

From

Date: 02-02-2022.

P Venkata Sridhar,
Contractor,
Vizianagaram,

TO

The Head of Civil Engineering Department,
Satya Institute of Technology and Management,
Vizianagaram.
Vizianagaram District.

Sir,

Sub: - Requesting Soil Test reports (Grain Size analysis, Atterberg Limits, OMC & MDD, CBR)
– Reg.

With reference to above subject, it is informed that the soil test reports are required for Construction of pavement- NH26 to Kothuru via Badukondapeta, Kotha Kapupeta, Koradapeta, Gundalapeta.

In this connection, I here with request you to collect the soil samples and communicate the result values. Necessary charges will be paid after hearing from you.

Thanking you,



Yours faithfully,

P Venkata Sridhar,
Contractor,
Vizianagaram.

From

Date: 02-02-2022.

P Venkata Sridhar,
Contractor,
Vizianagaram,

TO

The Head of Civil Engineering Department,
Satya Institute of Technology and Management,
Vizianagaram.
Vizianagaram District.

Sir,

Sub: - Requesting Mix Design and Testing of concrete (M15 & M30) results – Reg

With reference to above subject, it is informed that the concrete mix design (M15 & M30) and strength values are required for Construction of pavement- NH26 to Kothuru via Badukondapeta, Kotha Kapupeta, Koradapeta, Gundalapeta.

In this connection, I here with sending Cement OPC 43 grade 50kg bag to test and communicate the result values. Necessary charges will be paid after hearing from you.

Thanking you,



Yours faithfully,

P Venkata Sridhar,
Contractor,
Vizianagaram.



SITAM



EAMCET CODE: SGVP

SATYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT
ACCREDITED BY NAAC, APPROVED BY AICTE, NEW DELHI,
(PERMANENTLY AFFILIATED TO JNTUK, RECOGNISED BY SBTET, GOVERNMENT OF A.P.)

JNTUK CODE: B6

Vizianagaram,
Date:02-02-2022

To
P. Venkata Sridhar,
Contractor,
Vizianagaram District.

Sub: Acceptance for Soil Test reports (Grain Size analysis, Atterberg Limits, OMC & MDD, CBR) results for Construction of pavement- NH26 to Kothuru via Badukondapeta, KothaKapupeta, Koradapeta, Gundalapeta. and bill details.

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Respected sir/madam,

With the reference to the request letter regarding Soil Test reports (Grain Size analysis, Atterberg Limits, OMC & MDD, CBR) results and certification, we hereby let you know that we have accepted the consultancy work given by you.

We would like to begin the work as soon as possible and certify the test results accordingly in a stipulated time, and our charges include testing + 18% GST, transportation and other miscellaneous charges.

Thanking you sir,

Yours Faithfully,

HOD,

Civil Engineering Department,
SITAM, Vizianagaram.



SITAM



EAMCET CODE: SGVP

SATYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT
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JNTUK CODE: B6

Vizianagaram,
Date: 28-02-2022

To
P Venkata Sridhar,
Contractor,
Vizianagaram District.

Sub: Acceptance for Mix Design and Testing of concrete (M15 & M30) results for
Construction of pavement- NH26 to Kothuru via Badukondapeta, Kotha
Kapupeta, Koradapeta, Gundalapeta. and bill details.

---0---

Respected sir/madam,

With the reference to the request letter regarding Mix Design and Testing of concrete (M15 & M30) results and certification, we hereby let you know that we have accepted the consultancy work given by you.

We would like to begin the work as soon as possible and certify the test results accordingly in a stipulated time, and our charges include testing + 18% GST, transportation and other miscellaneous charges.

Thanking you sir,

Yours Faithfully,


28/02/2022
NOD,
Civil Engineering Department,
SITAM, Vizianagaram.


20/02/2022

NEAR RTO OFFICE, GAJULAREGA, VIZIANAGARAM - 535003, ANDHRA PRADESH, INDIA

☎ 96767 88811/55, 08922-234775/9

f /Sitam.Sgvp

@ /sitamvzm

✉ sitam@sitam.co.in, principal@sitam.co.in

🌐 www.sitam.co.in



Satya Institute of Technology And Management



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Approved by AICTE, New Delhi and Govt. of A.P.
Affiliated to JNTUK, KAKINADA.

FAMCET Code: SGVP

JNTUK Code: BG

NAME OF THE INSTITUTE : SATYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, VZM
 NAME OF THE TEST : SIDE EARTH SAMPLES of Soil
 NAME OF THE CLIENT : Assistant Executive Engineer,
 PIU (P R), Bhogapuram.
 NAME OF THE WORK : "NH 26 to Kothuru via Badukondapeta, Kotha Kapupeta,
 Koradapeta, Gundalapeta" sanctioned under PMGSY III.
 CLIENT REF NO. : Lr.No. Dt.09.04.2022
 REFERENCE NO : CE/GTE LAB/Soil/Side Earth /04
 DATE OF SAMPLE RECEIVED : 09/04/2022
 DATE OF TESTING : 09/04/2022 onwards

CERTIFICATE

This is to certify that the following test has been conducted on the test samples supplied by the client.

| | TEST RESULTS | | | | |
|--------------------------------------|--------------|----------|----------|----------|----------|
| | 0/720km | 1/650 km | 2/080km | 3/870km | 4/850km |
| 01. Grain Size Analysis | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 |
| a) Gravel : | 03 % | 04% | 05% | 06% | 08% |
| b) Sand : | 60 % | 58% | 55% | 60% | 57% |
| c) Fines : | 37 % | 38% | 40% | 34% | 35% |
| 02. Type of soil | SC | SC | SC | SC | SC |
| 03. Atterberg limits | | | | | |
| i. Liquid limit | 36% | 35% | 34% | 38% | 36% |
| ii. Plastic limit | 23 % | 24% | 22% | 23% | 22% |
| iii. Plasticity Index | 13 | 11 | 12 | 15 | 14 |
| 04. Optimum Moisture Content (%) | 15.1 | 15.5 | 15.0 | 14.8 | 14.5 |
| 05. Maximum dry density (gm/cc) | 1.65 | 1.68 | 1.69 | 1.66 | 1.67 |
| 06. 96 Hours soaked C.B.R. Value (%) | 4.30 | 4.25 | 4.35 | 4.15 | 4.10 |

TEST REFERENCE CODE: SP 36- Part I, IRC: SP:77-2008

Note: Test results are related to the samples tested only.

B.H.S. in PL
 TESTING-IN-CHARGE

[Signature]
 HEAD OF SECTION

[Signature]
 PRINCIPAL

Head of the Department
 Dept of Civil Engineering
 Satya Institute of Technology and Management

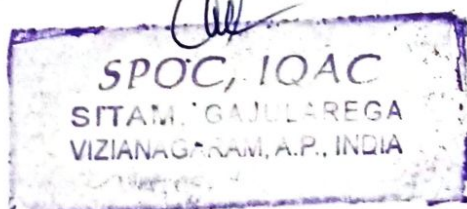
Dr. D.V.Rama Murthy
 Principal
 SATYA INSTITUTE OF
 TECHNOLOGY AND MANAGEMENT
 Vizianagaram



Gajularega, Kondakarakam (PO), Vizianagaram - 535003, A.P., India.

Contact : 9676788811 / 55, 08922 - 234775 / 9

e-mail: sitam@sitam.co.in, principal@sitam.co.in, Facebook: sitam.sgvp, website : www.sitam.co.in



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Affiliated to JNTUK, KAKINADA.

LAMCEET Code: SGVP

JNTUK Code: B6

NAME OF THE INSTITUTE : SATYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, VZM
NAME OF THE TEST : SIDE EARTH SAMPLES of Soil
NAME OF THE CLIENT : Assistant Executive Engineer,
PIU (P R), Bhogapuram.
NAME OF THE WORK : "NH 26 to Kothuru via Badukondapeta, Kotha Kapupeta,
Koradapeta, Gundalapeta" sanctioned under PMGSY III.
CLIENT REF NO. : Lr.No. Dt.09.04.2022
REFERENCE NO : CE/GTE LAB/Soil/Side Earth /04
DATE OF SAMPLE RECEIVED: 09/04/2022
DATE OF TESTING : 09/04/2022 onwards

CERTIFICATE

This is to certify that the following test has been conducted on the test samples supplied by the client.

TEST RESULTS

| | 5/450km Sample 6 | 6/780 km Sample 7 | 7/350km Sample 8 | 8/690km Sample 9 |
|--|---------------------|----------------------|---------------------|---------------------|
| 01. Grain Size Analysis | | | | |
| a) Gravel | 07 % | 05% | 08% | 06% |
| b) Sand | 58 % | 58% | 56% | 56% |
| c) Fines | 35 % | 37% | 36% | 38% |
| 02. Type of soil | SC | SC | SC | SC |
| 03. Atterberg limits | | | | |
| i. Liquid limit | 35% | 34% | 37% | 36% |
| ii. Plastic limit | 23 % | 21% | 23% | 22% |
| iii. Plasticity Index | 12 | 13 | 14 | 14 |
| 04. Optimum Moisture Content (%) | 15.0 | 15.6 | 14.5 | 14.8 |
| 05. Maximum dry density (gm/cc) | 1.67 | 1.65 | 1.69 | 1.70 |
| 06. 96 Hours soaked C.B.R. Value (%) : | 4.20 | 4.35 | 4.40 | 4.10 |

TEST REFERENCE CODE: SP 36- Part I, IRC: SP:77-2008

Note: Test results are related to the samples tested only.

B.H.S. Reddy
Testing-in-charge

Dr. D.V. Rama Murthy
Head of Section

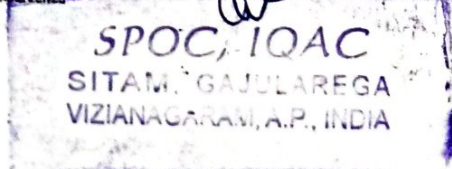
Dr. D.V. Rama Murthy
Principal

Gajularega, Kondakarakam (P.O), Vizianagaram - 535003, A.P., India.

Contact : 9676788811 / 55, 08922 - 234775 / 9

e-mail : sitam@sitam.co.in, principal@sitam.co.in, Facebook: sitam.sgvp.

Dr. D.V. Rama Murthy
Principal
SATYA INSTITUTE OF
TECHNOLOGY AND MANAGEMENT
website : www.sitamecharam.com





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EAMCET Code: SGVP



NAME OF THE INSTITUTE : SATYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, VZM
 NAME OF THE TEST : Mix Design for Wet Mix Macadam (WMM)
 NAME OF THE CLIENT : Assistant Executive Engineer,
 PIU (P R), Bhogapuram.
 NAME OF THE WORK : "NH 26 to Kothuru via Badukondapeta, Kotha Kapupeta,
 Koradapeta, Gundalapeta" sanctioned under PMGSY III.
 CLIENT REF NO. : Lr.No. Dt.09.04.2022
 REFERENCE NO : CE/GTE LAB/Soil/05
 DATE OF SAMPLE RECEIVED: 09/04/2022
 DATE OF TESTING : 09/04/2022 onwards

CERTIFICATE

Sieve Analysis is conducted on the supplied samples of aggregate and after several trails the following gradation is suggested for the aggregate mixture obtained by mixing 30% of 45-22.4mm (Average of 40-45mm, 25-27mm & 19-22mm metal), 40% of 22.4mm to 2.36 mm (Average of 19-22mm, 12-14mm, 9.5-11.20mm, 5-7mm & 2.36-5 mm), 30 % of 2.36 mm to 75 micron below Fine aggregate/crushed sand.

Description of Test : GRADATION, WMM (Wet Mix Macadam)

| S.No | IS Sieve Designation | Suggested Gradation | As per MORD Table 400.11 & |
|------|----------------------|---------------------|----------------------------|
| | | % Finer | 400.12 & Clause 406 |
| 1 | 53.00 mm | 100 | 100 |
| 2 | 45.00 mm | 97 % | 95 - 100 |
| 3 | 26.50 mm | - | - |
| 4 | 22.40 mm | 64 % | 60 - 80 |
| 5 | 11.20 mm | 51 % | 40 - 60 |
| 6 | 4.75 mm | 30 % | 25 - 40 |
| 7 | 2.36 mm | 24 % | 15 - 30 |
| 8 | 600 microns | 14 % | 8 - 22 |
| 9 | 75 microns | 02 % | 0 - 8 |

02. Physical Properties of Aggregates:

| | | |
|---|---|------|
| 01. Aggregate Impact Value (%) | : | 21 |
| 02. Combined Flakiness and Elongation Index (Total %) | : | 19 |
| a. Optimum Moisture Content (%) OMC | : | 5.05 |
| b. Maximum Dry Density in (gm / cc) MDD | : | 2.85 |

Test Reference : IS 2386(Part-IV), IS 2386 (Part- I), IS 2386 (part - III), IS 2720 (Part-V)

NOTE : Tests are conducted on samples brought to the Laboratory by the party.

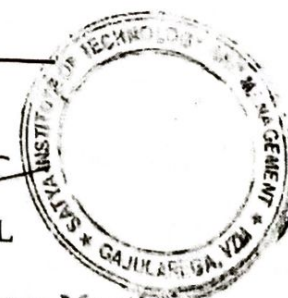
B.H.S. e
TESTING IN CHARGE

HEAD OF SECTION

Head of the Department
Dept of Civil Engineering
Satya Institute of Technology and Management
Vizianagaram 535001

PRINCIPAL

Dr. D.V.Rama Murthy
Principal
SATYA INSTITUTE OF
TECHNOLOGY AND MANAGEMENT
Vizianagaram



Gajularega, Kondakarakam (P.O), Vizianagaram - 535003, A.P., India.

Contact : 9676788811 / 55, 08922 - 234775 / 9

e-mail : sitam@sitam.co.in, principal@sitam.co.in, Facebook: sitam.sgvp, website : www.sitam.co.in





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EAMCET Code: SGVP

NAME OF THE INSTITUTE : SATYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, VZM
NAME OF THE TEST : OMC, MDD, Gradation of **Selected Earth**
NAME OF THE CLIENT : Assistant Executive Engineer,
PIU (P R), Bhogapuram.
NAME OF THE WORK : "NH 26 to Kothuru via Badukondapeta, Kotha Kapupeta,
Koradapeta, Gundalapeta" sanctioned under PMGSY III.
CLIENT REF NO. : Lr.No. Dt.09.04.2022
REFERENCE NO : CE/GTE LAB/Soil/Selected Earth /03
DATE OF SAMPLE RECEIVED: 09/04/2022
DATE OF TESTING : 09/04/2022 onwards

CERTIFICATE

This is to certify that the following test has been conducted on the test samples supplied by the client.

TEST RESULTS

Sample

Selected Earth for Shoulders

1. Grading Analysis :

| | | |
|-----------|---|-----|
| a) Gravel | : | 62% |
| b) Sand | : | 34% |
| c) Fines | : | 04% |

2. Atterberg limits :

| | | |
|---------------------|---|-----|
| a. Liquid limit | : | 25% |
| b. Plastic limit | : | 20% |
| c. Plasticity Index | : | 05 |

3. Optimum Moisture Content (%) : 8.20

4. Maximum dry density (MDD) gm/cc : 1.88

5. Soaked CBR Value : 12.0

Test Reference : SP - 36 (Part -I), IS: 2720, IS: 1498

TESTING IN CHARGE

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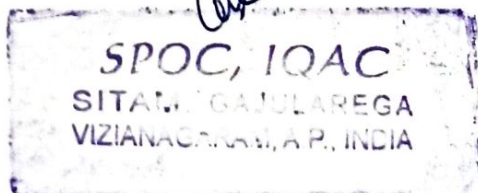
PRINCIPAL



Gajularega, Kondakararam (P.O), Vizianagaram - 535003, A.P., India. Principal

Contact : 9676788811 / 9506822 - 234775 / 9

e-mail : sitam@sitam.co.in. principal@sitam.co.in. Facebook: sitam.sgvp. website : www.sitam.co.in





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Affiliated to JNTUK, KAKINADA.

EAMCET Code: SGVP

JNTUK Code: B6

NAME OF THE INSTITUTE : SATYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, VZM
NAME OF THE TEST : Design Mix for Granular Sub Base Grading III
NAME OF THE CLIENT : Assistant Executive Engineer,
PIU (P R), Bhogapuram.
NAME OF THE WORK : "NH 26 to Kothuru via Badukondapeta, Kotha Kapupeta,
Koradapeta, Gundalapeta" sanctioned under PMGSY III.
CLIENT REF NO. : Lr.No. Dt.09.04.2022
REFERENCE NO : CE/GTE LAB/Soil/GSB/02
DATE OF SAMPLE RECEIVED : 09/04/2022
DATE OF TESTING : 09/04/2022 onwards

TEST RESULTS

Sieve Analysis is conducted on the supplied samples of aggregate Well graded/ Close Graded granular Sub-base material as per Table 400.10 of MORD and after several trails the following gradation is suggested for the aggregate mixture obtained by mixing 66 % of 9.5 to 4.75mm, 34 % of 2.36 mm and below (stone dust).

01. Sieve Analysis

| S.No | IS Sieve Designation | Suggested Gradation % Finer | % Finer as per MORD Table 400.1, Grading - III (HBG M/C + Stone Dust) |
|------|----------------------|-----------------------------|--|
| 1 | 26.5 mm | 100 | 100 |
| 2 | 4.75 mm | 38 | 25 - 45 |
| 3 | 0.075 mm | 01 | <10 |

02. Physical Properties of Aggregates

01. Consistency limits (LL, PL & IP) : Non Plastic
02. I.S. Compaction
a. Optimum Moisture Content (%) : 5.15
b. Maximum Dry Density in (gm / cc) : 2.12
03. CBR. Value (Soaked) : 23.6

Test Reference : IS 2386(Part -IV), IS 2386 (Part- I), IS 2386 (part - III), IS 2720 (Part-V)

NOTE: Tests are conducted on samples brought to the Laboratory by the party

TESTING IN CHARGE

HEAD OF SECTION

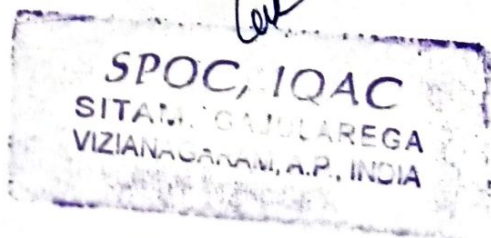
Dr. D. V. RAMAMURTHY
Principal
Satya Institute of Technology and Management
Vizianagaram



Gajularega, Kondakarakam (PO), Vizianagaram - 535003, A.P., India.

Contact : 9676788811 / 55, 08922 - 234775 / 9

e-mail : sitam@sitam.co.in, principal@sitam.co.in, Facebook: sitam.sgvp, website : www.sitam.co.in





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Affiliated to JNTUK, KAKINADA.

EAMCET Code: SGVP



JNTUK Code: B6

NAME OF THE INSTITUTE : SATYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, VIZIANAGARM
 NAME OF THE TEST : Tests on Mix Design M-30
 NAME OF THE CLIENT : Assistant Executive Engineer,
 PIU (P R), Bhogapuram.
 NAME OF THE WORK : "NH 26 to Kothuru via Badukondapeta, KothaKapupeta,
 Koradapeta, Gundalapeta" sanctioned under PMGSY III.
 CLIENT REF NO. : Lr.No. Dt.09.04.2022
 POLY. REFERENCE NO : HCES/SM LAB/MIX Design/74
 DATE OF SAMPLE RECEIVED : 09/04/2022
 DATE OF TESTING : 09/04/2022 onwards

CERTIFICATE

This is to certify that the following tests has been conducted on the test Samples supplied by the client. This report includes the test results of the materials used in the concrete mix design supplied namely **Cement (OPC 43 grade), River sand, Coarse aggregate 20mm & 10mm** and the recommended mix proportion. The mix proportion was designed according to IS:10262-2019 and IS: 456-2000. Cubes with proportions detailed below cast to determine the compressive strength at the age of 7 days and 28 days.

DESIGN MIX for CONCRETE (M30)

DESIGN STIPULATIONS:

1. Characteristic Compressive strength (28 days) : $f_{ck} = 30 \text{ N/mm}^2$
2. Maximum size of coarse aggregate : 20 mm
3. Degree of Workability : 25-50 mm
4. Degree of Quality Control : Good
5. Type of exposure : Moderate to severe
6. Quality of Cement : OPC 43grade
7. Maximum water cement Ratio : As per Table 5 of IS: 456-2000
8. Maximum water Content : 186 Lit (Table 4 of IS: 10262-2019)
9. Minimum Cement Content : As per Table 5 of IS: 456-2000

TESTING INCHARGE

HEAD OF SECTION
 Dept of Civil Engineering

Dr.D.V. RAMMURTHY
 Principal

Satya Institute Technology and Management
 Vizianagaram



Gajularega, Kondakarakam (P.O), Vizianagaram - 535003, A.P., India.

Contact : 9676788811 / 55, 08922 - 234775 / 9

E-mail : sitam@sitam.co.in, principal@sitam.co.in, Facebook: sitam.sgvp, website : www.sitam.co.in

SPOC, NAAC
 SITAM, GAJULAREGA
 VIZIANAGARAM, A.P., INDIA



DESIGN PROCEDURE:

Target mean strength, $f_{ck} : f_{ck} + 1.65 S$ $30 + 1.65 * 5$ 38.25 N/mm^2
Or (Higher value) 38.25 N/mm^2
 $f_{ck} : f_{ck} + X$ $30 + 6.5$ 36.50 N/mm^2

M 30 GRADE CONCRETE

Selected Water-Cement ratio : 0.42 (<0.45 HENCE OK)
Selected Water Content : 172 lits (<186 lits, Hence ,OK)
Selected Cement Content : 350 Kg/m³ (>320Kg/m³, Hence OK)
Total Volume : 1m³
Volume of entrapped air : 1.0%=0.01 (Table 2 of IS : 10262-2019)
Volume of Cement : $350 / (3.15 * 1000) = 0.130 \text{ m}^3$
Volume of water : $172 / 1000 = 0.172 \text{ m}^3$
Volume of all in aggregate : $(1 - 0.01 - 0.130 - 0.172) = 0.690 \text{ m}^3$
Volume of Coarse aggregate : $0.654 + 0.016 = 0.656 \text{ m}^3$ (Table 5 IS:10262-2019)
Volume of Fine aggregate : $1 - 0.656 = 0.344 \text{ m}^3$
Coarse Aggregate Content : $0.690 \times 0.656 \times 2.77 \times 1000 = 1253 \text{ Kgs/m}^3$
Fine Aggregate Content : $0.690 \times 0.344 \times 2.61 \times 1000 = 620 \text{ Kgs/m}^3$

The following mix proportions according to IS :10262-2019 were proposed using OPC 43 grade , 20mm, 10mm, coarse aggregate for M30 grade Concrete. The Cubes were casted to determine the Compressive strength.

| Cement ,Kgs | Water lit | Sand | C.A | Mix proportions | W/C ratio | Compressive strength | |
|-------------|-----------|------|------|-----------------|-----------|----------------------|--------|
| | | | | | | 7days | 28days |
| 370 | 172 | 668 | 1205 | 1:1.59:2.87 | 0.42 | 32.04 | 39.88 |
| 350 | 172 | 620 | 1253 | 1:1.51:3.06 | 0.42 | 31.11 | 39.01 |

Recommendations:

Trail Mix No2 is recommended:

| | |
|-----------|-----------|
| Cement | 350 Kgs |
| W/C Ratio | 0.42 |
| 20mm | 0.594 Cum |
| 10mm | 0.306 Cum |
| Sand | 0.45Cum |

Note:

1. The above mix proportions are based on the materials supplied by the client.
2. The quality of water to be used for concreting shall confirm to IS :456-2000

P.S.
TESTING IN CHARGE

HEAD OF SECTION
Head of the Department
Dept of Civil Engineering
Institute of Technology and Management
VIZIANAGARAM - 751001



PRINCIPAL

Dr.D.V.RAMAMURTHY
Principal
Salya Institute Technology and Management
Vizianagaram

SPOC, IQAC
SITAM, VIZIANAGARAM
VIZIANAGARAM, A.P., INDIA



Satya Institute of Technology And Management

NAAC ACCREDITED

Approved by AICTE, New Delhi and Govt. of A.P.
Affiliated to JNTUK, KAKINADA.



JNTUK Code: B6

EAMCET Code: SGVP

NAME OF THE INSTITUTE : SATYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, VZM.
NAME OF THE TEST : Tests on Mix Design
NAME OF THE CLIENT : Assistant Executive Engineer,
PIU (P R), Bhogapuram.
NAME OF THE WORK : "NH 26 to Kothuru via Badukondapeta, Kotha Kapupeta,
Koradapeta, Gundalapeta" sanctioned under PMGSY III.
CLIENT REF NO. : Lr.No. Dt.09.04.2022
POLY. REFERENCE NO : CE/CT LAB/MIX Design/02
DATE OF SAMPLE RECEIVED : 09/04/2022
DATE OF TESTING : 09/04/2022 onwards

CERTIFICATE

This is to certify that the following tests has been conducted on the test Samples supplied by the client. This report includes the test results of the materials used in the concrete mix design supplied namely Cement (OPC 43 grade), River sand , Coarse aggregate (40mm , 20mm, 10mm) and the recommended mix proportion. The mix proportion was designed according to IS:10262-2019 and IS: 456-2000. Cubes with proportions detailed below cast to determine the compressive strength at the age of 7 days and 28 days

DESIGN MIX FOR CONCRETE (M15)

DESIGN STIPULATIONS:

1. Characteristic Compressive strength (28 days) : $f_{ck} = 15 \text{ N/mm}^2$
2. Maximum size of coarse aggregate : 40 mm
3. Degree of Workability : 50-75 mm
4. Degree of Quality Control : Good
5. Type of exposure : Moderate to severe
6. Quality of Cement : OPC 43 grade
7. Maximum water cement Ratio : 0.60 (Table 5 of IS: 456-2000)
8. Maximum water Content : 165 Lit (Table 4 of IS: 10262-2019)
9. Minimum Cement Content : 240 Kg/m^3 (Table 5 of IS: 456-2000)



TESTING INCHARGE

HEAD OF SECTION

PRINCIPAL

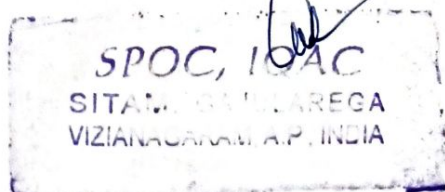


Gajularega, Kondakarakam (P.O), Vizianagaram - 535003, A.P., India.

Contact : 9676700811, 55 08022, 234775 / 9

e-mail : sitam@sitam.co.in, principal@sitam.co.in, Facebook: sitam.sgvp, website: www.sitam.co.in

TEST RESULTS ON COARSE AGGREGATE:



The coarse aggregate sample 10mm size supplied by the client was tested according to IS: 2386-1963 and the results are given in the table below:

| IS sieve size (mm) | % of cumulative Wt. retained | Percentage passing or percentage finer than | Grading Limits | As per |
|--------------------------|------------------------------|---|----------------|----------------------------------|
| 20 | 0 | 100 | 100% | MORTH Table 1000-1 & IS:383-2016 |
| 12.5 | 0 | 100 | 100% | |
| 10 | 35 | 65 | 40-85% | |
| 4.75 | 86 | 14 | 0-20% | |
| 2.36 | 94 | 6 | 0-10% | |
| Aggregate Impact Value | | 18.30% | <30% | IS: SP 23-1982 |
| Aggregate Crushing Value | | 20.50% | <30% | |
| Flakiness Index | | 12.60% | <30% | |
| Elongation Index | | 16.65% | <30% | |
| Specific Gravity | | 2.76 | 2.60 | |
| Water absorption | | 0.27% | -- | |
| Bulk Density | Loose | 1336kg/m ³ | -- | |
| | Compacted | 1471 Kg/m ³ | -- | |

M 15 GRADE CONCRETE

| | |
|-------------------------------|--|
| Selected Water – Cement Ratio | : 0.60 (<0.6, Hence, OK) |
| Selected Water Content | : 165 liters (<186 lits, Hence, OK) |
| Selected Cement Content | : 275 Kg/m ³ (>240 Kg/m ³ , Hence, OK) |
| Total Volume | : 1 m ³ |
| Volume of entrapped air | : 0.8% = 0.008 (Table 2 of IS: 10262-2019) |
| Volume of Cement | : $275 / (3.15 \times 1000) = 0.087 \text{ m}^3$ |
| Volume of Water | : $165 / 1000 = 0.165 \text{ m}^3$ |
| Volume of all in aggregates | : $(1 - 0.008 - 0.087 - 0.165) = 0.74 \text{ m}^3$ |
| Volume of Coarse aggregates | : $0.70 \times 0.74 = 0.518 \text{ m}^3$ (Table 5 of IS: 10262-2019) |
| Volume of fine aggregates | : $0.30 \times 0.74 = 0.222 \text{ m}^3$ |
| Coarse aggregate content | : $0.518 \times 2.78 \times 1000 = 1440 \text{ Kg/m}^3$ |
| Fine Aggregate content | : $0.222 \times 2.63 \times 1000 = 584 \text{ Kg/m}^3$ |

TESTING IN-CHARGE

HEAD OF SECTION

Head of the Department
Dept of Civil Engineering

Satya Institute of Technology and Management
Vizianagaram - 535001

PRINCIPAL

Dr. D.V. RAMAMURTHY
Principal

Satya Institute Technology and Management
Vizianagaram

SPOC, IOAC
SITAT, VIZIANAGARAM
VIZIANAGARAM, A.P. INDIA



The following mix proportions according to IS: 10262-2019 were proposed using OPC 43 grade, 40mm, 20mm, 10mm coarse aggregate for M15 grade Concrete. The cubes were casted to determine the Compressive strength.

| Cement Kgs | Water Lit | Sand | CA | Mix Proportion | W/C ratio | Compressive Strength | |
|---------------|-----------|------|------|-----------------|-----------|-------------------------|---------|
| | | | | | | 7 days | 28 days |
| 295 | 177 | 576 | 1403 | 1 : 1.95 : 4.76 | 0.6 | 16.44 | 23.12 |
| 275 | 165 | 584 | 1440 | 1 : 2.12 : 5.24 | 0.6 | 16.00 | 21.75 |

Recommendations:

Total Mix No. 2 is recommended:

Cement: 275 Kgs
W/C Ratio: 0.60
40mm: 0.480 Cum
20mm: 0.240 Cum
10mm: 0.080 Cum
Sand: 0.480 Cum

Note:

1. The above mix proportions are based on the materials supplied by the client.
2. The quality of water to be used for concreting shall confirm to IS: 456-2000.
3. For in-situ mixing of concrete, the mixing time after adding all the ingredients should be minimum 2 minutes.

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Head of the Department
Dept of Civil Engineering

Saty Institute of Technology and Management
Vizianagaram - 535001

PRINCIPAL

DR.D.V.RAMAMURTHY

Principal

Saty Institute Technology and Management
Vizianagaram

SPOC, IOAC
SITAM, VIZIANAGARAM
VIZIANAGARAM, A.P., INDIA



TEST RESULTS ON CEMENT:

The Cement OPC 43 grade cement supplied by the client was tested as per IS 269-2015 and IS 8112-2013 specifications and the results are given below:

Sample Designation: OPC 43 Grade Cement

| S.No | Test Parameter | | Result | Limit as per IS 8112-2013 |
|------|----------------------|---------|------------|---------------------------|
| 1 | Fineness | -- | 5.00% | <10% |
| 2 | Standard consistency | -- | 30% | -- |
| 3 | Setting Time | Initial | 140min | >30min |
| | | Final | 270min | >600min |
| 4 | Compressive Strength | 3days | 28 Mpa | >23Mpa |
| | | 7days | 37Mpa | >33Mpa |
| | | 28days | 46Mpa | >43mpa |
| 5 | Specific Gravity | | 3.15 | -- |
| 6 | Unit weight | | 1440 Kg/m3 | -- |

Test Results on Fine aggregate: SAND

The fine aggregate sample supplied by the client was tested according to IS: 2386(Part-1)-1963 and results are given in the following table:

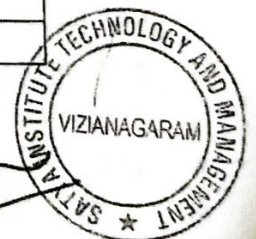
| Sieve Size (mm) | Percentage passing or percentage finer than | Remarks | Limits MoRTH table 1000-2 IS :383-2016 |
|-----------------|---|-----------------------------|--|
| 10.00 | 100 | Zone-III | 100 |
| 4.75 | 100 | Fineness Modulus : 2.27 | 90-100 |
| 2.36 | 91.7 | Specific Gravity : 2.61 | 85-100 |
| 1.18 | 85.3 | Bulking : 8% | 75-100 |
| 0.60 | 66.7 | Loose Density : 14499 Kg/m3 | 60-79 |
| 0.30 | 25.5 | Rodded Density :1551 Kg/m3 | 12-40 |
| 0.15 | 3 | | 0-10 |

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Dany
HEAD OF SECTION
Dept of Civil Engineering
Satya Institute of Technology and Management
Vizianagaram 535001

Dr. D.V. Ramamurthy
PRINCIPAL

Dr.D.V.RAMAMURTHY
Principal
Satya Institute Technology and Management
Vizianagaram



SPOC, IQAC
SITAM, VIZIANAGARAM
VIZIANAGARAM, A.P. INDIA

TEST RESULTS ON COARSE AGGREGATE:

The coarse aggregate sample 20mm size supplied by the client was tested according to IS: 2386-1963 and the results are given in the table below:

| IS sieve size (mm) | % of cumulative Wt. retained | Percentage passing or percentage finer than | Grading Limits | As per |
|--------------------------|------------------------------|---|----------------|----------------------------------|
| 40 | 0 | 100 | 100% | MORTH Table 1000-1 & IS:383-2016 |
| 20 | 3 | 97 | 95-100% | |
| 10 | 60 | 40 | 25-55% | |
| 4.75 | 94 | 6 | 0-10% | |
| Aggregate Impact Value | | 19.10% | <30% | IS: SP 23-1982 |
| Aggregate Crushing Value | | 21.50% | <30% | |
| Flakiness Index | | 12.30% | <30% | |
| Elongation Index | | 15% | <30% | |
| Specific Gravity | | 2.77 | 2.60 | |
| Water absorption | | 0.35% | -- | |
| Bulk Density | Loose | 1346kg/m ³ | -- | |
| | Compacted | 1480 Kg/m ³ | -- | |

The coarse aggregate sample 10mm size supplied by the client was tested according to IS: 2386-1963 and the results are given in the table below:

| IS sieve size (mm) | % of cumulative Wt. retained | Percentage passing or percentage finer than | Grading Limits | As per |
|--------------------------|------------------------------|---|----------------|----------------------------------|
| 20 | 0 | 100 | 100% | MORTH Table 1000-1 & IS:383-2016 |
| 12.5 | 0 | 100 | 100% | |
| 10 | 35 | 65 | 40-85% | |
| 4.75 | 86 | 14 | 0-20% | |
| 2.36 | 94 | 6 | 0-10% | |
| Aggregate Impact Value | | 19.10% | <30% | IS: SP 23-1982 |
| Aggregate Crushing Value | | 21.50% | <30% | |
| Flakiness Index | | 12.30% | <30% | |
| Elongation Index | | 15% | <30% | |
| Specific Gravity | | 2.77 | 2.60 | |
| Water absorption | | 0.35% | -- | |
| Bulk Density | Loose | 1346kg/m ³ | -- | |
| | Compacted | 1480 Kg/m ³ | -- | |

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Dept of Civil Engineering
Satya Institute of Technology and Management
Vizianagaram - 535001

PRINCIPAL

Dr. D.V. RAMAMURTHY
Principal
Satya Institute Technology and Management
Vizianagaram

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VIZIANAGARAM, A.P., INDIA

| Date | Particulars | Vch Type | Vch No. | Debit | Credit |
|------------|--|----------|---------|--------------|--------------|
| | Brought Forward | | | 14,06,183.69 | |
| 27-4-2022 | Cr University Fee UPI/CR/211756097462 | Receipt | | 5,000.00 | |
| | Cr TUITION FEE UPI/CR/211721055679 | Receipt | | 20,400.00 | |
| | Cr Hostel Fee-Exempted UPI/CR/211702147849 | Receipt | | 5,000.00 | |
| | Cr Hostel Fee-Exempted UPI/CR/211791786689 | Receipt | | 10,000.00 | |
| 28-4-2022 | Cr Hostel Fee-Exempted UPI/CR/211801730360 | Receipt | | 5,000.00 | |
| | Cr Hostel Fee-Exempted UPI/CR/211868173154 | Receipt | | 10,000.00 | |
| 29-4-2022 | Cr Hostel Fee-Exempted UPI/CR/211986003413 | Receipt | | 9,000.00 | |
| 3-5-2022 | Cr TUITION FEE UPI/CR/212355170117 | Receipt | | 5,400.00 | |
| ✓ 4-5-2022 | Cr GEENAPATI SAGAR Cheque/DD 4-5-2022 1,00,000.00 Dr UPI/CR/212482649556 | Receipt | | 1,00,000.00 | |
| | Cr TUITION FEE UPI/CR/212416247563 | Receipt | | 20,000.00 | |
| ✓ 5-5-2022 | Cr GEENAPATI SAGAR Cheque/DD 5-5-2022 99,000.00 Dr UPI/CR/212549637541 | Receipt | | 99,000.00 | |
| ✓ | Cr GEENAPATI SAGAR Cheque/DD 5-5-2022 1,000.00 Dr UPI/CR/212564887432 | Receipt | | 1,000.00 | |
| Dr | Closing Balance | | | 16,95,983.69 | |
| | | | | | 16,95,983.69 |
| | | | | 16,95,983.69 | 16,95,983.69 |

[Signature]

SPOC, IQAC
SITA: GANULAREGA
VIZIANAGAR, A.P., INDIA

Principal
Satya Institute of Technology and Management
Vizianagaram