



L&T-STECC JV MUMBAI

Mumbai Metro Line 3
Package No : UGC 01

AUDIT NOTIFICATION

QUALITY MANAGEMENT SYSTEM

PROJECT QUALITY PLAN
ISSUE No. 01

PQP / WP 16 F04

Location: L & T STECC Office, UGC01 Mumbai

Date: 08-03-21

Sl. No: 109

To : **Mr. Atul Kokare**
Operational Manager-M/s TCR Lab

Section : **Material testing Lab**
Navi Mumbai

cc: **Priyank Kulshreshtha**

This notification is to advise that an Audit has been scheduled to take place in your Site/Department as detailed below.

Please acknowledge receipt of this notification by signing and returning a copy of this form during the time of audit.

Audit Details

Audit Number: **01**

Date Planned: **16-03-2021**

Time: **02:30 PM**

Proposed Audit Scope: **Process of Material testing & Documentation as per ISO/IEC: 17025 and ISO 9001, Calibration records of testing equipment's, Internal audit reports, Management review records, Training records, Storage of documents, Uncertainty records Customer feedback/Complaints Records.**

The Auditor / Audit Team will be: **Mr. Rashpal Pahwa, Mr. Sampath & Mr. Shaikh Abdul Majid**

The following personnel will be required to be available during the audit:

Laboratory Manager and his concerned team.

Issued by
QAM Site: Mr. Rashpal Pahwa

Signature:

Date: 08-03-2021



Received by Audi tee (Lab. head)

Name: **GANESH A. SONAWANE**

Signature:

Date: **16/03/2021**



| | | | |
|---|---|-----------------------------|---|
|  | <p align="center">L&T-STECC JV MUMBAI Mumbai Metro Line 3 Pkg. No : UGC 01</p> <p align="center">AUDIT SUMMARY REPORT</p> | Doc No : LTS/QAS/P01/R/105 |  |
| | | Contract No: MM3-CBS-UGC-01 | |

BU / PROJECT : Metros / MML3

AUDIT NO: 01

AUDIT TEAM: Mr. Sampath

DATE OF AUDIT: 16-03-21

SCOPE OF AUDIT: Process of Material testing & Documentation as per ISO/IEC: 17025 and ISO 9001, Calibration records of testing equipment's, Internal audit reports, Management review records, Training records, Storage of documents, Uncertainty records Customer feedback/Complaints Records.



PERSONS CONTACTED: Mr. Jayesh, Mr. Ganesh, Mr. Atul and all concerned team

AUDIT HIGHLIGHTS:

| Number of Minor NCRs | Number of Major NCRs | Number of Observations | Number of Improvements |
|----------------------|----------------------|------------------------|------------------------|
| Nil | Nil | - | - |

ENCLOSURE: Detailed audit report & photographs

Note: Audit Report is issued to TCR Lab concerned team

| | | | |
|---|---|-----------------------------|---|
|  | <p style="text-align: center;">L&T-STECH JV MUMBAI Mumbai Metro Line 3 Pkg. No : UGC 01</p> <p style="text-align: center;">AUDIT SUMMARY REPORT</p> | Doc No : LTS/QAS/P01/R/105 |  |
| | | Contract No: MM3-CBS-UGC-01 | |

DETAILED AUDIT REPORT:

| S.NO | ISO Clause /Doc. Ref | Description of Item | Remarks |
|------|----------------------------|--|-------------|
| 01. | General | BIS license records for the laboratory were verified and found within validity up to 31-12-23. | |
| 02. | ISO/IEC: 17025:2017 | NABL accreditation certificate (ref no:TC-6905) verified and found within validity up to 26-02-22. | - |
| 03. | 8.1 | Process of material inward and testing was verified and found OK. | - |
| 04. | 9.2 | Internal audit records of TCR lab were verified. Three non-conformances were recorded on 31-10-20. All the non-conformance is found closed. | - |
| 05. | 7.1.5.2 | Calibration records were verified, and all equipment calibrations were performed by external third party NABL accredited agencies. Calibration reports of measuring scale, Vernier caliper, UTM and extensometer (ref no: 42546/14,42405/01zd-100,270,30911014,25mm and 50mm GL) was verified. | - |
| 06. | 7.2 | Training records were verified. Competent persons were involved in material testing. | - |
| 07. | 9.3 | Management review meeting records were verified. Latest MRM was conducted on 04-11-20 and minutes were recorded. | - |
| 08. | 7.1.5.2 | All equipment's in the laboratory were labelled with calibration due date and deviation limits. | Good |
| 09. | 8.1 | Reinforcement chemical analysis process was verified and found OK. | - |
| 10. | 10.2 | Customer complaints records were verified, and all were attended. | - |
| 11. | General | As a process verification, coupler samples physical testing (Tensile and elongation) were witnessed and found testing process is complying to the codal requirements | - |

Auditor Signature: 



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भारतीय मानक ब्यूरो
उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय
भारत सरकार
BUREAU OF INDIAN STANDARDS
Ministry of Consumer Affairs, Food & Public Distribution
Government of India

Our Ref: LPPD/LRS/OSL-7103506

26-02-2021

TCR Engineering Services (P) Ltd

VKB House, EL-182, electronic Zone,
MIDC, TTC, Mahape,
Navi Mumbai-400710.

Sub: Renewal of recognition under BIS Lab Recognition Scheme 2020

Dear Sir,

With reference to your application seeking renewal of recognition of your laboratory by BIS and the subsequent assessment(s) / correspondences made in this regard, we are pleased to inform you that the recognition of your lab operating at the address " TCR Engineering Services (P) Ltd, VKB House, EL-182, electronic Zone, MIDC, TTC, Mahape, Navi Mumbai-400710" has been renewed by the Competent Authority for a period of three years w.e.f. **01 Jan 2021 to 31 Dec2023** under BIS Lab Recognition Scheme 2020 and the recognized scope of your lab is given as **Annex-I**.

The recognition shall stand automatically withdrawn unless renewed further subject to satisfactory performance of your laboratory based on periodic review/surveillance by BIS. The recognition shall stand expired if renewal is not sought by your laboratory in advance of the expiry date along with the prescribed fee. In this connection, you may kindly go through BIS LRS 2020 available at BIS website www.bis.org.in.

It may be noted that you are required to comply with the Terms & Conditions as laid down under item 5.0 of the BIS LRS 2020 and also the Undertaking given by you along with the application form. In case your laboratory is found violating any of the provisions of the Scheme or the undertaking given by you, the recognition of your laboratory may be suspended or your lab may be de-recognized by BIS. The conditions under which the laboratory can be suspended/ deferred /expired or can be de-recognized are given under Item 7 & 8 of BIS LRS 2020.

You are advised to get all the clauses of each ISs applied/covered in BIS scope in your NABL accreditation scope within 1 year from the implementation of BIS LRS 2020 ie. by 31 May 2021, thereafter scope of the lab will be reviewed.

It may also be noted that this recognition does not bind BIS to make use of the test facilities available in your laboratory. However as and when required your test facilities would be utilized as decided by BIS from time to time.

Thanking you,

Yours faithfully
Anushree
(Anushree) 26/2/2021
Sc.B, LPPD

एलपीपीडी कार्यालय नं. १६/२०२१
LPPD Diary No. १६/२०२१
दिनांक: २६/०२/२०२१
Dated: 26/02/2021

मानक भवन, ९, बहादुरशाह जफर मार्ग, नई दिल्ली ११०००२
दूरभाष : 23230131, 23233375, 23239402
ई-मेल : info@bis.gov.in वेबसाईट : www.bis.gov.in

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi-110002
230131, 23233375, 23239402
in Website : www.bis.gov.in

Photo evidence to point no 1 of the report



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Contract No: MM3-CBS-UGC-01





National Accreditation Board for
Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

TCR ENGINEERING SERVICES PVT. LTD.
has been assessed and accredited in accordance with the standard
ISO/IEC 17025:2017
"General Requirements for the Competence of Testing & Calibration Laboratories"
for its facilities at
VKB HOUSE, PLOT NO. EL 182, MIDC TTC, INDUSTRIAL AREA, ELECTRONIC ZONE, MAHAPE, NAVI
MUMBAI, THANE, MAHARASHTRA, INDIA
in the field of
TESTING

Certificate Number: TC-6905
Issue Date: 27/02/2020 Valid Until: 26/02/2022

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Signed for and on behalf of NABL



N. Venkateswaran
N. Venkateswaran
Chief Executive Officer

Photo evidence to point no 2 of the report



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TESTING MACHINE SERVICES

VASANT GALAXY, NEPTUNE 704 B, BANGUR NAGAR,
GOREGAON (WEST), MUMBAI - 400 104 (INDIA).
● TEL.: (022) 28783413 ● E-MAIL : testing_m_s@yahoo.co.in

CALIBRATION CERTIFICATE

Certificate No.: 10399
ULR No. – CC25172000000134F
Discipline: Mechanical Calibration, Group: UTM, Tension Creep & Torsion Testing Machine

Format No. : TMS/CERT/01
Date of Issue: 05th June – 2020
Page : 1 of 2



| | |
|--|--|
| CUSTOMER NAME AND ADDRESS | : M/S. TCR Engineering Services Pvt. Ltd., TTC Electronic Zone, Navi Mumbai . |
| REF. | : As Per request dated 28 th May – 2020 . |
| ITEM DESCRIPTION | : UNIVERSAL TESTING MACHINE . |
| MACHINE MAKE/SR. NO. | : MTS SYSTEMS (CHINA) CO. LTD. 30911014 . |
| DIGITAL CONTROL SYSTEM MAKE/MODEL : | MTS SYSTEMS (CHINA) CO. LTD. DCS - 300 . |
| LOAD CELL MAKE/SR. NO. | : CELTRON / AE88669 |
| MACHINE MAX CAPACITY | : 0 - 1000 kN . |
| METHOD OF FORCE APPLICATION | : COMPRESSION . |
| CALIBRATION MASTER | : Dynamometer . |
| TRACEABILITY | : National Phy. Laboratory, New Delhi through FRI . |
| ROOM TEMPERATURE AT CALIBRATION | : 1) 25.8° C 2) 25.8° C 3) 25.8° C MEAN : 25.8° C |
| CALIBRATION METHOD | : IS 1828 PART 1 - 2015 & ISO 7500-1:2018 (E) |
| UNCERTAINTY OF MEASUREMENT (AT 95% CONFIDENCE LEVEL) | : ± 0.59 % . |
| DATE OF CALIBRATION | : 03 rd June – 2020 . |
| NEXT CALIBRATION DUE | : 02 nd June – 2021 . |

1. This report refers only to the particular item (s) calibrated at customer site.
2. The calibration results reported are valid at the time of and under the conditions of measurement.
3. This report may not be reproduced, except in full without prior permission of Testing Machine Services.
4. Any correction in this certificate, invalidates the certificate.
5. TMS is not liable for any change in calibration data and performance specifications on account of Malfunctioning of standard/Instrument/Equipment covered by this report due to damage caused to it after issuance of this report.
6. Uncertainty of Measurement at 95 % Confidence level where coverage factor K = 2.
7. The Accuracy Error is not considered for Uncertainty calculation.
8. The machine is calibrated as per TMS Calibration Procedure No.: QP/019 based on IS 1828 Part 1 – 2015 & ISO 7500-1:2018 (E) .
9. The machine shall in any case be verified (Re-calibrated) if it is moved to a new location necessitating dismantling or if it is subject to major repairs or adjustments.



For Testing Machine Services

Photo evidence to point no :5 of the report (GEHANI)

| | | | |
|---|---|-----------------------------|---|
|  | L&T-STECH JV MUMBAI Mumbai Metro Line 3 Pkg. No : UGC 01 | Doc No : LTS/QAS/P01/R/105 |  |
| | AUDIT SUMMARY REPORT | Contract No: MM3-CBS-UGC-01 | |



SIZE MASTERS CALIBRATION SERVICES

Final Plot No. 123, Lane No. 10, Ramtekdi Industrial Estate, Hadapsar,
Pune - 411 013. (INDIA) Tel. : +91 9890644445, 8237644445
E-mail : kiranzanwar@yahoo.com / smscalibration@gmail.com



CERTIFICATE OF CALIBRATION

| ELECTRONIC EXTENSOMETER | | | |
|-----------------------------------|---------------------------|---------------------------|--------------------------|
| Date of Calibration: 09/01/2020 | Next Due Date: 08/01/2021 | Date of Issue: 11/01/2020 | Page 1 of 2 |
| Certificate No: 2020 / 39291 / 06 | ULR: CC24602040000053F | Discipline: Mechanical | Product Group: Dimension |

| | |
|-------------------------------------|--|
| Customer Name & Address: | M/s. TCR Engineering Services Pvt Ltd. LAB – VKB House-EL-182, TTC Industrial Area, MIDC Electronic Zone, Mahape, Navi Mumbai – 400 710. |
|-------------------------------------|--|

Reference Standard: ASTM E-83 **Calibration Procedure :** LAB PROCEDURE WI 71

| | | | | |
|--|--------------------|---------------------|-------------------|-----------------------|
| Details of Extensometer Under Calibration | Make | EPSILON | Model / Type | --- |
| | Sr. No. | --- | Id No. | GL 50 mm |
| | Gauge Lengths | 50 mm | Location | LAB. |
| | Extension Capacity | 10.0 mm | Mounting Position | Vertical / Horizontal |
| Details of Digital Indicator | Make | Display on Computer | Model | --- |
| | Sr. No. / Id No. | | Least count | 0.0001 mm |

- EQUIPMENT USED FOR CALIBRATION & IT'S TRACEABILITY:**
- Electronic Probe & D.R.O.: (Make: HEIDENHAIN, L.C. 0.00001mm, Sr. No.: 37407936A) Traceable to National standard through NABL Lab No. C-0313 Through it's certificate no. 2019/08/1870 Cal. On 27/11/2019 & valid up to 27/11/2021
 - Digital Vernier Caliper : (Make: Mitutoyo, L.C. 0.010 mm, Sr. No. 11261747) Traceable to National standard through NABL Lab No CC-2460 through its certificate no. 2019/37760/02 Cal. On 24/09/2019 & valid up to 24/09/2020.

UNCERTAINTY OF MEASUREMENT: ± 2.0 µm

The uncertainty stated is the Expanded uncertainty of Measurement obtained by Multiplying the standard uncertainty by coverage factor K=2 corresponds to confidence level of 95.45%


D.G. NANAWARE
Calibrated By


Photo evidence to point no :5 of the report


K. ZANWAR
ger Calibration Lab

Note : This certificate is issued subject to conditions stated overleaf.



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SIZE MASTERS CALIBRATION SERVICES

Final Plot No. 123, Lane No. 10, Ramtekdi Industrial Estate, Hadapsar,
Pune - 411 013. (INDIA) Tel. : +91 9890644445, 8237644445
E-mail : kiranzanwar@yahoo.com / smcscalibration@gmail.com



CERTIFICATE OF CALIBRATION

| | | | |
|--|---|---|-------------|
| CALIBRATION CERTIFICATE OF: VERNIER CALIPER (DIGITAL TYPE) | DATE: 12/10/2020 | CERTIFICATE NO. 2020/42405/01 | PAGE 1 OF 1 |
| DATE OF CALIBRATION: 12/10/2020 | NEXT DATE OF CALIBRATION: 11/10/2021 (As per customer requirement) | ULR: CC246020600003045 F | |
| CUSTOMER'S REF. D.C.NO.: 2846 DATED: 09/10/2020 | DATE OF RECEIPT: 10/10/2020 CONDITION OF ITEM: SATISFACTORY | DISCIPLINE: MECHANICAL | |
| | | GROUP: DIMENSION (BASIC- MEASURING INSTRUMENT, GAUGES ETC.) | |

CUSTOMER: TCR ENGINEERING SERVICES.
EL-182 TTC INDL AREA ELECTRONIC ZONE MIDC MAHAPE, NAVI MUMBAI-400710.

CALIBRATION PROCEDURE: LAB PROCEDURE WI 05.

REF. DOCUMENT USED: N.A.

EQUIPMENT USED FOR CALIBRATION & IT'S TRACEABILITY:
a) Caliper checker: (Make: Mikronix, Sr.No. 2322, Range: 0-1000 mm, I.D. No.: R-18-2) having Traceability to National Standards by NABL Lab NO. CC-2282 via. CER. NO. SCL/20-21/08/098-001, cal. On 14/08/2020 & valid upto 13/08/2022.

UNCERTAINTY OF MEASUREMENT: ± 16.0 µm
The uncertainty stated is the Expanded uncertainty of Measurement obtained by Multiplying the standard uncertainty by coverage factor K=2 corresponds to confidence level of 95.45%

ENVIRONMENTAL CONDITION: 20 ± 1°C

VERNIER CALIPER (DIGITAL TYPE) RANGE: 0-200 mm, L.C.: 0.010 mm
(ALL DIMENSIONS ARE IN mm)

| | |
|------------------------------|---------------------|
| CUSTOMER CODE: TCR/DVC/WS/01 | MAKE: AEROSPACE |
| SR.NO.: 0505191391 | LAB. I.D.: 42405/01 |

RESULTS:

| Sr. No. | REFERENCE STD. READINGS IN mm | OBSERVED AVG. READINGS | |
|---------|-------------------------------|----------------------------------|----------------------------------|
| | | EXTERNAL MEASUREMENT ERROR IN µm | INTERNAL MEASUREMENT ERROR IN µm |
| 1. | SET '00.00' | 00 | 00 |
| 2. | 20.00 | 00 | -10 |
| 3. | 50.00 | -10 | 00 |
| 4. | 100.00 | -10 | +10 |
| 5. | 150.00 | -20 | +10 |
| 6. | 200.00 | -20 | +10 |

THE ABOVE READINGS ARE THE AVERAGE OF 3 READINGS TAKEN

-----X-----


M. TINGRE
Calibrated by




A. PATIL

Technical Manager, Dimension Lab

Note : This certificate is issued subject to conditions stated overleaf

Photo evidence to point no :5 of the report



L&T-STECH JV MUMBAI
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SIZE MASTERS CALIBRATION SERVICES

Final Plot No. 123, Lane No. 10, Ramtekdi Industrial Estate, Hadapsar,
Pune - 411 013. (INDIA) Tel. : +91 9890644445, 8237644445
E-mail : kiranzanwar@yahoo.com / smcscalibration@gmail.com



NABL ACCREDITATION
CERTIFICATE NO. CC - 2460

CERTIFICATE OF CALIBRATION

| | | | |
|--|---|---|-------------------------------|
| CALIBRATION CERTIFICATE OF: MEASURING SCALE | DATE: 20/10/2020 | CERTIFICATE NO.: 2020/42546/14 | PAGE 1 OF 1 |
| DATE OF CALIBRATION: 19/10/2020 | NEXT DATE OF CALIBRATION: 18/10/2021 (As per customer requirement) | ULR: CC246020600003283 F | DISCIPLINE: MECHANICAL |
| CUSTOMER'S REF. D.C.NO.: 2920 DATED: 16/10/2020 | DATE OF RECEIPT: 17/10/2020 CONDITION OF ITEM: SATISFACTORY | GROUP: DIMENSION (BASIC- MEASURING INSTRUMENT, GAUGES ETC.) | |

CUSTOMER: TCR ENGINEERING SERVICES PVT. LTD.
EL-182 TTC INDL AREA ELECTRONIC ZONE MIDC MAHAPE, NAVI MUMBAI-400710.

CALIBRATION PROCEDURE: LAB PROCEDURE WI 45.

REF. DOCUMENT USED: IS 1481.

EQUIPMENT USED FOR CALIBRATION & IT'S TRACEABILITY:

- a) Tape & Scale Measuring Machine: (Make: Octagon, Sr.No. 054, Range: 0-1000 mm, L.C.: 0.001 mm, I.d. No.: E-9-1) having Traceability by NABL Lab NO. CC-2460 via. CER. NO.2020/40430/01 cal. On 21/05/2020 & valid upto 21/05/2021.

UNCERTAINTY OF MEASUREMENT: ±75.0 µm.

The uncertainty stated is the Expanded uncertainty of Measurement obtained by Multiplying the standard uncertainty by coverage factor K=2 corresponds to confidence level of 95.45%

ENVIRONMENTAL CONDITION: 20 ± 1°C

MEASURING SCALE RANGE: 0-1000 mm, L.C.: 0.5 mm

(ALL DIMENSIONS ARE IN mm)

| | |
|---------------------------------------|---------------------------|
| CUSTOMER CODE: TCR/MEC/MS/1000 | MAKE: TECHNIKA |
| SR. NO.: --- | LAB I.D.: 42546/14 |

RESULTS:

| Sr. No. | REFERENCE STD. READINGS IN mm | OBSERVED AVG. ERROR IN mm |
|---------|-------------------------------|---------------------------|
| 1. | SET '00.00' | 0.0 |
| 2. | 100.00 | +0.167 |
| 3. | 200.00 | +0.149 |
| 4. | 300.00 | +0.082 |
| 5. | 500.00 | +0.071 |
| 6. | 600.00 | +0.028 |
| 8. | 800.00 | -0.053 |
| 9. | 1000.00 | -0.115 |

THE ABOVE READINGS ARE THE AVERAGE OF 3 READINGS TAKEN

-----X-----

P. GHOLE
Calibrated by



A. PATIL
Technical Manager, Dimension Lab

Note : This certificate is valid only for the purpose mentioned above.

Photo evidence to point no :5 of the report



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TCR ENGINEERING SERVICES PVT LTD

LAB: VKB House EL-182, TTC Industrial Area, MIDC, Electronic Zone, Mahape, Navi Mumbai 400 710.
Phone: 022- 67380900 Fax: 022 2761 2044 Email:sales@tcrcng.com

TCR/FRM-37

RECORDS OF CRM VERIFICATIONS

| Date | Calibration/Standardization done (Yes/No) | Standard checked and found within acceptable %MU (Yes/No) | Standard/CRM | Element/Parameter | Assigned value | Observed value | Analysed by Sign |
|----------|---|---|--------------|-------------------|----------------|----------------|------------------|
| 17.03.21 | Yes | Yes | MPA 486200 | C | 0.208 | 0.21 | Satisfactory |
| | | | | S | 0.025 | 0.024 | |
| | | | | P | 0.015 | 0.014 | |
| | | | | Mn | 0.866 | 0.87 | |
| | | | | Si | 0.301 | 0.31 | |
| | | | | Cr | 0.573 | 0.58 | |
| | | | | Ni | 0.523 | 0.52 | |
| | | | | Mo | 0.231 | 0.21 | |
| | | | | Cu | 0.026 | 0.026 | |
| | | | | V | 0.004 | 0.004 | |
| | | | | Al | 0.021 | 0.023 | |
| | Yes | Yes | BAS 4667 | C | 0.014 | 0.014 | |
| | | | | S | 0.007 | 0.010 | |
| | | | | P | 0.016 | 0.010 | |
| | | | | Mn | 1.31 | 1.33 | |
| | | | | Si | 0.48 | 0.47 | |
| | | | | Cr | 17.84 | 17.80 | |
| | | | | Ni | 10.20 | 10.26 | |
| | | | | Mo | 2.77 | 2.75 | |
| | | | | Cu | 0.028 | 0.024 | |
| | | | | V | 0.035 | 0.033 | |
| | | | | N | 0.051 | 0.053 | |
| | Yes | Yes | BS 8001 B | C | 0.10 | 0.10 | |
| | | | | Mn | 0.95 | 0.94 | |
| | | | | Si | 0.16 | 0.15 | |
| | | | | Cr | 20.40 | 20.50 | |
| | | | | Ni | 81.30 | 81.35 | |
| | | | | Mo | 0.51 | 0.52 | |
| | | | | Al | 0.47 | 0.49 | |
| | | | | Ti | 0.53 | 0.55 | |
| | | | | Co | 1.09 | 1.10 | |

Prepared By *[Signature]*

Approved By *[Signature]*

Name of CAB: TCR ENGINEERING SERVICES PVT. LTD. Navi Mumbai
 Document No.: TCR/FRM-37 Document Name: RECORD OF CRM VERIFICATIONS
 Issue No.: 9 Issue Date: ---
 Prepared by: Asso. QA *[Signature]* Photo evidence to point no :9 of the report 1 of 1



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ISO/IEC 17025 : 2017
Accredited Testing Laboratory by
NABL
Valid Certificate No. TC - 6808

TCR Engineering Services Pvt. Ltd.
YK33 House, EL-182 MIDC-TTC
Electronic Zone, Mahape
Navi Mumbai - 400 710, India
T: +91-9022137295 | W: www.tcrang.com

TEST REPORT

ULR - TC690521000006381F

Page 1 of 1

T.C. No. : CC1665

Date: 17-03-2021

Issued To. : M/s L&T STECC JV MUMBAI
MMRCL, UGC-01, Project-MIDC Ground, Near Back Bay Bus Depot
Colaba, Mumbai-400005

Party Ref. : LT-STECC-JV/QC/UGC01/L-1152 (RFI No- SHC/040) **Condition of Sample** : Test Piece

Ref. Date : 12-03-2021

Description of Sample : Coupler with TMT Steel Bars, Coupler Grade: EN 8D.

Specification : IS 1786:2008 (Ra 2018) Grade Fe 500D / IS 16172:2014 **Sample Received on** : 13-03-2021

Sample Drawn By : Party **Date of Completion** : 17-03-2021

Enclosure : Graph

Test : STATIC TENSILE

Manufacturer : Steel Era Pvt Ltd
Sample Code : Sample No-01: 25mm Coupler/SHC/UGC-01
Batch No : SPL250330620H
Size : 25mm

I. Mechanical Testing

1. Mechanical Properties of Metals

STATIC TENSILE TEST

Test Method : IS 16172 : 2014

Equipment : ZD 100/D-1000KN

| | | Requirement |
|---|---|-------------|
| Nominal Cross-sectional area (mm ²) | 491.1 | |
| Overall Gauge length (mm) | 250.00 | |
| Gauge length at maximum force (mm) | 262.00 | |
| Ultimate tensile load (N) | 337170 | |
| U.T.S (N/mm ²) | 686.56 | 565 min. |
| Total elongation at maximum force (%) | 4.80 | 3.00 min. |
| Distance of fracture from centre of coupler | 220.80 | |
| Location of failure | Outside the length of the mechanical splice | |
| Result | Satisfactory | |

Remark: The above result(s) meets the specified requirements of IS 1786:2008 (Ra 2018) Grade Fe 500D / IS 16172:2014 with respect to test(s) carried out.

Test Witnessed By : 1) Mr.Shariq of Maple 2) Mr.sampath Kumar of L&T 3) Mr.Saravana Kumar of L&T on 16-MAR-21

Sr/-

CHECKED BY

Checked By

*****END OF REPORT*****

Reviewed & Authorised By
Mukesh Kumar
Metallurgist

TCR Engineering Services, India: Redefining On-Time Quality since 1973
A NABL/ISO 17025 : 2017 and BIS accredited Material Testing, Metallurgical Evaluation, Corrosion Testing, NDT/Inspection, Civil Audit, Engineering Consulting & Research Laboratory.

- The results that are reported in this Test Report only relate to the sample(s) provided and tested.
- This Test Report cannot be used as evidence for any other purpose than to fulfill the contract and/or regulatory obligations.
- TCR always strives to provide financial/legal liability arising.

TCR/20/0101

Photo evidence to point no :10 of the report





L&T-STEEL JV MUMBAI
Mumbai Metro Line 3
Pkg. No : UGC 01

AUDIT SUMMARY REPORT

Doc No : LTS/QAS/P01/R/105

Contract No: MM3-CBS-UGC-01



ISO/IEC 17025 : 2017
Accredited Testing Laboratory by
NABL
NABL Certificate No. TC - 6508

TCR Engineering Services Pvt. Ltd.
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Navi Mumbai - 400 710, India
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TEST REPORT

ULR - TC690521000006382F

Page 1 of 1

T.C. No. : CC1666
Issued To. : M/s L&T STEEL JV MUMBAI
MMRCL, UGC-01, Project-MIDC Ground, Near Back Bay Bus Depot
Colaba, Mumbai-400005

Date: 17-03-2021

| | | | |
|-----------------------|--|---------------------|--------------|
| Party Ref. | : LT-STEEL-JV/QC/UGC01/L-1152 (RFI No-SHC/040) | Condition of Sample | : Test Piece |
| Ref. Date | : 12-03-2021 | | |
| Description of Sample | : TMT Steel Bar | | |
| Specification | : IS 1786 : 2008 (Re 2018) Grade Fe 500D | Sample Received on | : 13-03-2021 |
| Sample Drawn By | : Party | Date of Completion | : 17-03-2021 |
| | | Enclosure | : Graph |
| Test | : TENSILE | | |
| Manufacturer | : JSW Steel | | |
| Sample Code | : Sample No-01.1: 25mm Un-spliced specimen | | |
| Batch No | : 21200151 | | |
| Size | : 25mm | | |

I. Mechanical Testing

1. Mechanical Properties of Metals

TENSILE TEST

Test Method : IS 1608 Part 1:2018

Equipment : ZD 100/D-100007N

| | |
|--|--------|
| Weight of specimen (gm) | 2712 |
| Length of specimen (mm) | 705.00 |
| Sectional weight (kg/m) | 3.8468 |
| Cross-sectional area (mm ²) | 490.04 |
| Original gauge length (mm) | 250.00 |
| Gauge length at maximum force (mm) | 270.00 |
| 0.2% Proof load (N) | 282414 |
| 0.2% Proof strength (N/mm ²) | 576.31 |
| Ultimate tensile load (N) | 338430 |
| U.T.S (N/mm ²) | 690.62 |
| Final gauge length (mm) | 281.60 |
| TS/YS ratio (N/mm ²) | 1.20 |
| Elongation (%) | 12.64 |
| Total elongation at maximum force (%) | 8.00 |
| Fracture | W.G.L |

Test Witnessed By : 1) Mr.Shariq of Maple 2) Mr.sampath Kumar of L&T 3) Mr.Saravana Kumar of L&T on 16-MAR-21

CHECKED BY

Checked By

*****END OF REPORT*****

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Metallurgist

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- TCR always strives to provide accurate and reliable test results. However, TCR does not accept any financial/legal liability arising out of any test results.

Photo evidence to point no :10 of the report



TCR/MS/1599



L&T-STECC JV MUMBAI
 Mumbai Metro Line 3
 Pkg. No : UGC 01

AUDIT SUMMARY REPORT

Doc No : LTS/QAS/P01/R/105

Contract No: MM3-CBS-UGC-01



PROJECT: Mumbai Metro Line 3 (UGC-01)
 CLIENT: Mumbai Metro Rail Corporation
 ENGINEER: MAPLE Consortium
 CONTRACTOR: L&T - STECC JV MUMBAI (LTS)



ATTENDANCE RECORD

Ref: LTS/QAS/P01/F14

Subject: *Joint Sub-Contractor Audit - H/L TCR Engineering*
 Contents covered in brief: *As mentioned in audit scope*
 Name: *Mr. Sampath*
 Date: *15-03-24*

Staffs / Workmen Attended

| S.No | Name | *ID No. | Department | Location/ Station of Work | Signature |
|------|----------------------------|----------------|-------------------|---------------------------------|--------------------|
| 1 | <i>GANESH A. SAMANTH</i> | | <i>Quality</i> | <i>TCR</i> | <i>[Signature]</i> |
| 2 | <i>Prabhakar Singh</i> | | <i>H&O R</i> | <i>TCR</i> | <i>[Signature]</i> |
| 3 | <i>Mohd Reham</i> | | <i>Mechanical</i> | <i>TCR</i> | <i>[Signature]</i> |
| 4 | <i>SAMPATH KUMAR VERMA</i> | <i>2010120</i> | <i>QA/QC</i> | <i>Project office - L&T</i> | <i>V. Sampath</i> |
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* Compulsory For Staff

Name & sign of coordinator:

V. Sampath
[Signature]