PUBLIC WORKS COMMISSION

City of Fayetteville

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ELECTRIC SERVICE STANDARDS

ORIGINAL ISSUE
FEBRUARY 24, 2009

REVISED
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DRAWING NO.
ESS-0

GLOSSARY OF TERMS

Clearances- The minimum distances required by NEC, NESC and NFPA.

Commercial Service- Any electric service used for non-residential purposes.

City / County / State Permit- Permission requested by PWC from governmental authorities to allow work to be performed in their right of ways.

Customer- Any present or prospective user of PWC's electric service, or any person or entity representing him, such as the architect, engineer, electrical contractor, land developer, builder, etc.

Conduit Riser- The portion of the exposed pipe that originates from the meter can and ties to the underground conduit. This pipe is owned by the customer and can be made of rigid galvanized pipe, intermediate pipe, or Schedule 40 PVC.

Drip Loop- A u-shaped bend in the wires that allows water to drip off, so it shall not enter the service entrance. The drip loop is typically part of the service entrance and is the responsibility of the customer. The presence of a drip loop reflects that the wires are properly secured to the building and are relaxed. It is located at the top of the weatherhead.

Easement- A legal, recorded document granting PWC permission to install facilities on private property. Once granted, it is the customer's responsibility to maintain this area and shall be readily accessible at all times.

Estimated Completion Date- This is the proposed date when the installation of electric utilities is to be completed.

Electrical Conduit- A PVC pipe that is used for protecting and routing of electrical wiring typically in an underground system.

Fault Current- Abnormal flow in an electrical circuit due to a short circuit or abnormally low impedence path.

Feeder- Conductors and equipment originating from PWC power stations carrying high voltage energy to a service area.

Handhole- A PWC splice point that sits flush to the ground with only the concrete/fiberglass cover exposed.

Inspection- Confirmation from municipalities/counties indicating approval that the electrical wiring has passed inspection. After receiving this approval, PWC may install the meter.

Local Jurisdictional Responsibilities- Issue the appropriate permit for the installation of customer wiring and equipment, if applicable. Inspect and approve customer's wiring and equipment. Provide PWC with inspection approval notification for customer's wiring and equipment.

Meter- Device that is used by PWC to measure the quantity of electricity used.

REF: Construction and Operation Procedures Dwg. 20.2-00a

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GLOSSARY OF TERMS

Meter Socket- Device which provides support and means of electrical connection to a watthour meter. It has a wiring chamber, with provisions for conduit entrances and exits, and a means of sealing the meter in place.

Mobile Home- A mobile home is a factory assembled structure designed to be used as a living unit, and readily movable on it own running gear. It has no permanent foundation.

Multiple Occupancy Building- A unified structure containing five or more individual dwelling units.

NEC- National Electrical Code

NESC- National Electrical Safety Code

NFPA- National Fire Protection Association

Pedestal- An above ground PWC splice point. This equipment is made of fiberglass and extends approximately 24" above ground.

Point Of Connection- The location where PWC owned conductors are connected to customer owned conductors. Typical points of connection include weatherheads, meter sockets, service junction boxes, PWC handholes, padmounted transformers, and vaults. The point of connection shall be determined by PWC. The point of connection for a PWC owned and maintained underground residential service drop is the line side of the meter socket. The point of connection for a PWC owned and maintained overhead service drop is the attachment to the customer's weatherhead.

Primary- The conductors and equipment that deliver high voltage energy to a PWC transformer.

PVC (Polyvinyl Chloride)- a widely used thermoplastic polymer that is most commonly used in construction applications.

PWC- Public Works Commission or an employee properly qualified to represent the Public Works Commission.

Readily Accessible- Capable of being reached quickly for operation, maintenance, or inspections.

Residential Service- Electric service supplied exclusively for domestic purposes in individually metered dwelling units. Includes the separately metered non-commercial-use facilities of a residential customer (e.g. garages,water pumps,etc.).

Secondary- The conductors and equipment that deliver electricity, from PWC's main system to a PWC handhole or pedestal.

Service- The conductors and equipment that deliver electricity from PWC's system to the point of connection. It also means maintenance of voltage and frequency (within acceptable tolerances) by PWC to the point of connection.

Service Drop (Overhead)- The overhead conductors from PWC's last pole or other aerial support, connecting the Customer's service entrance conductors at point of connection.

REF: Construction and Operation Procedures Dwg. 20.2-00b

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GLOSSARY OF TERMS

Service Drop (Underground)- The underground service conductors connecting PWC's distribution system to the Customer's point of connection.

Service Entrance- The Customer's installation from the point of connection.

Service Entrance Conductors- The Customer's conductors from point of connection.

Service Equipment- The Customer's equipment which contains the switching and overcurrent protective devices, usually located near the point of connection.

Site Address- Physical street address as assigned by governmental authority where construction shall be performed.

Site Ready- The customer's site shall be prepared to enable construction crews and equipment to be deployed to the site and construction activities to commence. The site ready criteria addresses final grade, installation of facilities (water, well, septic, sewer, storm drain), location of private underground facilities and property lines, removal of obstructions in the cable path, and installation of transformer pads and duct, if required.

Standard Service- The minimum level of service, as determined by PWC, for the load to which electric service is being requested by the Customer.

Temporary Electric Service- A service intended to be used for a limited period, for construction, exhibit, or carnival purposes. The temporary facilities will be removed at the completion of its use. This may also be referred to as Temporary/Construction Service.

Transformer- Equipment that converts primary voltage to a lower secondary voltage.

Underground Distribution- A distribution system where the conductors are installed in conduit or directly buried. Transformers, switches and other equipment are normally above ground.

Service Pedestal- A free standing customer owned structure that accommodates a meter enclosure in cases where either the meter cannot be mounted directly on the facility wall (ex. Mobile Home) or when the meter needs to be positioned as close as possible to the PWC power source per the company's standards.

URD (Underground Residential Distribution)- An underground distribution system, primarily supplying single phase, three wire service to residential dwelling units. Transformers and primary switches are contained in above ground padmounted enclosures.

Weatherhead- A weatherproof entry point for overhead electrical wiring into a home or business.

Work Request Number- An Identification number assigned to each job in the PWC Work Management System.

REF: Construction and Operation Procedures Dwg. 20.2-00c

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DRAWING NO.
ESS-3

1 Phase Services

Service Size	Voltage	Amp Rating	Type	Manufacturer/Item Number
≤ 100 Amp	1ϕ 120/240 V OH	100 Amp	4 Terminal	MILBANK / 57490-2LTG DURHAM / 1RT-RS1O1M SUPERIOR / RLTU312UD60558605
≤ 100 Amp	1ϕ 120/240 V UG	200 Amp	4 Terminal	MILBANK / S1980-XTL-BL DURHAM / 1005694 DUNCAN / HQ-4-2W
200 Amp	1ϕ 120/240 V	200 Amp	4 Terminal	MILBANK / S1980-XTL-BL DURHAM / 1005694 DUNCAN / HQ-4-2W
225 Amp	1ϕ 120/240 V	200 Amp	4 Terminal	MILBANK / S1980-XTL-BL DURHAM / 1005694 DUNCAN / HQ-4-2W
400 Amp	1ϕ 120/240 V	320 Amp	4 Terminal	MILBANK / U2214-2/K2 CUTLER HAMMER / UTH533OUCH W/LUG KIT LANDIS-GYR / 48704-82
>400 Amp	1ϕ 120/240 V	See Note 1	6 Terminal	MILBANK / AP2300-03W W/TERM 5&6 ANCHOR / U1000-636
≤100 Amp	1ϕ 120/208 V	200 Amp	5 Terminal	MILBANK / 57490-2LTG DURHAM / 1RT-RS1O1M SUPERIOR / RLTU312UD60558605
200 Amp	1ϕ 120/208 V	200 Amp	5 Terminal	MILBANK / S1980-XTL-BL DURHAM / 1005694 DUNCAN / HQ-4-2W
225 Amp	1ϕ 120/208V	200Amp	5 Terminal	MILBANK / AP2300-03W W/TERM 5&6 ANCHOR / U1000-636
≥400 Amp	1ϕ 120/208 V	See Note 1	6 Terminal	MILBANK / AP2300-03W W/TERM 5&6 ANCHOR / U1000-636

-NOTE-

1. Enclosures for services greater than 400 amps shall be provided by PWC as needed
2. All meter sockets are furnished and owned by Customer.

REF: Construction and Operation Procedures Dwg. 20.2-10a

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Electric Service Standards

APPROVED METER SOCKETS
(SINGLE PHASE)

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

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DRAWING NO.
ESS-4

3 Phase Services

Service Size	Voltage	Amp Rating	Type	Manufacturer/Item Number
≤ 100 Amp	3ϕ 120/240 V 3ϕ 120/208 V 3ϕ 277/480 V	200 Amp	7 Terminal	DURHAM / IT-H72334 OR 1005908 SUPERIOR / RLO-559-RLP DUNCAN/LANDIS&GYR / HQ-7-2W
200 Amp	3ϕ 120/240 V 3ϕ 120/208 V 3ϕ 277/480 V	200 Amp	7 Terminal	DURHAM / IT-H72334 OR 1005908 SUPERIOR / RLO-559-RLP DUNCAN/LANDIS&GYR / HQ-7-2W
225 Amp	3ϕ 120/240 V 3ϕ 120/208 V 3ϕ 277/480 V	200 Amp	7 Terminal	DURHAM / IT-H72334 OR 1005908 SUPERIOR / RLO-559-RLP DUNCAN/LANDIS&GYR / HQ-7-2W
400 Amp	3ϕ 120/240 V 3ϕ 120/208 V 3ϕ 277/480 V	320 Amp	7 Terminal	ANCHOR / 1-RS44572-H10W/2-L2250-4 SUPERIOR / RPTU559HDSA W/LUG KIT DURHAM / H733OU W/LUG KITS LANDIS-GYR / 48707-82 CUTLER HAMMER / UTH733OUCH W/LUG KIT
>400 Amp	3ϕ 120/240 V 3ϕ 120/208 V 3ϕ 277/480 V	See Note 1	8 Terminal	DURHAM / 1005849 DUNCAN / HQ-8T LANDIS&GYR / 9804-8456

-NOTE-

1. Enclosures for services greater than 400 amps shall be provided by PWC as needed
2. All meter sockets are furnished and owned by Customer.

REF: Construction and Operation Procedures Dwg. 20.2-10b

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Electric Service Standards

APPROVED METER SOCKETS
(THREE PHASE)

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Fayetteville, North Carolina

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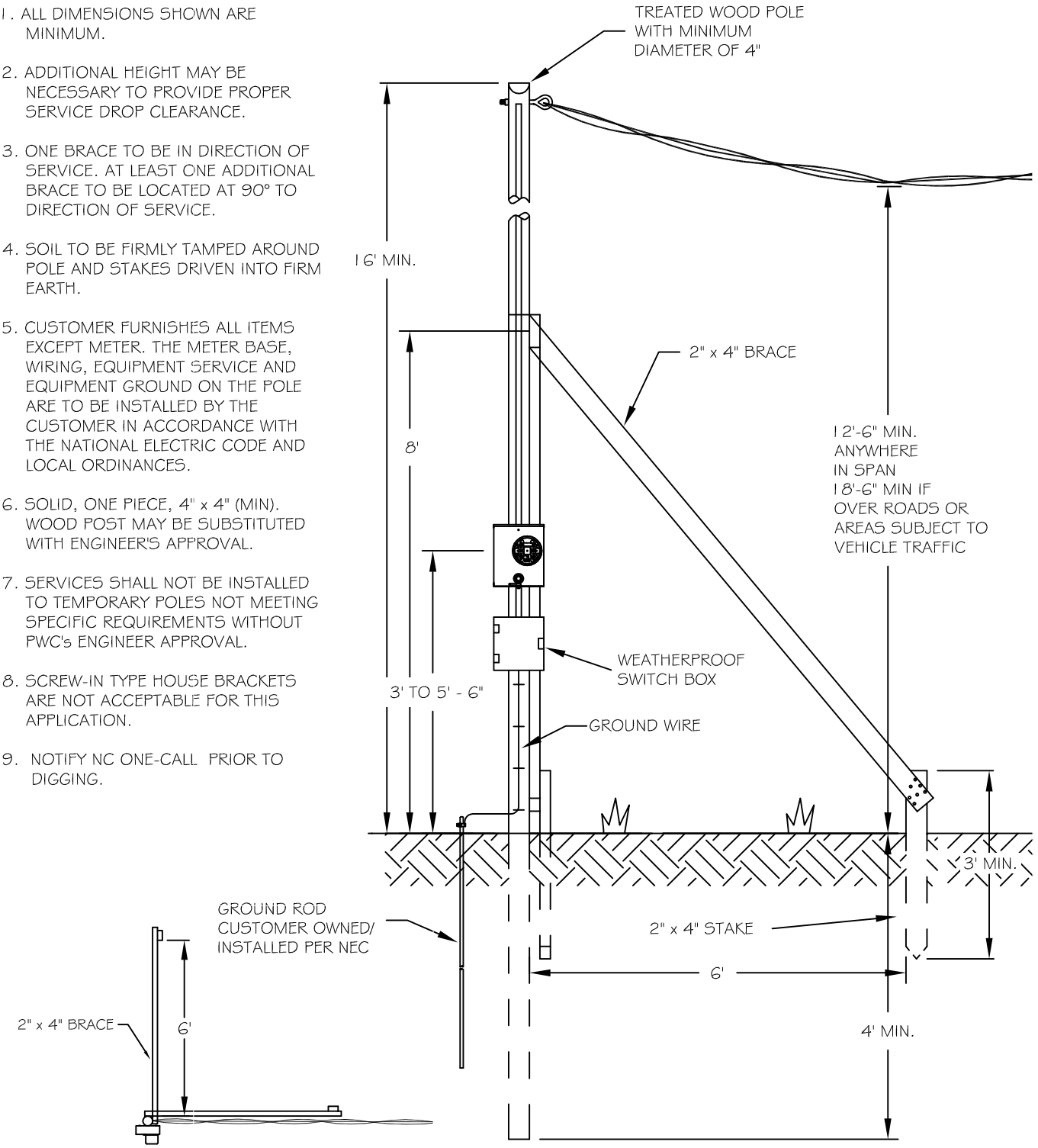
DRAWING NO.
ESS-5

NOTES:

1. ALL DIMENSIONS SHOWN ARE MINIMUM.
2. ADDITIONAL HEIGHT MAY BE NECESSARY TO PROVIDE PROPER SERVICE DROP CLEARANCE.
3. ONE BRACE TO BE IN DIRECTION OF SERVICE. AT LEAST ONE ADDITIONAL BRACE TO BE LOCATED AT 90° TO DIRECTION OF SERVICE.
4. SOIL TO BE FIRMLY TAMPED AROUND POLE AND STAKES DRIVEN INTO FIRM EARTH.
5. CUSTOMER FURNISHES ALL ITEMS EXCEPT METER. THE METER BASE, WIRING, EQUIPMENT SERVICE AND EQUIPMENT GROUND ON THE POLE ARE TO BE INSTALLED BY THE CUSTOMER IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND LOCAL ORDINANCES.
6. SOLID, ONE PIECE, 4" x 4" (MIN). WOOD POST MAY BE SUBSTITUTED WITH ENGINEER'S APPROVAL.
7. SERVICES SHALL NOT BE INSTALLED TO TEMPORARY POLES NOT MEETING SPECIFIC REQUIREMENTS WITHOUT PWC's ENGINEER APPROVAL.
8. SCREW-IN TYPE HOUSE BRACKETS ARE NOT ACCEPTABLE FOR THIS APPLICATION.
9. NOTIFY NC ONE-CALL PRIOR TO DIGGING.



REF: Construction and Operation Procedures Dwg. 20.2-07

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Electric Service Standards

TEMPORARY OVERHEAD SERVICE POLE

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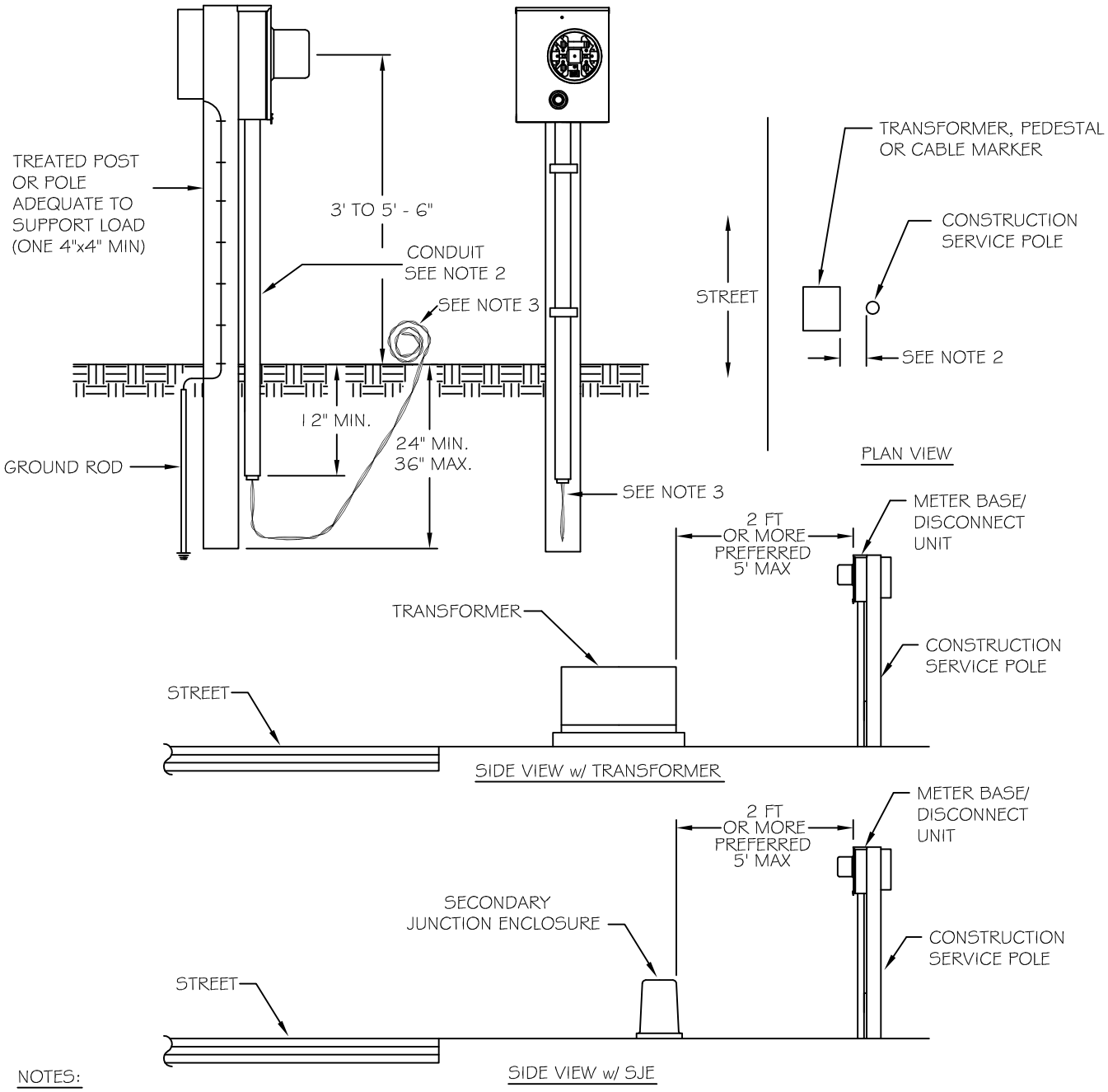
ESS-6



NOTES:

1. CUSTOMER FURNISHES ALL ITEMS EXCEPT METER. INSTALLATION IS TO BE MADE BY ELECTRICIAN TO MEET N.E.C. AND LOCAL ORDINANCES.

2. LOCATION AND DISTANCE OF CONSTRUCTION SERVICE POLE TO TRANSFORMER OR SECONDARY JUNCTION ENCLOSURE SHALL BE 2 FEET OR MORE PREFERRED WITH A MAXIMUM OF 5 FEET.

3. CUSTOMER SHALL TERMINATE CONDUCTORS IN METER SOCKET. CUSTOMER SHALL COIL SUFFICIENT SERVICE CONDUCTOR TO ADEQUATELY REACH SECONDARY TERMINALS OF TRANSFORMER OR SECONDARY JUNCTION ENCLOSURE.

4. NOTIFY NC-ONE CALL PRIOR TO DIGGING

REF: Construction and Operation Procedures Dwg. 20.2-08

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Electric Service Standards

UNDERGROUND/TEMPORARY SERVICE POLE

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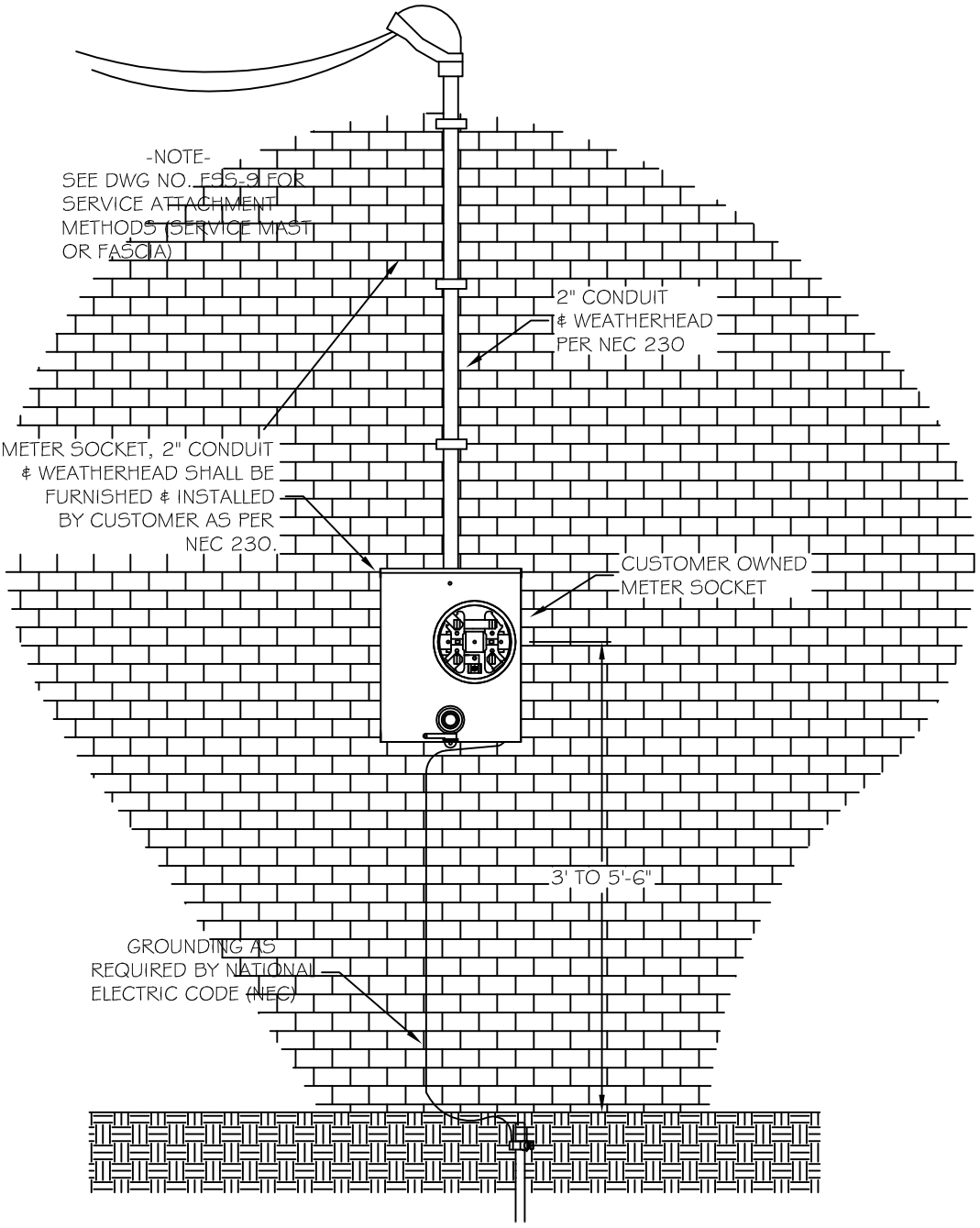
DRAWING NO.
ESS-7



NOTES:

1. POINT OF DELIVERY IS WHERE PWC's CONDUCTORS ARE CONNECTED TO CUSTOMER'S CONDUCTORS.
2. CUSTOMER TO OWN AND INSTALL SERVICE GROUND(S) TO COMPLY WITH THE NATIONAL ELECTRIC CODE.
3. SERVICE MAST SHALL BE OF ADEQUATE STRENGTH OR BE SUPPORTED BY A GUY OR BRACE TO WITHSTAND THE STRAIN IMPOSED BY SERVICE DROP, SEE NEC 230. (ESS-9)

REF: Construction and Operation Procedures Dwg. 20.2-01

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Electric Service Standards

PERMANENT OVERHEAD RESIDENTIAL SINGLE-PHASE SERVICE RISER

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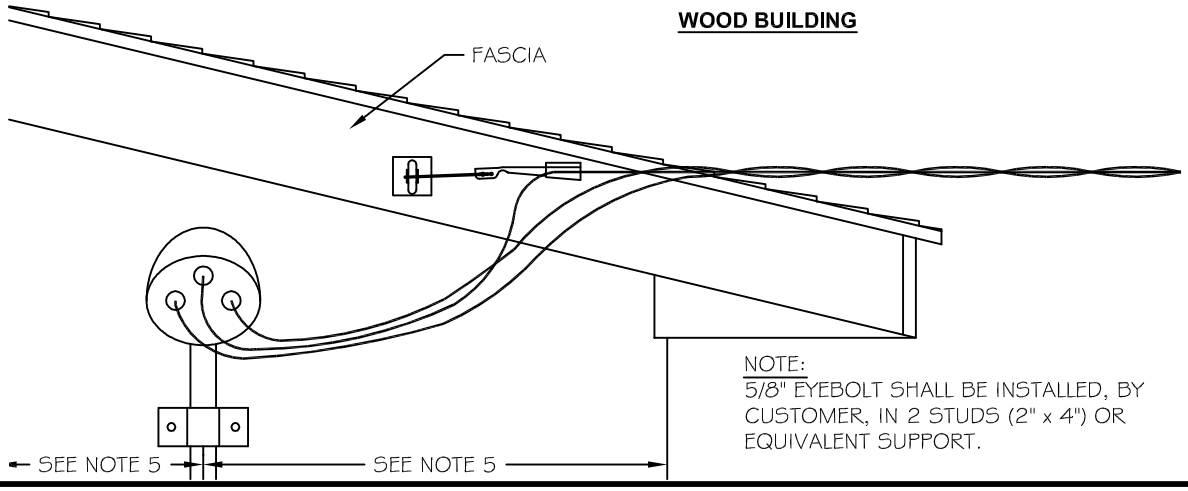
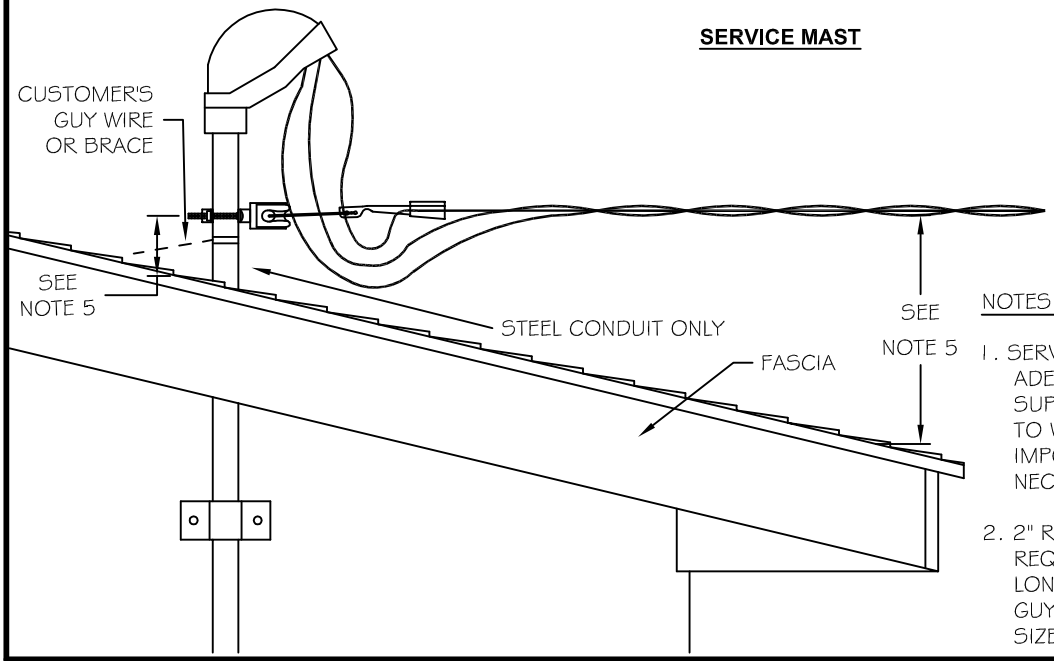
DRAWING NO.
ESS-8

WOOD BUILDING



NOTE:
5/8" EYEBOLT SHALL BE INSTALLED, BY CUSTOMER, IN 2 STUDS (2" x 4") OR EQUIVALENT SUPPORT.

SERVICE MAST



NOTES:

1. SERVICE MAST SHALL BE OF ADEQUATE STRENGTH OR BE SUPPORTED BY A GUY OR BRACE TO WITHSTAND THE STRAIN IMPOSED BY SERVICE DROP. SEE NEC 230.
2. 2" RIGID STEEL CONDUIT IS REQUIRED FOR MASTS UP TO 4'. LONGER MAST HEIGHTS REQUIRE GUYING, BRACING, LARGER MAST SIZE, OR SPECIAL SAG.

NOTES:

1. DRIP LOOPS SHALL BE FORMED ON SERVICE DROP SERVICE ENTRANCE CONDUCTORS.
2. THE CONNECTIONS OF THE SERVICE DROP CONDUCTORS TO THE SERVICE ENTRANCE CONDUCTORS SHALL BE MADE BELOW THE LEVEL OF THE SERVICE WEATHERHEAD.
3. SEE DWG. ESS-6 FOR SERVICE GROUND CLEARANCES AND DWG. ESS-8 FOR SERVICE CLEARANCES AT BUILDINGS.
4. SERVICE ENTRANCE CONNECTORS SHALL BE INSULATED PER NEC RULE 230.
5. MINIMUM CLEARANCES SPECIFIED BY NEC.

REF: Construction and Operation Procedures Dwg. 20.2-03

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Electric Service Standards

PERMANENT OVERHEAD RESIDENTIAL SERVICE ATTACHMENT METHODS

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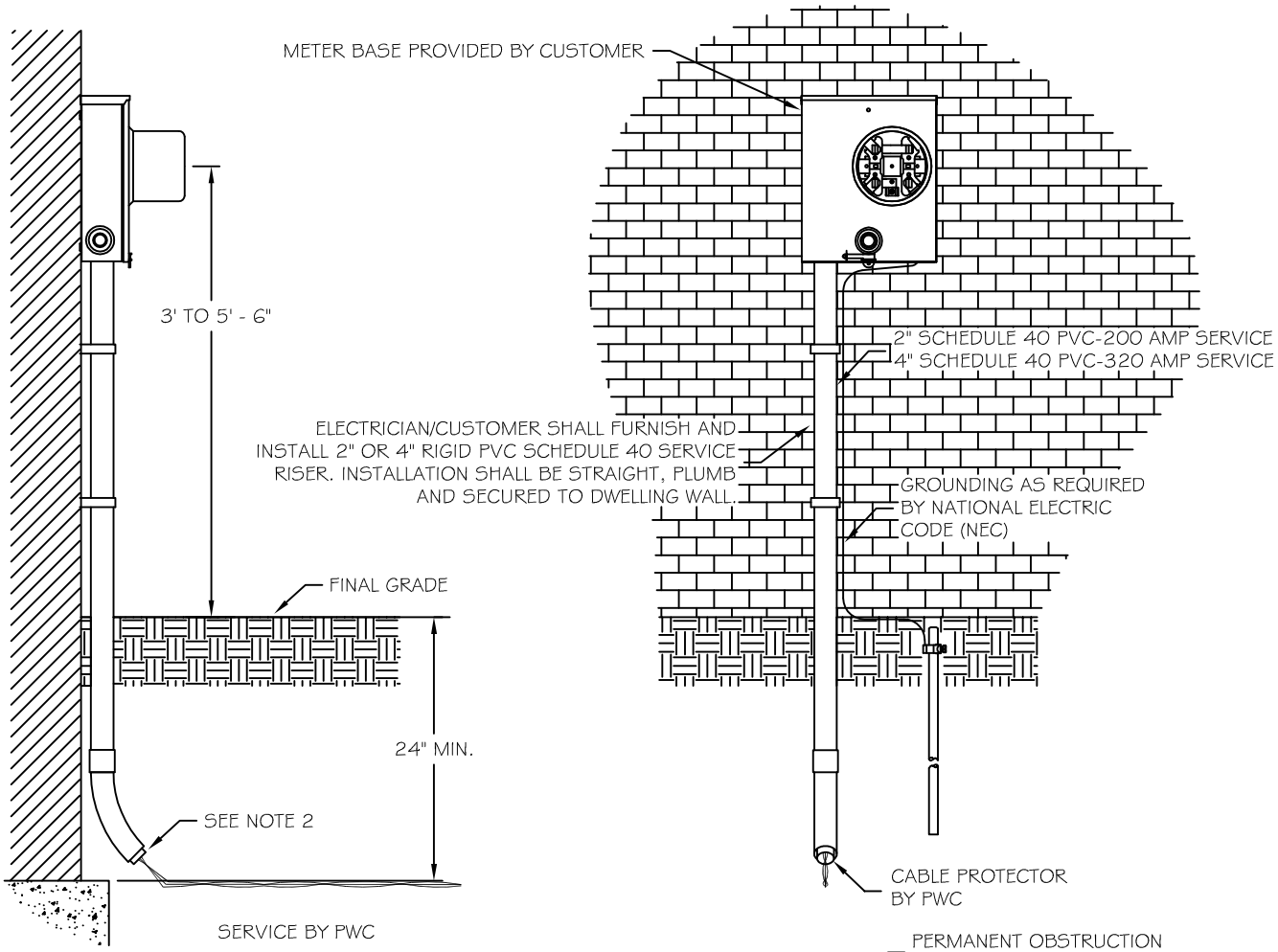
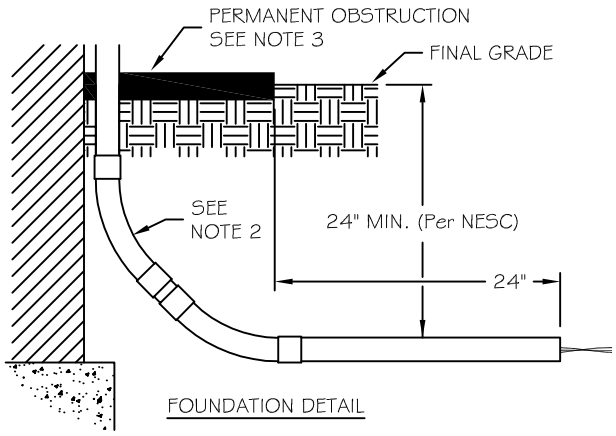
ESS-9





FOUNDATION DETAIL

NOTES:

1. ELECTRICIAN/CUSTOMER SHALL BE RESPONSIBLE FOR INSTALLATION OF METER BASE, CONDUIT RISER PIPE AND GROUNDING.

2. ELECTRICIAN/CUSTOMER SHALL INSTALL CONDUIT RISER PIPE AS SHOWN ABOVE. CONDUIT RISER SHALL BE INSTALLED WITH A 24" RADUIS MINIMUM 45° ELBOW. BOTTOM OF ELBOW MUST BE CLEAR OF FOUNDATION AND 24" BELOW GRADE. OPEN-END OF RISER PIPE SHALL BE FITTED WITH A COUPLING AND TAPED CLOSED TO PROHIBIT DIRT ENTRY DURING INSTALLATION. FOR CONDUIT SIZING SEE TABLE A.

3. SERVICE CONDUIT MUST BE EXTENDED 24" PAST A PERMANENT OBSTRUCTION.

4. FOR EXAMPLES OF UNACCEPTABLE RISERS. SEE SHEET ESS-11

TABLE A

RISER CONDUIT	WIRE SIZE Cu or Al	SERVICE AMPERAGE	45° BENDS	
			BENDS	RADUIS
2"	#2 or #4/0	200	2" - 45°	24"
4"	2- #4/0	320	4" - 45°	24"

REF: Construction and Operation Procedures Dwg. 20.2-04

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Electric Service Standards

PERMANENT UNDERGROUND RESIDENTIAL SINGLE-PHASE SERVICE RISER

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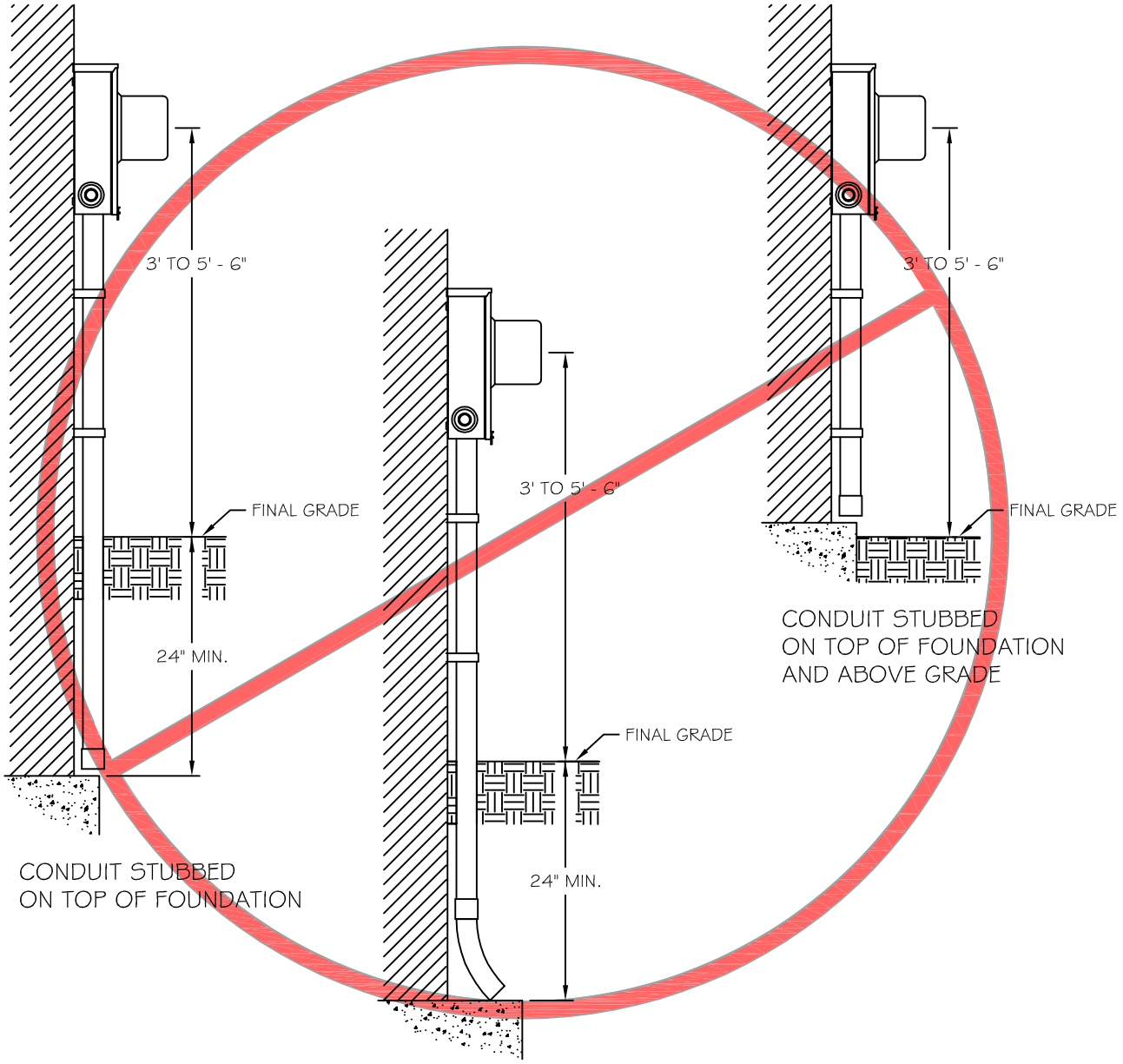

REF: Construction and Operation Procedures Dwg. 20.2-04a

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Electric Service Standards

EXAMPLES OF UNACCEPTABLE SERVICE RISERS

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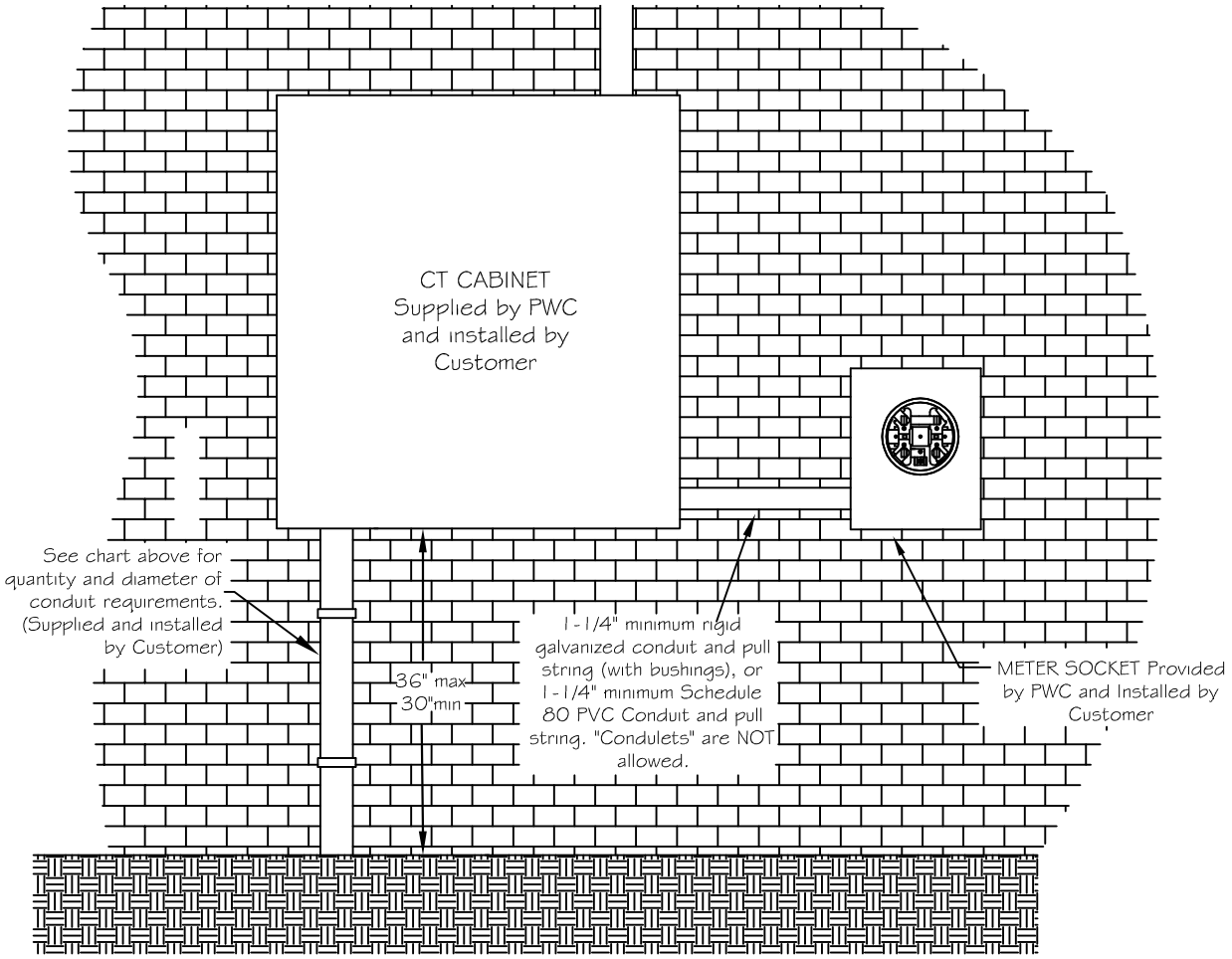
DRAWING NO.
ESS-11

CT METERING CONFIGURATION

MAXIMUM CONDUIT SIZE AND QUANTITY		
Amp	1 Phase	3 Phase
600 Amp	1-5" PVC	2-4" PVC
800 Amp	2-4" PVC	2-4" PVC
1000 Amp	2-4" PVC	2-5" PVC
1200 Amp	2-5" PVC	3-4" PVC



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Electric Service Standards

CT METERING CONFIGURATION

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/25/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

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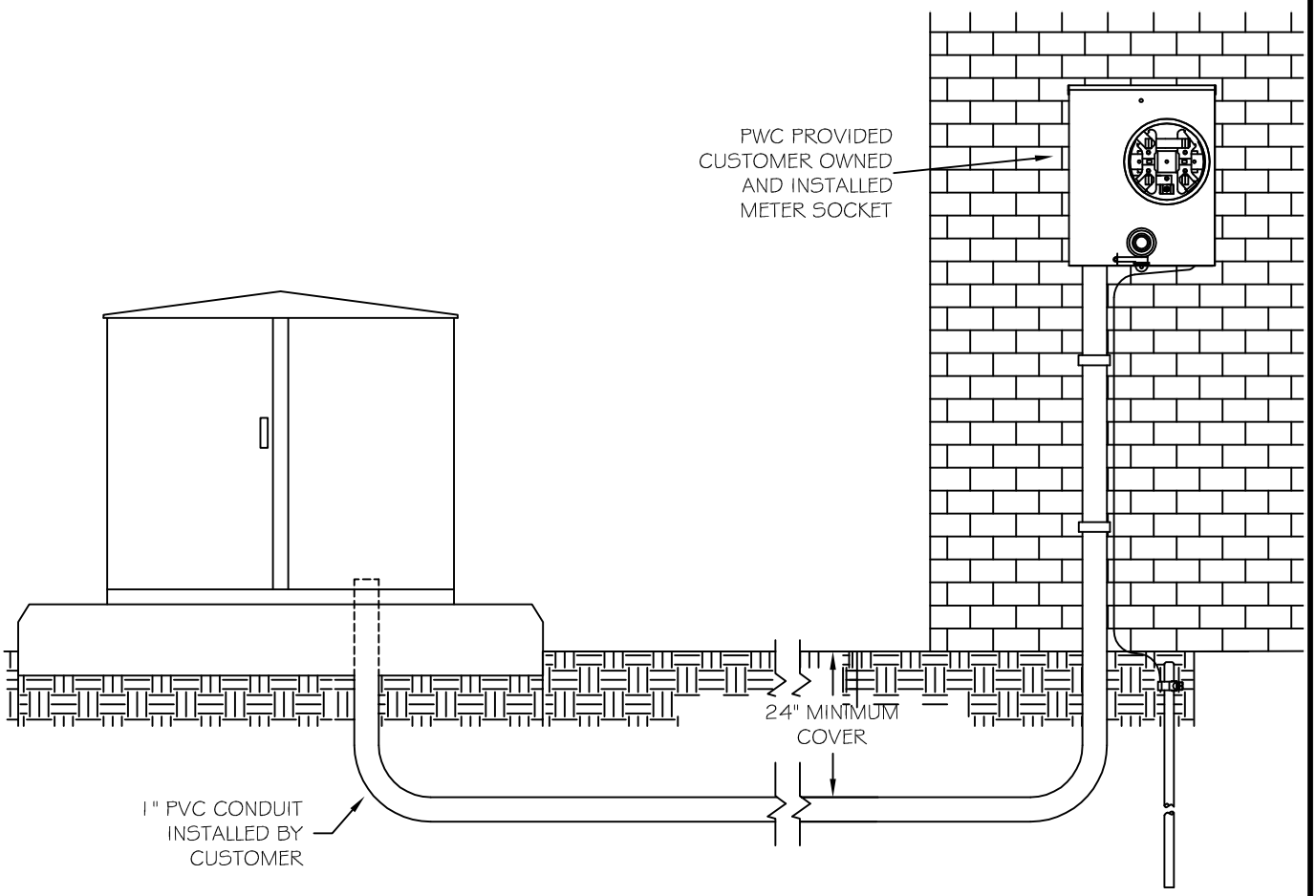
DRAWING NO.
ESS-12



REF: Construction and Operation Procedures Dwg. 20.2-06

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Electric Service Standards

CT METER INSTALLATION IN TRANSFORMER

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

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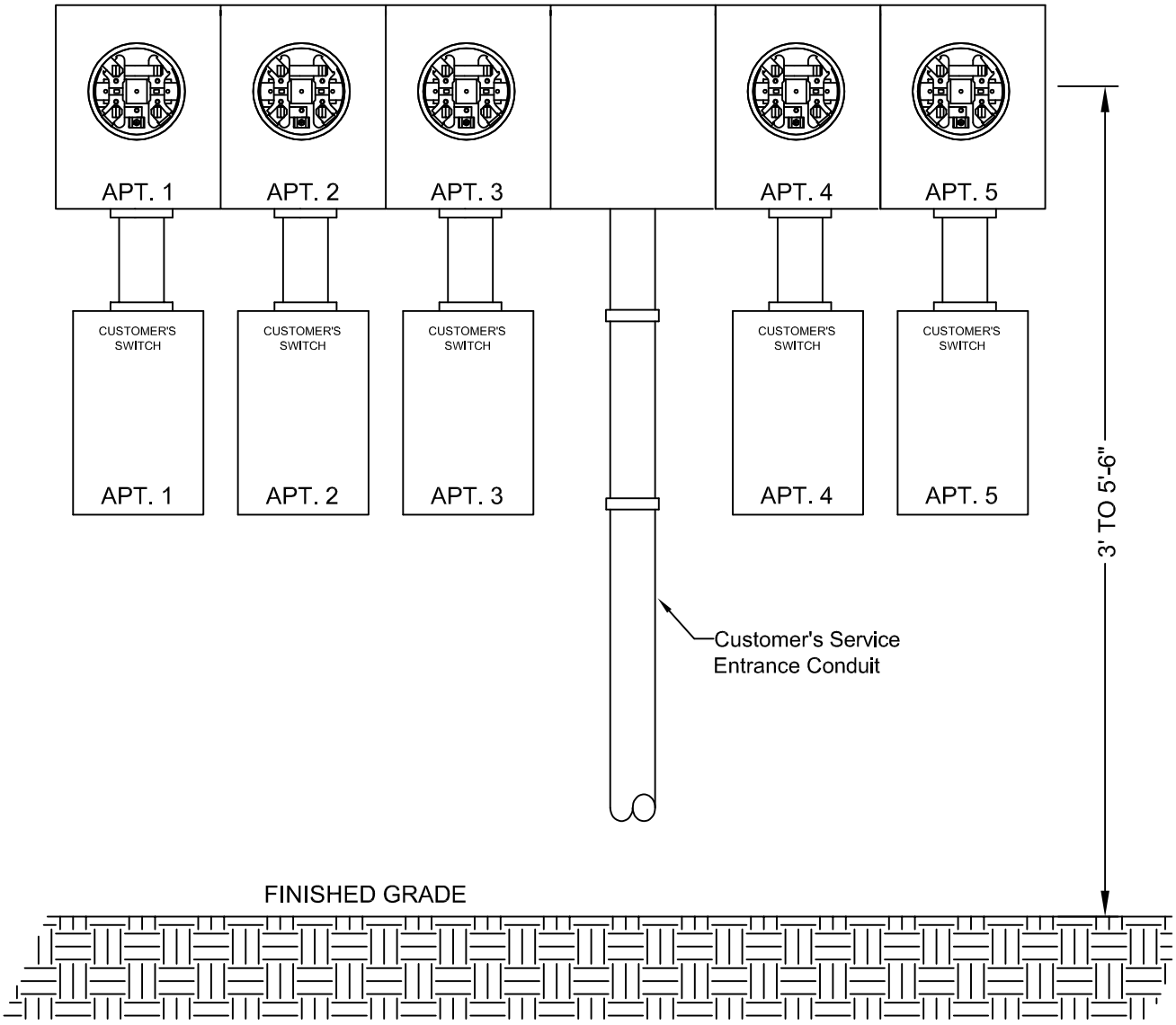

NOTE:

Customer shall label meter sockets and switch covers with paint or other permanent durable marker to identify premises served. Markings shall also be placed inside meter socket (to prevent confusion if covers are interchanged before service is connected). If living units have different house numbers, these should be shown in place of apartment numbers.

REF: Construction and Operation Procedures Dwg. 20.2-09

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Electric Service Standards

MULTIPLE METER SOCKETS IDENTIFICATION

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

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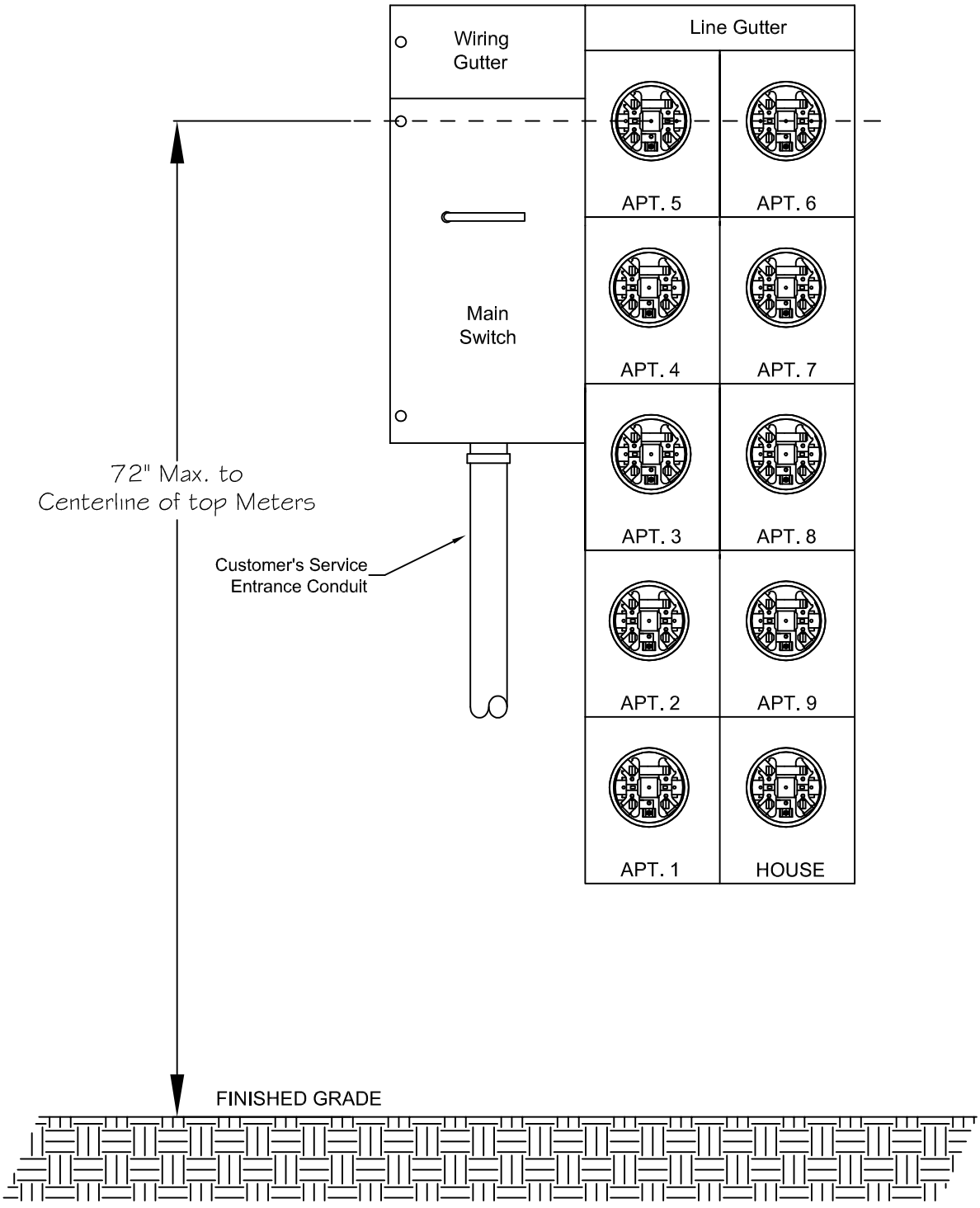
DRAWING NO.
ESS-14



REF: Construction and Operation Procedures Dwg. 20.2-09a

REV.	DATE	BY
1	00/00/00	XXX

Electric Service Standards

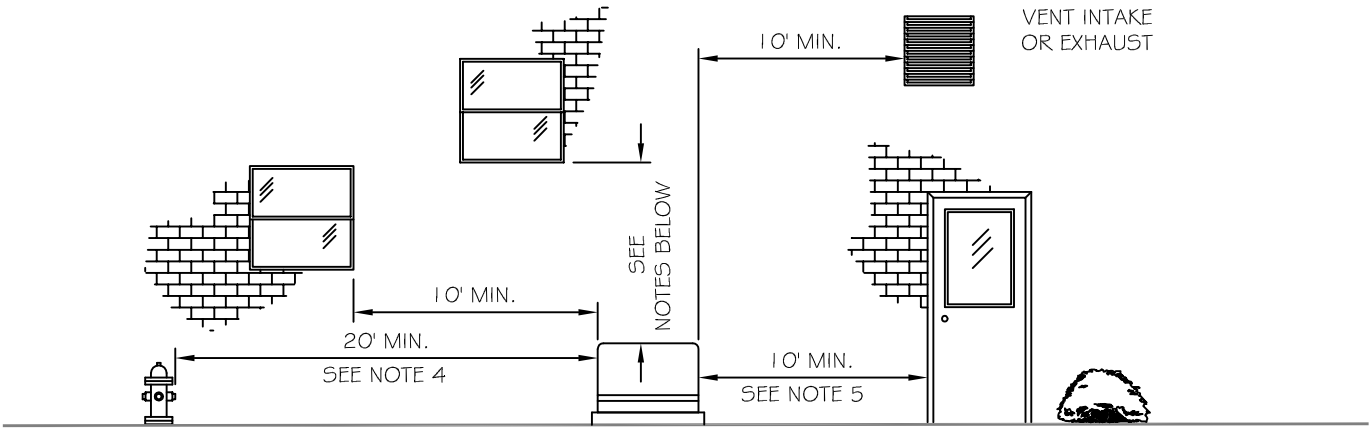
RESIDENTIAL MULTIPLE OCCUPANCY BUILDINGS MULTIPLE METER CENTER

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

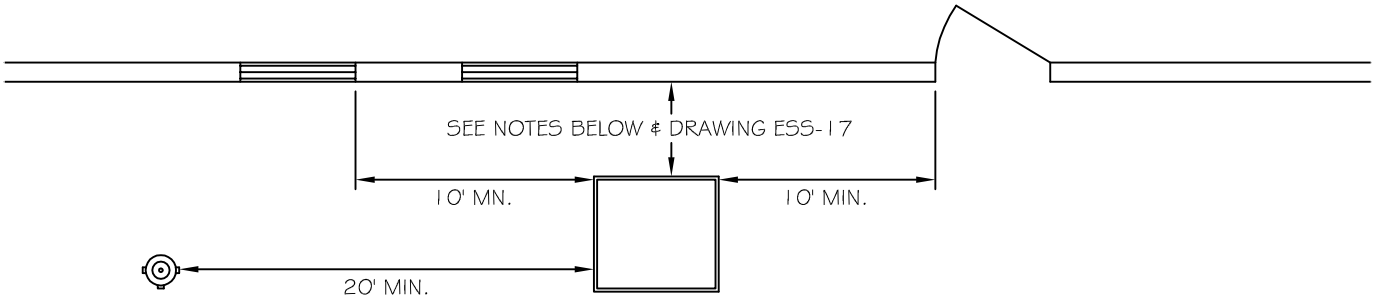
PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

PWC

DRAWING NO.
ESS-15



ELEVATION VIEW



PLAN VIEW

NOTES:

1. TRANSFORMER FRONT SHALL NOT FACE BUILDING.
2. ACCESS FOR TRUCKS AND NECESSARY OPERATION AND MAINTENANCE EQUIPMENT SHALL BE MAINTAINED AT ALL TIMES.
3. NO PORTION OF THE BUILDING SHALL EXTENDED OVER THE TRANSFORMER.
4. THERE IS A 20' MINIMUM CLEARANCE FROM TRANSFORMER TO ALL FIRE HYDRANTS. THIS 20' CLEARANCE SHALL ALSO BE MAINTAINED FOR ALL FIRE ESCAPES.
5. THERE IS A 20' MINIMUM CLEARANCE FROM TRANSFORMER TO ALL DOORWAYS. THIS 10' CLEARANCE SHALL ALSO BE MAINTAINED FOR ALL OPEN STAIRWAYS.
6. SURROUNDING AREA MUST DRAIN AWAY FROM BUILDING AND TRANSFORMER.
7. AN AREA 8' IN FRONT, 3' TO EACH SIDE AND 3' TO THE REAR TRANSFORMER SHALL REMAIN CLEAR ON ALL STRUCTURES, SIGNS OR PERMANENT PLANTINGS THAT EXTEND MORE THAN 4" ABOVE GRADE FOR OPERATION AND MAINTENANCE ACCESS. ADDITIONAL SPACE MAY BE REQUIRED FOR COOLING OF LARGE 3 PHASE TRANSFORMERS.
8. CUSTOMER IS RESPONSIBLE FOR COMPLIANCE WITH ALL INSURANCE REQUIREMENTS, BUILDING CODES, AND LOCAL ORDINANCES AFFECTING THE INSTALLATION.
9. CLEARANCES SHOWN ARE IN ACCORDANCE WITH NESC RULES.

REF: Construction and Operation Procedures Dwg. 17.0-01

REV.	DATE	BY
1	00/00/00	XXX

Electric Service Standards

LOCATION OF OIL FILLED PADMOUNTED TRANSFORMERS

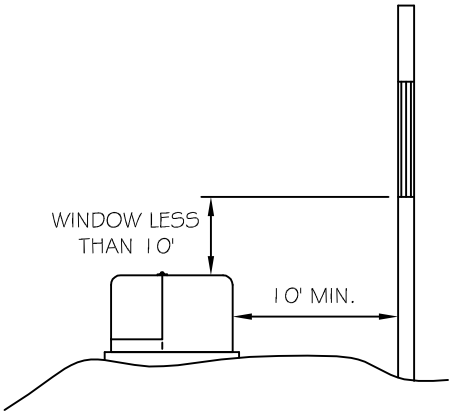
DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

PWC

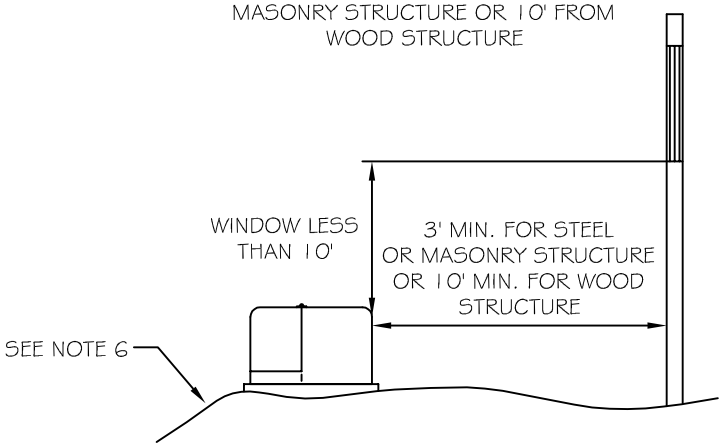
DRAWING NO.
ESS-16

IF WINDOW EXISTS LESS THAN 10' ABOVE PROPOSED TRANSFORMER LOCATION, TRANSFORMER SHALL BE LOCATED A MINIMUM OF 10' FROM STRUCTURE



ELEVATION VIEW

IF WINDOW EXISTS MORE THAN 10' ABOVE PROPOSED TRANSFORMER LOCATION, TRANSFORMER SHALL BE LOCATED A MINIMUM OF 3' FROM STEEL OR MASONRY STRUCTURE OR 10' FROM WOOD STRUCTURE



ELEVATION VIEW

NOTES:

1. TRANSFORMER FRONT SHALL NOT FACE BUILDING.
2. ACCESS FOR TRUCKS AND NECESSARY OPERATION AND MAINTENANCE EQUIPMENT SHALL BE MAINTAINED AT ALL TIMES.
3. NO PORTION OF THE BUILDING SHALL EXTENDED OVER THE TRANSFORMER.
4. THERE IS A 20' MINIMUM CLEARANCE FROM TRANSFORMER TO ALL FIRE HYDRANTS. THIS 20' CLEARANCE SHALL ALSO BE MAINTAINED FOR ALL FIRE ESCAPES.
5. THERE IS A 10' MINIMUM CLEARANCE FROM TRANSFORMER TO ALL DOORWAYS. THIS 10' CLEARANCE SHALL ALSO BE MAINTAINED FOR ALL OPEN STAIRWAYS.
6. SURROUNDING AREA MUST DRAIN AWAY FROM BUILDING AND TRANSFORMER.
7. AN AREA 8' IN FRONT, 3' TO EACH SIDE AND 3' TO THE REAR TRANSFORMER SHALL REMAIN CLEAR ON ALL STRUCTURES, SIGNS OR PERMANENT PLANTINGS THAT EXTEND MORE THAN 4" ABOVE GRADE FOR OPERATION AND MAINTENANCE ACCESS. ADDITIONAL SPACE MAY BE REQUIRED FOR COOLING OF LARGE 3 PHASE TRANSFORMERS.
8. CUSTOMER IS RESPONSIBLE FOR COMPLIANCE WITH ALL INSURANCE REQUIREMENTS, BUILDING CODES, AND LOCAL ORDINANCES AFFECTING THE INSTALLATION.
9. CLEARANCES SHOWN ARE IN ACCORDANCE WITH NESC RULES.

REF: Construction and Operation Procedures Dwg. 17.0.01a

REV.	DATE	BY
1	00/00/00	XXX

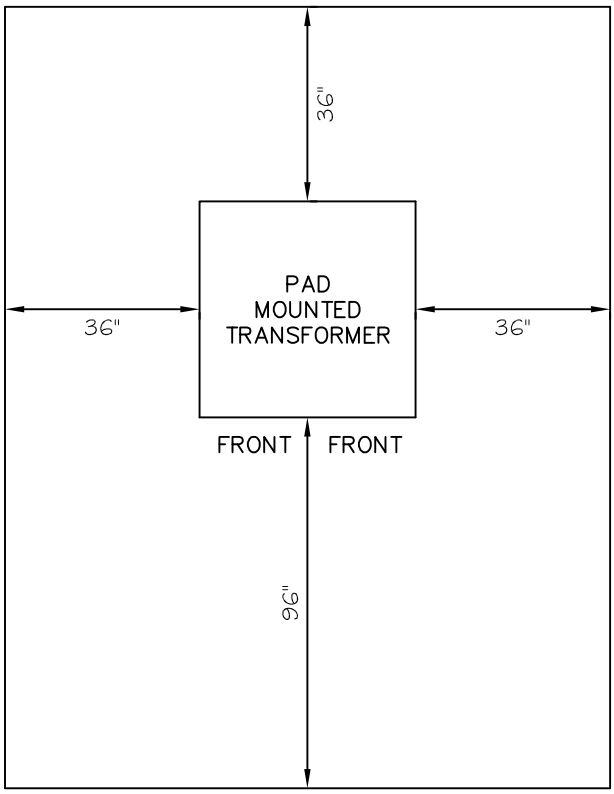
Electric Service Standards

LOCATION OF OIL FILLED PADMOUNTED TRANSFORMERS

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

DRAWING NO.
ESS-17



NOTES:

1. CLEARANCE ENVELOPE SHOWN MARKS THE CLOSEST PERMITTED PLACEMENT OF STRUCTURES, SIGNS, OR PERMANENT PLANTINGS THAT EXTEND MORE THAN 4 INCHES ABOVE GRADE.
2. FRONT OF TRANSFORMER IS MARKED BY WARNING LABELS AND LOCKING HANDLE, AND USUALLY FACES THE ROADWAY.
3. TRANSFORMER WILL NORMALLY BE LOCATED 6 OR MORE FEET FROM BACK OF CURB OR 15 OR MORE FEET FROM PAVEMENT EDGE, ONE FOOT BEHIND THE FRONT PROPERTY LINE.

REF: Construction and Operation Procedures Dwg. 17.0-05

REV.	DATE	BY
1	00/00/00	XXX

Electric Service Standards

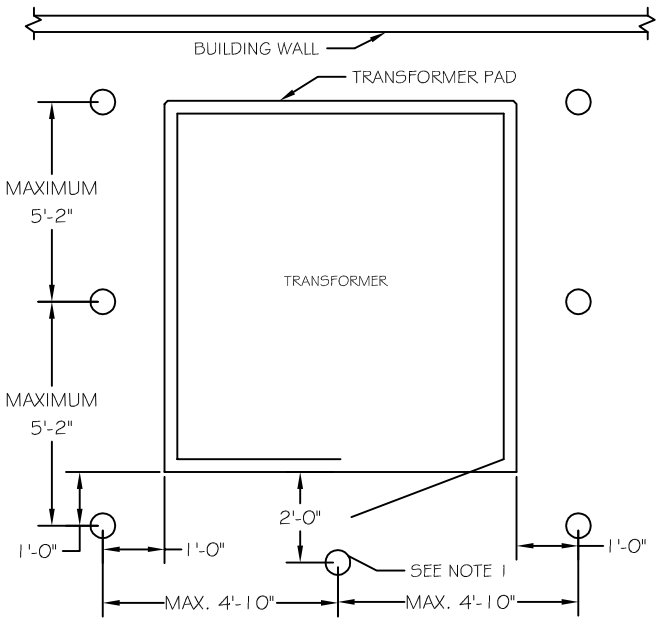
MINIMUM CLEARANCE REQUIREMENTS for PADMOUNTED TRANSFORMERS

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

PWC

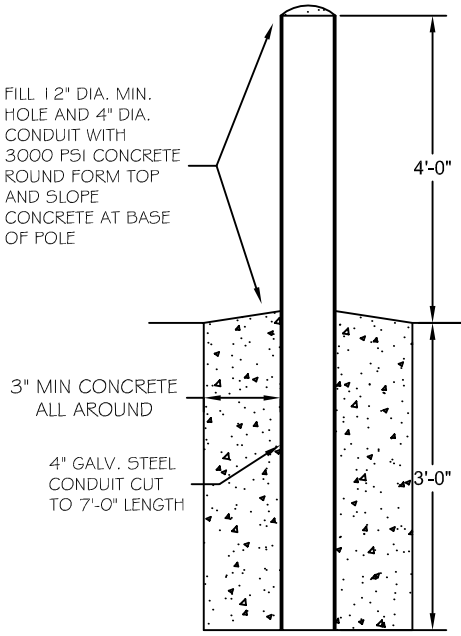
DRAWING NO.
ESS-18



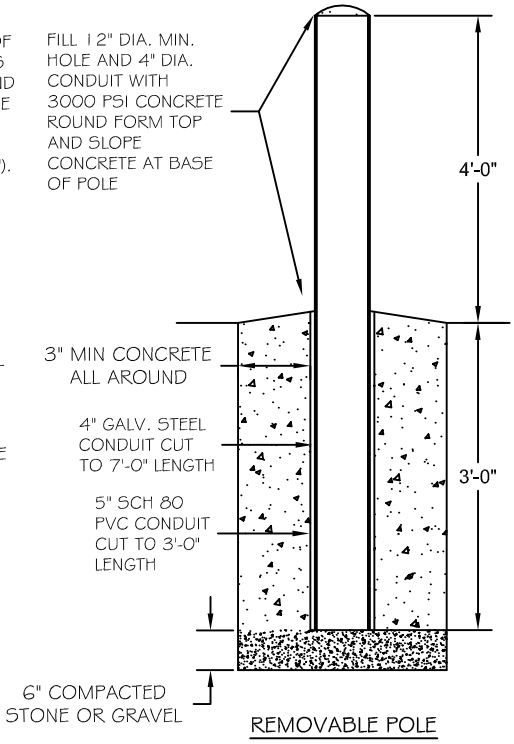
PLAN VIEW

NOTES:

1. ON THREE-PHASE PAD-MOUNTED TRANSFORMERS, THIS POLE SHALL BE CENTRALLY LOCATED 2'-0" IN FRONT OF THE TRANSFORMER BETWEEN THE DOORS TO ACCOMMODATE THE DOOR SWING AND SHALL BE REMOVABLE. ON SINGLE-PHASE TRANSFORMERS, THIS POLE SHALL BE LOCATED APPROXIMATELY 3'-6" IN FRONT OF THE TRANSFORMER (NO LESS THAN 3').
2. TRANSFORMER PROTECTION POLES SHALL BE INSTALLED ON ALL SIDES OF THE TRANSFORMER WHICH ARE SUBJECT TO VEHICULAR TRAFFIC.
3. POLES SHOULD BE PAINTED YELLOW.
4. CUSTOMER MAY PROVIDE AN ALTERNATE DESIGN FOR A REMOVABLE BARRIER, BUT MUST BE APPROVED BY PWC ENGINEER.
5. ANY SINGLE AND THREE-PHASE PAD-MOUNTED TRANSFORMERS THAT ARE EXPOSED TO PAVED AREAS AND/OR VEHICULAR TRAFFIC SHALL HAVE PROTECTIVE BARRIERS PROVIDED AND INSTALLED BY THE CUSTOMER.



STANDARD POLE



REMOVABLE POLE

REF: Construction and Operation Procedures Dwg. 17.0.06

1	00/00/00	XXX
REV.	DATE	BY

Electric Service Standards

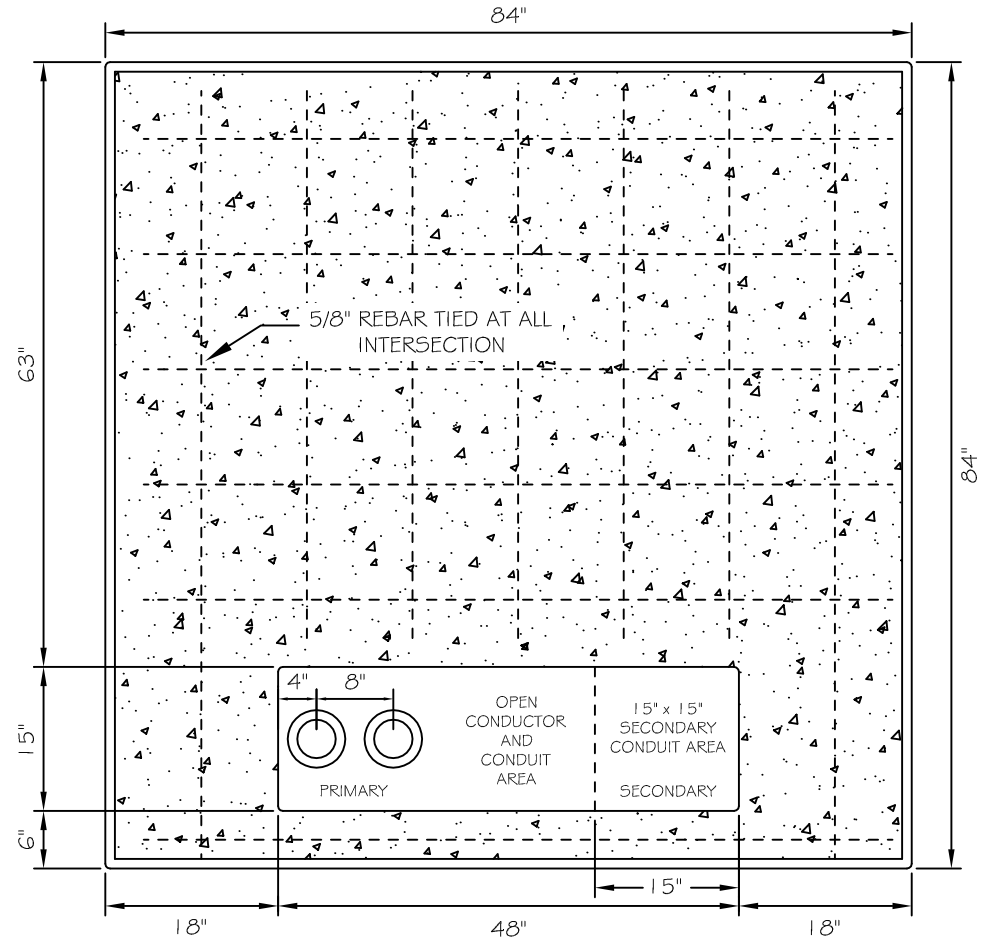
GUARD POST FOR PADMOUNTED TRANSFORMER

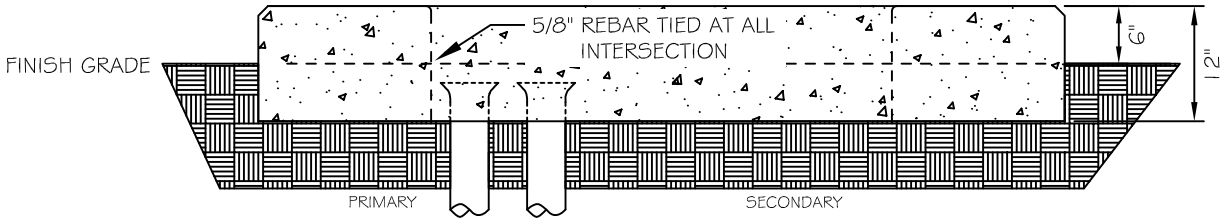
DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

PWC

DRAWING NO.
ESS-19





NOTES

1 - PRIMARY DUCT, SWEEPS, AND BELLENDS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR/CUSTOMER. MATERIAL SHALL BE 4" NOMINAL SCHEDULE 40 PVC (36" MINIMUM SWEEP RADIUS).

2 - SECONDARY CONDUCTORS, DUCT, BELLENDS, AND SWEEPS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR/CUSTOMER.

3 - METERING CONDUIT, WHEN REQUIRED, SHALL BE 1" SCHEDULE 40 PVC EXTENDING TO METER CABINET ON OUTSIDE WALL OF PREMISE.

4 - P.W.C. WILL TERMINATE SECONDARY CABLES AT TRANSFORMER; A MINIMUM OF 6' OF CABLE SHALL BE LEFT ABOVE PAD SURFACE.

5 - CONCRETE SHALL BE 3000 PSI MINIMUM, PLACED AND COMPACTED ON UNDISTURBED EARTH OR 95% COMPACTED FILL. ALL EXPOSED SURFACES OF THE PAD SHALL BE FREE OF VOIDS AND TROWELLED SMOOTH WITH A 1" CHAMFER APPLIED TO ALL EXPOSED EDGES. 5/8" ASTM A615 REBAR SHALL BE INSTALLED AND BOUND AS SHOWN.

6 - MINIMUM CLEARANCE OF 10 FEET SHALL BE MAINTAINED IN FRONT OF PAD AND A MINIMUM CLEARANCE OF 3 FEET SHALL BE MAINTAINED IN BACK AND EACH SIDE OF PAD.

7 - GUARD POSTS AS SHOWN ON DRAWING ESS-19 SHALL BE INSTALLED BY THE CUSTOMER/CONTRACTOR 3' DIAGONALLY FROM EACH CORNER OF THE PAD THAT IS 6' OR LESS FROM A PAVED AREA.

8. PAD LOCATION AND SIZING SHALL BE COORDINATED WITH THE PWC ELECTRICAL ENGINEERING DEPARTMENT.

REF: Construction and Operation Procedures Dwg. 12.2-02a

REV.	DATE	BY
1	00/00/00	XXX

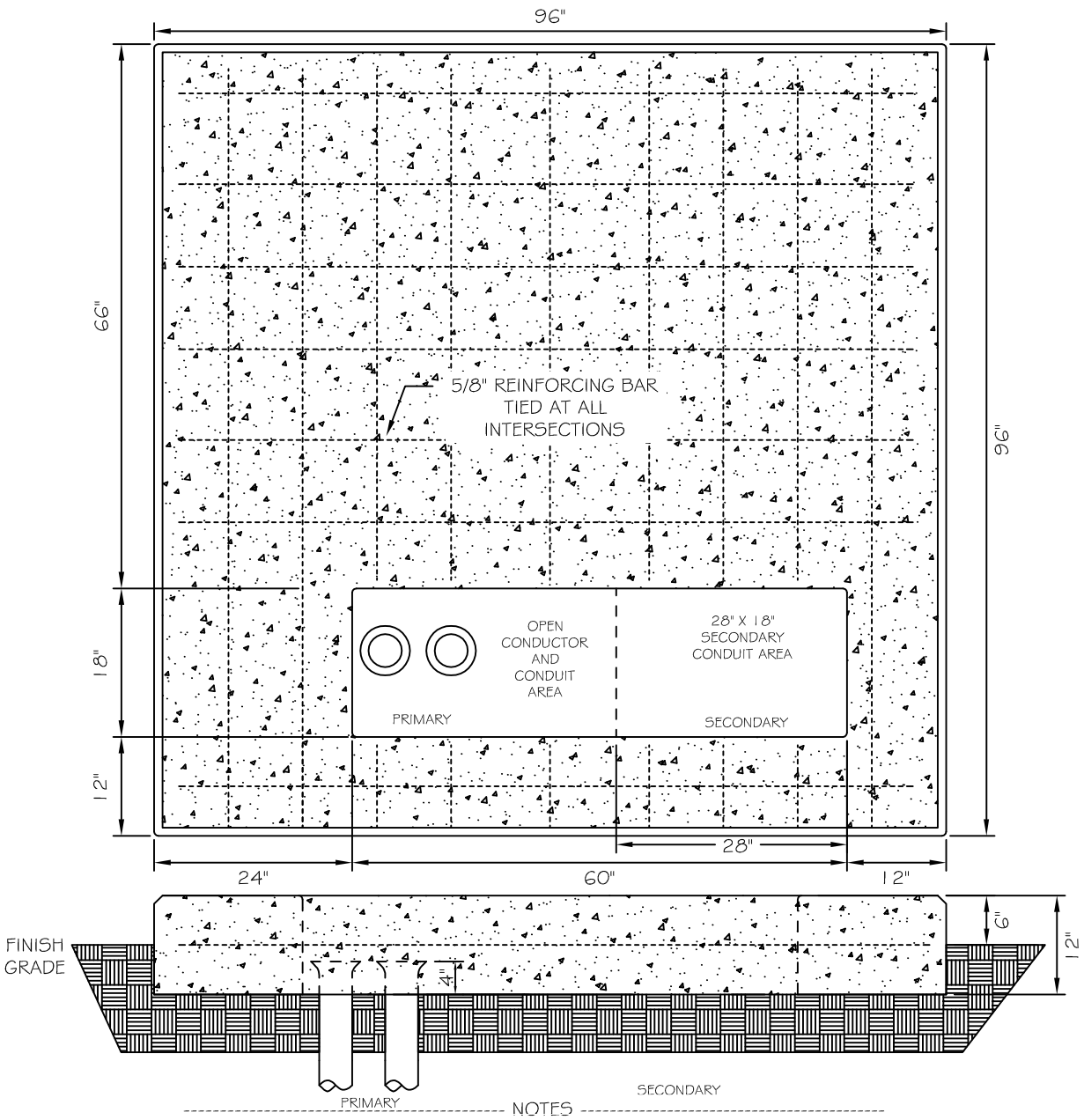
Electric Service Standards

FOUNDATION PAD
150 thru 750 KVA
PADMOUNTED TRANSFORMER

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

DRAWING NO.
ESS-20



NOTES

1 - PRIMARY DUCT, SWEEPS, AND BELLENDS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR/CUSTOMER. MATERIAL SHALL BE 4" NOMINAL SCHEDULE 40 PVC (36" MINIMUM SWEEP RADIUS).

2 - SECONDARY CONDUCTORS, DUCT, BELLENDS, AND SWEEPS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR/CUSTOMER.

3 - METERING CONDUIT, WHEN REQUIRED, SHALL BE 1" SCHEDULE 40 PVC EXTENDING TO METER CABINET ON OUTSIDE WALL OF PREMISE.

4 - P.W.C. WILL TERMINATE SECONDARY CABLES AT TRANSFORMER; A MINIMUM OF 6' OF CABLE SHALL BE LEFT ABOVE PAD SURFACE.

5 - CONCRETE SHALL BE 3000 PSI MINIMUM, PLACED AND COMPACTED ON UNDISTURBED EARTH OR 95% COMPACTED FILL. ALL EXPOSED SURFACES OF THE PAD SHALL BE FREE OF VOIDS AND TROWELLED SMOOTH WITH A 1" CHAMFER APPLIED TO ALL EXPOSED EDGES. 5/8" ASTM A615 REBAR SHALL BE INSTALLED AND BOUND AS SHOWN.

6 - MINIMUM CLEARANCE OF 10 FEET SHALL BE MAINTAINED IN FRONT OF PAD AND A MINIMUM CLEARANCE OF 3 FEET SHALL BE MAINTAINED IN BACK AND EACH SIDE OF PAD.

7 - GUARD POSTS AS SHOWN ON DRAWING ESS-19 SHALL BE INSTALLED BY THE CUSTOMER/CONTRACTOR 3' DIAGONALLY FROM EACH CORNER OF THE PAD THAT IS 6' OR LESS FROM A PAVED AREA.

8 - PAD LOCATION AND SIZING SHALL BE COORDINATED WITH THE PWC ELECTRICAL ENGINEERING DEPARTMENT.

REF: Construction and Operation Procedures Dwg. 12.2-02b

REV.	DATE	BY
1	00/00/00	XXX

Electric Service Standards

FOUNDATION PAD
1000 thru 2500 KVA
PADMOUNTED TRANSFORMER

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

DRAWING NO.
ESS-21

Transformer KVA	Secondary Voltage	Max. Number of Conductors & Size		Max. Number of Conduit & Sizes
25-167	120/240V	8 Sets	500 KCMIL	8 - 2" Max.
150-500	120/208V 277/480V	8 Sets	750 KCMIL	8 - 4" Max.
750	277/480V	8 Sets	750 KCMIL	8 - 4" Max.
750	120/208V	10 Sets	750 KCMIL	10 - 4" Max.
1000	277/480V	10 Sets	750 KCMIL	10 - 4" Max.
1000	120/208V	10 Sets	750 KCMIL	10 - 4" Max.
1500-2000	277/480V	10 Sets	600-750 KCMIL	10 - 4" Max.
1500-2000	277/480V	10 Sets	500 KCMIL or less	10 - 4" Max.
2500	277/480V	10 Sets	600-750 KCMIL	10 - 4" Max.
2500	277/480V	10 Sets	500 KCMIL or less	10 - 4" Max.

REF: Construction and Operation Procedures Dwg. 20.2-11

REV.	DATE	BY
1	00/00/00	XXX

Electric Service Standards

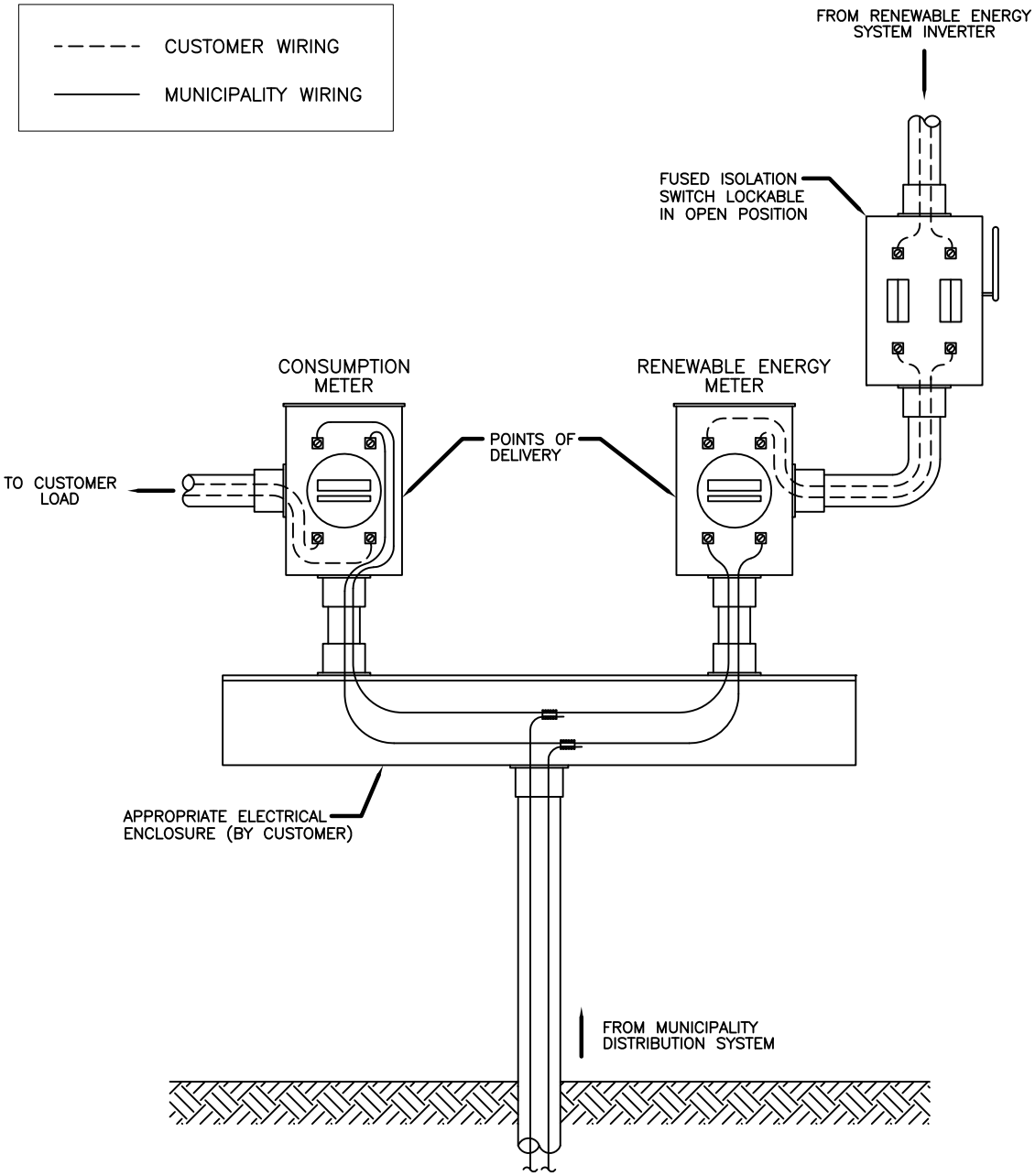
SPECIFIED CONDUCTOR & CONDUIT SIZES FOR PADMOUNTED TRANSFORMERS

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: JCC	SCALE: NONE	DATE: 2/24/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

PWC

DRAWING NO.
ESS-22



NOTES:

1. NEUTRAL AND GROUND WIRING NOT SHOWN.
2. CONSUMPTION METER AND RENEWABLE ENERGY METER SHALL HAVE A NAMEPLATE ATTACHED AS SHOWN ON ESS–25.
3. SEE DWG. ESS–24 FOR WIRING DIAGRAM.

REV.	DATE	BY
1	06/19/17	JLL

Electric Service Standards

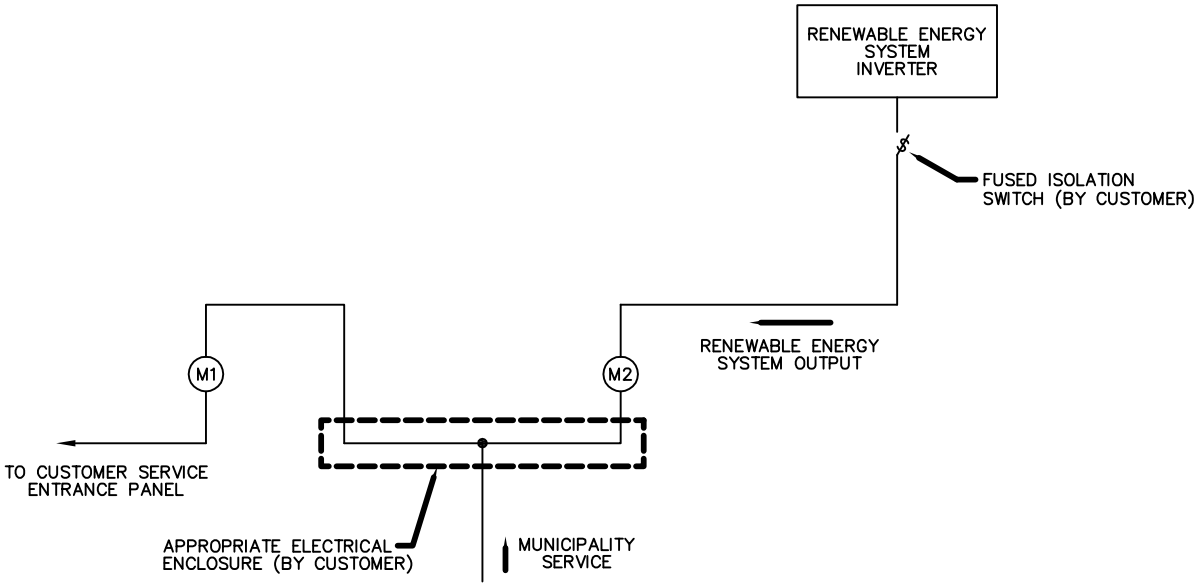
RENEWABLE ENERGY INTERCONNECTION INSTALLATION-PHYSICAL CONNECTION ILLUSTRATION METERING AND DISCONNECT-UG

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: WRW3	SCALE: NONE	DATE: 05/18/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

PWC

DRAWING NO.
ESS-23



NOTES:

1. SYSTEM SHALL NOT ENERGIZE A DEAD BUSS SYSTEM.
2. M1 IS THE METER FOR THE RESIDENTIAL SERVICE.
3. M2 IS THE METER FOR THE RENEWABLE ENERGY INPUT TO THE SYSTEM.
4. INVERTER/ISOLATION SYSTEM TO BE UL 1741 LISTED AND INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NFPA 70).
5. THE ISOLATION BY THE CUSTOMER TO BE SIZED PER NATIONAL ELECTRIC CODE MINIMUM SIZE = 100 AMPS. SWITCH SHALL BE LOCKABLE IN THE OPEN POSITION.
6. SEE DWG. ESS–23 FOR PHYSICAL CONNECTION ILLUSTRATION.

REV.	DATE	BY
1	00/00/00	WRW3

Electric Service Standards

RENEWABLE ENERGY INTERCONNECTION INSTALLATION-DIAGRAM FOR SYSTEMS LESS THAN 10 KW CAPACITY

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: WRW3	SCALE: NONE	DATE: 5/19/09

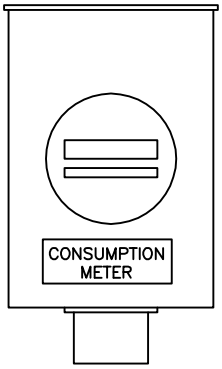
PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

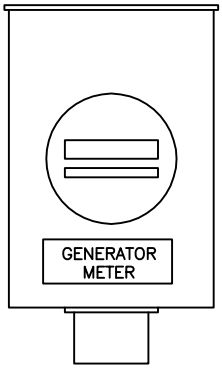
PWC

DRAWING NO.
ESS-24

NOTES:

1. MINIMUM TEXT HEIGHT OF 3/8"
2. SIGNAGE SHALL BE MADE OF PLASTIC AND UTILIZE EMBOSSED LETTERING.
3. SIGNAGE SHALL BE PERMANENTLY AFFIXED TO METER BASE COVER.





1	00/00/00	WRW3
REV.	DATE	BY

Electric Service Standards

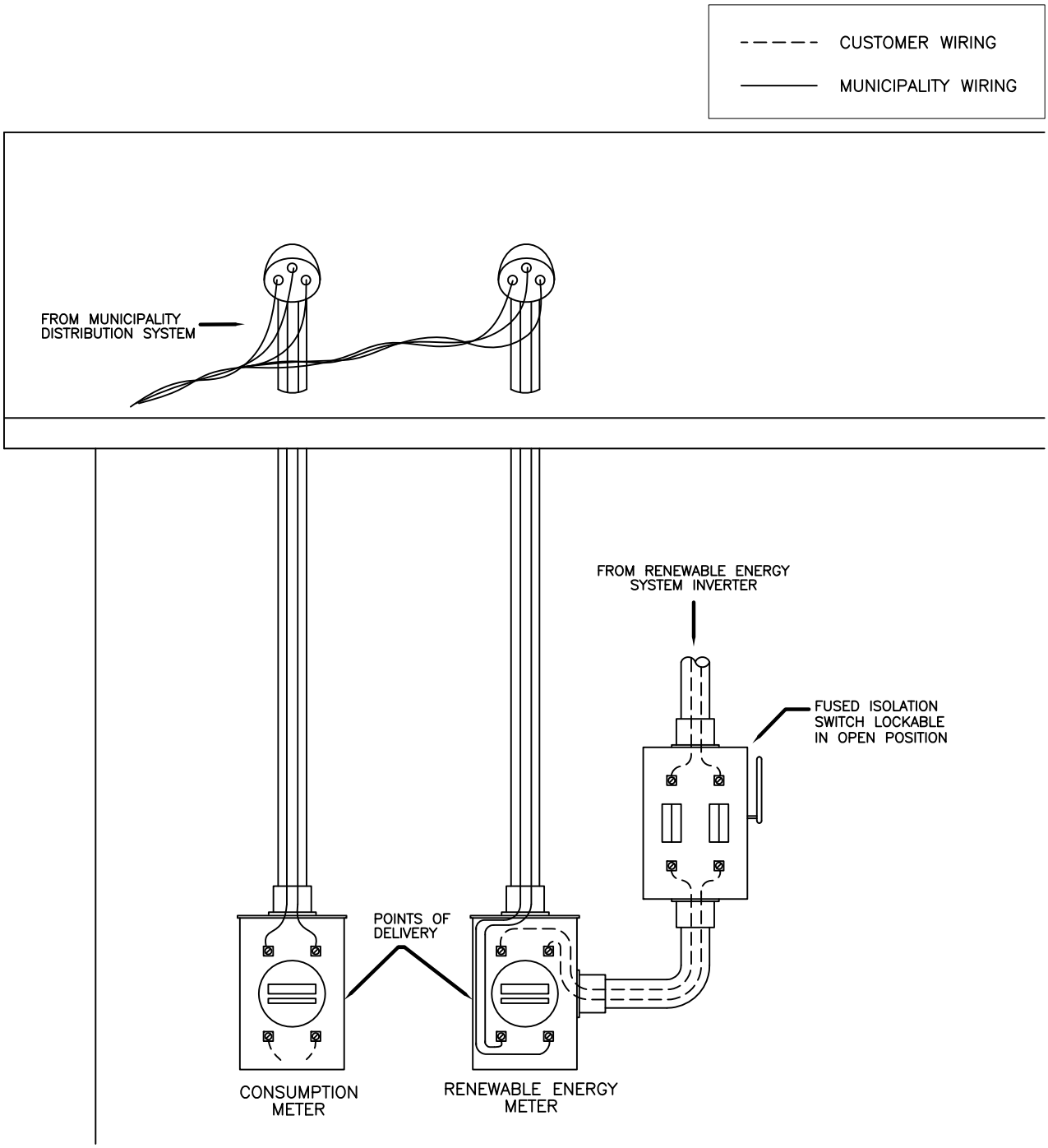
RENEWABLE ENERGY INTERCONNECTION INSTALLATION-METER BASE LABELING DIAGRAM

DWN. BY: WJJ	CK'D BY: WRW3	APPR. BY: WRW3	SCALE: NONE	DATE: 5/19/09

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

PWC

DRAWING NO.
ESS-25



NOTES:

1. NEUTRAL AND GROUND WIRING NOT SHOWN.
2. CONSUMPTION METER AND RENEWABLE ENERGY METER SHALL HAVE A NAMEPLATE ATTACHED AS SHOWN ON ESS–25.
3. SEE DWG. ESS–24 FOR WIRING DIAGRAM.

1	00/00/00	WRW3
REV.	DATE	BY

Electric Service Standards

RENEWABLE ENERGY INTERCONNECTION INSTALLATION-PHYSICAL CONNECTION ILLUSTRATION METERING AND DISCONNECT -OH

DWN. BY: JLL	CK'D BY:	APPR. BY:	SCALE: NONE	DATE: 06/19/17

PUBLIC WORKS COMMISSION
Fayetteville, North Carolina

PWC

DRAWING NO.
ESS-26