



Aboveground Equipment Screening Manual (AESM) For Electric Utility Equipment

**CITY OF ANAHEIM PUBLIC UTILITIES DEPARTMENT
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ANAHEIM, CA 92805**



TABLE OF CONTENTS

	<u>PAGE</u>
Introduction, Purpose, and Contacts	1
 <u>SECTIONS</u>	
Section 1 Acceptable Screening Devices & Methods	4
1.01 Landscape	4
1.02 Fencing.....	5
1.03 Re-Painting Utility Equipment.....	5
1.04 Graffiti-Resistant Vinyl Wrap.....	5
 Section 2 Approval Process	7
 Section 3 Typical Screening Methods and Clearance Requirements	8
3.01 Single Phase Pad Mounted Transformer	8
3.02 Pad Mounted Distribution Fuse Cabinet (DFC).....	9
3.03 Three Phase Pad Mounted Transformer.....	10
3.04 Pad Mounted Capacitor Cabinet.....	13
3.05 Pad Mounted Switch (PMC & PME)	14
3.06 Pad Mounted Switch (PMV).....	15
3.07 Re-Painting Utility Equipment.....	16
 Section 4 Irrigation Systems	17
 Section 5 Maintenance	17
 <u>APPENDICES</u>	
Planting Material Examples	Appendix A

Introduction:

The Aboveground Equipment Screening Manual (AESM) provides guidelines for screening or softening the appearance of aboveground utility equipment. Utility equipment is primarily located on private property as part of development projects and shall be reviewed and approved by the Planning Department and the Public Utilities Department. The screening methods illustrated are typical and provides visual examples from which a developer can work with the Planning Department to make choices for improving aesthetics, selecting plant types, and locating equipment necessary to serve the development.

In addition, the AESM provides clearance requirements for utility workers to safely access, operate, and maintain utility equipment. The Public Utilities Department intends to maximize service reliability in a cost-effective manner in its placement of utility infrastructure for all types of aboveground utility devices, and allows screening to help improve overall aesthetics as long as it does not adversely impact operation or maintenance of equipment. These include, but are not limited to, devices such as electric utility pad mounted equipment and aboveground water utility devices.

Utility equipment that is required to be placed within the public right-of-way shall be reviewed and approved by the Department of Public Works and the Public Utilities Department. This may apply to electrical, water, telecommunications, or other utility-related equipment.

SAFETY NOTICE: Electrical utility equipment may only be operated and maintained by Anaheim utility workers, or its qualified contractors, who have requisite training to operate high voltage equipment.

Purpose:

The AESM provides developers, consultants, contractors, property owners, and general customers with alternatives and guidelines for acceptable screening around aboveground utility equipment primarily located on private property. The manual provides acceptable screening methods including screening devices, equipment location and clearance requirements.

In accordance with Section 18.38.160 of the Anaheim Municipal Code, aboveground utility equipment must be screened from view. Screening may be provided through landscaping, vinyl wraps, fencing, or other architectural features. For new construction projects, the equipment shall be located a minimum of five feet from property line (except in single-family zones) and outside of required structural setbacks. Equipment that is over 18 inches must also be reviewed for line-of-sight considerations. A site plan including

elevation details shall be submitted to the Planning Department and Public Utilities Department identifying the location of the device and the proposed screening for review and approval prior to construction.

In accordance with the AESM, screening methods shall be planned and installed such that it provides required clearances for safe operation and maintenance of the utility equipment. Accessibility to utility equipment on private property shall be maintained by the property owner or their tenant in order to maintain service reliability. The AESM is not intended to replace or supersede the current Anaheim Public Utilities Construction Standards. The standards are available at <http://www.anaheim.net/512/Electric-Construction-Standards> and are updated periodically.

Contacts:

Electrical Engineering Division	(714)765-5156
Electric Utility Inspection	(714)765-6843
Planning Department	(714)765-5139
Public Works Development Services	(714)765-5176

Section 1 – Acceptable Screening Devices & Methods

The following screening devices and methods are not intended to be all-inclusive. There may be instances where customers propose to utilize screening devices and methods not included in this manual. Alternative screening devices and methods may be acceptable provided they effectively reduce the visual impact of the electric utility equipment and maintain required clearances. Whether the screening plans incorporate guidelines from this manual or otherwise, the plans must be submitted to the Planning Department and the Public Utilities Department for review and approval prior to construction.

1.01 Landscape

Shrubs and plants are popular screening devices that provide aesthetically pleasing results by screening electric utility equipment from view. Placement of shrubs and plants shall be outside the easement/clearance area as shown on the Typical Screening Methods and Clearance Requirements illustrations under Section 3. In order to maintain required clearances around electric utility equipment, customers shall consider the size and spread that shrubs will reach at maturity. In addition, the customer shall select shrubs that are not invasive and whose root systems, vines, or branches will not grow under or into structures or equipment. See Appendix A for planting material recommendations that are low maintenance and drought tolerant.

Specific plant types shall be reviewed and approved by the Planning Department.

1.02 Fencing

Fencing can be used as an alternative screening device to screen electric utility equipment from public view. Typically, fencing used to screen utility equipment is custom made by the customer for each application. All fencing shall be non-see through solid construction.

Acceptable fence types include block, wood, and vinyl. All fence installations shall follow the AESM equipment clearance requirements. Since utility equipment also requires access from above by crane or other means, the easement/clearance area shall remain open to the sky and screening from above will not be allowed. The customer shall submit proposed fencing plans including elevation details to the Planning Department and Public Utilities Department for review and approval prior to construction. All fencing construction shall comply with the Planning Department - Building Division requirements.

1. *Retaining block walls* may be utilized for screening and shall be installed outside the easement/clearance area with an unrestricted clear 10-foot working clearance in front of the utility equipment. The front side of the equipment can be enclosed with a gate provided that it opens outward and provides a clear 10-foot working clearance upon opening (Reference Electrical Construction Standard CU 1600-6). The gate shall screen the equipment completely and shall be non-see through construction. If the gate opens onto the right-of-way, it shall meet minimum clearances for ADA requirements.
2. *Wood and vinyl fences* can also be used to screen electric utility equipment. All fencing shall be installed outside the easement/clearance area as shown on the Typical Screening Methods and Clearance Requirements illustrations under Section 3. However, removable type fencing can be installed in the easement/clearance area. Removable type fencing shall be planned and constructed in panel sections in order for a 1-man crew to easily remove for access and working clearance. Wood and vinyl fencing shall be non-see through construction.
3. *Other architectural features* and devices may also be acceptable provided they screen electric utility equipment from view and maintain working clearances. Alternative architectural screening features shall be submitted to the Planning Department and Public Utilities Department for review and consideration.

1.03 Re-Painting Utility Equipment

The Public Utilities Department may also grant authorization to change the color of electric utility equipment to closely match the surrounding environment. Re-painting of electric utility equipment is not intended to camouflage equipment, but to help improve aesthetics. The equipment identification numbers and any utility signage shall not be painted over and shall remain visible. Paint colors shall be submitted to the Planning Department and Public Utilities Department for review and approval.

1.04 Graffiti-Resistant Vinyl Wrap

The Public Utilities Department utilizes a method of deterring graffiti on high voltage electric utility equipment by installing vinyl wraps with protective sealants (shown below). This screening method can provide the developer with the option of matching the electric utility equipment with the surrounding environment and background. The standard vinyl wrap is ivy and palm trees. Any aesthetic deviation will require a site visit, creating a graphic art to match the theme as directed and approved by the City prior to installation. Vinyl wrap materials shall meet City's specifications, and not affect the cooling of equipment or restricts opening and closing of access doors.



Pad-mounted transformer with graffiti-resistant vinyl wrap to blend in with surrounding shrubs.



Pad-mounted switch with graffiti-resistant vinyl wrap to blend in with block wall.

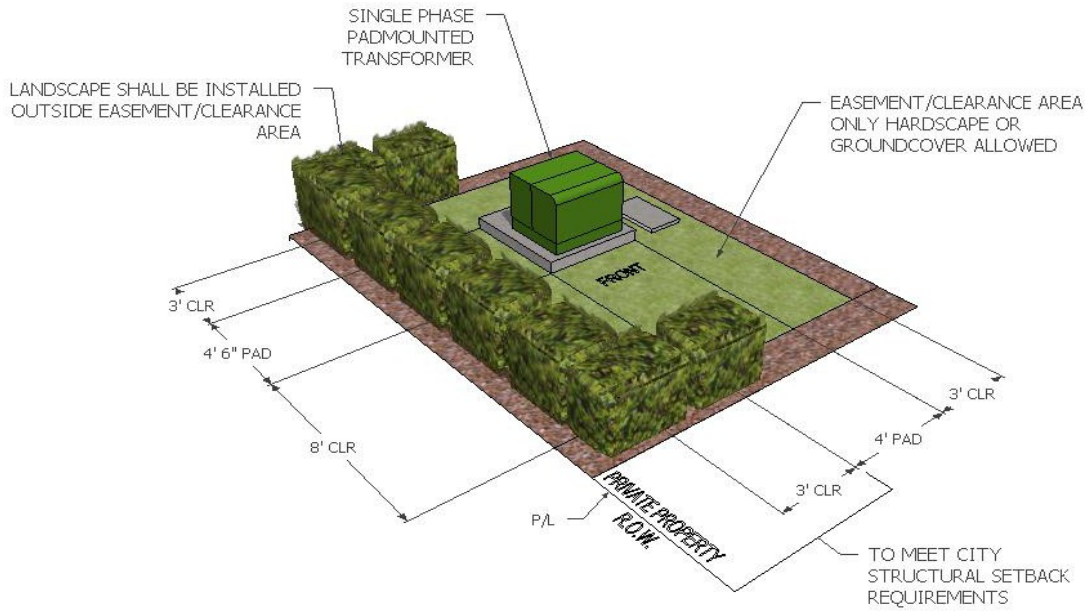
Protective posts may be required to prevent vehicle-caused damage to utility equipment. The Public Utilities Department will work with the developer to identify and locate protective posts. (Reference Electrical Construction Standard CU 1600-9)

Section 2 – Approval Process

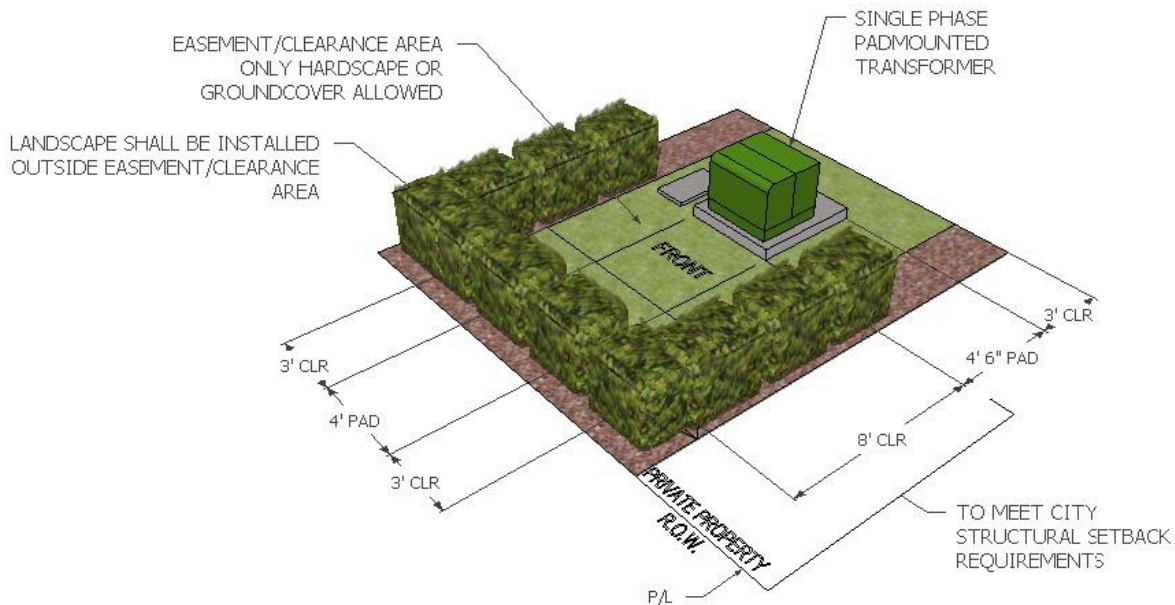
The approval process consists of a coordinated effort between the Planning Department, Public Utilities Department, and the customer. Every case is considered on an individual basis to accommodate the needs and requirements of each project. The location of electric and water facilities on private property must be approved by the Planning Department and Public Utilities Department prior to the initiation of the screening coordination. The customer shall provide a site plan including elevation details and landscape plans showing screening methods and how the utility equipment will fit within the area. After electric equipment locations are approved, the Electrical Engineering Division will provide an approved electric utility service plan that will include electric service requirements and show approved equipment locations. Easement and clearance requirements vary depending on the electric utility equipment type and size, and must follow the clearance requirements per the Electrical Construction Standard. Access to electric utility equipment on private property shall always be maintained. After approval and during installation, the Electric Utility Inspector will check for compliance with the AESM.

Section 3 – Typical Screening Methods and Clearance Requirements

The following are typical screening installation methods and clearance requirements for aboveground electric utility equipment. The illustrations and guidelines are intended as a reference in developing an acceptable screening method for submittal to the City for approval process.

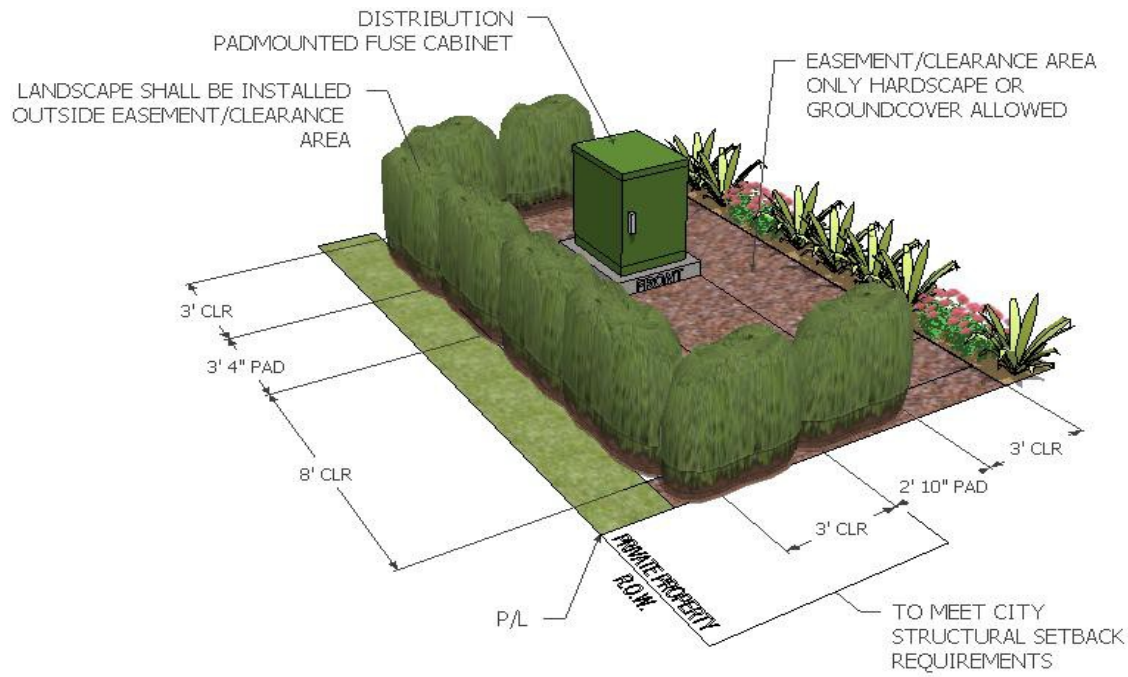


Front of transformer is parallel to R.O.W.

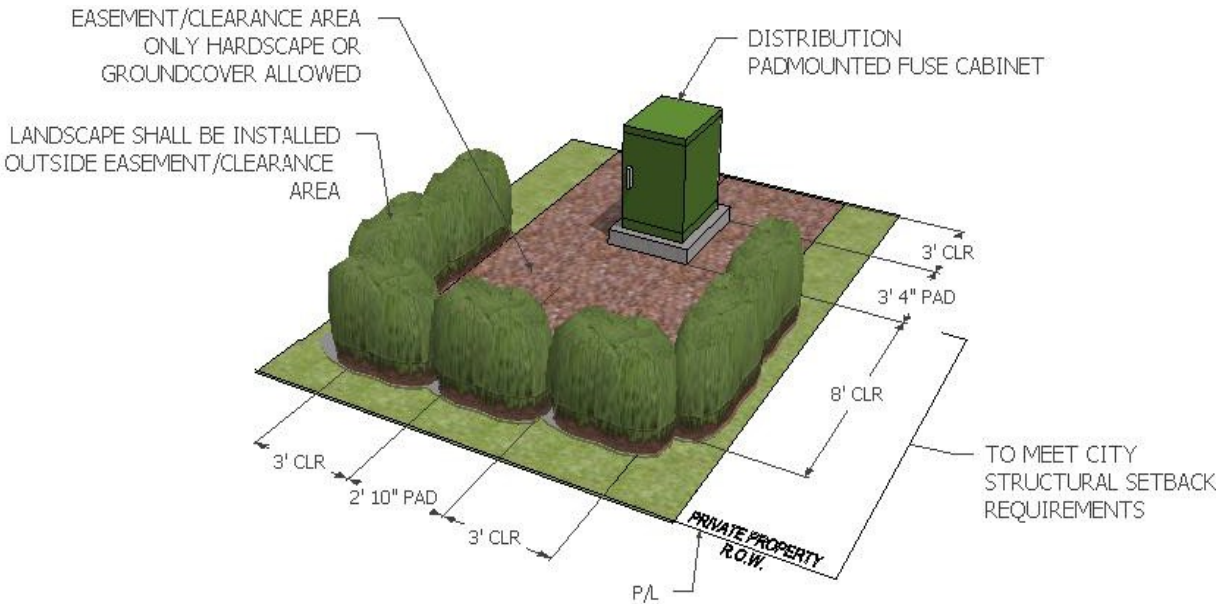


Front of transformer facing R.O.W.

3.01 Single Phase Pad Mounted Transformer

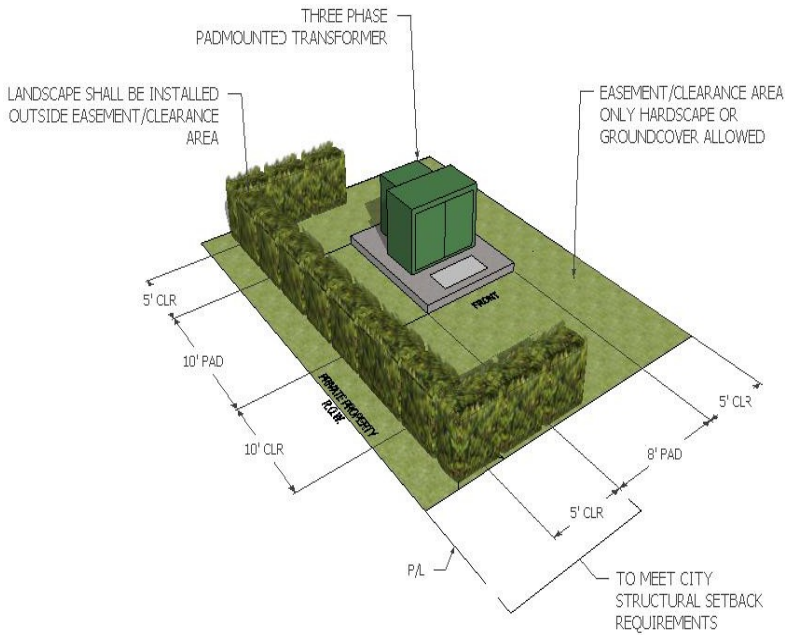


Front of fuse cabinet is parallel to R.O.W.

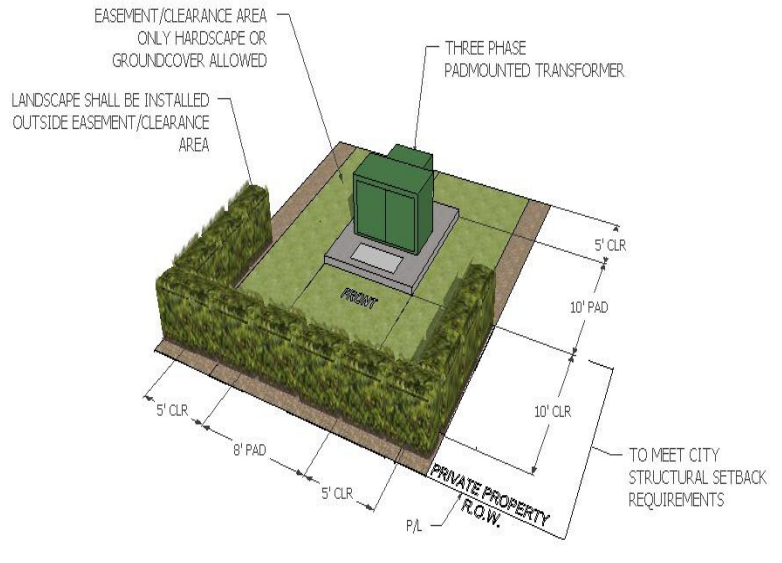


Front of fuse cabinet facing R.O.W.

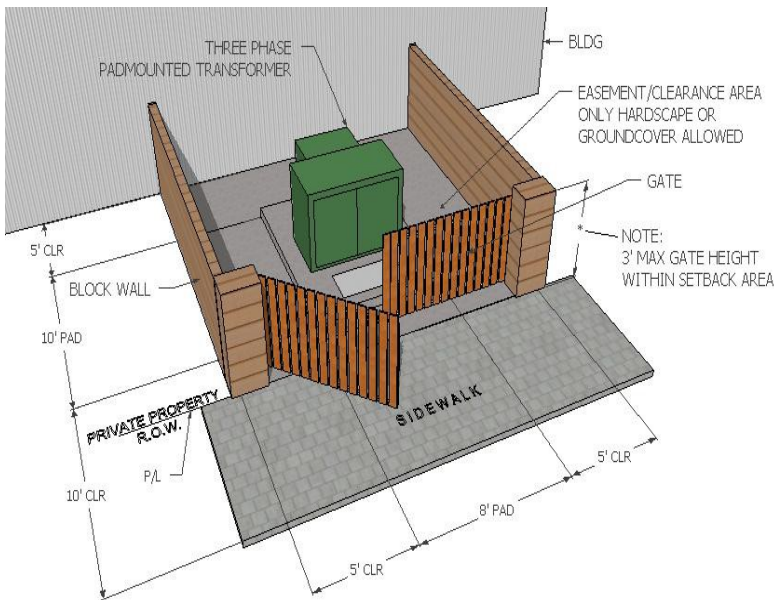
3.02 Pad Mounted Distribution Fuse Cabinet (DFC)



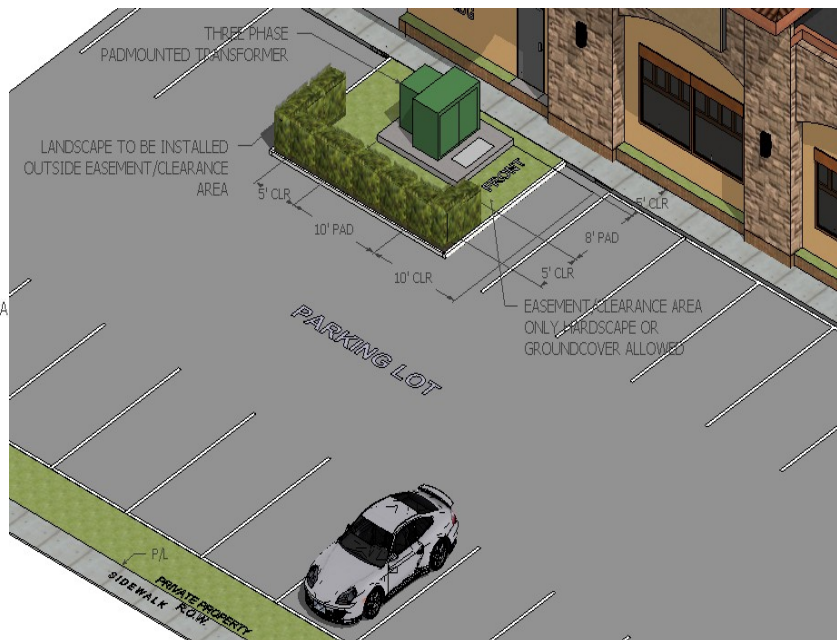
Transformer with **8'X10'** pad.
Front of transformer parallel with R.O.W.



Transformer with **8'X10'** pad.
Front of transformer facing R.O.W.

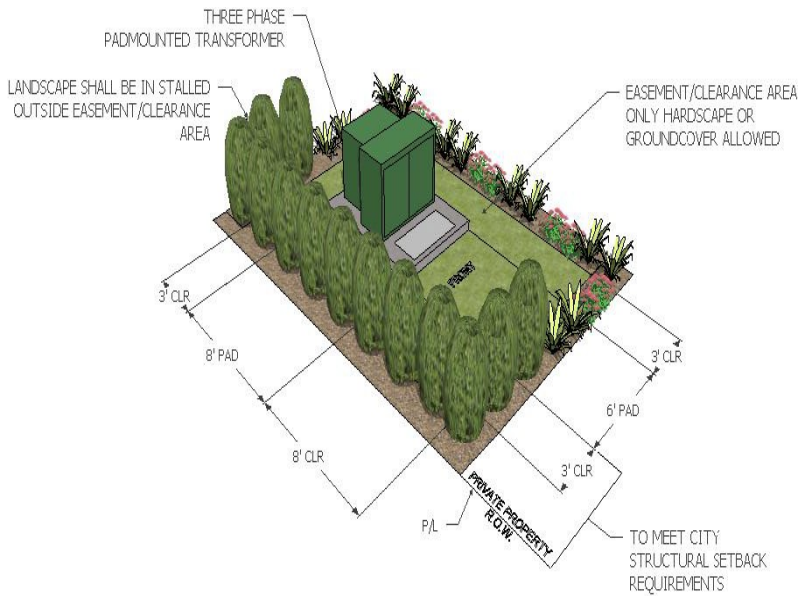


Transformer with **8'X10'** pad screened with block wall and gate. Gate opening provides a 10 foot working clearance in front.

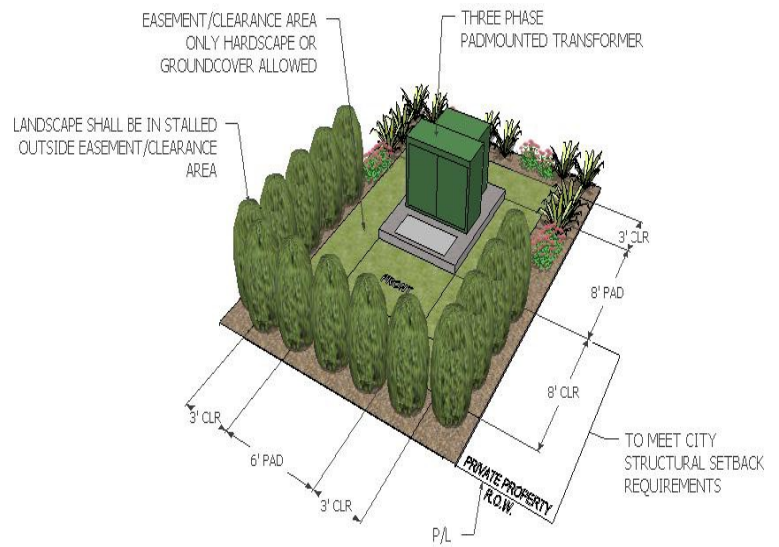


Transformer with **8'X10'** pad screened with landscape. Screening is installed outside clearance area.

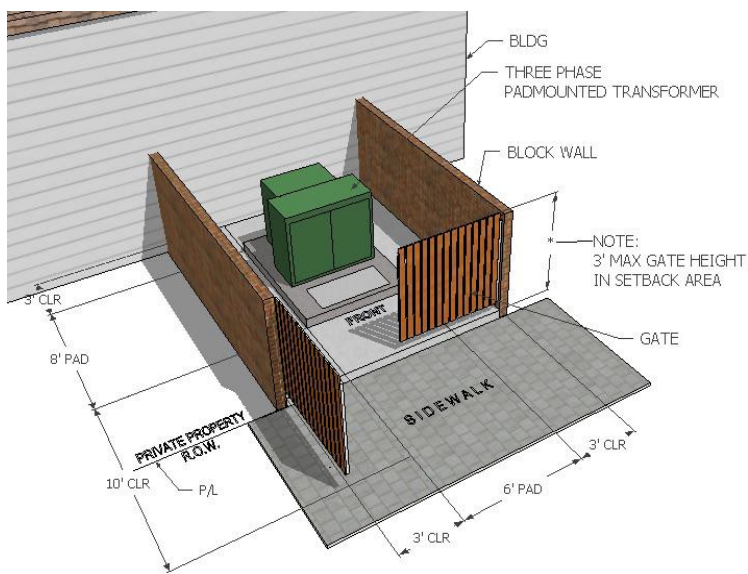
3.03 Three Phase Pad Mounted Transformer



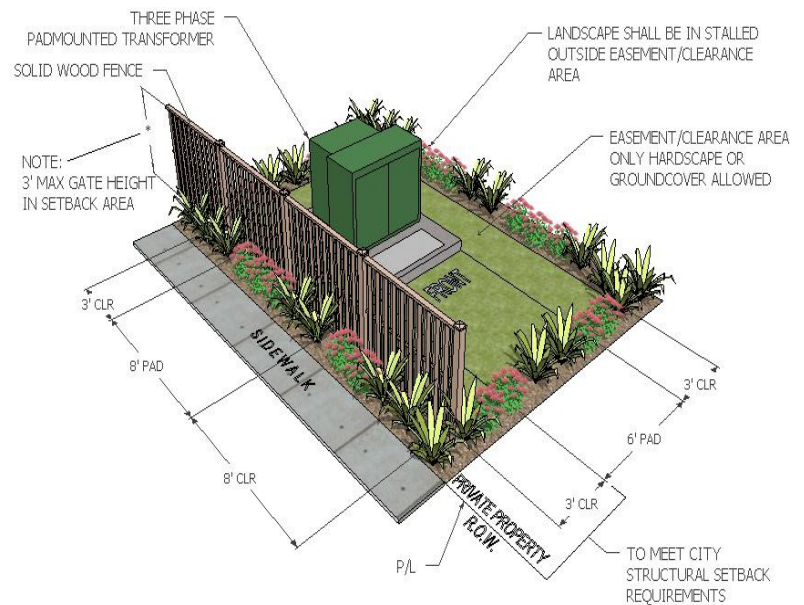
Transformer with 6'X8' pad.
Front of transformer parallel with R.O.W.



Transformer with 6'X8' pad.
Front of transformer facing R.O.W.



Transformer with 6'X8' pad screened with block wall and gate. Gate opening provides a 10 foot working clearance in front.



Transformer with 6'X8' pad screened with landscape and fencing. Screening is installed outside clearance area.

3.03 Three Phase Pad Mounted Transformer



Hedge used to screen transformer.
See picture to the right.



Hedge is installed outside clearance area.



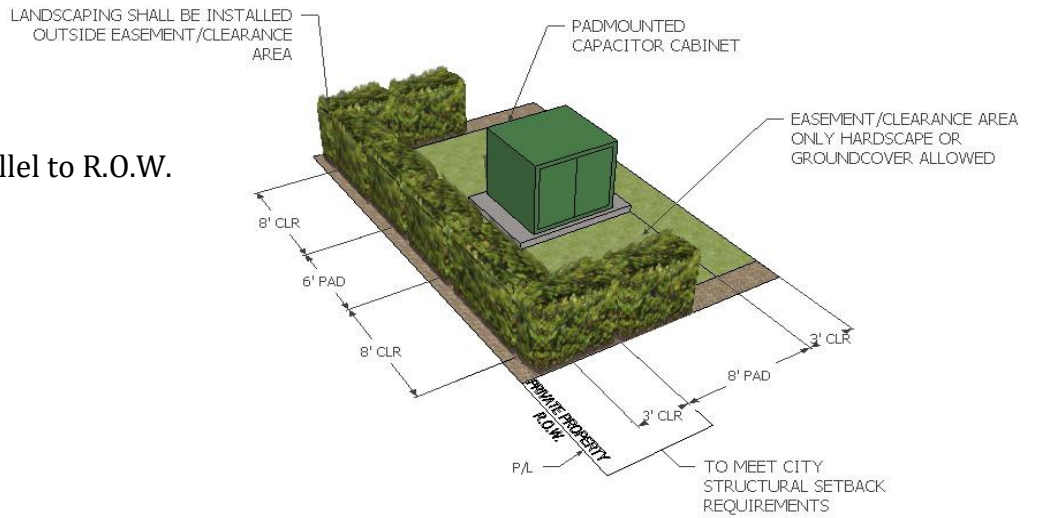
Wall and gate used to screen transformer.
See picture to the right.



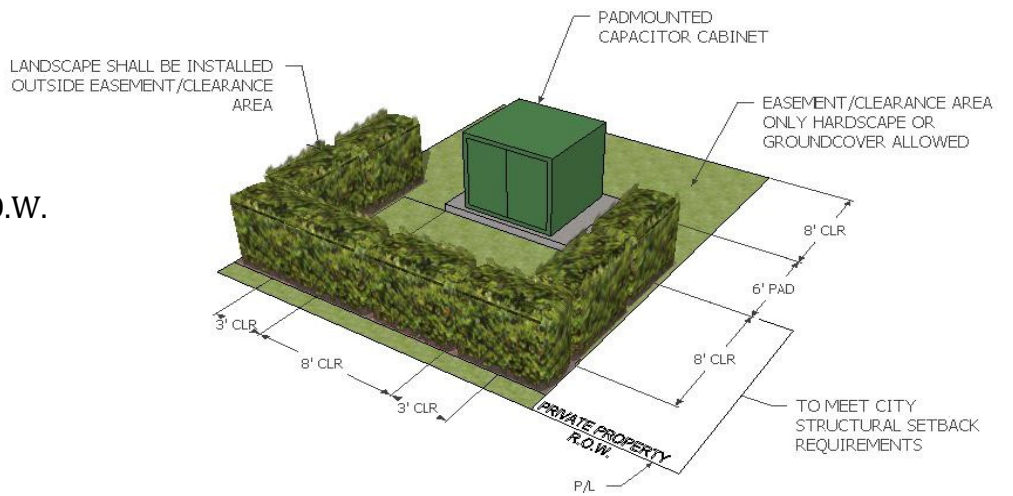
Gate opening provides a 10 foot clearance
in front.

3.03 Three Phase Pad Mounted Transformer

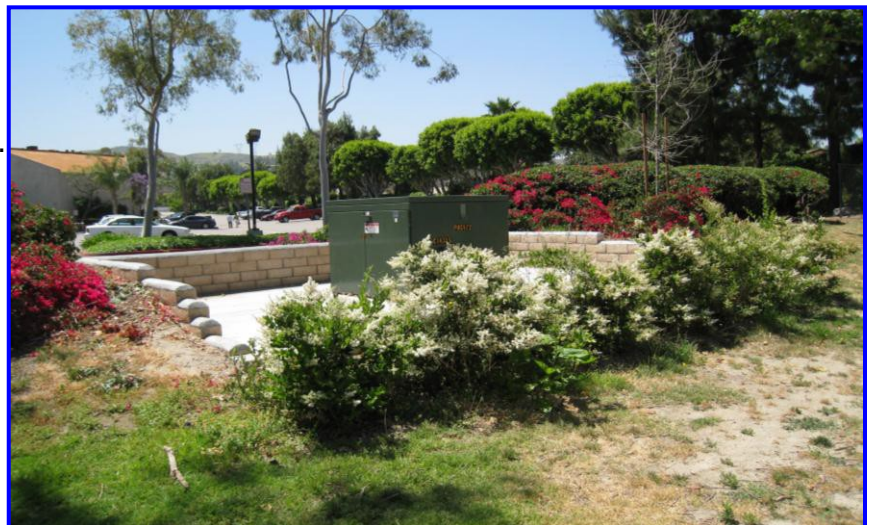
Front of capacitor parallel to R.O.W.



Front of capacitor facing R.O.W.

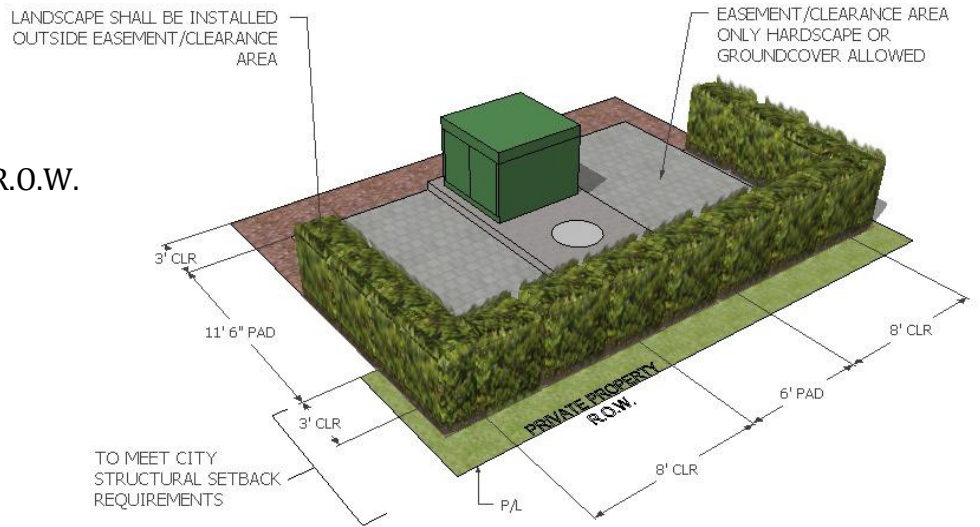


Picture of pad mounted capacitor. Screening is installed outside easement/clearance area.

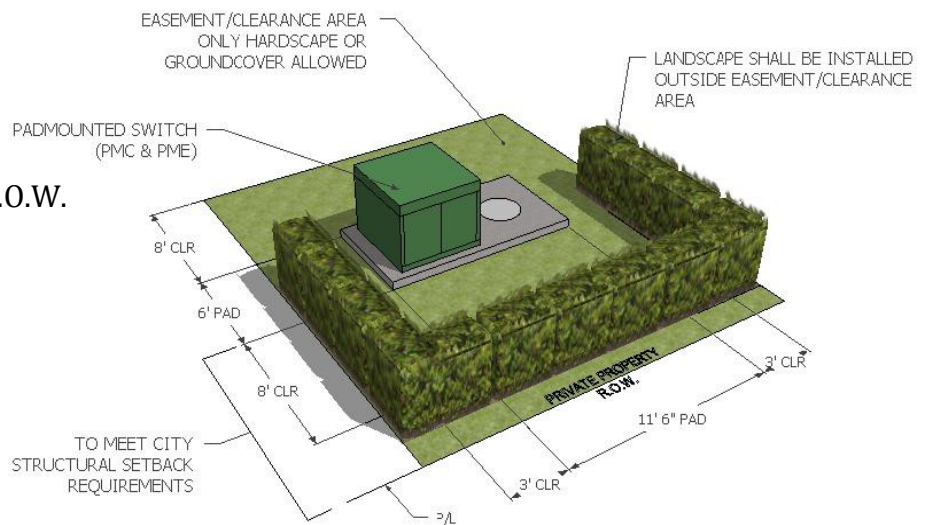


3.04 Pad Mounted Capacitor Cabinet

Front of PMC switch facing R.O.W.



Front of PMC switch parallel to R.O.W.

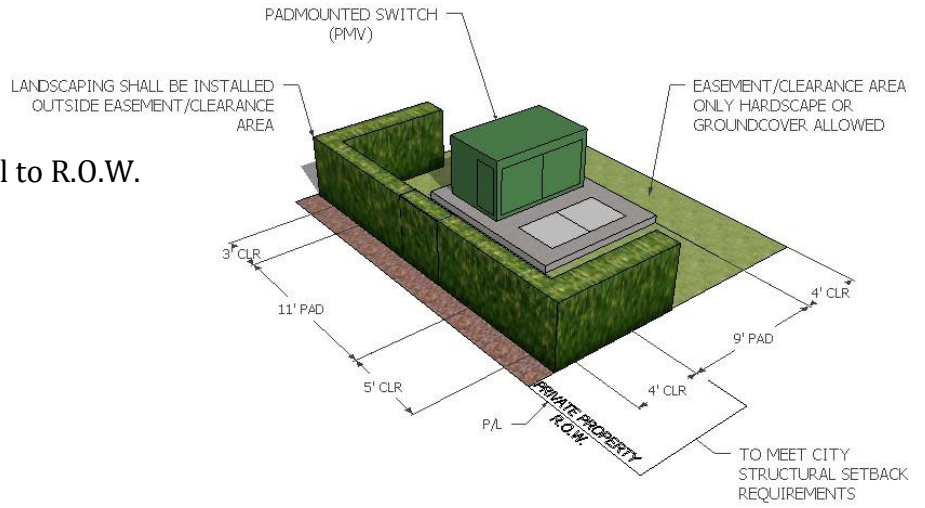


Picture of pad mounted switches. Screening is installed outside easement/clearance area.

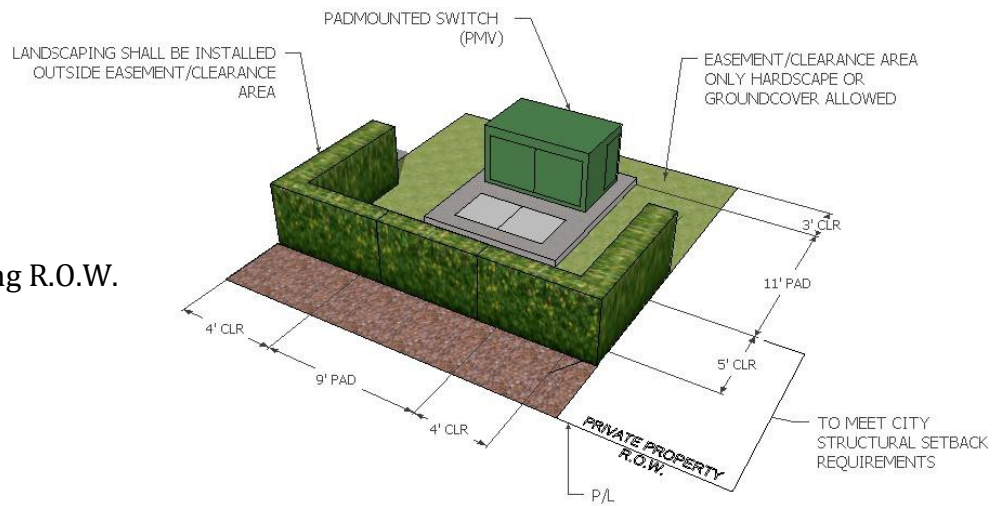


3.05 Pad Mounted Switch (PMC & PME Types)

Front of PMV switch parallel to R.O.W.



Front of PMV switch facing R.O.W.



Picture of pad mounted switch. Screening is installed outside easement/clearance area.



3.06 Pad Mounted Switch (PMV Type)



Pad mounted transformer painted to match surrounding environment.



Pad mounted equipment painted to blend with surrounding environment.

3.07 Re-Painting Utility Equipment

Section 4 - Irrigation Systems

Complete, operable, and automatic irrigation systems shall be installed by the customer for all landscape screening around utility equipment. The water supply line to irrigate the landscape around utility equipment shall be provided via the property owner's water supply. Irrigation systems including controllers, wiring, backflow prevention devices, valves, conduit, and sprinklers shall be installed in accordance with all codes and ordinances including testing and inspection. No water lines shall be installed beneath the electric utility equipment slab or box. Sprinklers shall be preset or adjusted to spray water away from electric utility equipment.

Section 5 - Maintenance

The property owner shall maintain all screening devices including fencing, landscaping, and irrigation systems in accordance with all applicable City codes and ordinances. In order to maintain required clearances, the property owner shall maintain shrubs, and plants on a regular basis. Please note that utility crews may need to remove shrubs that have grown into the easement/clearance area or is too close to the equipment to safely operate and maintain for the benefit of the customer and tenant, as accessibility helps to keep service reliability at a high level.

Landscape screening in the public ROW is subject to the Department of Public Works Standard Plans and Details, Section 5: Landscape and Irrigation Improvements. For details, please go to www.anaheim.net and view the Department of Public Works' City Standards.

APPENDIX A

Planting Material Examples

The requirements for planting materials are as follows:

- Placement of shrubs and plants shall be outside the easement/clearance area as shown on the Typical Screening Methods and Clearance Requirements illustrations.
- Size and spread of shrubs shall be consistent with requirements for utility screening as identified in the AESM.
- Shrubs shall not be invasive, i.e., root systems, vines, or branches will not grow under or into structures or equipment.

It is recommended that shrubs are half as tall as the utility equipment being screened so as to provide immediate softening of the surrounding environment. The Planting Material Examples provides a list of suggested plant materials that are low maintenance and drought tolerant that may be used for screening utility equipment.

APPENDIX A

PLANTING MATERIAL EXAMPLES

LANDSCAPE		Plant Properties	Low Maintenance	Drought Tolerant
Botanical Name	Common Name			
Small Shrub				
Artemisia 'Powis Castle'	Artemisia			•
Helictotrichon Sempervirens	Blue Oat Grass			•
Hemerocallis Hybrid	Daylily			•
Tulbaghia Violaceae 'Silver Lace'	Society Garlic		•	•
Medium Shrub				
Cassia artemisioides	Feathery Cassia			•
Ceanothus 'Joyce Coulter'	NCN*		•	•
Ligustrum Japonicum 'Texanum'	Waxleaf Privet		•	•
Lupinus Hybrid	Silver Lupine		•	•
Myrtus Communis 'Compactum'	Dwarf Myrtle		•	•
Pennisetum Setaceum 'Cupreum'	Purple Fountain Grass		•	•
Pittosporum Tobira 'Wheelerii'	Tobira Dwarf		•	•
Rosemarinus Officinalis	Rosemary		•	•
Salvia Leucantha	Mexican Bush Sage		•	•
Large Shrub				
Dodoneae Viscosa	Hopseed Bush		•	•
Pittosporum Tobira	Mock Orange		•	•
Photinia Fraseri 'Indian Princess'	Photinia		•	•