



positive energy

Drawing Submission Checklist for Customer Padmount Transformer Sites

To be used in conjunction with UDC Manual – Not a Substitute

Project			Project Name and Location
Planner			
Date	/	/	Consultant
Certifications and/or other requirement checklist			
N/A	Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Supply confirmation proposed substation floor 75mm above Defined Flood Level (DFL)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Supply single line diagram of consumers mains and main switch board (Route, Size & Number)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Supply easement documentation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Padmount site location complies with clearances from Hazardous Areas as per the appropriate AS/NZS standards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Padmount site shall not be located within 10m from a Fire Hydrant as per AS2419.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Padmount site shall not be located within 3m from a Gas Metering Station as per AS/NZS 5601.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Padmount site shall not be located within 5m (common earthed) or 20m (separate earth) from a Private Swimming Pool and/or Spa. Public Swimming Pools are subject to an Earthing Design. Refer to the Energen Distribution Earthing Manual (section 3.5).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Civil RPEQ certification (Form 15) provided for non-standard foundation construction
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Civil RPEQ certification (Form 15) provided for cut and fill of Padmount site greater than 150mm to ensure levels, compaction standards and drainage have been considered
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Civil RPEQ certification (Form 15) provided for design of non-standard retaining walls
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Civil RPEQ certification (Form 15) provided for non-standard cable pit designs and / or designs for modifications / extensions to existing pits
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Note on Drawing – Civil RPEQ certification (Form 16) required to certify all Civil Construction works by customer.

Energen cannot progress this project to design or construction until all the applicable requirements above have been fulfilled.

Padmount Drawing Checklist

1 – General Drawing Requirements			
N/A	Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Padmount to be located on the frontage at ground level (subject to flood level)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The transformer must maintain a 4m clearance from areas for which human occupancy/habitation can be expected for an extended period of time.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The edge of all Padmount Substations (PMT) enclosure shall be located a minimum of 4 m from the edge of Buildings or Building envelopes.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Padmount site has minimum 5m vertical clearance from ground level to any building or any permanent structure above the padmount for installation & future maintenance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drawing submission is to detail of the 4m clearance zone in relation to building structures both within the development site & adjacent lots.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fire & Explosion Risk - A barrier with a FRL of 120/120/120 shall be provided between the padmount substation and buildings. Drawings showing buildings within the 4 m clearance zone are protected by a fire barrier or fire resisting wall.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Any front gates / doors must be louvered to allow air flow with a minimum door opening width of 3.0m
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No other services to pass through or under (if directly on ground) substation site
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Padmount site drawings to include overall site drawing showing location of substation within the development and Padmount site detail (scale drawing or full dimensions provided)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cross-sections provided for any sloping sites or surrounded by buildings / overhangs etc.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	RL of PMT site (all 4 corners) and adjacent footpath levels to be shown on detailed plan view of PMT to ensure 2m level safety zone.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Include drawings of relevant Energex Standards e.g. Retaining Walls, Conduit cross-sections, Pits, Bollards, remote earth grid and earth grid riser etc
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Include full details of external works to be done by builder / developer e.g. footpath conduits, cable jointing pit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detail access route for Energex equipment, personnel and all Energex cables for sites located within the property
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dedicated 2.0m clear and level safety zone in front of Padmount doors
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Provision of 24-hour personnel unrestricted (Energex dedicated) emergency access from street to Padmount
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Consumers Mains route (through pit or cable room) to Padmount shown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Note on drawing – Consultant primary contact details as first point of call for construction queries
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Note on drawing – Padmount site to be inspected and handed to Energex at least 6 weeks prior to Date Supply Required

2 – Access

N/A	Yes	No	
Equipment			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Confirmation on drawing of 25 tonne load capacity along equipment access route
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.0m minimum width clear access along straight equipment access route
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Turning radius along access route:- Minimum turning radii – 4900 inside, 7400 outside with 9000 minimum outside radius for equipment clearance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Vehicle headroom no less than 5.0m (slope not exceeding 1:8)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Doors swing outwards to 180 degrees
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	One door leaf secured with standing bolt, the other door leaf fitted with Lockwood 570 series or similar
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All signs on the Padmount to be duplicated on the front enclosure gates / doors
Personnel			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detail arrangement of unrestricted access without notice – 24 hours 7 days a week

3 – Single Padmount Site Sizing Requirements

N/A	Yes	No	
Square Type - Common Earth			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.8m (W) x 5.0m (D)
Square Type - Separate Earth			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.6m (W) x 8.9m (D) – minimum 5m clearance is required between edge of Padmount Plinth and any other metallic structure
Rectangle Type - Common Earth			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.6m (W) x 6.7m (D)
Rectangle Type - Separate Earth			

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.9m (W) x 9.9m (D) – minimum 5m clearance is required between edge of Padmount Plinth and any other metallic structure
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4 – Dual Padmount Sites			
N/A	Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Common Earthed site – 8.8m (W) x 5.0m (D)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.0m minimum separation between Padmount unculverts
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No more than two square type Padmount transformers allowed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No dual sites allowed over basements
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LV switchboards to be isolated by castell key interlocks to prevent paralleling of transformers

5 – Construction			
N/A	Yes	No	
5.1 General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Site excavation size and depth as per Energex specifications
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unculvert foundation layout (and slab if required) as per Energex specifications. RPEQ certification (Form 15) required for non-standard
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Backfilling of the Padmount site (after Energex works) by customer. Backfill to be compacted before final restoration of concrete surrounds completed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Concrete surrounds by builder / developer shown as per Energex specifications
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Retaining walls / fences shown and compliant as per Energex specifications. RPEQ certification (Form 15) required for non-standard
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.0m wide un-reinforced concrete apron in front of Padmount sectioned with construction joints for easy removal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Padmount Doors face road reserve
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bollards installed as per Energex specifications where Padmounts are likely to be impacted by vehicles
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Note on Drawing – RPEQ certification (Form 16) required to certify all Civil Construction works by customer.

5.2 Painting / Artwork			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Artwork on Padmounts must be approved by Energex – Refer to section C3.1.18

6 – Conduits and Cable			
N/A	Yes	No	
6.1 Conduits			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Show applicable drawing standards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reference to minimum radius bends of 1830mm
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Include conduit cross-section drawings (for inside development and for footpath)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Draw rope reference
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Entries to be bell mouthed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Conduits / cable ducts sealed to prevent ingress of water before and after installation of cables
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2-hour fire rating encased where required within buildings

7 – Padmounts over Basements – Subject to Energex Approval			
N/A	Yes	No	

7.1 Cable Rooms

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design (Form 15) and construction (Form 16) of cable rooms to be certified by Civil RPEQ
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Maximum height of room 3.7m
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plan of lighting layout and location of power outlets (as required)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Room entry door must have an Energex lock fitted (lock body 3572 series) and the opening must be a minimum 1200mm wide for personnel access
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Micro switch to personnel door to activate Fluorescent light fittings
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Light switches (heavy duty) adjacent to personnel doors
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bollards should be installed on either side of the entry door/s on the outside of the room to protect staff from carpark traffic whilst exiting the room and also prevent cars from parking within 1m of the room
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2-hour fire rated
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cabling pulling eyes as required along internal cable route
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Provide a "water trap" chamber and suitable drainage for conduit runs to basement cable rooms (as required). Refer to Section 6.1.8 in the Energex C&I manual.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drainage is required to remove any water which may enter the room. Refer to Section 6.1.9 in the Energex C&I manual.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Remote Earth grid located directly below Padmount site, or as agreed to by Energex

7.2 Cable Risers

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum width 900mm and depth, Minimum 300mm and Maximum 450mm
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unimpeded access – 1500mm clear area in front of riser door
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Full width and height doors on each level of building
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unistrut or similar fixed at a minimum vertical spacing of 1000mm
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	False ceiling to be removable and area above to be kept clear of services
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2-hour fire rated
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2 cabling pulling eyes at top of riser and where required along internal cable route

7.3 Cable Tray / Ladder / T-Brackets inside Cable Room

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Show applicable drawing standards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Supported along the <u>centre line only</u> or cantilevered off wall
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Brackets at 600mm spacing, between centres (Ladder between 1000mm and 1500mm)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cable support brackets braced to end walls

8 – Earthing

N/A	Yes	No	
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8.1 Earth Grid

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Show applicable drawing standards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100mm diameter conduit installed through retaining wall footing for earth rod
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.0m clearance between Padmount earth grid and Telstra plant for Common earthed sites
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.0m clearance between Padmount earth grid and Telstra plant for Separate earthed sites
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Customer to provide their own local Earthing arrangements (not to be connected to Energex Substation earth)

8.2 Remote Earth Grid

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Show applicable drawing standards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clear of obstacles and building lightning protection system

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Two separate earth riser conduits
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	63mm encased structurally or outer steel pipe or HAT section for surface mounted
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Earth riser and test pockets formed with removable covers fitted with Energex identification
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Earth ring cable identification plates imbedded in concrete
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50mm Chase between Earth Pockets for both Lower and Upper earth chases
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	63mm conduits for connection of Upper earth grid to Padmount
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Note on drawing – All earth chases to be grouted in by the builder after Energex works completed

9 – External Works by Developer

N/A	Yes	No	
Conduits / Cable pit			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Show applicable drawing standards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Footpath conduits – quantity, size and configuration
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Note to inspect conduit installation before backfilling
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Intake cable pit type and pit dimensions shown and compliant as per Energex specifications. RPEQ certification (Form 15) required for designs of non-standard pit and / or modification to existing pit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cable bell into development

Comments