directly to the neutral bus.
- 2.3.10 Side-hinged doors shall be installed over all live electrical equipment where CWH personnel may be required to work (i.e. line splitters, unmetered sections of switchgear, breakers, switches, metering compartments, meter cabinets and enclosures). These hinged doors shall have metal latch with provision for sealing and padlocking. Where bolts are used, they shall be of the captive knurled type. All outer-hinged doors shall open no less than 135°. All inner-hinged doors shall open to a full 90°.
- 2.3.11 Meter bases/cabinets shall be installed downstream (on the load side of) the main disconnect for three phase services.
- 2.3.12 Meter bases shall be upstream (on the line side of) the main disconnect switch for single-phase services (unless approval is obtained from CWH for specific circumstances, i.e. multi-unit inside metering).
- 2.3.13 Meters for new or upgraded residential services will be mounted outdoors on a meter socket approved by CWH (Table 1). The meter base cover plate must be removable (i.e. not enclosed) in order to allow CWH maintenance access.
- 2.3.14 When a residential Customer is upgrading their service capacity, and the meter is inside, it must be moved outside to a CWH approved location at the Customer's expense.

2.4 Meter Rooms

- 2.4.1 Lighting levels of at least 6 lux (65 footcandles) shall be maintained.
- 2.4.2 No water, gas, sewer, or other pipes, communications wire or equipment will be permitted to encroach on the safe working space requirements, as viewed by CWH, of the metering. Where a meter room is provided, no items in the vicinity of the room can present a hazard to CWH employees.

- 2.4.3 Meter rooms, for multi-unit metering, shall be accessible to CWH via an outside lockable door at grade level. The minimum door dimensions shall be 2000mm x 810mm (6'8" x 2'8"). The Customer shall be responsible for supplying a key to CWH. CWH may request that the lock be keyed to CWH specifications.
- 2.4.4 In specific instances and at the sole discretion of CWH, the requirement for an outside door may be waived (i.e. a high rise apartment building where meter rooms may be required to be located on more than one floor).

2.5 Service Identification

- 2.5.1 Customers shall permanently and legibly identify all metered services with respect to unit number and/or civic address. The units, meter bases and main panel disconnect switches must have permanent unit numbers installed prior to the installation of any metering apparatus according to Drawing "MS-1".
- 2.5.2 The Customer must inform CWH in writing if changes are made to unit numbering and will be liable to pay CWH any incurred costs as a result of unit re-numbering.

2.6 Multi-Unit Sites

- 2.6.1 Multi unit sites shall be individually or bulk metered in accordance with applicable legislation and CWH's Conditions of Service.
- 2.6.2 For row housing, meter sockets for each block must be ganged. The owner is responsible for the extension of the unit services from the meters to the individual units.
- 2.6.3 The customer or a representative must be present at the time of the meter installation and assist in the verification of each unit. The Metering Department at CWH needs to be notified to arrange a day and time (during normal working hours) to meet on site.
- 2.6.4 The developer and/or electrician shall provide CWH with the following, prior to the service being energized:
- a) All keys required to gain access to the metering room.
 - b) A copy of the building layout, indicating the municipal address and permanent unit numbers, for each floor if applicable, duly signed by the electrician or developer as correct.
 - c) A copy of the meter panel layout, indicating the correct corresponding permanent unit numbers, for each floor if applicable, duly signed by the electrician or developer as correct.
- 2.6.5 The units, doors, meter bases and main disconnect switches must have permanent unit numbers installed prior to the installation of any metering apparatus according to Drawing "MS-1".
- 2.6.6 Examples of the equipment layout for multi-unit metering are shown in Drawings "MS1, MS-10A, MS-10B, MS-10C, MS-10D, MS-30B and MS-30E."
- 2.6.7 The current list of approved 120/240V single-phase meter bases for multi-unit services is in Table 1. Three phase meter bases or centers shall meet the requirements of this document in addition to ESA requirements.

3. Equipment Requirements

3.1 Single-Phase

- 3.1.1 For servicing details, refer to Drawing "MS-1, MS-10A, MS-10B and MS-10D", respectively.
- 3.1.2 For underground or overhead service meter relocations refer to Drawing "MS-10A, MS-10B and MS-10D", respectively.
- 3.1.3 Each detached, semi-detached or linear row-housing unit shall be separately metered.

3.2 400 Amp Single Phase Services

3.2.1 225A to 400A single phase services:

- a) Use of a transformer-rated combination meter base enclosure. Refer to Drawing "MS-20A".
- b) Customer to supply and install combination meter base enclosure on the outside complete with all lugs. CWH approved units are listed in Table 1.
- c) The 5-jaw meter base must be equipped with an automatic bypass for the current circuit on the left side, with the 5th-jaw located at the 9 o'clock position and equipped with a security ring specified in Table 2.

For the current list of approved meter bases for individual 400A services refer to Table 1.

3.2.2 225A to 600A Single Phase Central Metering Service (CMS):

- a) At the discretion of CWH, pole-mounted CMS may be permitted for single phase rural services at 200 to 600 amperes to two or more buildings. If a rural-service Customer requires a greater service size than 600 amperes, single-phase, they will be required to convert to a three-phase service, at their expense.
- b) All central metering equipment will be located on the transformer pole. The pole will be a minimum 40' Class 4 Wood pole, supplied and installed by the Customer.
- c) The Customer will supply and install an approved 5-jaw (5th jaw at 9 o'clock position) meter base with automatic bypass at the current circuit on the left side, and a 25mm (1") PVC conduit from the meter base up the pole to a point 300mm (12") above the neutral wire, complete with weatherhead. Refer to Drawing "MS-20B" for complete details.

3.3 Metering Cabinets

- 3.3.1 For all indoor three-phase services 225-800 amperes, without switchgear, the following applies: *One IT/metering cabinet*- Refer to Drawings "MS-30C and MS-2" for equipment requirement and layout details.
- 3.3.2 At the sole discretion of CWH, two smaller cabinets may be allowed. Refer to Drawings "MS-30D and MS-2" for equipment requirement and layout details. These cabinets shall be physically located in the same electrical room and within line of sight.

- 3.3.3 The Customer's Electrician shall supply all necessary lugs, connecting hardware and CSA approved 1000V rated non-adhesive heat shrink for bar type CT installation. The Customer's Electrician shall apply heat shrink to all exposed energized CT connections. Neutral block is required in cabinet.
- 3.3.4 The Customer will supply and install meter cabinet grounding in accordance with Drawing MS-2.
- 3.3.5 The Customer or contractor will contact CWH Metering Department to arrange a time for backplate drop-off during regular business hours. Allow 10 working days for CWH staff to build and install the metering equipment. Upon completion, CWH's Metering Department will notify the Customer or contractor and arrange a day and time (during normal working hours) to meet on site for delivery of the backplate. It is Customer's or a contractor's responsibility to install the backplate at time of delivery.
- 3.3.6 For three-phase services greater than or equal to 225 amperes with switchgear:
- a) Refer to Drawings "MS-30A", "MS-30B" and "MS-2" for equipment requirement and layout details.
 - b) The Customer shall provide at least two (2) sets of original switchgear drawings from the manufacturer. Any discrepancies between the submitted drawings and the equipment on-site will require re-submittal of new drawings. CWH will not provide comment on 'as-built' switchgear drawings. Any deficiencies caused as a result of not coordinating switchgear drawing approval beforehand must be remedied by the Contractor/Customer at their expense. All switchgear drawings are subject to approval by CWH, and must also include the following manufacturer contact information:
 - i. Project and Job Number
 - ii. Complete shipping address for the instrument transformers
 - iii. Full name and phone number(s) of the contact person(s)
 - c) Barriers are required in each section of switchgear or service entrance equipment between metered cell and all adjacent cells.
 - d) CWH will provide the necessary current and potential transformers and these can be either shipped to the switchgear manufacturer (with reasonable notice) or installed locally by the Customer/Contractor. CWH will not be responsible to install these transformers or perform any bus modifications.
 - e) The Customer or contractor will contact CWH Metering Department when all conduit work is completed, IT's, meter cabinet and 120VAC duplex receptacle installed. Allow 10 working days for CWH staff to build and install the metering equipment.

3.4 Central Metering

- 3.4.1 Central metering may be provided at the discretion of CWH. This involves the installation of instrument transformers at the transformer location to meter secondary cables running to two or more buildings on the same property, typically installed in rural areas.
- 3.4.2 For single-phase installations refer to Drawing "MS-208". For three phase installations refer to Drawing "MS-30F".

- 3.4.3 All central metering equipment will be located on the transformer pole unless an intermediate pole is required. The pole will be a minimum 45' Class 3 Wood pole, supplied and installed by the Customer.
- 3.4.4 The Customer will supply and install a NEMA 3R 900mm x 900mm x 300mm (36" x 36" x 12") metering cabinet with a three point latch and handle. The metering cabinet shall be complete with a removable backplate and two (2) side hinged, opening doors. Mounted with the right door opening first.
- 3.4.5 Only bottom entry allowed for all conduits entering metering cabinet.
- 3.4.6 The Customer to supply a Caloritech PXFT200 c/w wire guard condensation heater on a 120V cord.
- 3.4.7 The Customer will supply and install a continuous 32mm (1 1/4") PVC conduit from the meter cabinet up the pole to a point 300mm (12") above the neutral wire, complete with weatherhead.
- 3.4.8 The Customer will supply and install meter cabinet grounding in accordance with Drawing MS-2.
- 3.4.9 The Customer will supply and install a grounded 120VAC duplex receptacle, fed from a dedicated 15A single-pole breaker, routed via EMT or PVC. Wiring to receptacle to be kept to minimum length.
- 3.4.10 The Customer or contractor will contact CWH Metering Department when all conduit work is completed, meter cabinet and 120VAC duplex receptacle installed. Allow 10 working days for CWH staff to build and install the metering equipment.
- 3.4.11 Interval meters will be installed for all new or upgraded services where the monthly average peak demand over a calendar year is forecast to be 200 kW or greater.

3.5 Primary Metering

- 3.5.1 Primary metering may be a requirement of CWH. A deposit payable in full to CWH is required before CWH orders such equipment. CWH will retain ownership of primary metering equipment.
- 3.5.2 Outdoor, pole mounted primary metering units may be acceptable to CWH. Contact CWH for further information.
- 3.5.3 Each primary metered service is reviewed thoroughly and on an individual basis. The Customer and/or its agent shall submit to CWH all required switchgear and electrical single line drawings in a timely manner to allow for CWH's reviews and comments. Drawing submissions in hardcopy only unless electronic copies specified.
- 3.5.4 Primary metering potential transformers in customer-owned switchgear shall be installed in a manner that permits fuse and/or P.T. replacement, while the service is energized via:
 - a) P.T.'s and fuses mounted on a tilt-out drawer or slide-out tray, or
 - b) Fuses mounted on a slide-out tray with P.T.'s in a separate compartment,Allowing for all of the following three positions:
 - a) connected
 - b) isolated

c) grounded

Provisions for padlocking to be provided for the connected and grounded positions.

3.5.5 The P.T./fuse compartment(s) must be fully barriered from remaining compartments to permit servicing of P.T. or fuses while the remainder of switchboard is energized.

3.5.6 All clearances as per Electrical Safety Code and field modifications are subject to Electrical Inspection.

3.5.7 Contact CWH early in the design stage to begin the review as additional standards and requirements for primary metering may apply. Please note that CWH does not stock either PMU's or PMT's and that this equipment typically has long lead times.

3.6 Interval Metering

3.6.1 Interval meters will be installed for all new or upgraded services where the monthly average peak demand over a calendar year is forecast to be 200 kW or greater. For any other Customer, please contact CWH for availability. The Customer will be responsible for the installation and ongoing monthly costs of operating the communications system required to communicate with the interval meter.

3.6.2 Where interval meters are installed and being remotely interrogated by CWH, the Customer may also request read-only access. The "CWH Interval Metering, ReadOnly Access Agreement" must be completed and sent to CWH for approval. Contact CWH's Metering Department for further details. Alternatively, the Customer may contact CWH to obtain access to interval data provided via an internet website.

3.6.3 All customers installing new or upgraded three phase services sized at 225 Amps or greater (at 600V), 800 Amps or greater (at 120/208V) and any primary service, are required to supply and maintain an analog telephone line for CWH's use.

3.6.4 CWH will install an electronic meter to measure the electricity consumption at the service location. This meter will be equipped with mass memory storage capability and a modem. This will allow CWH to read the meter remotely via the telephone circuit using its Remote Interrogation Metering System (RIMS). RIMS aids in providing detailed information about the service's electricity consumption to better understand its daily load pattern. Furthermore, it may also help identify opportunities for improving the energy efficiency at the service.

3.6.5 The following requirements should be reviewed with the person(s) responsible for the service's internal telephone system:

The owner/customer must provide CWH with 24 hr/365 day telephone line access to the electric meter. Options in order of preference are;

- a) Dedicated, direct-access ANALOG line bypassing any switchboard or call processing equipment.
- b) Dedicated ANALOG extension if going through the Customer's automated telephone switch. Digital extensions are not allowed. The Customer's switch must provide 24 hr/365 day access to the meter.
- c) Shared ANALOG voice or telephone lines NOT connected to alarm monitoring equipment (fire, break-in, equipment failure, etc.) and without features such as "Call Answer".

In any case, the Customer's telephone contractor must supply and install the necessary programming services and equipment including a telephone circuit from their main telephone room (telephone switch) to the meter cabinet. The telephone circuit must be installed in a 12.7mm (1/2") conduit from the telephone room to the meter cabinet and terminated with an RJ11 modular telephone jack. The RJ11 jack must be mounted inside the meter cabinet within 150mm (6") of the electric meter. (Refer to Drawings "MS-30C, MS-30A, MS-30B, MS-300 or MS-30").

- 3.6.6 All externally routed phone cables shall be outdoor rated and protected with a surge suppressor on both ends.
- 3.6.7 When using an automated telephone attendant the new extension must be directly accessible for inbound telephone calls using a "back door" number with a unique extension. The extension must be labeled "For Use by CWH Equipment" only in the main telephone room. The extension must also be programmed to allow outbound local calls only. CWH usually programs its equipment to dial 9 prior to the number it is trying to reach. The Customer's telephone contractor must confirm that dialing 9 will allow CWH to initiate an outbound local call.
- 3.6.8 CWH's normal use of this telephone line will not burden the telephone switch or fax line with many calls. CWH normally uses this telephone circuit to contact its meter once daily for a less than two (2) minutes. This call is usually made between the hours of 00:00 EST and 09:00 EST. CWH may, on occasion, attempt to contact the meter during normal business hours to troubleshoot a problem with either the meter or the communications equipment. The metering equipment will only generate outbound local calls when it detects a metering equipment problem and an outside telephone line is available.
- 3.6.9 At all existing locations the Customer shall have a working phone line for the electric meter at time of service energization. New locations will require a working phone line within 30 days of service energization.

3.7 Pulse Outputs

- 3.7.1 Customers may request access to CWH's real time meter data for the purpose of supplying inputs to their energy management systems. For most three-phase services greater than 200 Amps, CWH will provide Customer access to certain KYZ metering pulse output(s) after completing a site review and quotation for the Customer.
- 3.7.2 The Customer will be responsible for all costs associated with supplying access to the metering pulse outputs.
- 3.7.3 The "CWH Metering Pulse Output(s) Access Agreement" must be completed and sent to CWH for approval.

3.8 Fire Equipment

If a separate service for a fire pump has been deemed necessary to comply with legislation, codes or regulations under emergency conditions involving a fire, CWH will offer it subject to the following additional requirements:

- a) A single line diagram showing the connection of the fire pump and meter base voltage and current ratings shall be submitted to CWH.

- b) The main disconnect and meter base for the fire pump service shall be located in the same room as the main breaker for the overall service.
- c) Laminated warning cards must be located at both the main disconnect for the fire pump service and at the main disconnect for the main secondary service (permanently affixed). They must be red with white lettering and the lettering must be a minimum of 12.7mm (0.5") in size. Wording on these cards must be "Fire Pump Installed Ahead of Main Breaker. Two (2) separate points of secondary supply exist in this room. There is a possibility of electrical backfeed."

Appendix A - Drawings

Standard Drawings MS-1 to MS-015

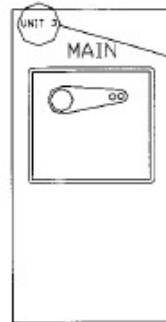
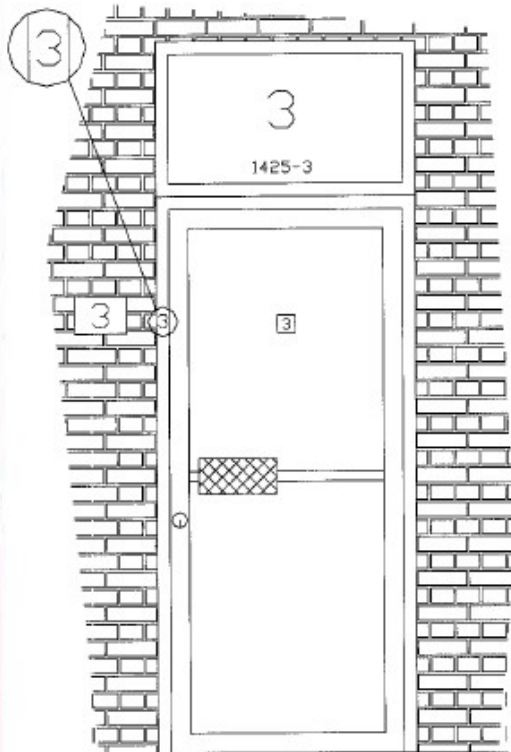
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MULTIPLE-UNIT METERING IDENTIFICATION DETAIL

DOOR TO UNIT

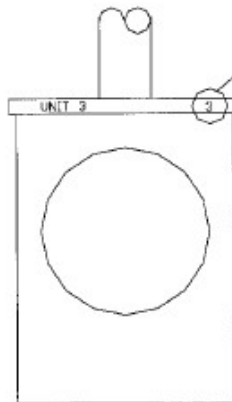
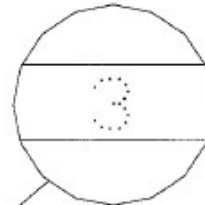
- THE UNIT NUMBER MUST BE:
- PERMANENTLY MARKED
 - EASILY IDENTIFIABLE
 - MINIMUM CHARACTER SIZE OF 50 mm (2")

NO MAGIC MARKER OR NUMBERS ON PAPER TAPED TO THE DOOR. SEE ILLUSTRATION AND SELECT SUITABLE METHOD.



UNIT MAIN SWITCH / PANEL

- PERMANENT UNIT NUMBER
- PERMANENT (MAGIC) MARKER ACCEPTABLE ON INDOOR EQUIPMENT



METER BASE

- NUMBER MUST BE ON NON-REMOVABLE PART OF BOX
- NUMBER MUST BE PERMANENT
- NO MAGIC MARKER ON OUTDOOR METER BASE
- MAGIC MARKER ACCEPTABLE ON INDOOR EQUIPMENT ONLY
- UNIT NUMBER TO BE MARKED ON THE INSIDE OF METER BASE WITH A PERMANENT (MAGIC) MARKER

SUITABLE METHODS

- ENGRAVED WITH ELECTRIC ETCHER
- CENTRE PUNCH DOTS (SEE ILLUSTRATION ABOVE)
- PAINT

PLEASE NOTE THAT UNITS NOT SUFFICIENTLY IDENTIFIED WILL NOT BE CONNECTED UNTIL THEY ARE PROPERLY IDENTIFIED

PLEASE ENSURE THE FOLLOWING ARE COMPLETED BEFORE REQUESTING CONNECTION:

1. DOOR MUST BE LABELLED WITH UNIT NUMBER.
2. METER BASE MUST BE LABELLED WITH UNIT NUMBER.
3. MAIN SWITCH MUST BE LABELLED WITH UNIT NUMBER.
4. STREET ADDRESS FOR BUILDING MUST BE CLEARLY POSTED.

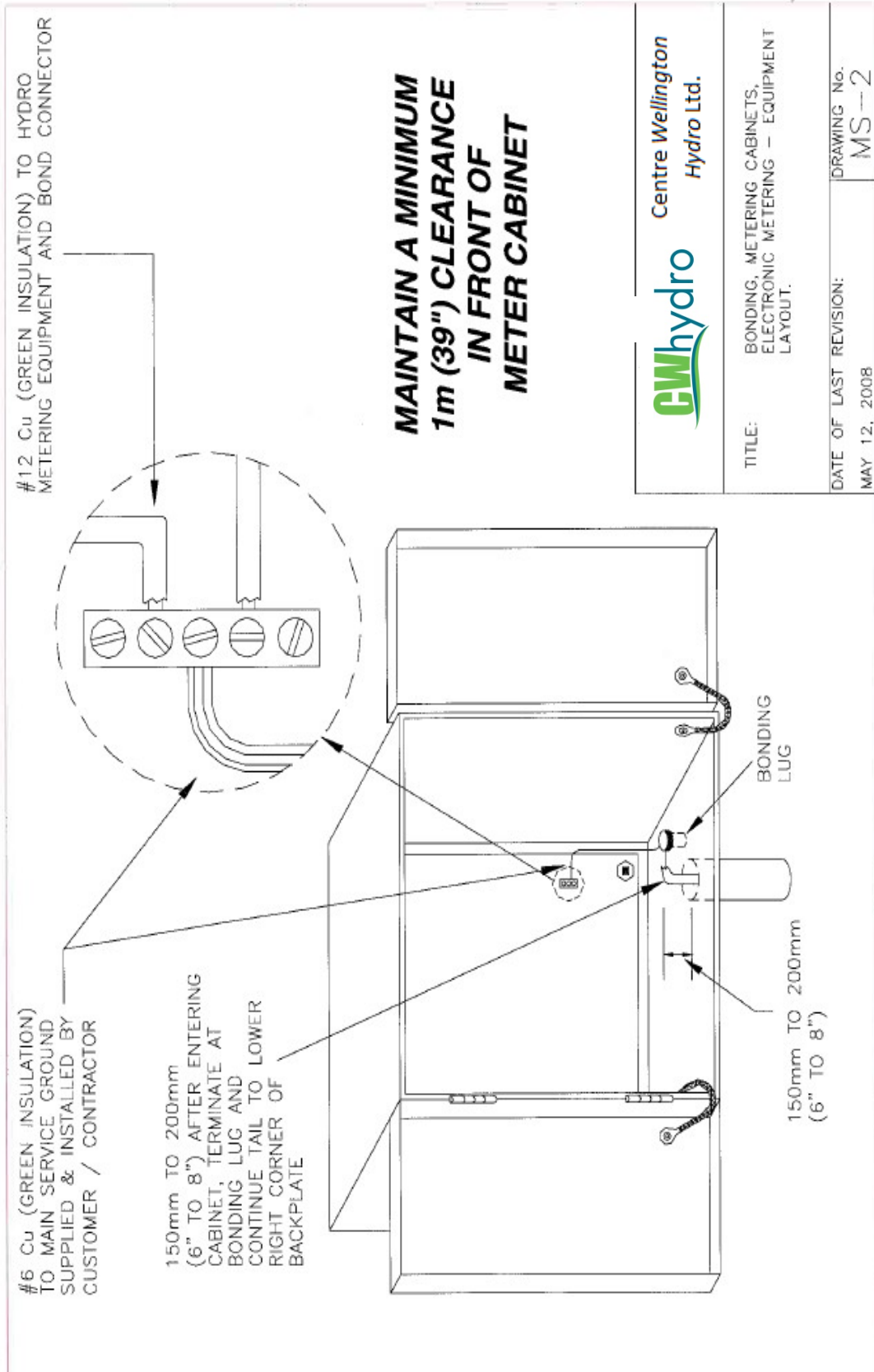


Centre Wellington
Hydro Ltd.

TITLE: MULTIPLE-UNIT METERING IDENTIFICATION DETAIL

DATE OF LAST REVISION:
MAY 12, 2008

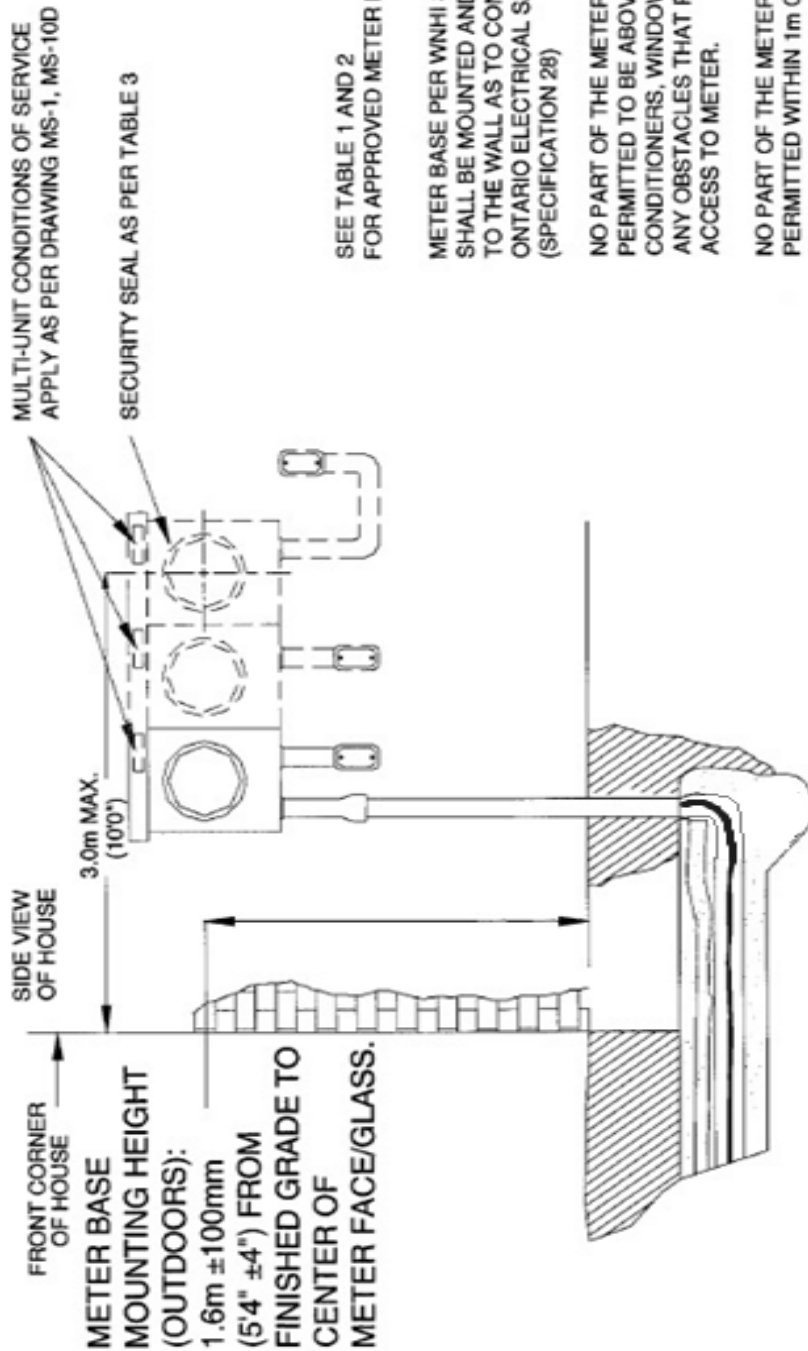
DRAWING No.
MS-1



Centre Wellington
 Hydro Ltd.

TITLE: BONDING, METERING CABINETS,
 ELECTRONIC METERING – EQUIPMENT
 LAYOUT.

DATE OF LAST REVISION: MAY 12, 2008
 DRAWING No. MS-2



**** WIRE SHALL BE INSTALLED IN DUCT FROM METER BASE TO POINT OF SUPPLY ****
****THIS WILL INCLUDE FROST JOINT AT METERBASE**
****DUCT SHALL BE SURROUNDED BY CLEAN SAND AND HAVE PROPER CAUTION TAPE**

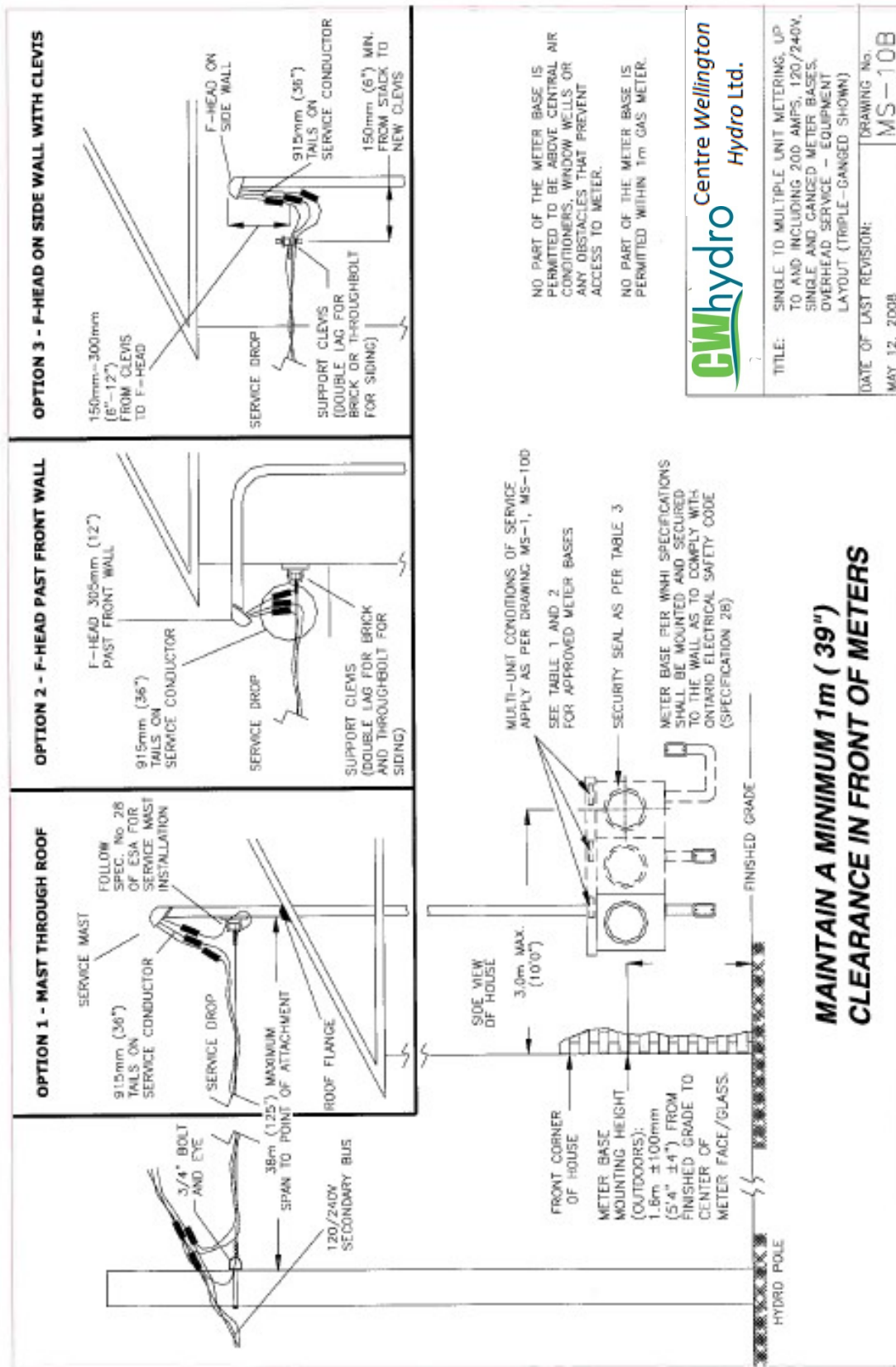
***MAINTAIN A MINIMUM 1m (39")
 CLEARANCE IN FRONT OF
 METERS**

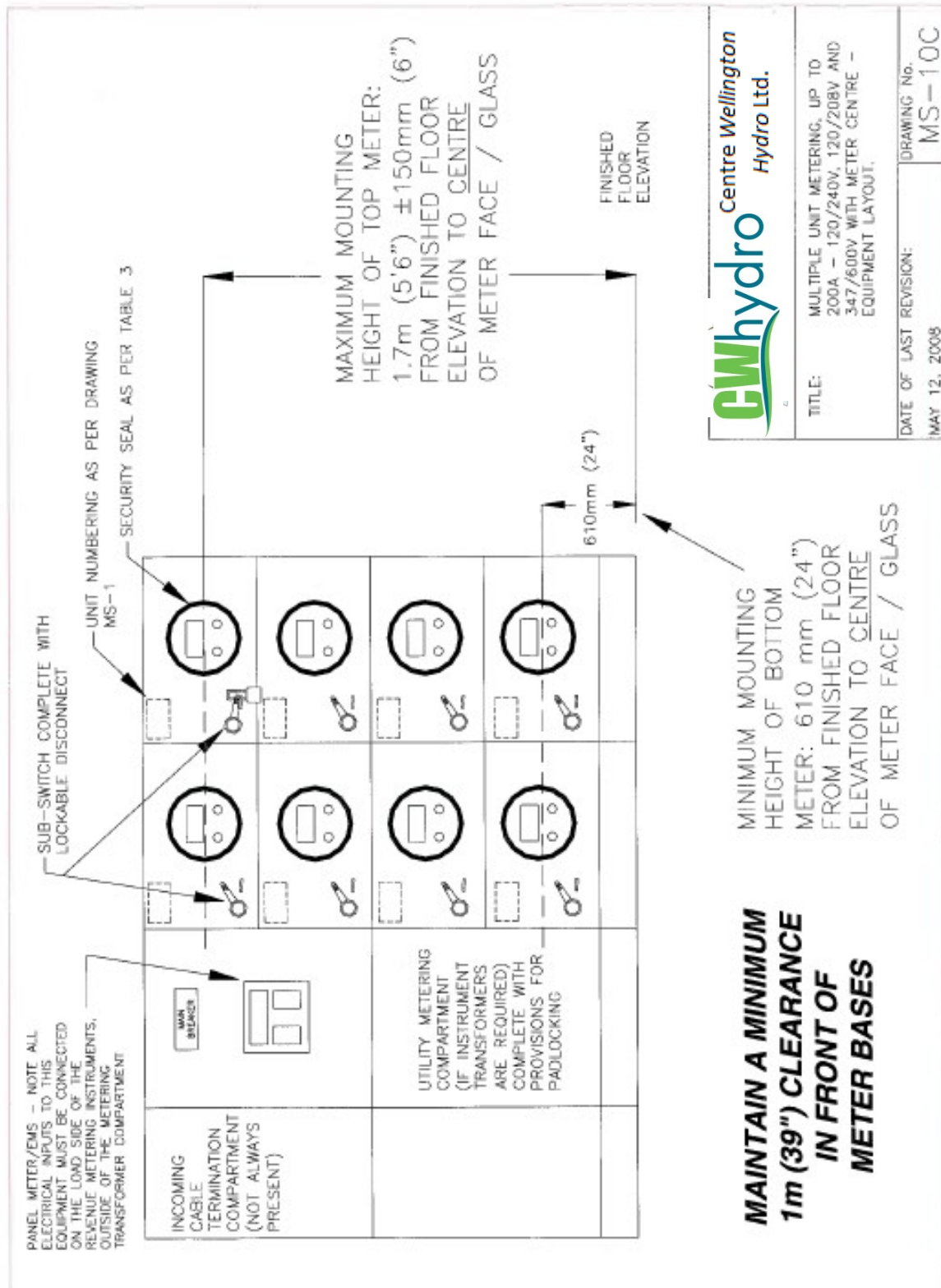


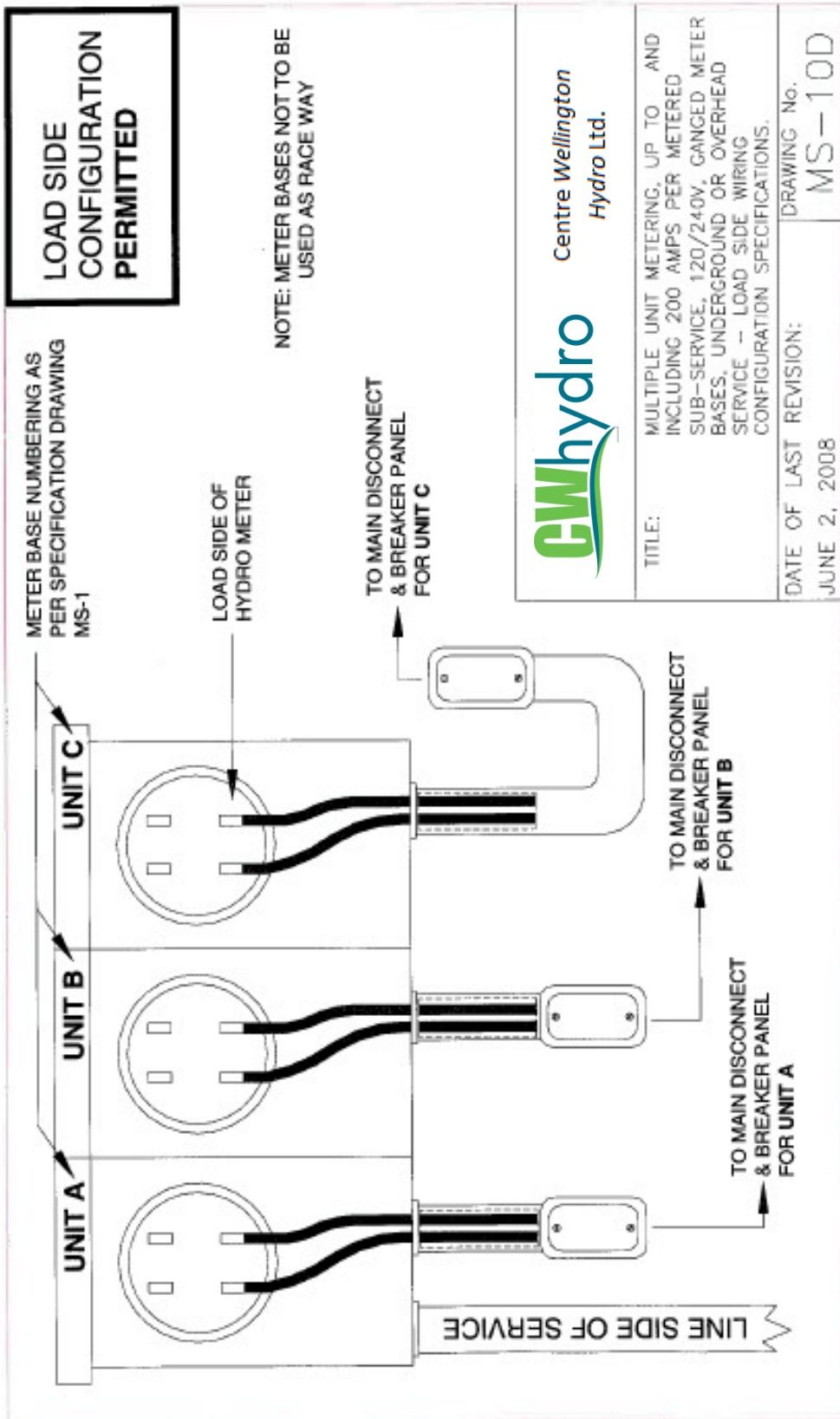
WATERLOO NORTH
 HYDRO INC.

TITLE: SINGLE TO MULTIPLE UNIT METERING, UP TO AND INCLUDING 200 AMPS, 120/240V, SINGLE AND GANGED METER BASES, UNDERGROUND SERVICE - EQUIPMENT LAYOUT (TRIPLE-GANGED SHOWN)

DATE OF LAST REVISION: MAY 12, 2008
 DRAWING No. MS-10A

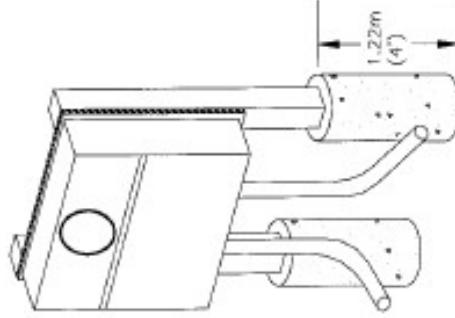






**PILE-STANDING STRUCTURE
SPECIFICATIONS:**

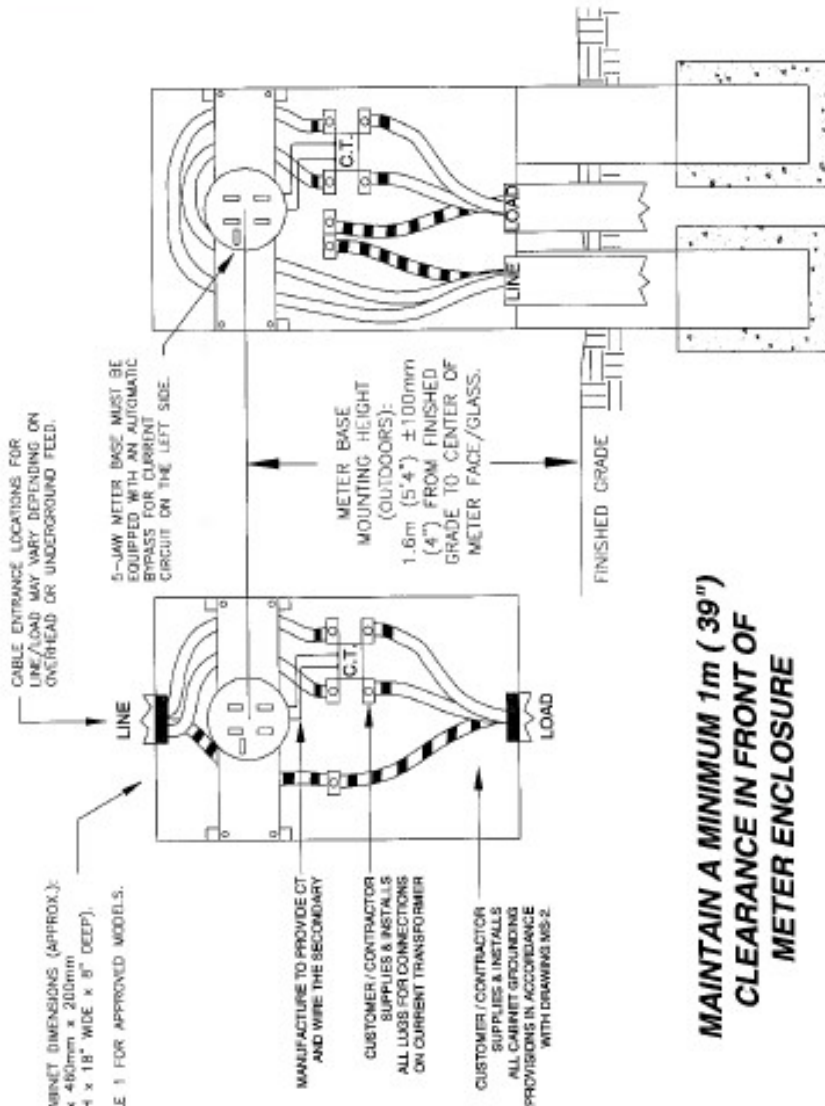
- 1) 2 - 6"X6"X10" PRESSURE TREATED POSTS (MINIMUM 1.22m (4') IN THE GROUND)
- 2) POSTS TO BE CONCRETE-ENCASED IN MINIMUM 1.22m (4') DEEP SONOTUBES
- 3) BACKBOARD: 5/8" OR 3/4" PRESSURE-TREATED PLYWOOD, 1" OVERLAP (ALL SIDES)



CWhydro Centre Wellington Hydro Ltd.

TITLE: 400 AMP, SINGLE-PHASE, 120/240V WITH TRANSFORMER-RATED COMBINATION METER BASE ENCLOSURE - EQUIPMENT LAYOUT.

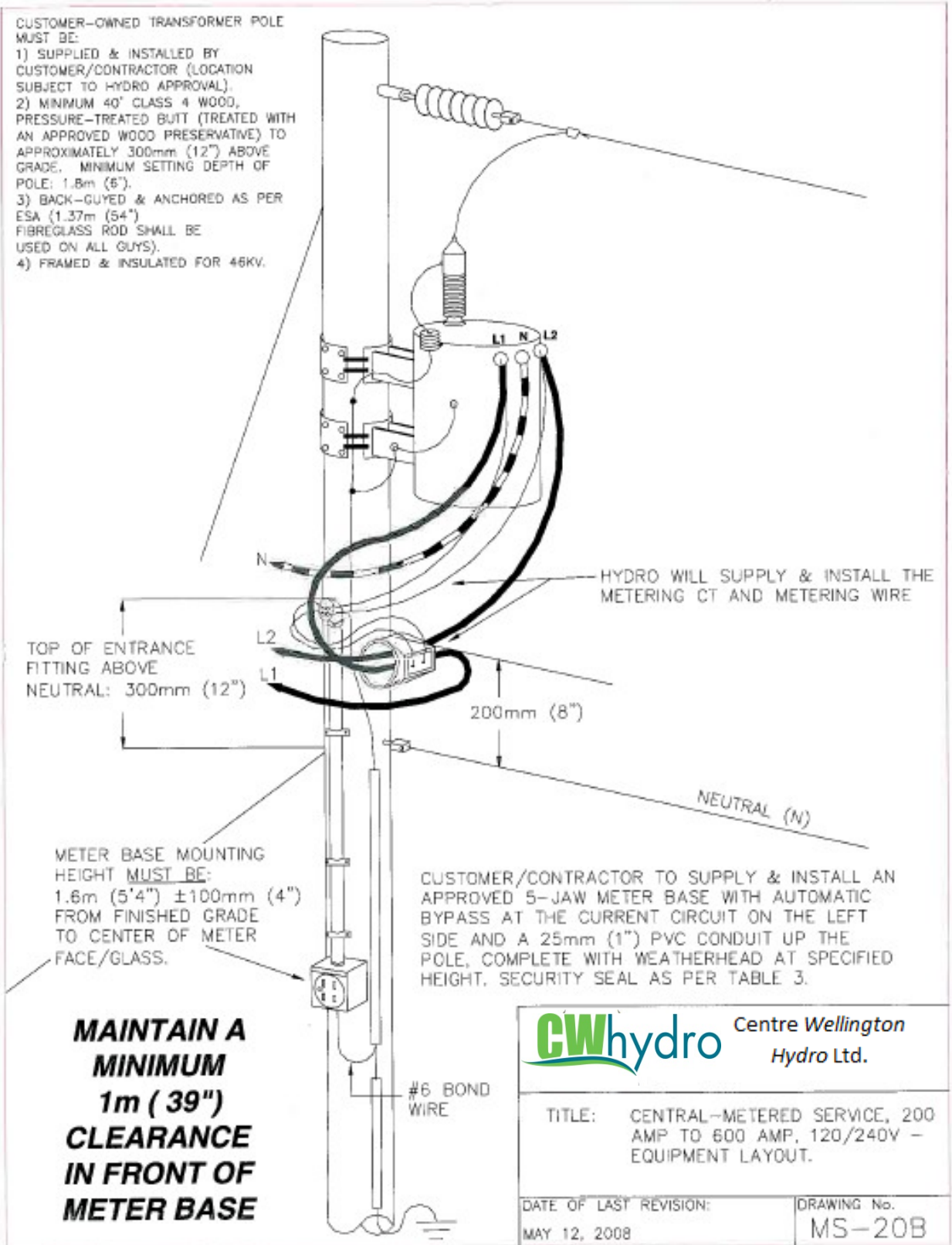
DATE OF LAST REVISION: JUNE 2, 2008
DRAWING No. MS-20A

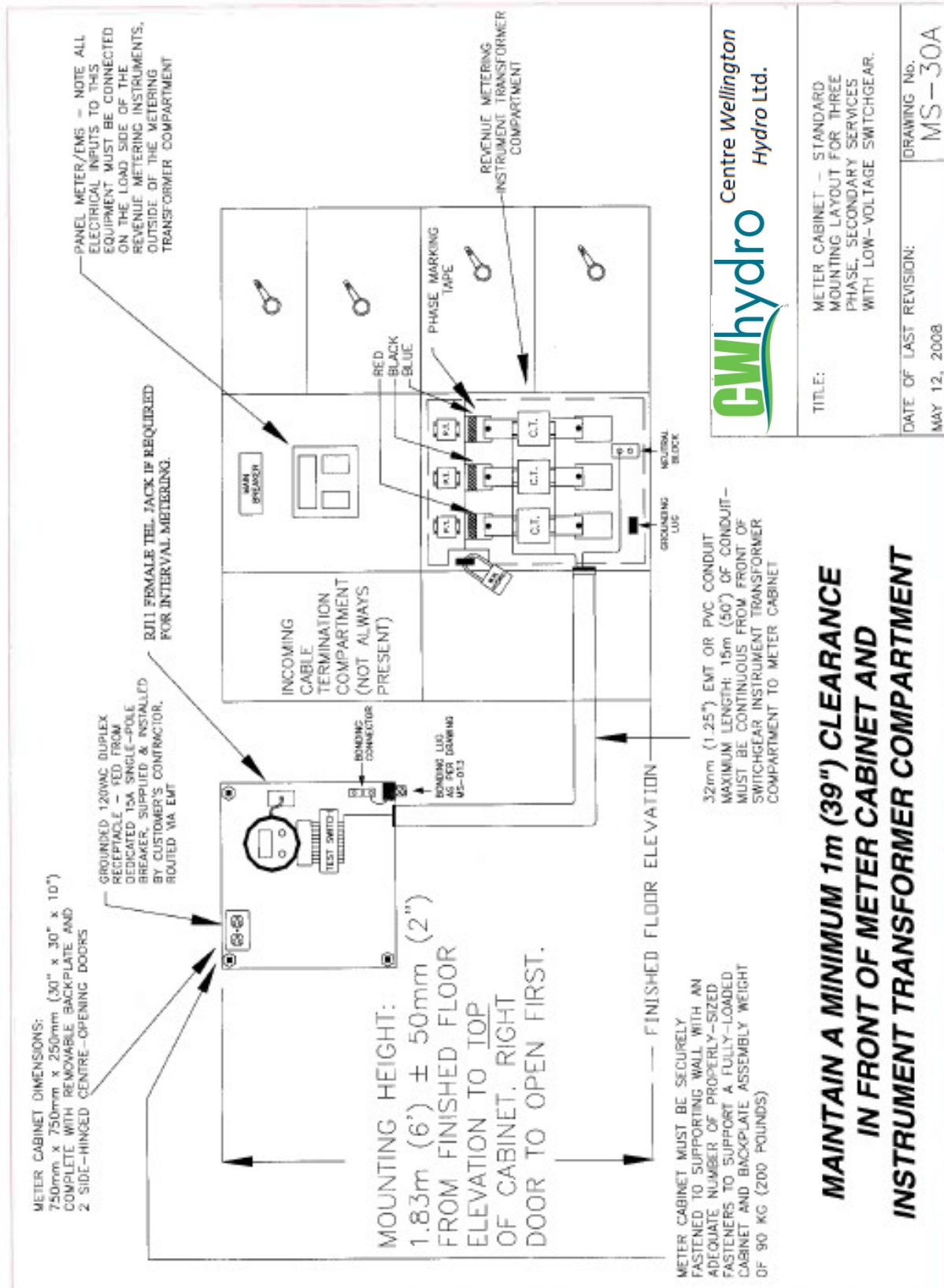


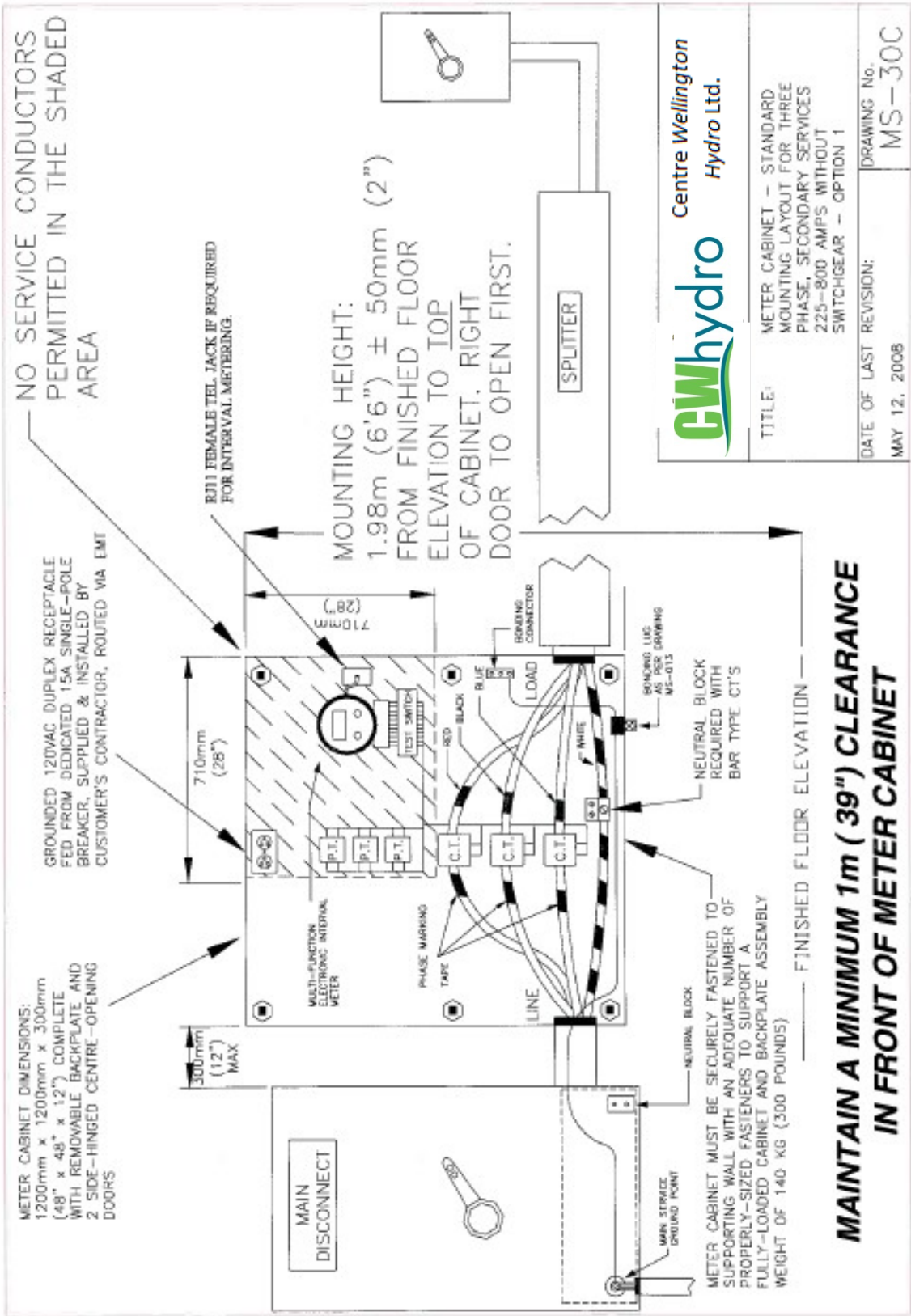
METER CABINET DIMENSIONS (APPROX.): 750mm x 460mm x 210mm (30" HIGH x 18" WIDE x 8" DEEP).
SEE TABLE 1 FOR APPROVED MODELS.

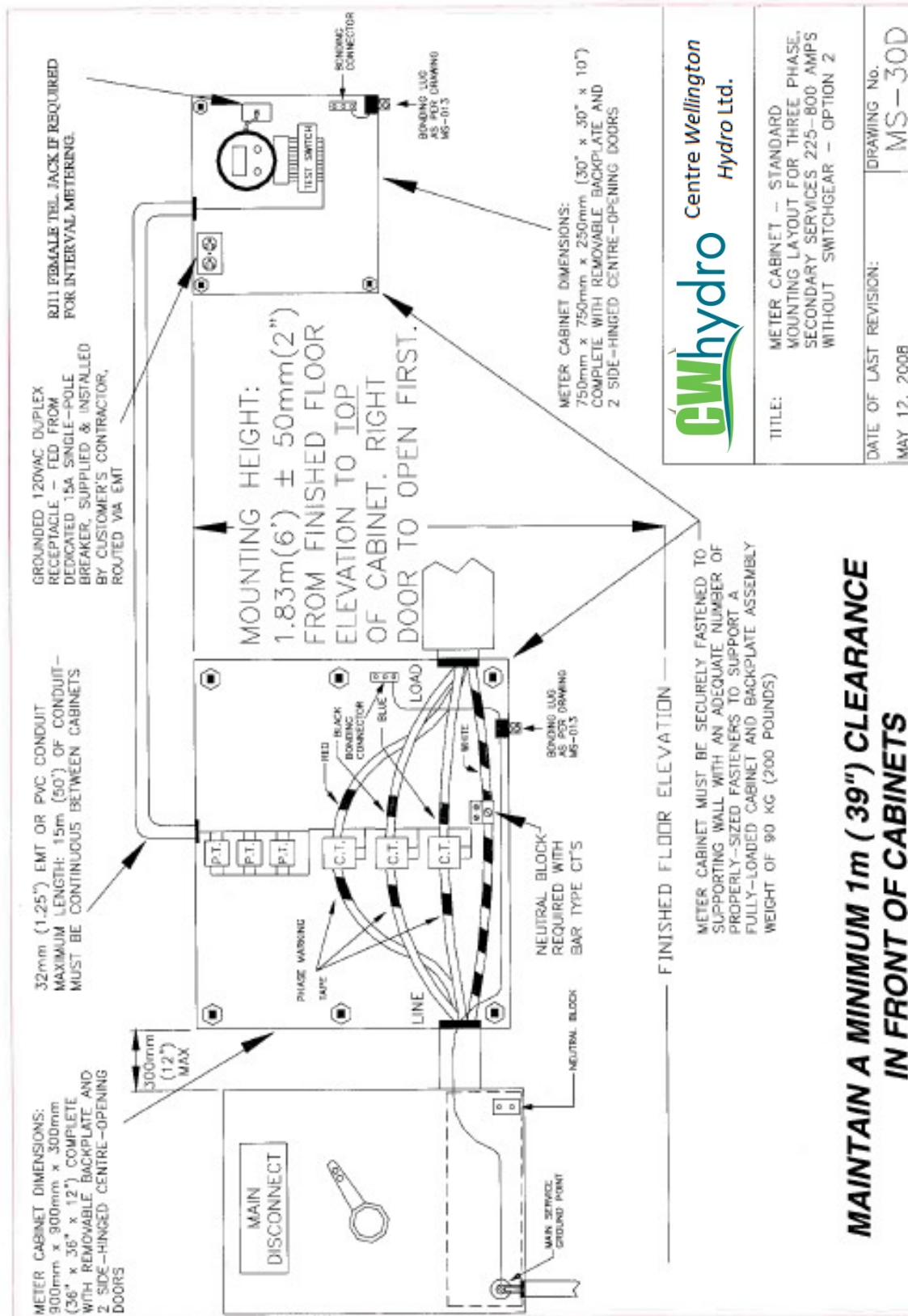
- MANUFACTURE TO PROVIDE CT AND WIRE THE SECONDARY
- CUSTOMER / CONTRACTOR SUPPLIES & INSTALLS ALL LUGS FOR CONNECTIONS ON CURRENT TRANSFORMER
- CUSTOMER / CONTRACTOR SUPPLIES & INSTALLS ALL CABINET GUIDANCE PROVISIONS IN ACCORDANCE WITH DRAWING MS-2

**MAINTAIN A MINIMUM 1m (39")
CLEARANCE IN FRONT OF
METER ENCLOSURE**



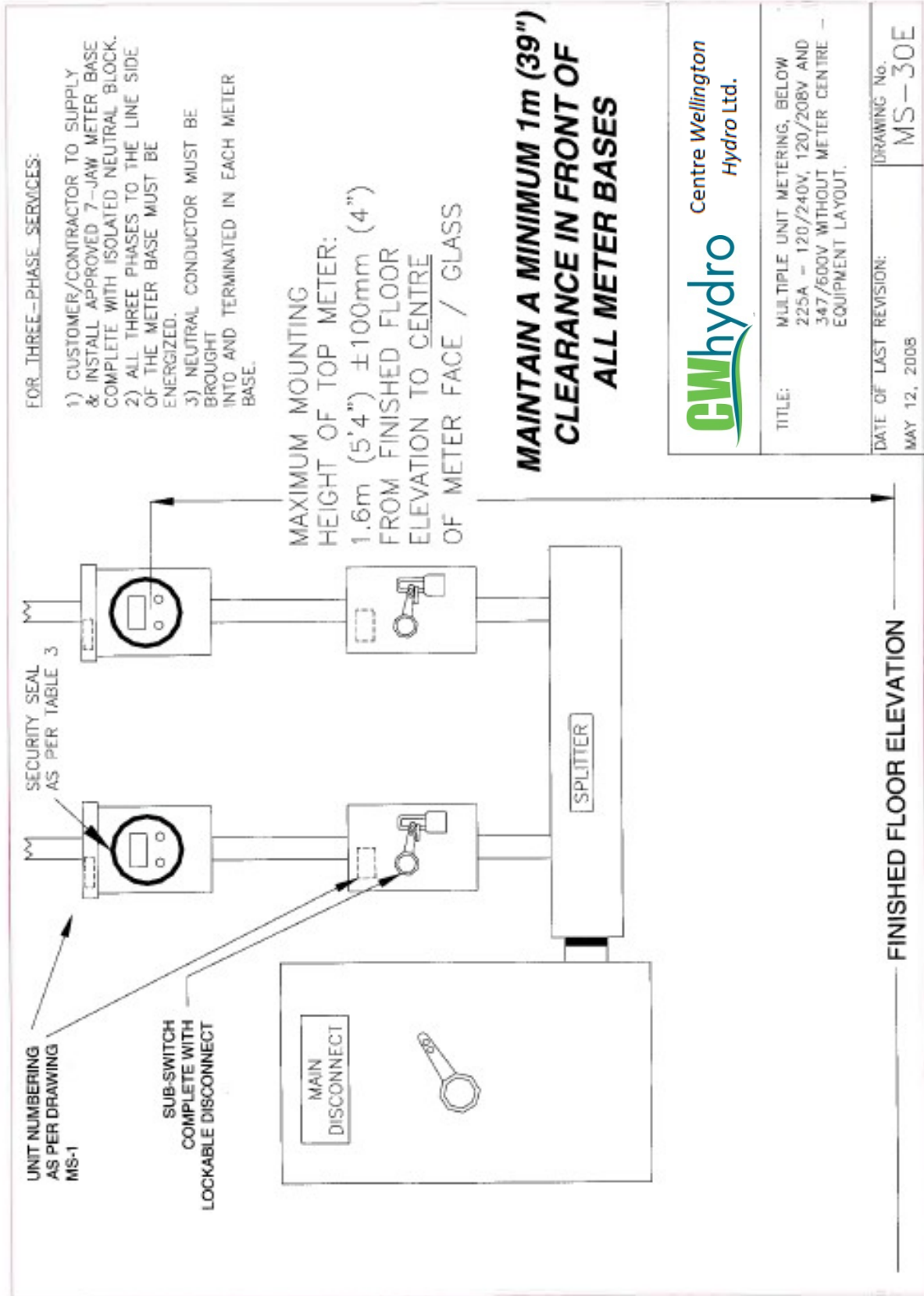






 Centre Wellington Hydro Ltd.	
TITLE: METER CABINET — STANDARD MOUNTING LAYOUT FOR THREE PHASE, SECONDARY SERVICES 225–800 AMPS WITHOUT SWITCHGEAR — OPTION 2	
DATE OF LAST REVISION: MAY 12, 2008	DRAWING NO.: MS-30D

MAINTAIN A MINIMUM 1m (39") CLEARANCE IN FRONT OF CABINETS

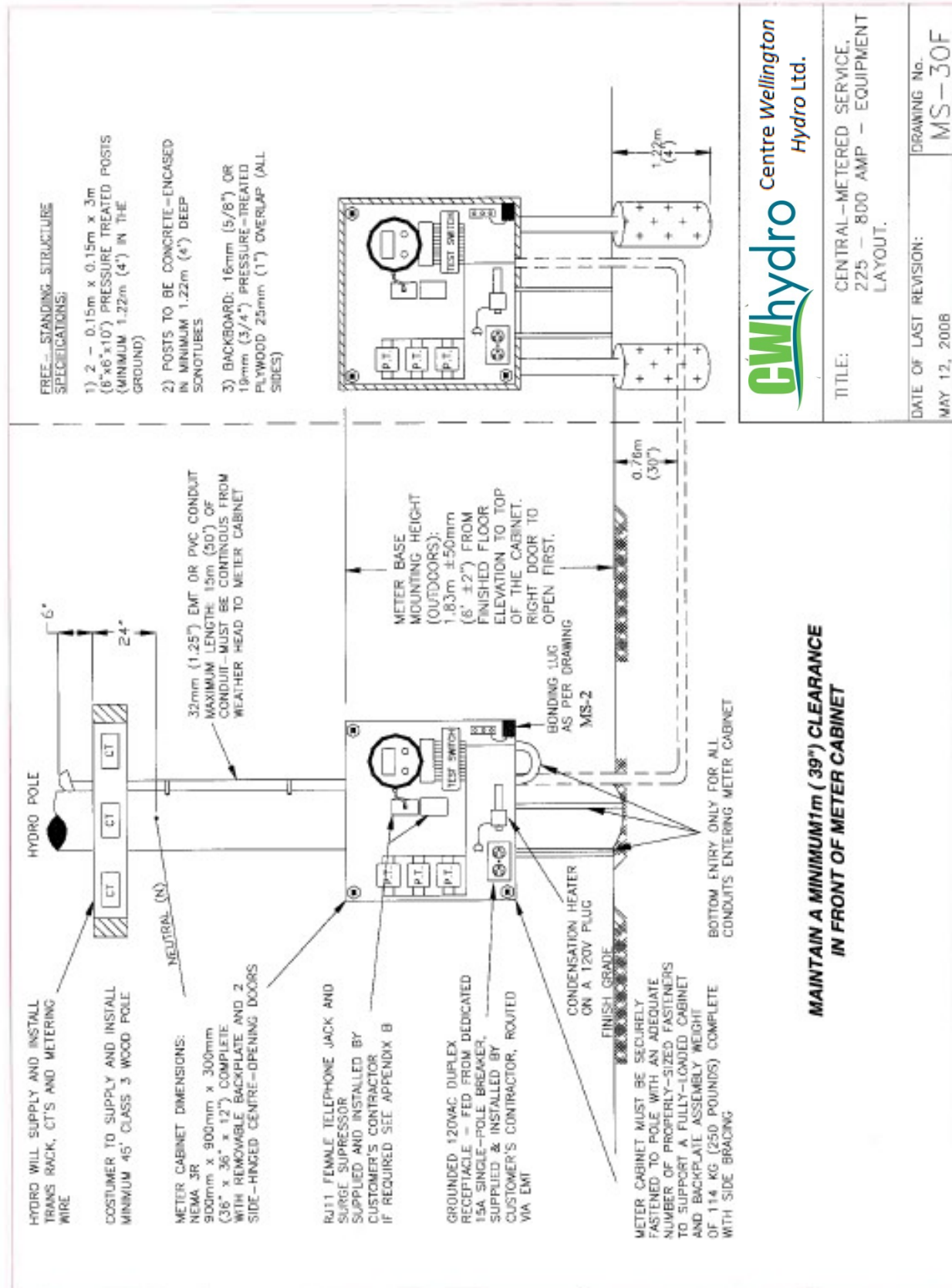


Centre Wellington
Hydro Ltd.

TITLE: MULTIPLE UNIT METERING, BELOW 225A - 120/240V, 120/208V AND 347/600V WITHOUT METER CENTRE - EQUIPMENT LAYOUT.

DATE OF LAST REVISION: MAY 12, 2008

DRAWING No. MS-30E



Appendix B- Tables

Table 1: CWH Approved Meter Bases

Table 2: CWH Approved Security Seal Rings

Table 1: CWH Approved Single Phase Meter Bases

Capacity	Service*	Manufacturer	Model Number
<i>Individual</i>			
200 Amp	Overhead	- any ESA approved unit is acceptable	
	Underground	- Cutler-Hammer (Eaton) - Thomas & Betts (Microelectric) - Hydel	LM2 or LU2 BS2-TV or BS2-TCV EK400RO or EK400T0
400 Amp	Overhead/ Underground	- Cutler-Hammer (Eaton) - Thomas & Betts (Microelectric) - Hydel - Durham/Jesstec	TCCS-2 SR4 JS4A-TW CT4-Z-200/5 1004718C
	<i>Multi Unit (Ganged)</i>		
200 Amp		- Cutler-Hammer (Eaton)	2K2 (2 position) 3K2 (3 position)
		- Thomas & Betts (Microelectric) - Hydel	BD2-V (2position) BD3-V (3 position) HC22R (2 position) HC23R (3 position)

*- 200 Amp units must be 4 jaw.
 400 Amp units must be 5 jaw and equipped with an automatic bypass for the current circuit on the left side. The 5th jaw is to be at the 9 o'clock position. All units are Single Phase, 3 wire, 120/240V, rated 600V.

All meter base faceplates must be self-supporting and securely clamped after installation.

Table 2: CWH Approved Security Seal Rings

Manufacturer	Model Number
Peerless Security Systems Inc.	S-102