

Submission Checklist for Customer Substations

To be used in conjunction with C&I Manual – Not a Substitute

Project	Project Name
Planner	and Location
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 Interim Residential Flood Level (IRFL)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fire detection and protection system installed and certified before substation energisation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Supply single line diagram of consumers mains and main switch board
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Supply mechanical ventilation design with certification
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Supply detail of permanent lifting equipment with certification
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Supply easement documentation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Supply substation drainage details – Oil separation tank and/or discharge pump and compliance with the EPA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Note to Provide Certificate of Classification for substation enclosure from Applicant's Building Certifier upon practical completion

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

Substation Drawing Checklist

1 – General Drawing Requirements			
N/A	Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Substation (Switchgear) located at ground level, one level below ground or one level above ground
<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"/>	Substation room/enclosure detail to include 1:50 plan view plus short and long section views
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Show all Energex Equipment – Transformers, 11kV and LV switchgear, battery charger, pilot isolation cubicles, fibre optic panels, interface panels and remote earthing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Include drawings of relevant Energex Standards eg. Floor anchor, earth pockets, conduit X-sections
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Include an overall site drawing showing location of substation within the development
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detail access route for Energex equipment, personnel and all Energex cables
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Provision of 24 hour personnel unrestricted (Energex dedicated) emergency access from street to substation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Include full details of external works to be done by builder eg. footpath conduits, cable jointing pit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Energex will not agree to EMF shielding being installed inside the substation. Provision must be made for this to be installed outside the substation room
<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 – Substation to be inspected and handed to Energex 12 weeks prior to Date Supply Required

2 – Access

N/A	Yes	No	
-----	-----	----	--

2.1 General

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"/>	3000mm minimum width 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 5.5m (slope not exceeding 1:8)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2500mm ² loading slab (slope not exceeding 1:20 includes in all manual handling areas)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum clear opening of 2500mm (2100mm for oil transformers) x 3100mm (indoor)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Doors swing outwards to 180 degrees
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All floor anchors shown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cable pulling eyes shown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bollard shown if required
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Permanent lifting equipment shown. Certification supplied to Energex

Hatch

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum size 2500mm x 3000mm
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	600mm clearance zone around hatch opening (above and below)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Retractable or swinging safety guard
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Retractable or swinging weatherproof and self draining tray (for hatch inside substation room only)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Harness anchoring points as per Energex BMS 01605
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clearance above hatch – 5300mm using crane OR 4300mm using non retractable beam with double hoist

Personnel

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detail arrangement of unrestricted access without notice – 24 hours 7 days a week
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Doors swing outwards

2.2 Outdoor Substations

Personnel

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum clear opening of 1200mm
--------------------------	--------------------------	--------------------------	---------------------------------

2.3 Indoor Substations

Equipment

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	One door leaf secured with standing bolt (top and bottom), the other door leaf fitted with Lockwood 570 series or similar
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Door operated by key from outside and Lockwood lever handle on inside
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Each door fitted with D handles on both sides. Vermin proof mesh fitted to rear of louvers
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Doors with louvers as Drawing 7874-A4 (external doors only – internal doors 2 hour fire rated timber)

Personnel

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Two separate personnel access doorways (or one personnel plus a suitable equipment access door)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum clear opening of 800mm x 2000mm
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fitting of Panic bars or large levers on designated personnel doors

3 – Substation Room / Enclosure Clearances – 1.6

N/A	Yes	No	
Outdoor			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clearances 900mm between equipment and walls and other obstructions 1500mm in front of operating equipment
Indoor			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ceiling height; Bottom entry – 3200mm, Top entry – 3750mm
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clearances 900mm between equipment and walls and other obstructions OR 1200mm for top entry 1500mm in front of the HV and LV side of dry transformers (ie along the 2300 length) 1500mm in front of operating equipment – HV and LV Sw Gr, pilot isolation cubicle, Battery Charger 1500mm between pilot isolation cubicle and earthed metal

4 – Construction

N/A	Yes	No	
-----	-----	----	--

4.1 General

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drained cavity wall (for external walls below ground)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All block walls concrete filled (indoor substations)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chamber isolated from remainder of building with a 2 hour fire rating
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Construction prevents the entry of vermin and birds

4.2 References to Painting

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Walls – Light straw and Ceiling – Gross white
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Steel work – Non galvanised metal (primed and grey paint)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Doors – Neutral (aluminium to be finished with clear anodising and clear lacquer)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Floors – Sealed for Dry Type transformers

4.3 Trench

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum 1200 deep 900 wide
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Suspended slab over trench for transformer (width:- 1500mm for oil transformers OR 1100mm for dry transformers)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Trench junctions and corners below slab – 300mm radius undercut with <u>rounded edges</u>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Trench covers and rebates (plywood – indoor or galvanised steel – outdoor)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Specifically cut one piece covers for trench 'T's and 'L's – level with bottom of trench cover rebate
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Suitably drained complying with local council requirements and EPA regulations

5 – Conduits and Cable

N/A	Yes	No	
-----	-----	----	--

5.1 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 7882-A4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2 hour fire rating encased

5.2 Cable Stand

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Show applicable drawing standards
--------------------------	--------------------------	--------------------------	-----------------------------------

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Low voltage stand Energex specifications
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Flexible braids connectors supplied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Low voltage cable guard to Energex specifications

5.3 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 spacings 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

5.4 Cable Tray / Ladder / T-Brackets inside substation 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
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not to install comms cable tray after hand over of sub room and after discussion Energex supervisor

5.5 Internal cable route between substation and remote transformers

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	300mm minimum clearance between ladder / tray and underside of supporting slab or services
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Placed under all other services
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2 hour fire rating encased

6 – Earthing

N/A	Yes	No	
-----	-----	----	--

6.1 Pockets

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Show applicable drawing standards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chase between pockets for outdoor stations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chase across doorway only for indoor stations
<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)

6.2 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"/>	(63)mm 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

7 – Substation Light and Power			
N/A	Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plan of lighting layout and location of power outlets
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Switchboard – supplied from Essential Supply section of Main Switchboard
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fluorescent light fittings – Not above plant
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Micro switch to personnel door or stairwell to activate light
<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"/>	Minimum of two GPO's plus and battery charger supply (to be hard wired via junction box or isolator)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fan control switch ON, OFF, AUTO (thermostat set point 28°C)
8 – Ventilation			
N/A	Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certification by practising mechanical engineer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clearances 900mm to any equipment
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Duct 100mm from floor
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fire Dampers
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	At least one fan or additional fan to be permanently operational to maintain positive pressure
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fan control switch ON, OFF, AUTO (thermostat set point 28°C)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ventilation outlet at top of room on opposite side to fan with vermin proof mesh fitted
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
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cable bell into development
Comments			