


GENERIC QA TICK SHEET FOR PROJECTS Rev3				
 <p> <b>Note 1:</b> This guide is based on the most commonly found discrepancies on site (<b>tick or comment as applicable</b>)  <b>Note 2:</b> To be used icw relevant equipment specific commissioning &amp; acceptance documents as applicable  <b>Note 3:</b> This tick sheet serves as part of the hand over documents on Project completion  <b>Note 4:</b> A separate tick sheet to be used for each end of the link or site (as applicable)  <b>Note 5:</b> All latest Policies, Procedures &amp; Standards takes precedence (as applicable) </p> <p align="center"><b>"DO IT RIGHT THE FIRST TIME"</b></p>				
Project Name:				
Project number:				
Site Name:				
Distant Site:				
	YES	NO	NA	COMMENTS (as applicable)
<b>1. Cabinet Installation</b>				<b>1. Spec for std 19" Cabinets (240-60725641)</b> <b>2. Installation of a Telecoms equipment cabinet -TST41-695</b>
Comment on cabinet details (new, existing, type, size, condition, etc)				
Location of cabinet as per SOW - (provide updated floor layout diagram (as applicable)				
Cabinet properly bolted / fixed to floor or overhead supporting frame (as applicable)				
Correct mounting hardware used (brackets/bolts/nuts/washers, etc)				
Test cabinet installation for stability				
Cabinet/s correctly labelled per std (stick-on graphite type, dimensions 300mm x 30mm, Black writing on white background)				
Cabinet earth connections /door straps /gland plate available as per spec (refer Cabinet Std 240-60725641)				
<b>Flat bar copper provided for equipment earth connections inside cabinet -identify option available &amp; ensure compliance accordingly as per earthing standard</b>				
<b>Option 1-</b> 25x3mm flat bar copper provided in cabinet for earthing (meets standard, no change required)				
<b>Option 2-</b> 16x5mm flat bar copper provided in cabinet for earthing (meets standard, no change required)				

Option 3- 16x3mm flat bar copper provided in cabinet for earthing (does not meet standard, ensure all spare holes on flat bar are populated with brass screws to maximise surface area, no need to replace flat bar)				
Cabinet earth bar connected to equipment room earth (std 25x3mm flat bar copper) using 25mm fine stranded welding type earth cable (check bolt, nut, serated washers, lugs, heat shrink, etc)				
Other				
	YES	NO	NA	COMMENTS (as applicable)
<b>2. Equipment Installation in cabinet</b>				1. Telecommunications Transport Network Equipment Installation and Commissioning Standard -240-56576361. 2. Radio Station Earthing & Bonding Standard -240-56872313
All equipment as per SOW received from PM (retain material handover form from PM for records /tracking, include dates, signatures, etc as applicable)				
Equipment positioning/ mounting in cabinet as per SOW (Planning Eng to be notified of changes/ final layout diagram & photos required on completion)				
All cage nuts/washers in place & properly fastened				
Brush panels utilised to route interconnection cables between equipment (as applicable)				
All cables/feeders checked (correct routing, secured & labelled on both ends as applicable, checked for loose connections, cable ties, adequate cable slack, bending radius, compression glands used, etc)				
All equipment correctly labelled with usable identification info eg. Cct no, remote site name, IP address, frequency, channel no, etc (as applicable)				
All labels must be clearly visible on equipment & cables on completion (as applicable)				
All equipment correctly earthed to cabinet flat bar (use min 6mm insulated fine stranded earth cable, avoid sharp bends, correct lug type/size used, use heat shrink over lug crimp as applicable, serated washers used, check for tightness, etc)				

Cabinet floor and equipment room left neat & tidy (all left over /recovered material must be removed)				
Relevant equipment serial numbers noted for asset register				
Other				
<b>3. IDF Installation</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS (as applicable)</b>
Note type & size (eg. 80 way standalone wall/floor type, 15-way recessed type in cabinet, etc)				
Positioning of IDF as per SOW (as applicable)				
IDF correctly installed with suitable hardware				
IDF properly earthed to equipment room earth				
Cable gantries correctly installed (as applicable)				
All cabling neatly routed, secured, terminated & labelled on both ends				
Krone blocks correctly fitted & all labelling updated (use flip up /fixed type as applicable)				
Cross connecting jumpers neatly/correctly routed /terminated (no excessive slack required)				
All unused jumpers removed (labelling updated)				
Work area /equipment room left neat & tidy				
Other				
<b>4. RF / IF Cables (Indoor between entry plate to equipment)</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS (as applicable)</b>
				<b>1. Telecommunications Transport Network Equipment Installation and Commissioning Standard -240-56576361.</b>
All entry holes properly sealed (as applicable)				
Correct Polyphasor type (Eskom mat 0241843) used <b>at entry plate</b> as applicable				
<b>If no entry plate exists</b> on site ie. where piped entry into equip room exists - a bulkhead type polyphasor (Eskom 0241845) may be used ie. bolted in line onto internal cable gantry/frame within approx 1m from entry hole (where practical) & then earthed with min 6mm earth cable to the existing room earth on gantry (ie. 25x3mm flat bar copper)				
All connectors correctly made off				
Feeders neatly/correctly routed, secured, no sharp bends (as applicable)				
Appropriate compression glands used at cabinet entry				

Adequate slack left in cabinet (as applicable)				
Feeders not obstructing cabinet door when closing especially for swing-type cabinets				
Correct connector type used for equipment termination eg. Right Angle (RA) connectors more suitable for Aprisa radio				
All feeders correctly labelled on both ends as applicable (entry plate & equipment ends)				
All equipment interconnecting cables correctly routed, secured, labelled (both ends)				
Brush panels utilised to route interconnecting cables				
All equipment correctly earthed (as applicable)				
Other				
<b>5. Equipment installation on tower (up to external entry plate)</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS (as applicable)</b>
				<b>1. Telecommunications Transport Network Equipment Installation and Commissioning Standard -240-56576361.</b>
Antenna polarization, size, type, positioning on tower as per SOW (planning eng to be informed of all changes)				
Suitable galvanized antenna mounting bracket utilised for the purpose				
Stabilizer arm utilised & properly secured to structure -not onto railings as per std (as applicable)				
Correct mounting hardware used (check galvanised brackets, bolts, nuts, appropriate spring & flat washers, thread to protrude min 20mm) - NB- no antenna or hardware shall be secured directly to the tower with stainless steel straps/ties)				
Any signs of damage to galvanising (cold galvanizing paint may be used for minor repairs as applicable)				
EMF warning label stuck onto ODU's (supplied with dishes as applicable)				
ODU's correctly earthed (min 16mm cable)				
Cable connectors properly made off & sealed (insulation/rubber tape used, tape ends may be cable tied to prevent opening up)				
Feeders correctly routed along cable ladder (no crossing over other feeders, no sharp bends, no schafing at any point, suitable cable/cumfy clamps fitted as required, no cable ties used to secure feeder, etc ) as applicable				

Both cable ends correctly labelled -antenna & entry plate (use distant site name, freq band, main/standby, etc-refer <b>STANDARD -240-56576361</b> )				
Earth kits fitted as per std as applicable (antenna level, gantry departure point from twr, proper connection to earth bonding plates with M8 brass bolts, nuts and washers, etc)				
Check correct earth lugs used, properly crimped or soldered, no excessive slack, properly routed & secured, etc				
All recoveries completed including obsolete feeders, clamps, brackets, antennas, etc (as applicable)				
All entry holes properly sealed (including spare holes as applicable)				
All recoveries completed as applicable (removal/disposal as per policy)				
Work area left neat & tidy (clamps, ties, cables, misc hardware, etc)				
Other				
	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS (as applicable)</b>
<b>6. Waveguides (Indoor /Outdoor)</b>				<b>1. Telecommunications Transport Network Equipment Installation and Commissioning Standard -240-56576361.</b>
Correct waveguide type used as per SOW (comment if contractor or Ops did installation)				
Check complete waveguide installation between antenna & equipment (connectors, routing, bending radius, kinks, earth kits, correct support clamps -no cable ties to be used on waveguide or flextwist adaptor)				
Entry hole properly sealed with correct protective flange				
Suitable gantry with support clamps provided for routing to cabinet (no bends to exceed spec)				
Correct flex-twist adaptor & flanges of correct length being used for equip interconnection purposes				
Check dehydrator connection to waveguide adaptor				
Dehydrator correctly installed (check earthing, all connectors, separate trip switch, labels, pressure readings, etc)				
Dehydrator alarm is connected and tested working to NMC via the EAS (as applicable)				
Check ODU installation & interconnecting cables in cabinet is per spec				

Check all labelling as applicable				
EMF warning label attached as applicable (supplied with equipment)				
Other				

	YES	NO	NA	COMMENTS (as applicable)
<b>6. TOWERS</b>				<b>1. Telecommunications Transport Network Equipment Installation and Commissioning Standard -240-56576361.</b> <b>2. Radio Station Earthing &amp; Bonding Standard -240-56872313</b> <b>3. Site Supervision in Telecommunications -240-102795302</b>
<b>6.1 EXISTING STRUCTURE</b>				
Note structure type (lattice, tubular, monopole, wall-mount, stayed lattice, wooden pole, etc)				
General condition of structure/ site (rust, paint, visible defects, stability, earthing, photos for records, aircraft lights, general cabling/feeder condition, etc)				
Availability of structural analysis report (additional loading, notable defects, etc)				
Other				
<b>6.2 NEW STRUCTURE (general issues to look out for)</b>				
Site clarification meeting held as applicable icw with relevant roleplayers ( <b>PM responsibility</b> ), all clarifications to be captured & submitted together with a copy of signed attendance register by PM to <b>Engineering who will then be responsible to update the final sow</b> & submit to all roleplayers via PM.				
Construction as per final approved design specifications & final sow including clarifications (location, excavations, foundations, structure type, platform levels, etc) - photos required for each stage, align with PM hold points to verify (PM still accountable for implementation)				
Approved method statement (as agreed with contractor) being followed (ensure all safety measures being adhered to)				
Other				

<b>All earthing related issues in accordance with Eskom "Radio Station earthing &amp; bonding standard - 240-56872313" (verify common issues as indicated below -photos required for various stages as applicable)</b>				
Earth test results required from contractor before & after connecting to station earth				
150mm <sup>2</sup> flat bar copper being used for foundation earth mat/ building earth ring (min trench depth 500mm where applicable) - (as a general guide all earthing below ground should utilise 50x3mm flat bar copper)				
All bonding of copper earth (as applicable) is braised as per above standard (take note of shortcuts by some contractors, photograph welded joints for records)				
Verify all tower legs bonded to ring below ground level by braising copper strap (150mm <sup>2</sup> ) directly onto the lower end of the cage bolts of each leg as per earthing standard				
Verify two radials of copper strip 150mm <sup>2</sup> cross-section, buried to a depth of not less than 500mm, should be bonded at one end to the tower ground ring furthest from the building and to the fence posts below ground ( <b>refer section 6.3 of Standard</b> )				
Earth bonding plates with M8 brass bolts, nuts and washers are fitted/clamped at all appropriate points on tower, same side of the cat ladder as the feeder run is installed as per spec (always 500mm below the equipment to be bonded, at all platform levels /as per std, at gantry departure point from tower)				
Separate copper earth strip running the length of the tower not required as per new standard				
Base of climbing ladder earthed with 150mm <sup>2</sup> flat bar copper below ground to earth mat				
<b>On completion of tower construction verify the ffg:</b>				
Tower height				
Tower base holding down bolts been fitted with spring washer & 2nd lock nut ( <b>ETSP0383</b> )				
All platform heights				
Platform grids (open mesh type)				

Safety rails				
Kick/ toe plates				
Catladder installation, uneven rung spacing & ladder stability (long sections may require additional support brackets)				
Cable run installation, uneven support spacing				
Antenna brackets / stabilizer arm mounting (not onto railings)				
Aircraft warning lights LED type, DC, mountings, cabling, connection to DB, testing, alarm connection, etc				
No missing bolts/nuts/washers				
All hardware properly secured				
No drilling, welding or grinding allowed on structure				
Minor Galvanizing /paint damage - contractor may use cold galvanizing zinc spray /appropriate paint to touch up as applicable				
Any signs of rust, corrosion, welding, drilling, etc				
Gantry construction between tower & equip room (correct routing with appropriate upright supports, std slow bends as required, adequate adjustable support poles mounted onto concrete plinth (plinth to protrude min100mm above site stoning on completion), interconnecting earth straps between gantry sections, hail guards, correct splices used at all gantry joints, adequate bolts/nuts/washers used, proper connections at both ends (twr/building/container), etc				
Tower data plate installed on tower (min 1 metre above ground level at suitable point) with all relevant information				
Site stoning as per sow (32mm stone, 100mm depth)				
Approved underfelt/plastic used prior to stoning				
All unused material / equipment removed from site				
Site re-instatement to acceptable standard				
Final completion photos of all project related issues required				
All construction discrepancies noted in writing & acknowledged by responsible reps (PM to be informed, ensure rectification thereof by responsible party)				
Other				



7. Optic Fibre	YES	NO	NA	COMMENTS (as applicable)
Installation as per SOW				
Duct fibre cable used between cabinets (use of orange sprag to house cable is optional)				
No patch leads allowed between cabinets				
Correct patch panel type used (Prysmian SC-SC type complete with all accessories as per webb contract item)				
Adequate jointing slack left in cabinet (check routing, secured, labelled, glands)				
OLTES's as per SOW (to be secured onto modem trays)				
Labelling as per standard - <b>eg. 24-core SM Fibre to (distant site, name, Length 1.5603km)</b>				
All test results acceptable - OTDR & Power Light Source results required for all fibres (soft copy)				
Earthing as per standard				
All relevant photos of installation required (as applicable)				
Other				
	YES	NO	NA	COMMENTS (as applicable)
<b>8. Power Related Issues (Charger /Batteries / DC Rail/ Converters)</b>				1. Distribution Type – Part 16: DC Systems Settings Standard - DST 34-366. 2. Eskom Battery spec doc, ETSP0451
<b>8.1 AC issues</b>				
Comment if contractor or Ops doing installation work				
AC supply as per sow - (verify cable type & size, correct trip ratings & type eg. single or double pole, earth connection to site earth (50x3mm flat bar), all terminations, lugs, heat shrink, glands, slack, routing, steel /pvc conduits or trunking, sealing of entry holes, labelling, etc) -as applicable				
Earth bonding per std (exoweld as applicable, etc)				
Correct Surge protection type installed				
Trenching per spec (min 500mm depth)				
Site re-instatement acceptable				
Recoveries complete / removed from site (as applicable)				
All tests completed & acceptable (COC required)				
Other				

<b>8.2 CHARGER</b>				
General (existing / new /upgrade of supply for specific site -DX, TX, Telecoms supply)				
Installation/commissioning done by contractor or Ops				
Charger installation & commissioning as per SOW				
Updated wiring diagram checked & available (note any changes)				
Charger trips correctly labelled for specific cabinets (note each cabinet to have separate supply cable /trip switch of correct rating, A&B supply on separate cables, etc)				
Charger panels correctly labelled on top front (graphite type, Dimensions 300mm x 30mm, Black writing on white background) - as applicable				
All aspects of installation work verified as applicable (gantries, trunking, correct cable size/color, use of armoured cable under floor, cable glands, cable routing, DB, trip switch ratings, correct lugs/terminal connections, heat shrink, nuts/bolts/washers, labelling, wiring diagram, etc)				
All relevant alarms – (AC fail, DC load, Battery undercurrent, etc) wired & tested to NMC via EAS (as applicable)				
Other				
<b>8.3 BATTERIES</b>				
Comment - batteries installed in separate battery room or in cabinet				
Installation /commissioning done by contractor or Ops				
Installation & commissioning as per SOW & per standard (red & black 25mm welding type cables to be used for battery cross connections as applicable)				
All aspects of installation work verified as applicable (gantries, trunking, correct interconnecting cable size & colors, cable glands, cable routing, DB, trip switch ratings, correct lugs/terminal connections, heat shrink, nuts/bolts/washers, labelling, wiring diagram, etc)				
All batteries checked for signs of leaks /corrosion /cracks /acid levels, correct numbering, etc (as applicable)				
Any signs of acid damage to floor paint (note battery number as applicable)				

Other				
<b>8.4 DC Rail</b>				
Note existing or new DC Rail / DIN rail type in cabinet				
Standard DC Rail ( <b>RACK:CIRCUIT BREAKER,19 INCH,3U</b> ) to be installed (if supplied on project) with adequate no of trip switches as required				
If A & B Supply available (note 2 separate feeder cables (4mm) must be used from supply to DC rail (as applicable)				
All aspects of installation work verified as applicable (gantries, trunking, correct cable size/color, armoured cable for under floor, cable glands, cable routing, DB, trip switch ratings, correct lugs/terminal connections, heat shrink, nuts/bolts/washers, labelling, wiring diagram, etc)				
All trips correctly & clearly labelled with equipment name				
Correct end of aisle DB used as per SOW (as applicable) - legend must be updated				
All relevant equipment serial numbers noted for asset register				
All obsolete equipment /cabling recovered & disposed off as per policy				
All earthing (as applicable) checked & is in accordance with specification				
Other				
<b>8.5 DC-DC Converters</b>				
Converter used (note new, existing, current rating, type)				
Equipment mounting as per sow				
All aspects of installation work verified as applicable ( correct cable size, cable glands, cable routing, trip switch ratings, correct lugs/terminal connections, heat shrink, nuts/bolts/washers, labelling, etc)				
Other				

9. Fencing / Gates				COMMENTS (as applicable)
General comments (new, existing, type, diamond mesh, palisade, swing/ sliding gates, gate motor, etc)				
Fencing /gate installation / refurbishment (as applicable) verified as per final SOW including issues as per site clarification meeting (Site clarification meeting - <b>PM responsibility</b> , Final sow updates - <b>Engineering responsibility</b> ) --refer section 6.2 for further clarity				
All aspects of installation work verified <b>as applicable</b> eg. wiring standard, correct gate motor type, correct mounting hardware, galvanised brackets, support poles, struts & stays, barbed wire, bolts, anti-tunneling, concrete kerbing, concrete ramp for easy access into the gate, nuts, appropriate washers, thread to protrude min 20mm, appropriate signage, etc				
Verify fence /gate earth commoned to site earthing (all connections to be done below ground level) - refer RADIO STATION EARTHING & BONDING -240-56872313				
All construction discrepancies noted in writing & acknowledged by responsible reps (PM to be informed, ensure rectification thereof by responsible party)				
Verify fence /gate earth commoned to site earthing (all connections to be done below ground level) - refer RADIO STATION EARTHING & BONDING -240-56872313				
All unused /recovered material removed from site & disposed off as per policy (check for illegal dumping on adjacent property eg. bush, trench, illegally burried under soil) of building material/ rubble, metal objects, etc.				
All relevant alarms– eg. electric fence, motorised gate, etc wired & tested to NMC via EAS (as applicable)				
Other				
10. Containers / Equipment room	YES	NO	NA	COMMENTS (as applicable)
Comment - new, existing, type, size, etc				
Installation / refurbishment (as applicable) verified as per final SOW including issues as per site clarification meeting (Site clarification meeting - <b>PM responsibility</b> , Final sow updates - <b>Engineering responsibility</b> ) --refer section 6.2 for further clarity				

Ensure concrete plinth for container meets spec (PM to have spec available & ensure contractor sign off on completion)				
Verify specification of container (size, type, mounting, earthing, AC supply/DB/surge protection, 19" rack mount equipment cabinet/ frame, entry plate/holes, internal /external DB, surge protection, trip switch ratings, connections, aircon units, lighting, plug points, switches, remotes, water leaks, certificate of compliance, etc)				
If aircon units installed seperately in equipment room - (verify installation as per sow, test working condition/remotes, neatness, sealing as applicable, alarm connection to EAS, certificate of compliance for required from contractor, etc)				
Verify AC supply connection as applicable (single or 3-phase, min 500mm depth of trench, soil/mat/stoning replacement acceptable, general re-instatement, correct size/type of cable used, lugs, terminations, routing, trip ratings, surge protection, galvanised piping/trunking for cables above ground, supply earth commoned to station earth by 50x3mm flat bar copper -reduce potential difference, etc) - <b>refer earthing standard</b>				
Verify earthing related issues as per standard - refer <b>RADIO STATION EARTHING &amp; BONDING -240-56872313</b> (50x3mm flat bar copper earth ring at min 500mmmm depth, commoned to station earth, proper welded connections, before /after earth readings, etc)				
Gantry provision as per SOW (verify gantry size, all gantry inter-connections, adequate bolts/nuts at joint splices, earth continuity, support poles, fitting onto container with suitable pop rivets, correct bends used, galvanise damage treated, sharp edges, etc)				
All construction discrepancies noted by responsible reps in writing (PM to be informed, ensure rectification thereof by responsible party)				
All relevant alarms– eg. door, aircon, etc wired & tested to NMC via EAS (as applicable)				
All unused /recovered material removed from site & disposed off as per policy				
Site re-instatement acceptable				
Other				

11. GENERAL (non project related issues)	YES	NO	NA	COMMENTS (as applicable)
List all historical site /equipment room /building, fence, etc - issues for ops managers attention & rectification thereof (not project related)				
12. Acceptance & Commissioning	YES	NO	NA	COMMENTS (as applicable)
Final verifications for all aspects of project done (photos /drawings required) as applicable				
All changes (as applicable) noted & Planning Engineering informed accordingly				
Final acceptance /commissioning documents (as applicable) completed for all relevant equipment & accepted by all parties				
QA tick sheet /asset form /journal submitted & signed off by all relevant parties				
Copy of QA snag list forwarded to ops supervisor for rectification				
Project related photos submitted to relevant parties (save on ngy network drive or on sharepoint site for region)				
Other				
	Mark - X			
ACCEPTED (without pending issues)				
ACCEPTED (with minor pending issues)				
DECLINED				

**LIST OF PENDING ISSUES / COMMENTS below- Note Workplace task number below (created on relevant supervisor's name) for all pending issues as per this tick sheet**

**NB: Supervisors to track all pending issues & ensure rectification within 3 weeks (or as agreed upon timeline) & feedback to project rep on completion via email. Failure to comply shall result in the task being re-classified as a "non-Conformance" in Workplace.**

**PROJECT EXECUTION REP:**

**SIGN:**

DATE:

**O&FS TECHNICIAN REP:**

**SIGN:**

DATE:

**O&FS SUPERVISOR:**

**SIGN:**

DATE: