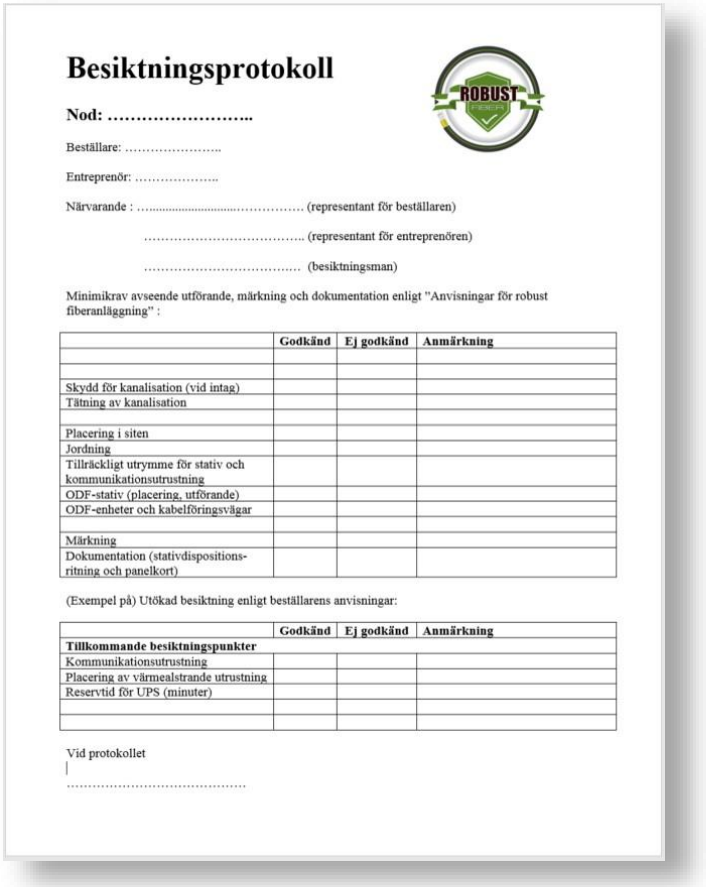
Instructions for Robust Fiber

Appendix 6 Inspection

Ver 1.7



Besiktningsprotokoll

Nod: ……..

Beställare: ……..

Entreprenör: ……..

Närvarande : ……. (representant för beställaren)

…….. (representant för entreprenören)

…….. (besiktningsman)

Minimikrav avseende utförande, märkning och dokumentation enligt "Anvisningar för robust fiberanläggning" :

	Godkänd	Ej godkänd	Anmärkning
Skydd för kanalisation (vid intag)			
Tätning av kanalisation			
Placering i siten			
Jordning			
Tillräckligt utrymme för stativ och kommunikationsutrustning			
ODF-stativ (placering, utförande)			
ODF-enheter och kabelföringsvägar			
Märkning			
Dokumentation (stativdispositions-ritning och panelkort)			

(Exempel på) Utökad besiktning enligt beställarens anvisningar:

	Godkänd	Ej godkänd	Anmärkning
Tillkommande besiktningspunkter			
Kommunikationsutrustning			
Placering av värmealstrande utrustning			
Reservtid för UPS (minuter)			

Vid protokollet

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CONTENTS

1. INTRODUCTION

The document *"Instructions for Robust Fiber"* comprises one main document and a number of appendices.

This appendix, Inspection, contains a description of the various steps in the inspection process and the minimum requirements that are stipulated regarding e.g. final inspection.

The aim of the appendix is for it to be able to be used as supporting data when a client (network owner) wants to engage an inspector to inspect a fibre installation.

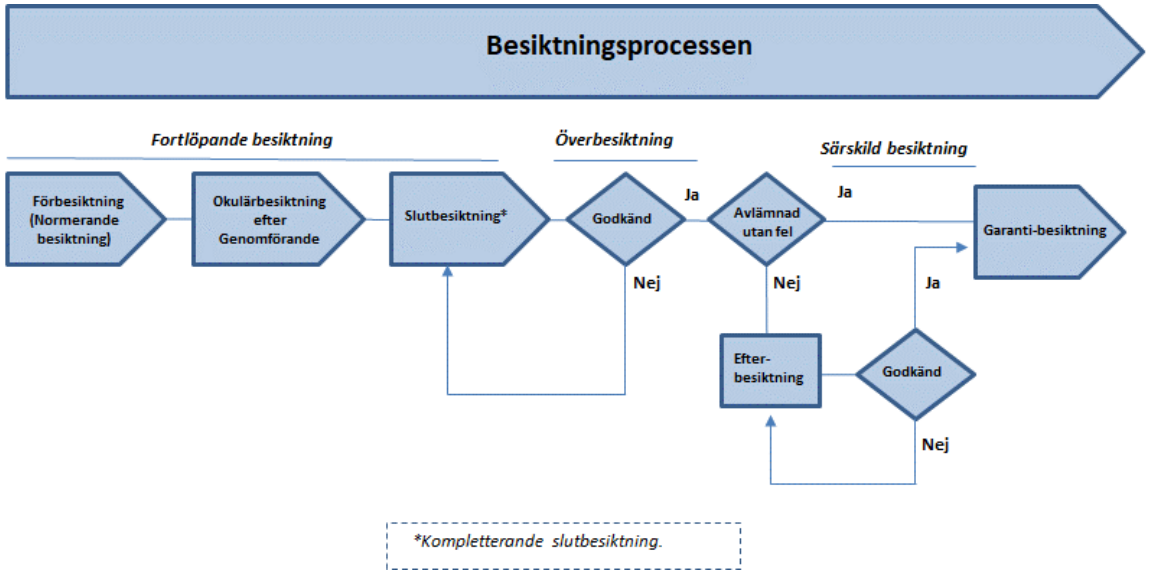
The inspection process is based on *AB 04 General conditions of contract for building and civil engineering works and building services* as well as *ABT 06 General conditions of contract for design and construct contracts for building, civil engineering and installation works.*

The contractor must carry out and document in-house checks, which are conducted and documented per section.

The scope of the inspector's work must at least conform to that set out in the minimum requirements below. The client normally has additional requirement/instructions that must also be included in the inspection.

2. THE INSPECTION PROCESS

The inspection process is illustrated by the following figure.



The inspection processes

Minimum requirements within the following areas are defined in the appendix:

- Review with the client prior to implementation
- Review with the contractor prior to implementation
- Visual inspection with landowners prior to implementation
- Pre-inspection (Normative inspection)
- Visual inspection after implementation
- Final inspection
- Inspection report
- Post-inspection
- Warranty inspection

In addition to the process steps specified above, there are further inspection measures that may be relevant for an inspector to implement:

- Ongoing inspection
- Reinspection
- Special inspection

The client should appoint a controller who then represents the client. A checklist must be drawn up regarding how the controller should continually check and document the installation work throughout the implementation period.

3. INSPECTION

3.1 Generally

An inspection of a fibre installation is carried out to verify that the installation has been executed in accordance with the contract documents and the client's instructions.

All the work and all documentation must be complete when final inspection is performed. The project is reported as complete to the client after approved final inspection.

The inspection work is a process involving three parties:

- the client
- the contractor
- the inspector.

Inspection of the fibre installation must be carried out by an impartial inspector with experience in this area. An inspector should be appointed relatively early in the project, before implementation commences, so that the conditions and contract documents can be reviewed. This makes things easier for the parties when the actual inspection work is to be carried out.

An inspector is appointed by the client. The inspector appointed by the client must be suitable for the assignment. The requirement of suitability includes, besides technical knowledge, the inspector's objectivity, since the assignment means that the inspection is carried out in an independent manner towards both the client and the contractor. Pre-inspection and final inspection are paid for by the client, while any post-inspection is paid for by the contractor.
The most common steps in the inspection process are presented below. Within each area, there are also minimum requirements in respect of the scope of an inspection. The client determines whether an extended inspection is to be carried out. Once each step has been implemented, this should be noted in the minutes from a Construction meeting (or equivalent).

For the implementation of the inspection, Appendix 6.1 Checklist final inspection is used. The checklist also includes the additional requirements, for the facility and the documentation, which must be verified if the facility has received broadband support in accordance with Chapter 3.2 Inspection of a facility that has received broadband support from the Swedish Post and Telecom Agency or from the Swedish Board of Agriculture.

3.2 Inspection of a facility that has received state support

If the facility has received broadband support from the Swedish Post and Telecom Authority (PTS) or the Swedish Board of Agriculture (SJV), the inspector must be used Appendix 6.1 Checklist final inspection.
The checklist has been supplemented with the additional requirements, on the facility and the documentation, that the authority prescribes in the following documents:

- PTS. Requirements for robustness, reliability, security and overcapacity in accordance with PTS's conditions for investment support for broadband.

- SJV. The Swedish Board of Agriculture's regulations on business support, project support and environmental investments as well as support for locally led development (SJVFS 2016: 19).

- SJV. Regulations on amendments to the Swedish Board of Agriculture's regulations (SJVFS 2016: 19) on business support, project support and environmental investments as well as support for locally led development (SJVSF 2020: 33)

If the inspection refers to a facility that has received broadband support from the Swedish Board of Agriculture, the inspector must certify that the facility meets the Swedish Board of Agriculture's requirements for the facility and the documentation.

- LSB12_23

- LSB12_24

3.3 Review with the client prior to implementation

The client and the inspector should review the conditions prior to implementation as set out below:

If a review with the client is conducted prior to implementation, the minimum requirements are as follows:

- Checking of risk and vulnerability analysis (if one has been drawn up).
- Review of local conditions and instructions in respect of routing and restoration.
- Review of contract documents, e.g. contract agreement, equipment list and timetable, as well as requirements regarding labelling and documentation.
- During implementation it must be ensured that the selected equipment, as well as the labelling and documentation, satisfy the minimum requirements.
- Coordination with the controller and production of an overall inspection plan.

3.4 Review with the contractor prior to implementation

Before commencing implementation, the client, contractor and inspector should conduct a review as set out below:

If a review with the contractor is conducted prior to implementation, the minimum requirements are as follows:

- General review of detailed planning and dimensioning.
- Review of installation instructions
- Review of choice of equipment.
- General review of routing methods in different sections.
- Review of labelling and documentation prior to final inspection and any normative inspection.
- Review of the contractor's plan for in-house checks

3.5 Visual inspection with land owners prior to implementation

The client initiates visual inspection prior to implementation. The visual inspection is performed by a representative of the client (normally a controller) and a representative of the contractor. The inspection of the work area's surface layer is performed together with landowner and road operator along sections where earthworks are planned. A report is drawn up. It is an advantage if the report can be supplemented with pictures/film.

MINIMUM REQUIREMENTS FOR INSPECTION PRIOR TO IMPLEMENTATION:

- A report must be drawn up setting out the inspected sections. Faults, deficiencies and agreements must be noted.
- Representatives of the client, the contractor and affected land owners/road operators must be set out in the report.

3.6 Ongoing inspection

If the parties agree on Ongoing inspection, this is carried out as a pre-inspection or final inspection.

3.7 Pre-inspection (Normative inspection)

Pre-inspection should be conducted when significant parts of the installation cannot be checked after completion. This is done to ensure that execution corresponds with the contract documents and in order to review in detail how labelling and documentation should be carried out. Representatives of the client and the contractor must be present during the inspection. When the aim of the inspection is to establish principles or quality requirements for a large amount of recurring work, this is known as a normative inspection.

If a pre-inspection is performed, the minimum requirements are as follows:

- Check that newly established sites and nodes satisfy minimum requirements.
- Check that the employed routing method corresponds with the requirements.
- Check that the indicated cable location has been used.
- Review that duct bedding, number of ducts, cable marking, backfilling and backfill height satisfy the requirements.
- Check that used equipment corresponds with the requirements.
- Check that seals satisfy the minimum requirements.
- Check that labelling has been carried out in accordance with the requirements.
- Review of agreed documentation for the section in question. Examples of agreed documents must be available, but do not need to be complete.

3.8 Visual inspection after implementation

When the fibre installation is completed and restoration of the work area has been conducted, a new visual inspection is normally conducted by representatives of the client and the contractor. The representative of the client should contact affected land owners/road operators before this takes place in order to obtain any opinions about how the contractor has conducted the implementation and restoration. Affected land owners/road operators can also participate in the visual inspection. The results are documented in a report, which should be supplemented with pictures/film of that which deviates from the work area's appearance prior to the implementation of the project.

If a visual inspection after implementation is carried out, the minimum requirements are as follows:

- A report must be drawn up setting out the inspected sections. Faults and deficiencies must be noted.
- Representatives of the client, the contractor and opinions from affected land owners/road operators must be set out in the report.

3.9 Final inspection

When the fibre installation is complete and (normally) visual inspection after implementation has been conducted, the final inspection is implemented. At this point, it is also a condition that all labelling, all documentation, all position measurement and all measurement reports are complete. The documentation must be available so that the inspector can examine it an agreed number of days prior to the final inspection.

The inspector calls the final inspection and draws up an inspection plan, which is followed unless something abnormal is discovered. It is normally the case that 10–15% of the fibre installation is checked during the final inspection. If deficiencies are discovered, the scope of the inspection work is expanded.

During the final inspection, checks are performed to ascertain that execution, labelling and documentation (including position measurement and measurement report) are carried out in accordance with the contract documents, the client's instructions and agreements during the normative inspection and at construction meetings.

MINIMUM REQUIREMENTS IN RESPECT OF FINAL INSPECTION:

Preparations prior to the final inspection:

- An agreed number of days prior to the final inspection, the inspector must review all documentation and check that no data is missing.
- The inspector must draw up an inspection plan. The inspection plan may be drawn up in consultation with the client.
- The inspection plan must not be communicated to the contractor prior to the final inspection.

Review with representatives of the client and the contractor:

- Check that selected installation instructions and routing methods correspond with the requirements.
- Check of the contractor's documentation of in-house inspections.
- Review of notes regarding deficiencies in respect of duct bedding, number of ducts, cable marking, backfilling and backfill height. The inspection plan is supplemented by checking noted deficiencies.
- Review of notes regarding deficiencies relating to normal restoration (e.g. deficiencies in respect of gravel, asphalt, slabs and grass). The inspection plan is supplemented by checking noted deficiencies.
- Check that used equipment corresponds with the requirements.
- Check that labelling has been carried out in accordance with the requirements.

Inspection in the field (random check of 10–15% of the fibre installation):

- Check of newly established sites and nodes in respect of location, execution and labelling so that minimum requirements and additional requirements are satisfied (see checklists and instructions from the client).

- Check of newly established optical fibre chambers and outdoor splice cabinets in respect of location, positioning, fittings, ground insulation, sealing of ducts and locking.
- Check that the indicated cable location has been used.
- Check of UV protection and mechanical protection for visible ducts outdoors.
- Check that search string (if this is used) is accessible in distribution points.
- Check that there is protection for fibre optic cables indoors where there is a risk of vandalism or sabotage.
- Check of bushings entering properties in respect of incline, sealing and labelling.
- Check of terminations in properties in respect of execution and labelling.
- Check that labelling and documentation correspond.

If a pre-inspection and/or visual inspection before/after implementation have not been carried out, the following must be verified, as far as this is possible, during the inspection in the field:

- Check that selected installation instructions and routing methods have been used.
- Check that duct bedding, number of ducts, cable marking, backfilling and backfill height have been executed in accordance with the requirements.
- Check of faults and deficiencies from normal restoration (e.g. deficiencies in respect of gravel, asphalt, slabs and grass).
- Check that used equipment corresponds with the requirements.

When routing in lakes or large watercourses, the following are added:

- Check that the ducts/underwater cable satisfies the minimum requirements (must be checked by divers).

When routing on poles, the following are added:

- Check that the height above ground satisfies the requirements.

The final inspection is concluded with a final meeting, during which the inspector goes through the results of the final inspection and gives verbal approval/rejection of the fibre installation.

Comment:
If the contract at the final inspection is obviously not completed so that it can be approved, the Inspector may cancel the Inspection and prescribe a new final inspection. The inspector must state in his opinion the reasons for this.
The fact that a party fails to attend the inspection without acceptable reason does not impede the conduct of the inspection.
If the final inspection is not carried out within the prescribed time due to the failure of the client, the contractor is considered approved and delivered from the date when the inspection would have been properly carried out

3.10 Inspection report

When the final inspection is complete, the inspector prepared an inspection report (inspection statement), which is distributed to the parties without delay and no later than three weeks after the inspection.

MINIMUM REQUIREMENTS REGARDING WHAT IS TO BE SET OUT IN THE

INSPECTION REPORT:

Parties	client, contractor
Conditions	relevant contract documents
Participants	persons present with information on who is bringing each party's claim, the inspector and who appointed him.
Scope	which elements are included in the final inspection
Notes	observations in conjunction with the final inspection
Comments	that which must be rectified by the contractor
Results	in respect of execution, labelling and documentation, as well as deadline for rectifying comments
Approval	adopting a stance in respect of approval/rejection from both parties with written signatures, digital signatures or e-mail acceptance.
Warranty period	the end date of the warranty period

3.11 post-inspection

If the final inspection has resulted in comments, these must be rectified by the contractor, after which a post-inspection of the comments is carried out and a new inspection report is prepared. The process is repeated if necessary, until all the comments have been rectified.

Restoration that has to be conducted long after the fibre installation has been reported as complete and taken into use, e.g. asphalting that cannot be conducted in the winter or grass that cannot be sowed in the autumn, will result in comments in the inspection report. The deadline for rectifying these must be set according to the prevailing conditions in the area. The post-inspection can be carried out by the client or the inspector.

3.12 Warranty inspection

Before the end of the warranty period that applies according to AB/ABT, a warranty inspection is performed of the fibre installation. The client initiates the warranty inspection, unless otherwise agreed.

AB/ABT: responsibility period 10 years after contract approval. Begins with a 5-year warranty period for the contract (unless otherwise stipulated in the contract documents) For warranty period regarding material, see AB04/ABT06 in accordance with contract form and contract documents.

3.13 Special inspection

After the expiry of the contract period, parties are entitled to request a Special inspection in respect of faults pointed out by the client that existed at the time of the final inspection, but that had not been dealt with at the time because they had not been noticed or had been ignored by the inspector. Applies both to faults that have been discovered during the warranty period and/or to faults that have emerged after the warranty period but within the 10-year responsibility period and for the status of the contract in a certain respect

3.14 Other

It is up to the client to deal with warranty commitments in relation to other affected parties, such as landowners and road operators.