SS. CYRIL AND METHODIUS UNIVERSITY IN SKOPJE
FACULTY OF ELECTRICAL ENGINEERING AND
INFORMATION TECHNOLOGIES

INSPECTION BODY FOR ELECTROTECHNICAL DEVICES, INSTALLATIONS AND EQUIPMENT
(Accreditation certificate according to the requirements of ISO/ IEC 17020)

Инспекција
МКС EN ISO/IEC 17020
ИТ - 074
Inspection

Accreditation Certificate No. IT - 074

Република Македонија
УНИВЕРЗИТЕТ "СВ. КИРИЛ И МЕТОДИЈ" - СКОПЈЕ
ФАКУЛТЕТ ЗА ЕЛЕКТРОТЕХНИКА И ИНФОРМАЦИСКИ ТЕХНОЛОГИИ
Бр. 03-1615/16
06-12-2016 201___ год.
СКОПЈЕ

Report number: _______

FINAL REPORT
CONDITION ASSESSMENT AND CHARACTERISTICS MEASUREMENT OF FIBER OPTIC CABLES AND LINKS

Customer: one.Vip DOO Skopje

Issued by: Faculty of Electrical Engineering and Information Technologies – Skopje

Order number: FEEIT's No. 03-1615/3, date 08.08.2016
Customer's No. 4500061869, date 29.07.2016

Dimitar Tashkovski
Digitally signed by Dimitar Tashkovski
Date: 2016.12.07 11:13:32 +01'00'

Dean,

Prof. Dr. Dimitar Taskovski

2016

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Used documentation	
Standards:	МКС EN 60793-1-40:2009 МКС EN 60793-1-42:2009 МКС EN 60793-1-48:2009
Inspection methods:	RU 14.2-17 Measurement of optical fiber attenuation with OTDR. RU 14.2-18 Measurement of optical fiber chromatic dispersion. RU 14.2-24 Measurement of optical fiber polarization dispersion
Measurement equipment:	EXFO FTB-730 EXFO FLS-5834A EXFO FTB-5500B EXFO FTB-5800
Head of the Inspection body:	Prof. Dr. Vlatko Stoilkov
Technical head:	Prof. Dr. Aleksandar Risteski
Measurements were conducted by:	Prof. Dr. Borislav Popovski Prof. Dr. Aleksandar Risteski Associate prof. Dr. Pero Latkoski Assistant prof. Dr. Marko Porjazoski Assistant prof. Dr. Tomislav Shuminoski Robert Adamovski, BScEE Zive Andonovski, BScEE
Date:	21.11.2016

Head of the Optical Communications Laboratory:

(signature)

Technical Head:

(signature)

CONTENTS

1. INTRODUCTION

The Inspection Body for Electrotechnical Devices, Installations and Equipment, which is a part of the Faculty of the Electrical Engineering and Information Technologies in Skopje (FEEIT), has conducted a measurement campaign of 60 optical fibers organized in 5 links, owned by one.Vip DOO Skopje. The measurements were performed on-site by the members of Optical Communication Laboratory (also part of FEEIT). The measurements of the optical fibers included fiber loss measurements with OTDR, chromatic dispersion (CD) measurements and polarization-mode dispersion (PMD) measurements.
The measurements were conducted upon received request (purchase order) by one.Vip DOO Skopje, submitted to the Faculty of Electrical engineering and Information Technologies in Skopje, with the following number 03-1615/3 on 08.08.2016.

2. MEASUREMENT PROCEDURE

The measurement set-up include: 1) light source (EXFO FLS-5834A) with high output power (Super LED) and with high level of polarization (PMD measurement ready), 2) polarization mode dispersion module EXFO FTB-5500B, compatible with EXFO FTB-500 platform, 3) chromatic dispersion module EXFO FTB-5800, also compatible with EXFO FTB-500 plaform and 4) OTDR module EXFO FTB-730, compatible with EXFO FTB-1 platform.
The measurements were conducted according to the inspection methods RU 14.2-17, RU 14.2-18 и RU 14.2-24 defined by the Inspection body of FEEIT and with compliance to the following standards 1) МКС EN 60793-1-40:2009 – Optical fibers – Part 1-40: Measurement methods and compliance testing – Loss, 2) МКС EN 60793-1-42:2009 - Optical fibers - Part 1-42: Measurement methods and compliance testing – Chromatic dispersion and 3) МКС EN 60793-1-48:2009 - Optical fibers - Part 1-48: Measurement methods and compliance testing – Polarization mode dispersion.

3. MEASUREMENT CAMPAIGN DETAILS

All measurements were performed between 06.10.2016 and 02.11.2016, based on the time schedule proposed by the customer. The total number of measured fibers is 60, organized in the following links presented in the table below.

No.	Link	No. of fibers	Measurement date
1.	Ohrid - Bitola	12	06.10.2016
2.	Gostivar - Ohrid	12	10.10.2016
3.	Bela crkva - Bitola	12	17.10.2016
4.	Gostivar - Skopje	12	19.10.2016
5.	Ќафасан - Ohrid	12	02.11.2016

As the table presents, all 60 fibers were measured completely, according to the predefined measurement procedures and standards.

The detailed measurement reports were timely submitted to one.Vip DOO Skopje and the Agency for Electronic Communications, according to the Rules and regulations for construction of public telecommunication networks published by the Agency for electronic communications (Official Gazette of the Republic of Macedonia 106/2014), on the following dates: 20.10.2016, 07.11.2016 and 14.11.2016. At the same time, the complete results in electronic format (on CD) are included in this Final report.