BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
O. A. No. 404 OF 2025

IN THE MATTER OF:

RAM KISHORE YADAV ...APPLICANT

VERSUS

MINISTRY OF ENVIRONMENT,
FORESTS & CLIMATE CHANGE & ORS. ...RESPONDENTS

INDEX FOR VOLUME-III

S.NO	PARTICULARS	PAGES
4.	**ANNEXURE-R1** A copy of the Environmental Impact Assessment (EIA) Report submitted vide Letter dated 21.04.2022.	400 – 582
5.	**ANNEXURE-R2** A copy of the Environmental Clearance (EC) dated 17.08.2022 issued by SEIAA, Haryana.	583 – 594

FILED BY:

D/18495/2018

[KARANJAWALA & CO.]
ADVOCATES FOR RESPONDENT NO. 6
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DEEN DAYAL UPADHYAY MARG,
NEW DELHI-110002
EMAIL: service@karanjawala.in;
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PLACE: NEW DELHI
DATE: 19.12.2025

ANNEXURE-R1(CONTD.)

LIST OF APPLICABLE INDIAN STANDARDS FOR ELECTRIFICATION WORK

S.No.	STANDARDS	TITLE
(1)	IS:732 - 1989	Code of practice for electrical wiring installations.
(2)	IS: 4648 - 1968	Guide for electrical layout in residential buildings.
(3)	IS:8061 - 1976	Code of practice for design, installation and maintenance of service lines upto and including 650V
(4)	IS: 8884 - 1978	Code of practice for installation of electric bells and call system.
(5)	IS: 5578 - 1985	Guide for marking of insulated conductor.
(6)	IS: 11353- 1985	Guide for uniform system of marking and identification of conductors and apparatus terminals.
(7)	IS: 5728 - 1970	Guide for short-circuit calculations.
(8)	IS: 7752(Part-1)-1975	Guide for improvement of power factor in consumer installation: Low and medium supply voltages.
(9)	IS: 3646(Part-1)-1966	Code of practice for interior illumination: Principles for good lighting and aspects of design.
(10)	IS: 3646(Part-2)-1966	Code of practice for interior illumination: Schedule of illumination and glare index.
(11)	IS: 2672 - 1966	Code of practice for library lighting.
(12)	IS:10118(Part-1)-1982	Code of practice for selection, installation and maintenance of switchgear and control gear : General.
(13)	IS: 10118(Part-2)-1982	Code of practice for selection, installation and maintenance of switchgear and control gear.
(14)	IS: 10118(Part-3)-1982	Code of practice for selection, installation and maintenance of switchgear and control gear: Installation.
(15)	IS: 10118(Part-4)-1982	Code of practice for selection, installation and maintenance of switchgear and control gear: Maintenance.

(16)	IS : 2309 - 1989	Code of practice for the protection and allied structures against lightning.
(17)	IS: 3043 - 1987	Code of practice for earthing.
(18)	IS: 5216(Part-1)-1982	Guide for safety procedures and practices in electrical work: General.
(19)	IS:4237 - 1983	General requirements for switchgear and control gear for voltages not exceeding 1000 V AC or 1200 V DC
(20)	IS: 6875(Part-1)-1973	Control switches (switching devices for control and auxiliary circuits including contractor relays) for voltages upto and including 1000 V AC and 1200 DC : General requirements and tests.
(21)	IS:4064(Part-1)-1978	Air break switches, air break dis-connectors, air-break switch disconnectors and fuse-combination units for voltages not exceeding 1000 V AC or 1200 DC : General requirements.
(22)	IS: 8828 - 1978	Miniature air break circuit breakers for voltages not exceeding 1000 volt.
(23)	IS:13032 - 1991	Miniature circuit breaker boards for voltages upto and including 1000 volts AC.
(24)	IS:12640 - 1988	Residua current operated circuit breakers.
(25)	IS:2959 - 1985	Contactors for voltages not exceeding 1000 V AC or 1200 V DC.
(26)	IS:8623(Part-1)-1977	Factory built assemblies of switchgear and control gear for voltages upto and including 1000 V AC and 1200 V DC: General requirements.
(27)	IS:8623(Part-2)-1980	Factory assemblies of switchgear and control gear for voltages upto and including 1000 V AC and 1200 V DC : Particular requirements for busbar trunking system (busways).
(28)	IS:694 - 1990	PVC Insulated cables for working voltages upto and including 1100 V.

(29)	IS:1554(Part-1)-1988	PVC insulated (heavy duty) electric cables :For working voltages upto and including 1100 V.
(30)	IS:3961 (Part-5)-1968	Recommended current ratings for cables: PVC insulated light duty cables.
(31)	IS:9537(Part-1)-1980	Conduits for electrical installations :General requirements.
(32)	IS:9537(Part-2)-1981	Conduits for electrical installations Rigid steel conduits.
(33)	IS:3480 - 1966	Flexible steel conduits for electrical wiring.
(34)	IS:2667 - 1988	Fittings for rigid steel conduits for electrical wiring.
(35)	IS:3837 - 1976	Accessories for rigid steel conduits for electrical wiring.
(36)	IS: 5133(Part-1)-1969	Boxes for enclosure of electrical accessories :Steel and cast iron boxes.
(37)	IS: 371 - 1979	Ceiling roses.
(38)	IS: 3854 - 1988	Switches for domestic and similar purposes.
(39)	IS: 4615 - 1968	Switch socket outlets (non-interlocking type).
(40)	IS: 4160 - 1967	Interlocking switch socket outlet.
(41)	IS:1293 - 1988	Plugs and socket outlets of rated voltage upto and including 250 volts and rated current upto and including 16 amperes.

ELECTRICAL SAFETY MEASURES

- Lightning Protection to be done as per the IS Codes applicable.
- Safety parameters as indicated under Indian Electricity Rules 1956 and ECBC shall be complied. The following safety measurement are considered
- Earth resistivity test shall be carried out in accordance with IS Code of Practice for earthing IS 3043
- Specifications in respect of conductor material, their installation & jointing and providing earth electrode shall be as stipulated in "EARTHING" sections of Technical Specifications of this tender document.
- The lightning protection system shall use either copper or GI as stipulated in Bill of quantities as conducting material throughout. Galvanizing shall conform class – IV of IS 4736 : 1986. Longest possible unbroken lengths of conductors shall be used to eliminate or at least minimize mid run jointing.
- No work shall be undertaken on live installations, or on installations which could be energized unless one another person is present to immediately isolate the electric supply in case of any accident and to render first aid, if necessary.

FIRE SOP

Fire

Fire could take place through various means; one of them is through electrical fire. Hence, all the electrical works and material of the building would adhere to the standards. Regular maintenance and audit of the electrical systems would be carried out by external auditors.

Mitigation measures proposed

- Fire Alarm system and Fire Hose located on each residential floor.
- Fire extinguishers located at all important locations.
- Common Assembly Point shall be demarcated and its location shall be displayed at the lift lobby for easy sighting.
- Mock drills shall be carried out with the help of Fire and Emergency Services
- Refuge floors provided in the buildings shall be highlighted and kept empty at all times for emergency evacuation. The following resources shall be available on the Refuge Area.
  - ✓ Copies of the Disaster Management Plan.
  - ✓ Layout Plan of proposed project.
  - ✓ Information regarding Safety Equipment, Fire Fighting material.
  - ✓ A list of important telephone numbers like those of neighbouring police station
  - ✓ Fire Brigade, Hospitals etc.

FIRE FIGHTING CODES & STANDARDS

TITLE	IMPORTANT INDIAN STANDARDS FOR FIRE FIGHTING WORK
IS 1239-1968 (Part-I)	Specifications for mild steel tube, tubular and other steel pipe fittings.
IS 1239-1968 (Part-II)	Specifications for mild steel tube, tubular and other steel pipe fittings.
IS 1536-1976	Specification for centrifugally Cast (Spun) Iron pressure pipes with flanges for water, gas and sewage.
IS 1538 (Part 1 to 23)	Specification for Cast Iron fittings for pressure pipes for water, gas and sewage.
IS 1726-1960	Code for cast iron manhole frame and cover.
IS 3589-1981	Specification for electrically welded steel pipes for water, gas and sewage.
IS 4736-1986	Galvanizing G.I. Pipes
IS 636-1988	Non percolating flexible fire fighting delivery hose (third revision)
IS 694-1990	PVC insulated cables for working voltages upto and including 1.100 volts (third revision)
IS 778-1984	Copper alloy gate, globe and check valves for water works purposes (fourth revision) (Amendment 2)
IS 780-1984	Sluice valves for water works purposes (50 to 300 mm) size (sixth revision) (amendment 3)
IS 884-1985	Specification for first-aid hose-reel for fire fighting (for fixed installations) (first revision) (with amendment No.1)
IS 900-1992	Code of practice for installation and maintenance of induction motors (second revision)
IS 901-1988	Specification for couplings, double male and double female, instantaneous pattern for fire fighting (third revision)
IS 902-1992	Suction hose coupling for fire fighting of purposes (third revision)
IS 903-1984	Specification of fire hose delivery couplings branch pipe, nozzles and nozzle

	spanner (third revision) (Amendment 5)
IS 937-1981	Specification for washers for water fittings for fire fighting purposes (revised) (with amendment No, 1)
IS 1520-1980	Horizontal centrifugal pumps for clear cold, fresh water (second revision)
IS 1536-1976	Horizontally cast iron pressure pipes for water, gas & sewage (first revision) (with Amendments No. 1 to 4)
IS 1554-1988 Part I	PVC insulated (heavy duty) electric cables (working voltage upto and including 1100 volts (third revision)
IS 1554-1988 Part II	PVC insulated (heavy duty) electric cables (working voltage from 3.3 KV upto and including 11 KV (second revision)
IS 1648-1961	Code of practice for fire safety of buildings (General) Fire fighting equipment and its maintenance (with amendment No.1)
IS 3624-1987	Pressure and vacuum gauges (Second revision)
IS 4736-1968	Hot-dip zinc coatings on steel tubes (with Amendment No.1)
IS 5290-1983	Specification for landing valves (second revision) (with Amendments No.6)
IS 5312- 1984 Part I	Swing check type reflux (non return) valves Part I-single door pattern (with amendments nos. 1 & 2)
IS 5312- 1986 Part II	Swing check type reflux (non return) valves Part II-Multi door pattern (with amendments nos. 1 & 2)
IS 7285	Seamless cylinders for storage of gas at high pressure.
IS 2189-1962	Code of practice for Automatic Fire alarm system
IS 2195-1962	Specification for heat sensitive fire detectors
IS 732-1973	Code of practice for electrical wiring installation
	UL 168 Underwriters Laboratory specification for smoke detector.

LIST OF APPLICABLE STANDARDS FOR FIRE ALARM SYSTEM

(1) IS:2189 – 1962	Code of Practice for Automatic Fire Alarm System.
(2) IS:2195 – 1962	Specifications for Heat sensitive Fire Detectors.
(3) IS:732 – 1973	Code of practice for Electrical Wiring installation
(4) UL 168	Under writers laboratory specifications for smoke detectors.

Fire Protection measures

Fire Protection System has been designed as per requirements of National Building Code 2005.

Fire protection system consists of following pumps for the Complex.

- Sprinkler pump
- Hydrant Pump

Apart for the above, following are also proposed:

a) Wet riser and hydrant system with accessories.

b) Underground fire tank

c) Overhead fire tank

c) Landing valve, Fire hose cabinets at each level, branch pipe , landing valve & fireman's axe.

d) Fire Extinguishers at every landing valve.

e) Hand Held fire extinguishers

f) Automatic Detection and Alarm System

g) Portable Fire Extinguishers.

Rainfall Data

The normal annual rainfall in Gurgaon district is about 430.8 mm mm recorded in 32 rainy days in a year. The south west monsoon sets in the last week of June and withdraws towards the end of September and contributes about 85% of the annual rainfall. July and August are the wettest months. 15% of the annual rainfall occurs during the non-monsoon months in the wake of thunder storms and western disturbances. The average rainfall data of last 5 years is given as:

Table 3.1: Average rainfall data of last 5 years

Month/ Year	2016	2017	2018	2019	2020
January	0.0	28.8	1.6	17.5	14.9
February	0.0	0.0	0.0	11.9	1.3
March	16.2	2.4	0.0	7.1	41.8
April	0.5	2.8	4.8	7.7	3.3
May	17.6	15.8	3.4	20.4	19.0
June	38.8	97.3	64.9	4.6	34.0
July	186.8	61.2	118.3	148.2	150.0
August	138.0	33.4	116.0	97.3	292.3
September	35.7	65.0	112.2	34.6	31.3
October	15.4	0.0	0.0	8.8	0.0
November	0.0	0.0	4.3	1.0	0.8
December	0.0	1.3	0.3	19.8	0.0
Total Rainfall	**449 mm**	**308 mm**	**425.8 mm**	**378.9 mm**	**588.7 mm**

(Source:http://hydro.imd.gov.in/hydrometweb/(S(h4tm2zru1ke5mg3mvix4zwef))/DistrictRaifall.aspx

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

PALM/NORTH/B/010322/645972

AAI/RHQ/NR/ATM/NOC/2022/17/68-71

मालिक का नाम एवं पता	DLF LIMITED	दिनांक/DATE:	17-01-2022
OWNERS Name & Address	DLF Shopping Mall, 3rd Floor, Arjun Marg, DLF City, Phase - I, Gurugram-122002, Haryana	वैधता/ Valid Up to:	16-01-2030

ऊँचाई की अनुमति हेतु अनापत्ति प्रमाण पत्र(एनओसी)
No Objection Certificate for Height Clearance

1) यह अनापत्ति प्रमाण पत्र भारतीय विमानपत्तन प्राधिकरण (भाविप्रा) द्वारा प्रदत्त दायित्वों के अनुक्रम तथा सुरक्षित एवं नियमित विमान प्रचालन हेतु भारत सरकार (नागर विमानन मंत्रालय) की अधिसूचना जी. एस. आर. 751 (ई) दिनांक 30 सितम्बर, 2015, जी. एस. आर. 770 (ई) दिनांक 17 दिसंबर 2020 द्वारा संशोधित, के प्रावधानों के अंतर्गत दिया जाता है।
1. This NOC is issued by Airports Authority of India (AAI) in pursuance of responsibility conferred by and as per the provisions of Govt. of India (Ministry of Civil Aviation) order GSR751 (E) dated 30th Sep.2015 amended by GSR770(E) dated 17th Dec 2020 for safe and Regular Aircraft Operations.

2). इस कार्यालय को निम्नलिखित विवरण के अनुसार प्रस्तावित संरचना के निर्माण पर कोई आपत्ति नहीं है।
2. This office has no objection to the construction of the proposed structure as per the following details:

अनापत्ति प्रमाणपत्र आईडी / NOC ID	PALM/NORTH/B/010322/645972
आवेदक का नाम / Applicant Name*	Pawan Chawla
स्थल का पता / Site Address*	Group Housing at Crest 2 in Park Drive (Off Ch. Raghvendra Marg), DLF5, Sector 54, Gurugram, Haryana,PARK DRIVE,Gurgaon,Haryana
स्थल के निर्देशांक / Site Coordinates*	28 26 45.11N 77 06 44.24E, 28 26 41.93N 77 06 46.20E, 28 26 44.29N 77 06 46.48E, 28 26 46.90N 77 06 48.07E, 28 26 41.29N 77 06 48.60E, 28 26 50.11N 77 06 50.45E, 28 26 40.65N 77 06 50.99E, 28 26 42.74N 77 06 52.23E, 28 26 42.52N 77 06 52.63E, 28 26 46.96N 77 06 53.00E, 28 26 45.22N 77 06 53.54E, 28 26 48.79N 77 06 53.90E
स्थल की ऊँचाई एएमएसएल मीटर में (औसतन समुद्र तल से ऊपर), (जैसा आवेदक द्वारा उपलब्ध कराया गया) / Site Elevation in mtrs AMSL as submitted by Applicant*	262.23 M
अनुमन्य अधिकतम ऊँचाई एएमएसएल मीटर में (औसतन समुद्र तल से ऊपर) / Permissible Top Elevation in mtrs Above Mean Sea Level(AMSL)	375.79 M (Restricted)

*** जैसा आवेदक द्वारा उपलब्ध कराया गया / As provided by applicant***

3) यह अनापत्ति प्रमाण पत्र निम्नलिखित नियम व शर्तों के अधीन है: -
3. **This NOC is subject to the terms and conditions as given below:**

क) आवेदक द्वारा उपलब्ध कराए गए स्थल की ऊँचाई तथा निर्देशांक को, प्रस्तावित संरचना हेतु अनुमन्य अधिकतम ऊँचाई जारी करने के लिए प्रयोग किया गया है। भारतीय विमान पत्तन प्राधिकरण, आवेदक द्वारा उपलब्ध कराये गए स्थल की ऊँचाई तथा निर्देशांक की यथार्थता का ना तो उत्तरदायित्व वहन करता है, और ना ही इनको प्रमाणीकृत करता है। यदि किसी भी स्तर पर यह पता चलता है कि वास्तविक विवरण, आवेदक द्वारा उपलब्ध कराए गए विवरण से भिन्न है, तो यह अनापत्ति प्रमाण पत्र अमान्य माना जाएगा तथा कानूनी कार्यवाही की जाएगी। सम्बंधित विमान क्षेत्र के प्रभारी अधिकारी द्वारा एयरक्राफट नियम 1994 (भवन, वृक्षों आदि के कारण अवरोध का विध्वंस) के अधीन कार्यवाही की जायगी।
a. Permissible Top elevation has been issued on the basis of Site coordinates and Site Elevation submitted by Applicant. AAI neither owns the responsibility nor authenticates the correctness of the site coordinates & site elevation provided by the applicant. If at any stage it is established that the actual data is different, this NOC will stand null and void and action will be taken as per law. The officer in-charge of the concerned aerodrome may initiate action under the Aircraft (Demolition of Obstruction caused by Buildings and Trees etc.) Rules, 1994",

ख) अनापत्ति प्रमाण पत्र के आवेदन में आवेदक द्वारा उपलब्ध कराए गए स्थल निर्देशांक को सड़क दृश्य मानचित्र और उपग्रह मानचित्र पर अंकित किया गया है जैसा कि अनुलग्नक में दिखाया गया है। आवेदक / मालिक यह सुनिश्चित करे कि अंकित किए गए निर्देशांक उसके स्थल से मेल खाते हैं। किसी भी विसंगति के मामले में, नामित अधिकारी को अनापत्ति प्रमाण पत्र रद्द करने के लिए अनुरोध किया जाएगा।
b. The Site coordinates as provided by the applicant in the NOC application has been plotted on the street view map and satellite map as shown in ANNEXURE. Applicant/Owner to ensure that the plotted coordinates corresponds to his/her site. In case of any discrepancy, Designated Officer shall be requested for cancellation of the NOC.

ग) एयरपोर्ट संचालक या उनके नामित प्रतिनिधि, अनापत्ति प्रमाण पत्र नियमों और शर्तों का अनुपालन सुनिश्चित करने के लिए स्थल (आवेदक या मालिक के साथ पूर्व समन्वय के साथ) का दौरा कर सकते हैं।
c. Airport Operator or his designated representative may visit the site (with prior coordination with applicant or owner) to ensure that NOC terms & conditions are complied with.

घ) संरचना की ऊँचाई (सुपर स्ट्रक्चर सहित) की गणना अनुमन्य अधिकतम ऊँचाई (ए एम एस एल) से स्थल की ऊँचाई को घटाकर की जायेगी। अर्थात, संरचना की अधिकतम ऊँचाई = अनुमन्य अधिकतम ऊँचाई (-) स्थल की ऊँचाई।

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d. The Structure height (including any superstructure) shall be calculated by subtracting the Site elevation in AMSL from the Permissible Top Elevation in AMSL i.e. Maximum Structure Height = Permissible Top Elevation minus (-) Site Elevation.

च) अनापत्ति प्रमाण पत्र जारी करना, भारतीय एयरक्राफ्ट एक्ट 1934 , के सैक्शन 9-A तथा इसके अंतर्गत समय-समय पर जारी अधिसूचनाएं तथा एयरक्राफट नियम (1994 भवन, वृक्षों आदि के कारण अवरोध का विध्वंस) के अधीन है ।

e. The issue of the 'NOC' is further subject to the provisions of Section 9-A of the Indian Aircraft Act, 1934 and any notifications issued there under from time to time including, "The Aircraft (Demolition of Obstruction caused by Buildings and Trees etc.) Rules, 1994".

छ) कोई भी रेडियो/ टीवी एन्टीना, लाइटनिंग अरैस्टर, सीढ़िया, मुमटी, पानी की टंकी अथवा कोई अन्य वस्तु तथा किसी भी प्रकार के संलग्नक उपस्कर पैरा 2 में उल्लेखित अनुमन्य अधिकतम ऊँचाई से ऊपर नहीं जानी चाहिए ।

f. No radio/TV Antenna, lightening arresters, staircase, Mumty, Overhead water tank or any other object and attachments of fixtures of any kind shall project above the Permissible Top Elevation as indicated in para 2.

ज) विमानक्षेत्र संदर्भ बिंदु के 8 KM के भीतर तेल, बिजली या किसी अन्य ईंधन का उपयोग जो उड़ान संचालन के लिए धुएं का खतरा पैदा नहीं करता है, ही मान्य है।

g. Use of oil, electric or any other fuel which does not create smoke hazard for flight operation is obligatory, within 8 KM of the Aerodrome Reference Point

झ) यह प्रमाणपत्र इसके जारी होने की तारीख से 8 साल की अवधि के लिए वैध है। एक बार रिवेलीडेशन की अनुमति दी जा सकती है, बशर्ते कि इस तरह का अनुरोध एनओसी की समाप्ति की तारीख से छह महीने के भीतर किया जाए और प्रारंभिक प्रमाणपत्र 8 साल की वैधता अवधि के भीतर प्राप्त किया जाए ।

h. The certificate is valid for a period of 8 years from the date of its issue. One-time revalidation shall be allowed, provided that such request shall be made within six months from the date of expiry of the NOC and commencement certificate is obtained within initial validity period of 8 years.

ट) भवन के निर्माण के दौरान या उसके बाद किसी भी समय स्थल पर ऐसी कोई भी लाइट या लाइटो का संयोजन नहीं लगाया जाएगा जिसकी तीव्रता, आकृति या रंग के कारण वैमानिक ग्राउन्ड लाइटों के साथ भ्रम उत्पन्न हो । विमान के सुरक्षित प्रचालन को प्रभावित करने वाली कोई भी गतिविधि मान्य नहीं होगी |

i. No light or a combination of lights which by reason of its intensity, configuration or colour may cause confusion with the aeronautical ground lights of the Airport shall be installed at the site at any time, during or after the construction of the building. No activity shall be allowed which may affect the safe operations of flights.

ठ) आवेदक द्वारा विमानपत्तन पर या उसके आसपास विमान से उत्पन्न शोर, कंपन या विमान प्रचालन से हुई किसी भी क्षति के विरुद्ध कोई शिकायत/दावा नहीं किया जाएगा ।

j. The applicant will not complain/claim compensation against aircraft noise, vibrations, damages etc. caused by aircraft operations at or in the vicinity of the airport.

ड) डे मार्किंग तथा सहायक विद्युत आपूर्ति सहित नाइट लाइटिंग (डीजीसीए भारत की वेबसाइट www.dgca.nic.in पर उपलब्ध) नागर विमानन आवश्यकताएं श्रंखला 'बी' पार्ट । सैक्शन-4 के चैप्टर 6 तथा अनुलग्नक 6 में विनिर्दिष्ट दिशानिर्देशों के अनुसार उपलब्ध कराई जाएंगी ।

k. Day markings & night lighting with secondary power supply shall be provided as per the guidelines specified in chapter 6 and appendix 6 of Civil Aviation Requirement Series 'B' Part I Section 4, available on DGCA India website: www.dgca.nic.in

ढ) भवन के नक्शे के अनुमोदन सहित अन्य सभी वैधानिक अनापत्ति, संबंधित प्राधिकरणों से लेना आवेदक की जिम्मेदारी होगी, क्योंकि इस ऊँचाई हेतु अनापत्ति प्रमाणपत्र लेने का उद्देश्य सुरक्षित एवं नियमित विमान प्रचालन सुनिश्चित करना है तथा इसे भूमि के स्वामित्व आदि सहित किसी अन्य उद्देश्य/ दावे के लिए दस्तावेज के रूप में प्रयोग नहीं किया जा सकता ।

l. The applicant is responsible to obtain all other statutory clearances from the concerned authorities including the approval of building plans. This NOC for height clearances is only to ensure safe and regular aircraft operations and shall not be used as document for any other purpose/claim whatsoever, including ownership of land etc.

ण) इस अनापत्ति प्रमाणपत्र आईडी का मूल्यांकन Chillarki,I.G.I Airport,Rohini Heliport,Safdarjung Airport,Sampla विमानक्षेत्रो के संबंध में किया गया है। यह अनापत्ति प्रमाणपत्र भारतीय विमान पत्तन प्राधिकरण के विमानक्षेत्रो और अन्य लाइसेंस प्राप्त सिविल विमानक्षेत्रो, जो जी. एस. आर. 751 (ई) जी. एस. आर. 770 (ई) द्वारा संशोधित के अनुसूची - III, अनुसूची - IV (भाग- I), अनुसूची- IV (भाग -2; केवल RCS हवाई अड्डे) और अनुसूची- VII में सूचीबद्ध हैं, के लिए जारी किया गया है ।

m. This NOC ID has been assessed with respect to the Chillarki,I.G.I Airport,Rohini Heliport,Safdarjung Airport,Sampla Airports. NOC has been issued w.r.t. the AAI Aerodromes and other licensed Civil Aerodromes as listed in Schedule – III, Schedule – IV(Part-I), Schedule- IV (Part-2; RCS Airports Only) and Schedule-VII of GSR 751(E) amended by GSR770(E)

त) यदि स्थल रक्षा विभाग के विमान क्षेत्र के अधिकार क्षेत्र में आता है, जैसा कि जीएसआर 751 (ई) की अनुसूची-V में सूचीबद्ध है, तो आवेदक को रक्षा विभाग से अलग से अनापत्ति प्रमाणपत्र लेना होता है। जीएसआर 751 (ई) जी. एस. आर. 770 (ई) द्वारा संशोधित के नियम 13 के अनुसार, आवेदकों को उन स्थलों के लिये, जो जीएसआर 751 (ई) जी. एंस. आर. 770 (ई) द्वारा संशोधित के अनुसूची- IV (भाग -2; आरसीएस हवाई अड्डों के अलावा) के रूप में सूचीबद्ध बिना लाइसेंस वाले विमान क्षेत्र के अधिकार क्षेत्र में आता हैं, तो संबंधित राज्य सरकार से भी अनापत्ति प्रमाणपत्र लेने की आवश्यकता है।

n. Applicant needs to seek separate NOC from Defence, if the site lies within the jurisdiction of Defence Aerodromes as listed in Schedule – V of GSR 751 E amended by GSR770(E). As per rule 13 of GSR 751 E amended by GSR770(E), applicants also need to seek NOC from the concerned state government for sites which lies in the jurisdiction of unlicensed aerodromes as listed in Schedule-IV (Part-2; other than RCS airports) of GSR 751 E amended by GSR770(E)

थ) अनापत्ति प्रमाण पत्र (एनओसी) की किसी भी त्रुटि/व्याख्या की स्थिति में अंगरेजी अनुवाद ही मान्य होगा |

o. In case of any discrepancy/interpretation of NOC letter, English version shall be valid.

द) स्थल की ऊँचाई और/या संरचना की ऊँचाई के किसी भी विवाद में अनुमन्य अधिकतम ऊँचाई एएमएसएल में ही मान्य होगी |

p. In case of any dispute with respect to site elevation and/or AGL height, Permissible Top Elevation in AMSL shall prevail.

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

PALM/NORTH/B/010322/645972

क्षेत्र का नाम / Region Name: उत्तर/NORTH

पदनामित अधिकारी/Designated Officer नाम/ पदनाम/दिनांक सहित हस्ताक्षर Name/Designation/Sign with date	एम. बालाचन्द्रन/M. BALACHANDRAN महाप्रबन्धक (विमान यातायात प्रबंधन)/General Manager (ATM) उत्तरी क्षेत्र/Northern Region भारतीय विमानपत्तन प्राधिकरण/Airports Authority of India प्रचालन कार्यालय परिसर रंगपुरी, नई दिल्ली
द्वारा तैयार Prepared by	Dheeraj kumar DGM(AFC)
द्वारा जांचा गया Verified by	Deepak Verma HOR (ATM)

ईमेल आईडी / EMAIL ID : noc_nr@aai.aero

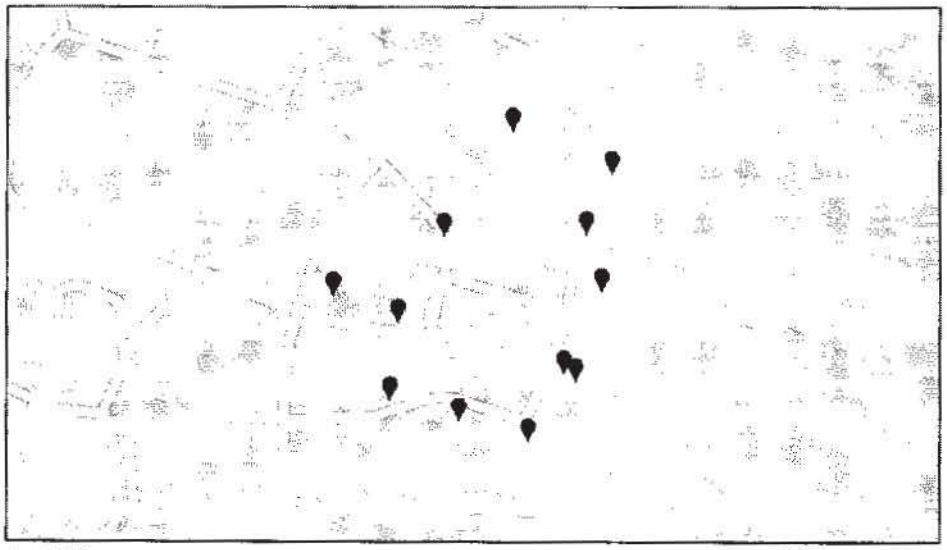
फोन/ Ph: 011-25653551

ANNEXURE/अनुलग्नक

Distance From Nearest Airport And Bearing/निकटतम विमानक्षेत्र से दूरी और बीयरिंग

Airport Name/विमानक्षेत्र का नाम	Distance (Meters) from Nearest ARP/ निकटतम विमानक्षेत्र संदर्भ बिंदु से दूरी (मीटर मे)	Bearing(Degree) from Nearest ARP/निकटतम विमानक्षेत्र संदर्भ बिंदु से बीयरिंग (डिग्री
Chillarki	45061.35	75.1
I.G.I Airport	13466.46	178.21
Rohini Heliport	34217.27	169.85
Safdarjung Airport	17705.58	209.51
Sampla	50342.33	144.15
NOCID	PALM/NORTH/B/010322/645972	

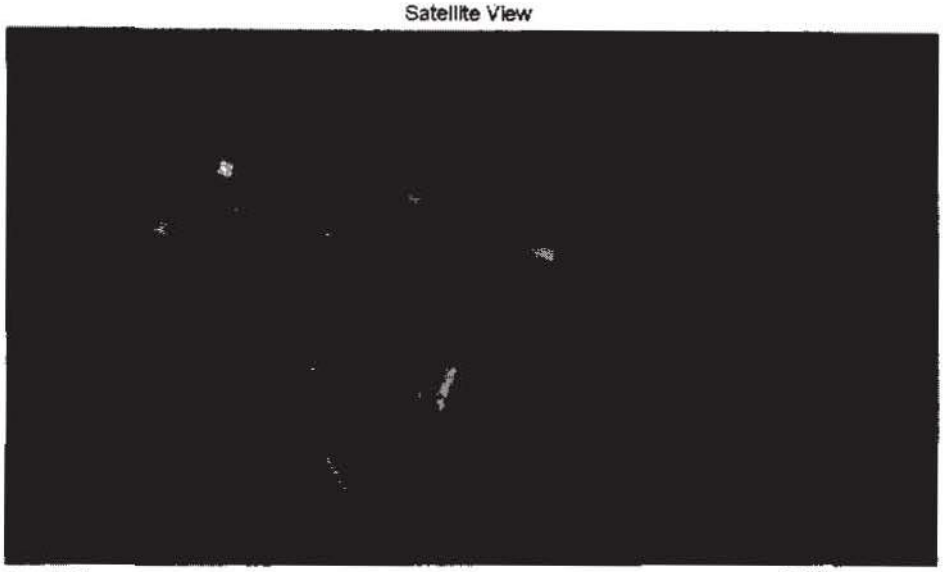
Street View



भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

PALM/NORTH/B/010322/645972

Satellite View



January 3, 2022

1:3,600

प्रेषक,

तहसीलदार,
वजीराबाद।

सेवा में,

उपायुक्त,
गुरूग्राम।

कमांक 161 /रीडर दिनांक 19.4.2022

विषयः— **Report of Tehsildar Gurugram through the office of DC that the land of the project does not fall under Moef aravalli certificate for project site of Proposed Group Housing Building in part of DLF – 5 Zone 10 Village Wazirabad Gurugram Haryana.**

उपरोक्त विषय पर आपके कार्यालय के पत्र कमांक 1980/एम.बी. दिनांक 11.04.2022 के संदर्भ में।

विषयाधीन मामले में अनुरोध है कि सम्बन्धित विषय पर पटवारी हल्का से रिपोर्ट प्राप्त की गई। रिपोर्ट अनुसार मांगी गई सूचना मौजा वजीराबाद, तहसील वजीराबाद जिला गुरूग्राम के खसरा नं0 2046/1/1 (1–12–19), 2046/1/2 (1–2–14), 2046/2 (1–6–7), 2047/1 (1–19–3), 2047/2 (1–11–17), 2048 (3–7–0), 2049 (4–4–0), 2050/1 (1–7–10), 2050/2 (2–13–18), किता 9 रकबा 19 बीघा 5 बिस्वा 8 बिस्वांसी का राजस्व रिकार्ड का अवलोकन किया गया। अवलोकन उपरान्त मांगी गई रिपोर्ट बिन्दुवार निम्न प्रकार है।

1 उपरोक्त अराजी दिनांक 07.05.1992 के नोटिफिकेशन के राजस्व रिकार्ड अनुसार जमाबन्दी की खाना कैफियत में अरावली क्षेत्र का कोई इन्द्राज दर्ज नहीं है।

2 उपरोक्त अराजी भूमि दिनांक 07.05.1992 के नोटिफिकेशन से पूर्व व उसके पश्चात उपरोक्त अराजी की किस्म गैर मुमकिन पहाड़, गैर मुमकिन राड़ा, गैर मुमकिन बीहड़, बजंड़ या रूद्र का इन्द्राज जमाबन्दी की खाना कैफियत में दर्ज नहीं रही है।

3 उपरोक्त अराजी भूमि की किस्म दिनांक 07.05.1992 के नोटिफिकेशन से पूर्व मगदा व हाल किस्म गैर मुमकिन है।

4 उपरोक्त अराजी मिसल हकीयत ताहाल कभी भी शामलात देह, पंचायत देह, नगर पालिका, नगर निगम की मलकियत नहीं रही है।

5 उपरोक्त अराजी का किसी भी न्यायालय में किसी कोर्ट केस बारे कोई हवाला/जमाबन्दी के खाना कैफियत में दर्ज नहीं है।

6 उपरोक्त अराजी का SEZ (Speceal Economical Zone) बारे कोई इन्द्राज जमाबन्दी की खाना कैफियत में दर्ज नहीं है।

7 उपरोक्त अराजी पर धारा 4, 6 व अवार्ड बारे कोई हवाला जमाबन्दी की खाना कैफियत में दर्ज नहीं है।

रिपोर्ट आपकी सेवा में आगामी आवश्यक कार्यावाही हेतू प्रेषित है।

तहसीलदार,
वजीराबाद।
19.04.2022

Input data

Stack Attached to	Capacity KVA	Stack Exhaust, nm3/s	Fuel Used	PM10 g/s	SO2 g/s	NOx g/s	CO g/s	PM2.5
1 -DG Set	1000	0.305865	HSD	0.003222	0.080556	0.292004	0.04588	0.001289
1 -DG Set	1250	0.305865	HSD	0.004028	0.100694	0.292004	0.04588	0.001611
3 -DG Set	2000	0.305865	HSD	0.006444	0.161111	0.292004	0.04588	0.002578

Parking Details:-1,615 ECS

In the absence of specific PM-2.5 emission limit, the emission rate is calculated based on the composition of PM2.5 recorded during ambient air monitoring

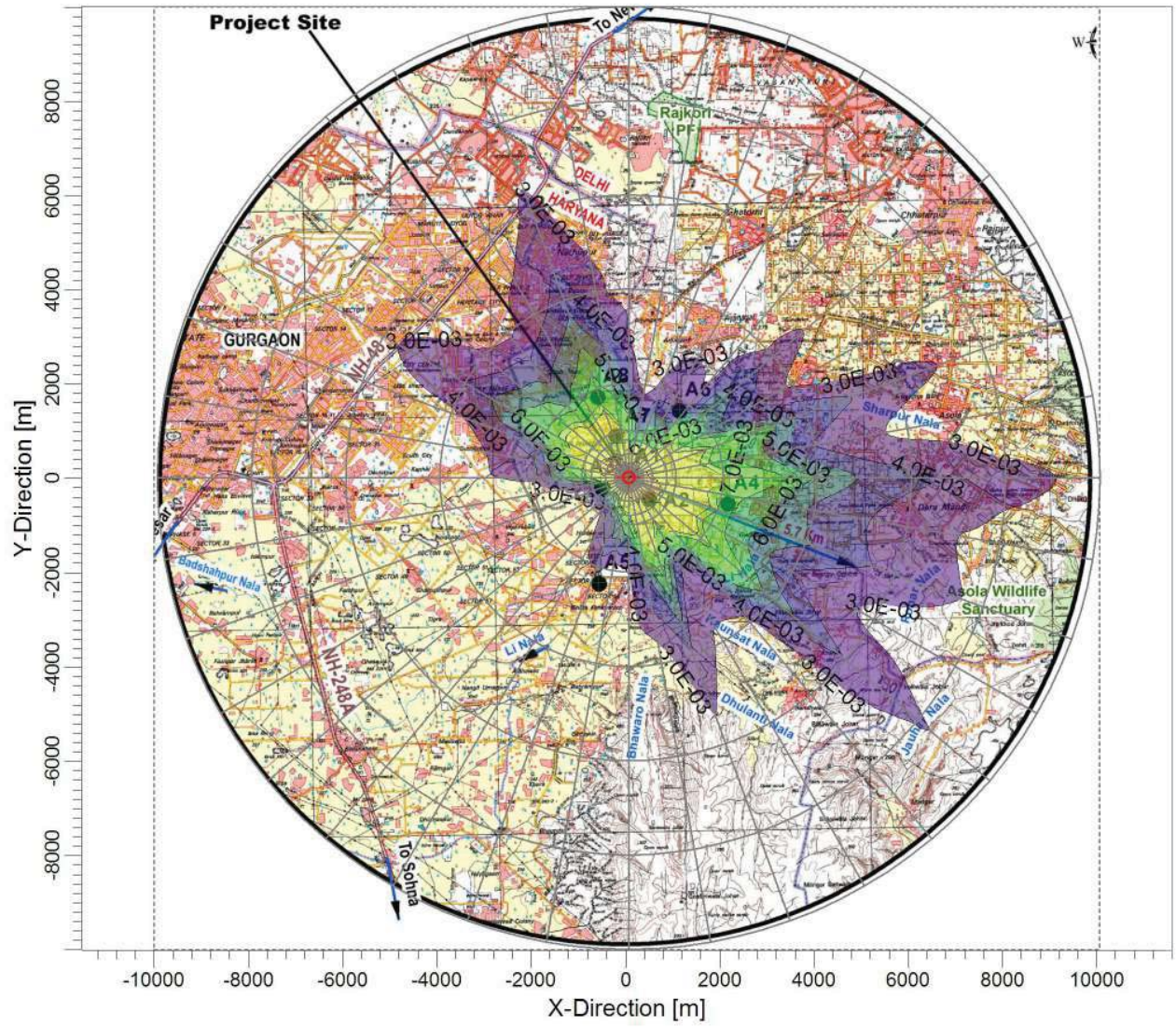
Output Data-

The Results are based on **24-operation of all DG Sets Summer Season (December 2021 to February 2022-Worst case Scenario).** The predicted incremental GLC is the maximum value predicted study area.

Location	Village	Max Baseline Concentrations					Predicted GLC – AERMOD					Cumulative GLC				
		PM10	PM2.5	Nox	SO2	CO	PM10	PM2.5	Nox	SO2	CO	PM10	PM2.5	Nox	SO2	CO
		($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	(mg/m^3)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	(mg/m^3)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	(mg/m^3)
A1	Project Site	135	74	29.9	12.8	1.2	0.00983	0.00794	0.0631	0.0994	0.0000049	135.00983	74.00794	29.9631	12.8994	1.2000049
A2	Open Scrub Near Dlf Phase 5	118	68	25.5	9	0.92	0.01908	0.00841	0.29654	0.35854	0.000017	118.01908	68.00841	25.79654	9.35854	0.920017
A3	Near Emaar The Palm Spring	130.1	72.1	29	10.5	1.06	0.00656	0.00281	0.10408	0.12595	0.0000059	130.10656	72.10281	29.10408	10.62595	1.0600059
A4	Near Gwalpahari	120.4	69.4	27.9	8	0.86	0.00729	0.00312	0.11575	0.13991	0.0000065	120.40729	69.40312	28.01575	8.13991	0.8600065
A5	Sector 54	140.5	75.5	30.5	12.9	1.1	0.00233	0.001	0.0369	0.04479	0.000002	140.50233	75.501	30.5369	12.94479	1.100002
A6	Near Arjungarh	125.2	70.2	27.3	7.8	0.85	0.00393	0.00168	0.06228	0.07531	0.0000035	125.20393	70.20168	27.36228	7.87531	0.8500035
A7	Near Dlf Phase 5	95.6	57.5	25.7	6.8	0.65	0.01531	0.00482	0.1761	0.213	0.00001	0.0111	0.0111	0.0111	0.0111	0.0111
A8	Near Qutab Plaza	98.4	59.5	26.3	19.4	0.75	0.00885	0.00381	0.14017	0.1694	0.0000079	98.40885	59.50381	26.44017	19.5694	0.7500079

PROJECT TITLE:

Proposed Group Housing Buildings,By M/s DLF Ltd
Isopleth of PM10



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

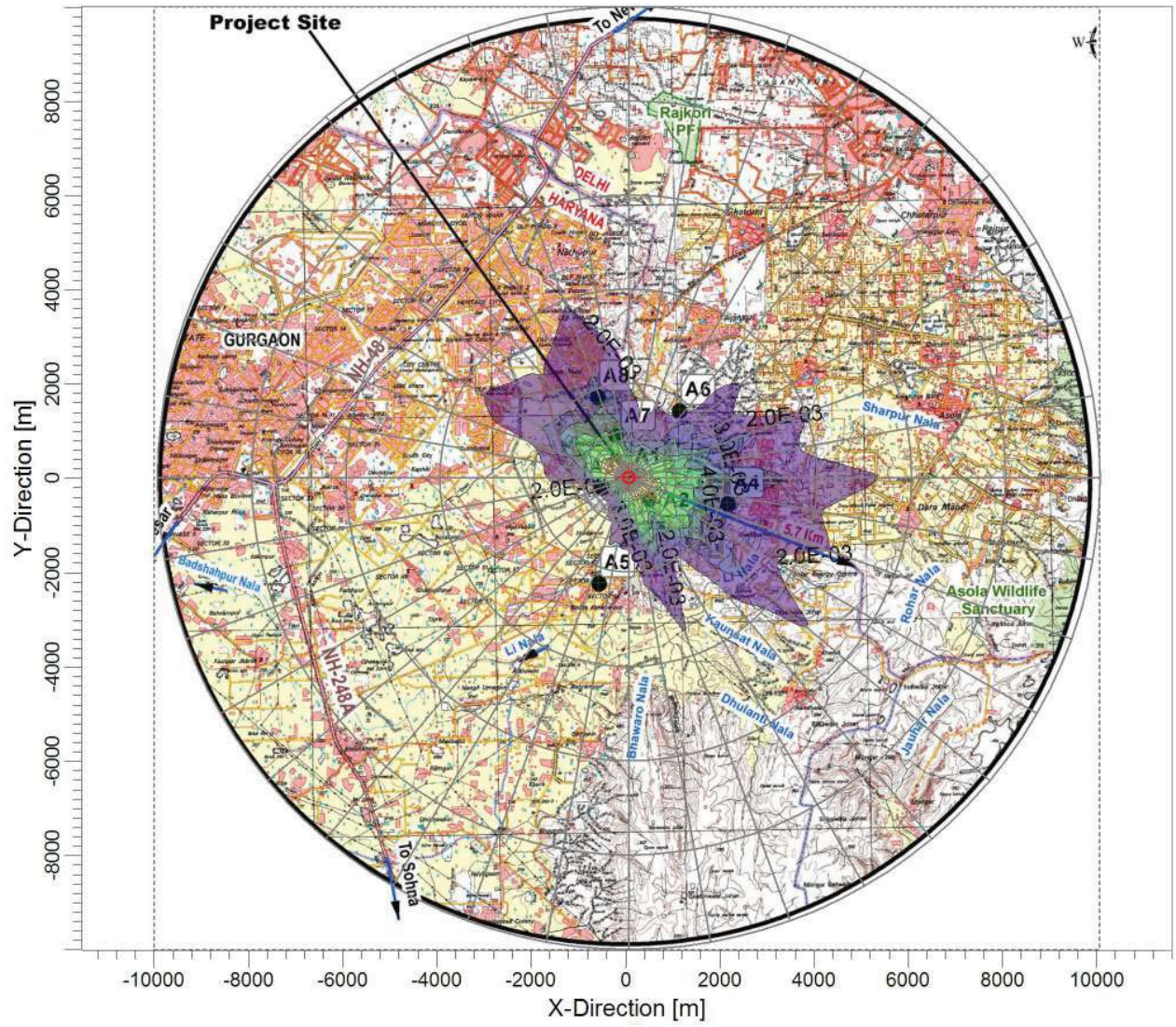
Max: 3.5E-02 [ug/m^3] at (-159.52, 211.49)

3.0E-03 4.0E-03 5.0E-03 6.0E-03 7.0E-03 9.0E-03 1.0E-02 2.0E-02 3.0E-02 3.5E-02

COMMENTS:	SOURCES: **6**	COMPANY NAME: **Vardan Environet**	
	RECEPTORS: **368**	MODELER: **Surbhi Makwana**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:145,592 0 5 km	
	MAX: **3.5E-02 ug/m^3**		PROJECT NO.:

PROJECT TITLE:

Proposed Group Housing Buildings,By M/s DLF Ltd
Isopleth of PM2.5



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

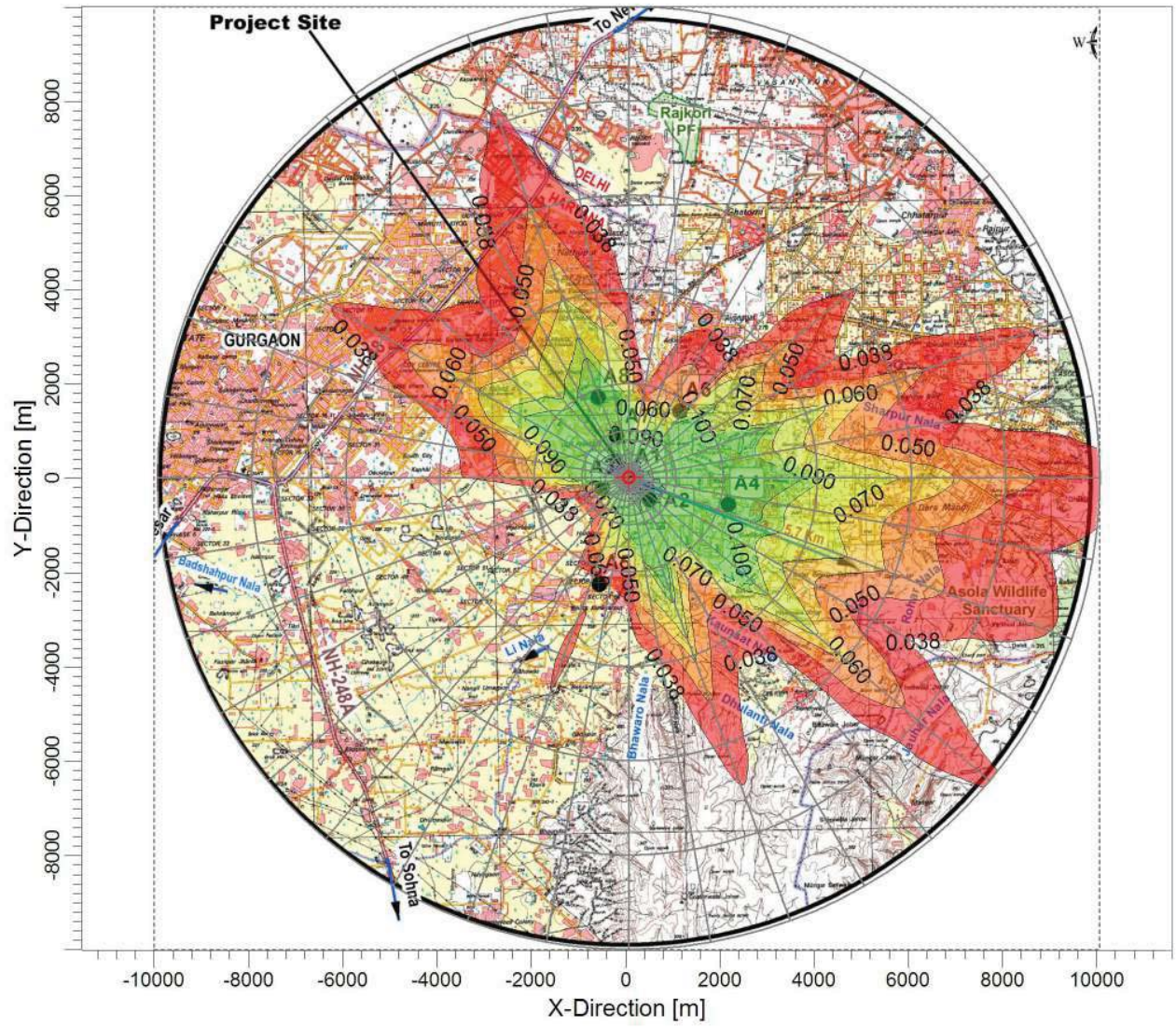
Max: 2.3E-02 [ug/m^3] at (168.77, 1.29)

2.0E-03 3.0E-03 4.0E-03 5.0E-03 6.0E-03 8.0E-03 9.0E-03 1.0E-02 2.0E-02 2.3E-02

COMMENTS:	SOURCES: **6**	COMPANY NAME: **Vardan Environet**	
	RECEPTORS: **368**	MODELER: **Surbhi Makwana**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:145,592 0 5 km	
	MAX: **2.3E-02 ug/m^3**		PROJECT NO.:

PROJECT TITLE:

Proposed Group Housing Buildings,By M/s DLF Ltd
Isopleth of NO2



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

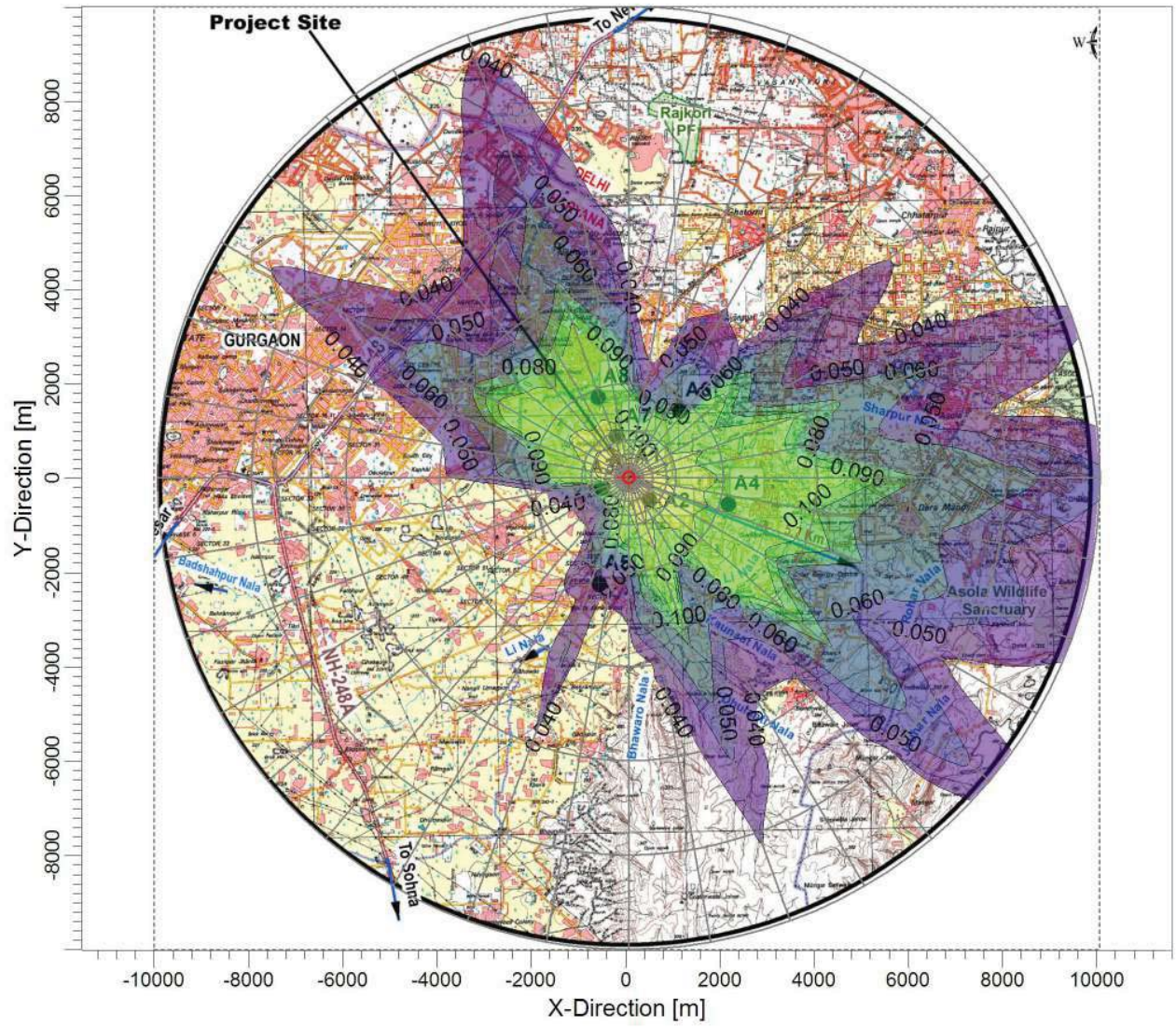
Max: 0.563 [ug/m^3] at (-159.52, 211.49)

0.038 0.050 0.060 0.070 0.090 0.100 0.300 0.400 0.500 0.563

COMMENTS:	SOURCES: **6**	COMPANY NAME: **Vardan Environet**	
	RECEPTORS: **368**	MODELER: **Surbhi Makwana**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:145,592 0 5 km	
	MAX: **0.563 ug/m^3**		PROJECT NO.:

PROJECT TITLE:

Proposed Group Housing Buildings,By M/s DLF Ltd
Isopleth of SO2



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

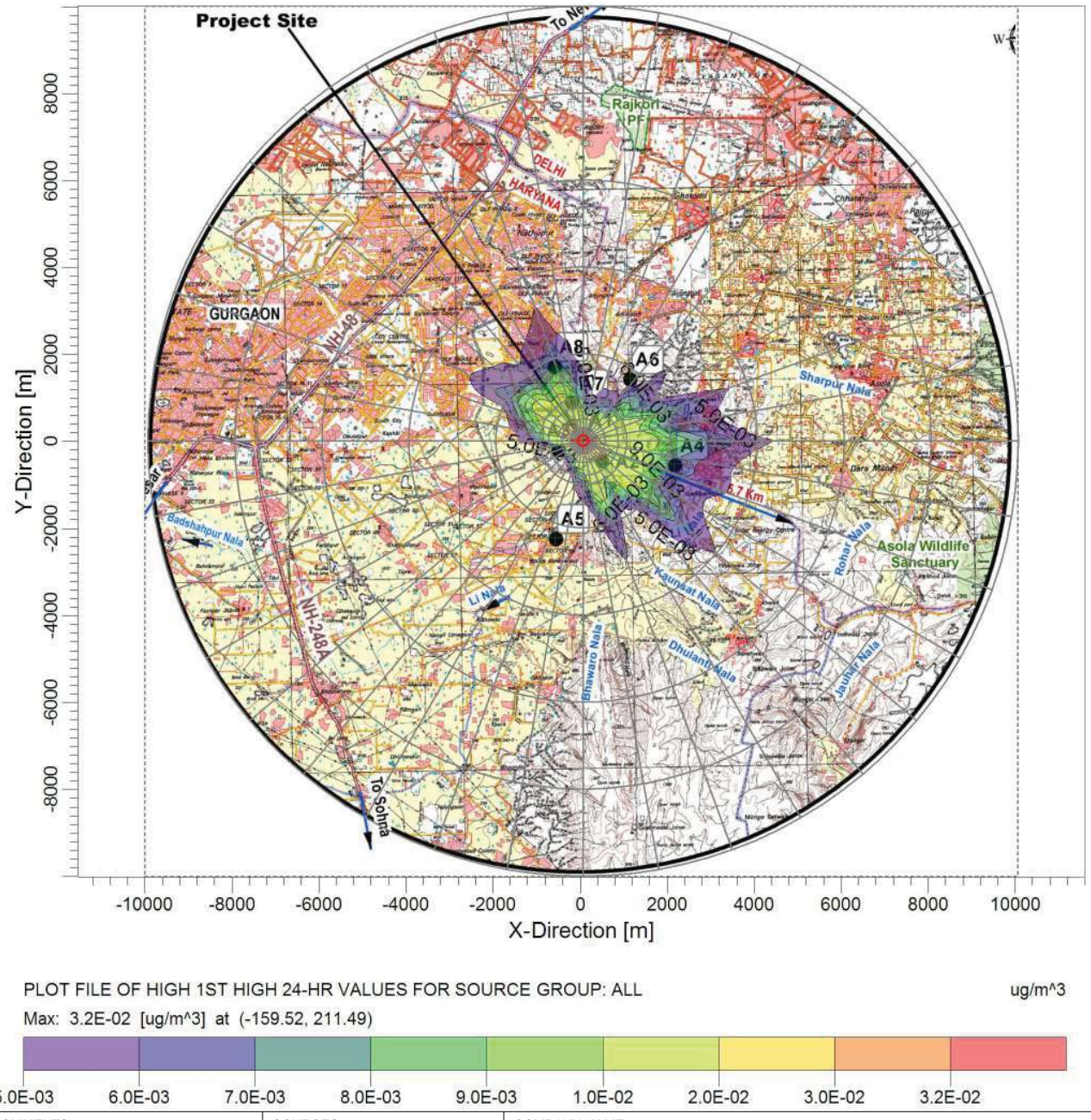
Max: 0.680 [ug/m^3] at (-159.52, 211.49)

0.040 0.050 0.060 0.080 0.090 0.100 0.200 0.300 0.500 0.600 0.680

COMMENTS:	SOURCES: **6**	COMPANY NAME: **Vardan Environet**	
	RECEPTORS: **368**	MODELER: **Surbhi Makwana**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:145,592 (0 — 5 km)	
	MAX: **0.680 ug/m^3**		PROJECT NO.:

PROJECT TITLE:

Proposed Group Housing Buildings,By M/s DLF Ltd
Isopleth of CO



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

Max: 3.2E-02 [ug/m^3] at (-159.52, 211.49)

5.0E-03 6.0E-03 7.0E-03 8.0E-03 9.0E-03 1.0E-02 2.0E-02 3.0E-02 3.2E-02

COMMENTS:	SOURCES: **6**	COMPANY NAME: **Vardan Environet**	
	RECEPTORS: **368**	MODELER: **Surbhi Makwana**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:145,592 0 5 km	
	MAX: **3.2E-02 ug/m^3**		PROJECT NO.:

AERMOD View - Lakes Environmental Software D:\Vardan AQ\DLF Ltd Housing colony in Zone\AERMOD\CO\AERMOD.isc

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/DLF/AA/01	**Report No:**	VEL/AA/001-027
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Reporting Date:**	03/03/2022
		Ref. No:	NIL
		Monitoring Period:	Dec 2021 to Feb 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	**Parameter Required:**	As per TOR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Project Site (A1)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m3)
01.12.2021	128.6	70.2	25.6	9.6	0.9
02.12.2021	125.2	68.2	23.2	8.2	0.88
08.12.2021	127.3	69.0	21.0	8.6	0.86
09.12.2021	135.0	74.0	25.2	12.8	1.20
15.12.2021	131.9	71.9	29.9	10.9	0.98
16.12.2021	127.7	69.7	26.1	8.7	0.87
22.12.2021	130.8	70.8	28.2	10.8	0.97
23.12.2021	131.6	71.6	29.3	10.6	0.93
29.12.2021	127.5	69.5	26.5	8.5	0.85
30.12.2021	132.3	72.3	29.6	11.3	1.10
05.01.2022	126.3	68.8	25.8	8.3	0.86
06.01.2022	128.4	69.2	23.2	9.4	0.93
12.01.2022	134.3	73.7	28.3	12.3	1.17
13.01.2022	130.1	70.1	27.0	10.1	0.99
19.01.2022	126.1	68.6	21.8	8.8	0.85
20.01.2022	129.3	69.9	26.9	9.9	0.91
26.01.2022	127.1	68.1	29.7	8.4	0.92
27.01.2022	125.3	67.2	27.2	8.1	0.95
02.02.2022	133.7	73.2	28.3	11.7	1.15
03.02.2022	130.3	70.3	27.3	10.3	1.04
09.02.2022	125.0	68.0	24.0	8.0	0.83

(Checked By) Kushal Sharma

(Approved By) Gaurav Pratap Singh

VARDAN ENVIROLAB GURUGRAM Authorised Signatory

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Report No:	VEL/AA/001-027				
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m3)
10.02.2022	132.2	72.2	27.2	11.2	1.09
16.02.2022	126.3	68.3	23.3	8.3	0.86
17.02.2022	131.2	71.2	26.5	10.5	0.94
23.02.2022	128.8	70.1	24.8	9.5	0.89
24.02.2022	134.7	73.7	29.7	12.5	1.19
28.02.2022	130.2	70.2	26.2	10.2	0.96

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

@ National Ambient Air Quality Standards.

VARDAN ENVIROLAB * GURUGRAM *

(Checked By)

VARDAN ENVIROLAB * Authorised Signatory *

(Approved By)

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/DLF/AA/02	**Report No:**	VEL/AA/028-054
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Reporting Date:**	03/03/2022
		Ref. No:	NIL
		Monitoring Period:	Dec 2021 to Feb 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	**Parameter Required:**	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Open Scrub Near Dlf Phase 5 (A2)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
01.12.2021	112.8	65.5	24.8	8.2	0.85
02.12.2021	117.5	67.6	25.5	8.7	0.83
08.12.2021	110.1	65.0	23.2	7.0	0.84
09.12.2021	109.2	64.1	21.8	8.5	0.81
15.12.2021	107.1	63.0	22.3	7.1	0.80
16.12.2021	105.9	62.5	23.0	8.9	0.65
22.12.2021	109.5	64.3	21.2	7.5	0.68
23.12.2021	111.7	62.7	24.7	7.1	0.61
29.12.2021	113.7	65.7	22.8	8.2	0.76
30.12.2021	115.1	66.5	20.0	8.0	0.69
05.01.2022	118.0	68.0	21.6	9.0	0.92
06.01.2022	106.3	62.7	23.3	7.3	0.63
12.01.2022	111.8	64.9	21.0	8.1	0.86
13.01.2022	114.2	66.1	20.9	8.3	0.84
19.01.2022	112.4	65.2	24.2	7.4	0.62
20.01.2022	110.6	64.3	25.0	8.2	0.88
26.01.2022	116.2	67.2	23.8	8.6	0.81
27.01.2022	108.3	63.5	22.7	8.8	0.68
02.02.2022	105.1	62.0	20.2	8.5	0.79
03.02.2022	114.5	66.3	23.6	8.4	0.64
09.02.2022	106.6	62.9	25.2	8.3	0.87

VARDAN ENVIROLAB GURUGRAM 02/03/22

(Checked By)
Kushal Sharma

VARDAN ENVIROLAB Pradip Singh Authorised Signatory

(Approved By)

VEL/E/1/TR/PN39209

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardan.co.in, bd@vardan.co.in

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Report No:	VEL/AA/028-054				
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
10.02.2022	113.9	65.9	23.5	7.0	0.60
16.02.2022	115.7	66.7	20.6	7.2	0.63
17.02.2022	112.1	65.4	22.5	6.1	0.67
23.02.2022	108.7	63.7	25.4	6.7	0.69
24.02.2022	110.4	64.1	21.3	7.5	0.73
28.02.2022	106.4	63.7	23.7	6.4	0.64

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

@ National Ambient Air Quality Standards.

(Checked By) Kushal Sharma

(Approved By) Gaurav Pratap Singh, Authorised Signatory

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/DLF/AA/03	**Report No:**	VEL/AA/055-081
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Reporting Date:**	03/03/2022
		Ref. No:	NIL
		Monitoring Period:	Dec 2021 to Feb 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	**Parameter Required:**	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Near Emaar The Palm Spring (A3)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
01.12.2021	126.6	68.6	26.6	8.9	0.91
02.12.2021	124.6	67.6	24.5	7.9	0.87
08.12.2021	125.2	68.1	26.1	8.4	0.89
09.12.2021	124.8	67.8	24.8	7.8	0.78
15.12.2021	128.4	70.4	27.2	9.7	0.92
16.12.2021	120.2	66.2	24.2	6.9	0.80
22.12.2021	125.4	68.3	28.3	8.3	0.97
23.12.2021	123.9	67.9	25.9	7.1	0.83
29.12.2021	121.5	66.4	27.3	7.0	0.84
30.12.2021	124.1	67.1	26.2	7.7	0.75
05.01.2022	126.2	68.5	25.2	8.8	0.94
06.01.2022	127.9	69.9	24.9	9.5	0.77
12.01.2022	120.5	66.5	26.5	6.8	0.82
13.01.2022	129.8	71.8	28.2	10.0	0.79
19.01.2022	130.0	72.0	29.0	10.5	1.03
20.01.2022	128.6	70.6	27.8	9.9	0.89
26.01.2022	123.8	67.7	25.3	7.2	0.79
27.01.2022	120.8	66.8	26.0	6.7	0.81
02.02.2022	130.1	72.1	24.3	10.4	1.06
03.02.2022	123.4	67.2	26.8	7.3	0.88
09.02.2022	128.2	70.2	27.5	9.8	0.78

(Checked By) Kushal Sharma

(Approved By) Pritap Singh

VARDAN ENVIROLAB * GURUGRAM * Authorised Signatory

VEL/E/1/TR/PN39211

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Report No:	VEL/AA/055-081				
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
10.02.2022	129.5	71.5	28.5	10.1	0.83
16.02.2022	124.5	67.5	27.0	7.5	0.86
17.02.2022	127.2	69.2	25.9	9.4	0.93
23.02.2022	121.2	66.2	28.6	7.2	0.90
24.02.2022	123.5	67.6	26.5	7.4	0.85
28.02.2022	126.3	69.0	25.1	8.6	0.76

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
@	--	100	60	80	80	4

@ National Ambient Air Quality Standards.

VARDAN ENVIROLAB GURUGRAM
(Checked By: Kushal Sharma)

VARDAN ENVIROLAB Gaurav Pratap Singh Authorised Signatory
(Approved By:)

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/DLF/AA/04	**Report No:**	VEL/AA/082-107
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Reporting Date:**	03/03/2022
		Ref. No:	NIL
		Monitoring Period:	Dec 2021 to Feb 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	**Parameter Required:**	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Near Gwalpahari (A4)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
03.12.2021	114.7	65.7	26.7	7.4	0.64
04.12.2021	112.3	64.7	24.2	7.2	0.72
10.12.2021	115.1	66.1	26.1	6.4	0.57
11.12.2021	117.3	67.3	27.4	6.2	0.65
17.12.2021	115.2	66.2	26.8	7.5	0.75
18.12.2021	120.4	69.4	27.6	7.9	0.83
24.12.2021	114.5	65.6	26.5	6.4	0.66
25.12.2021	116.9	66.9	26.7	6.6	0.86
31.12.2021	118.1	68.1	26.9	6.8	0.58
01.01.2022	115.5	66.5	27.0	6.5	0.65
07.01.2022	111.4	68.9	25.7	7.1	0.76
08.01.2022	116.7	66.7	26.6	6.6	0.56
14.01.2022	112.1	64.5	24.3	6.2	0.62
15.01.2022	120.0	69.0	27.9	8.0	0.80
21.01.2022	111.5	64.0	27.3	6.1	0.59
22.01.2022	113.3	65.1	25.9	6.3	0.85
28.01.2022	112.9	64.9	24.3	6.2	0.72
29.01.2022	111.7	68.7	23.0	7.8	0.68
04.02.2022	110.0	64.3	22.2	7.0	0.60
05.02.2022	113.8	65.4	25.9	6.7	0.69

(Checked By)
VARDAN ENVIROLAB GURUGRAM Kushal Sharma

(Approved By)
VARDAN ENVIROLAB Sanjay Pratap Singh Authorised Signatory

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Report No:	VEL/AA/082-107				
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
11.02.2022	98.9	52.8	21.8	5.9	0.71
12.02.2022	117.6	67.6	26.6	6.1	0.71
18.02.2022	118.4	68.4	26.4	6.4	0.55
19.02.2022	114.1	65.5	25.0	6.3	0.67
25.02.2022	110.1	64.1	25.3	6.0	0.70
26.02.2022	113.4	65.3	26.5	6.4	0.63

Limit as per NAAQS*	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

*National Ambient Air Quality Standards.

VARDAN ENVIROLAB Kushal Sharma (Checked By)

VARDAN ENVIROLAB Gaurav Pratap Singh (Approved By) Authorised Signatory

VEL/E/I/TR/PN39214

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/DLF/AA/05	**Report No:**	VEL/AA/108-133
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Reporting Date:**	03/03/2022
		Ref. No:	NIL
		Monitoring Period:	Dec 2021 to Feb 2022
		Equipment Used:	RDS & FPS with all accessories
Sample Collected By:	Vardan Envirolab Representative	**Protocol Used:**	IS-5182
Sample Description:	Ambient Air Quality Monitoring	**Parameter Required:**	As per ToR Letter
Location:	Sector 54 (A5)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
03.12.2021	140.4	75.4	30.4	12.6	0.95
04.12.2021	135.8	72.8	25.8	10.8	1.02
10.12.2021	132.3	71.3	26.3	8.9	0.97
11.12.2021	134.2	72.4	29.0	9.7	0.82
17.12.2021	138.4	74.5	28.4	11.4	0.86
18.12.2021	135.7	73.5	29.7	10.7	0.84
24.12.2021	140.2	75.2	30.2	12.9	1.10
25.12.2021	138.7	74.7	28.7	11.7	0.99
31.12.2021	132.6	71.6	26.6	8.6	0.91
01.01.2022	135.5	73.3	27.5	10.5	0.85
07.01.2022	131.1	71.1	25.1	8.5	0.94
08.01.2022	134.8	72.8	26.2	9.8	0.90
14.01.2022	137.0	73.0	27.4	10.1	1.03
15.01.2022	139.2	74.2	29.2	12.0	1.05
21.01.2022	140.0	75.0	30.0	12.5	0.87
22.01.2022	136.9	73.8	27.9	10.0	0.93
28.01.2022	138.6	74.6	28.6	11.6	0.98
29.01.2022	134.0	72.0	29.4	9.6	0.94
04.02.2022	137.2	73.2	26.4	10.9	0.83
05.02.2022	131.8	71.8	25.2	8.4	0.82

(Checked By) Kushal Sharma

(Approved By) Pratap Singh

VARDAN ENVIROLAB GURUGRAM * Authorised Signatory *

VEL/E/1/TR/PM39215

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Report No:	VEL/AA/108-133				
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
11.02.2022	136.6	73.7	27.6	10.5	0.88
12.02.2022	130.0	70.0	25.0	8.3	0.92
18.02.2022	132.8	71.9	26.2	8.8	0.89
19.02.2022	135.4	73.2	27.1	10.3	0.92
25.02.2022	138.0	74.0	28.0	11.9	0.86
26.02.2022	140.5	75.5	30.5	12.7	0.80

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

@ National Ambient Air Quality Standards.

VARDAN ENVIROLAB GURUGRAM — Checked By: Kushal Sharma

VARDAN ENVIROLAB — Authorised Signatory

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/DLF/AA/06	Report No:	VEL/AA/134-159
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	Reporting Date:	03/03/2022
		Ref. No:	NIL
		Monitoring Period:	Dec 2021 to Feb 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	Parameter Required:	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Near Arjungarh (A6)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
03.12.2021	115.5	65.3	25.7	6.5	0.75
04.12.2021	121.7	67.7	23.2	5.6	0.71
10.12.2021	122.3	68.8	25.1	7.1	0.62
11.12.2021	118.4	66.5	26.4	6.9	0.78
17.12.2021	124.8	69.8	25.8	5.9	0.68
18.12.2021	115.8	65.8	27.3	7.8	0.65
24.12.2021	123.8	69.5	25.5	5.4	0.63
25.12.2021	122.4	68.9	26.2	6.5	0.72
31.12.2021	115.8	65.4	27.1	7.5	0.55
01.01.2022	118.5	66.7	26.0	6.7	0.58
07.01.2022	124.9	69.9	24.7	5.5	0.74
08.01.2022	119.4	67.2	25.6	6.4	0.66
14.01.2022	116.9	65.9	23.3	5.7	0.56
15.01.2022	119.7	67.3	27.0	7.7	0.59
21.01.2022	121.5	68.3	25.3	5.4	0.41
22.01.2022	120.4	67.5	25.9	7.4	0.70
28.01.2022	122.7	68.7	25.0	7.2	0.61
29.01.2022	125.2	70.2	26.5	6.7	0.85
04.02.2022	117.1	66.0	24.2	6.6	0.57
05.02.2022	124.3	69.7	25.9	6.8	0.64

VARDAN ENVIROLAB GURUGRAM (Checked By) Vishal Sharma

VARDAN ENVIROLAB Authorised Signatory (Approved By) Pratap Singh

VEL/E/1/TR/PN39217

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Report No:	VEL/AA/134-159				
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
11.02.2022	121.2	68.1	20.8	5.1	0.60
12.02.2022	120.8	67.8	26.7	6.8	0.67
18.02.2022	123.5	69.2	25.4	7.4	0.77
19.02.2022	119.2	67.0	27.3	5.3	0.69
25.02.2022	117.4	66.1	24.3	6.2	0.73
26.02.2022	115.6	65.5	26.4	6.3	0.65

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

@ National Ambient Air Quality Standards.

(Checked By)

(Approved Signatory)

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/DLF/AA/07	**Report No:**	VEL/AA/160-184
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Reporting Date:**	03/03/2022
		Ref. No:	NIL
		Monitoring Period:	Dec 2021 to Feb 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	**Parameter Required:**	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Near Dlf Phase 5 (A7)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
06.12.2021	87.2	49.7	21.2	5.0	0.62
07.12.2021	95.5	57.5	20.8	6.7	0.59
13.12.2021	90.4	52.4	22.7	5.6	0.57
14.12.2021	88.7	49.7	21.4	5.7	0.64
20.12.2021	91.3	53.8	20.1	6.3	0.50
21.12.2021	88.6	48.8	23.1	5.5	0.54
27.12.2021	93.4	51.0	22.7	6.4	0.61
28.12.2021	88.2	48.4	21.0	5.4	0.56
03.01.2022	89.1	51.9	20.0	5.7	0.65
04.01.2022	91.9	52.0	22.4	6.2	0.63
10.01.2022	87.1	46.3	20.9	5.6	0.58
11.01.2022	94.5	52.6	23.9	6.6	0.59
17.01.2022	93.4	54.4	25.7	6.5	0.61
18.01.2022	85.8	46.2	21.6	5.1	0.52
24.01.2022	91.2	52.1	24.8	6.1	0.53
25.01.2022	89.7	50.8	25.0	6.4	0.57
31.01.2022	85.4	46.9	21.7	5.2	0.58
01.02.2022	87.3	48.3	20.3	5.7	0.55
07.02.2022	95.6	56.1	23.2	6.8	0.53
08.02.2022	91.8	51.8	21.7	6.0	0.51
14.02.2022	85.5	47.6	17.3	5.3	0.52
15.02.2022	89.1	50.0	25.2	6.3	0.57

VARDAN ENVIROLAB GURUGRAM (Checked By) Kushal Sharma 3/03/22

VARDAN ENVIROLAB Authorised Signatory (Approved By) Pratap Singh

VEL/E/1/TR/PN39219

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Report No:					VEL/AA/160-184
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
21.02.2022	86.5	47.9	24.4	5.4	0.53
22.02.2022	89.6	50.7	23.3	6.5	0.55
28.02.2022	90.7	51.1	21.2	6.7	0.56

Limit as per NAAQS@	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

@ National Ambient Air Quality Standards.

VARDAN ENVIROLAB GURUGRAM (Checked By) Kushal Sharma 03/03/22

VARDAN ENVIROLAB Gaurav Approved By Authorised Signatory

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/DLF/AA/08	**Report No:**	VEL/AA/185-209
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Reporting Date:**	03/03/2022
		Ref. No:	NIL
		Monitoring Period:	Dec 2021 to Feb 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	**Parameter Required:**	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Near Qutab Plaza (A8)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
06.12.2021	90.5	51.5	25.0	14.5	0.73
07.12.2021	95.4	56.2	22.4	15.7	0.60
13.12.2021	96.3	57.3	23.6	15.6	0.53
14.12.2021	93.5	54.2	21.2	18.4	0.59
20.12.2021	97.2	58.2	24.2	15.2	0.74
21.12.2021	98.2	59.4	26.1	16.1	0.75
27.12.2021	95.4	56.3	22.4	15.7	0.63
28.12.2021	93.3	54.3	21.3	18.2	0.59
03.01.2022	96.3	57.2	23.7	17.2	0.65
04.01.2022	94.2	55.1	21.6	16.3	0.61
10.01.2022	90.6	51.5	25.6	14.5	0.73
11.01.2022	94.3	55.3	21.1	17.4	0.66
17.01.2022	96.2	57.1	23.6	14.6	0.59
18.01.2022	95.4	56.4	22.2	15.2	0.71
24.01.2022	94.2	55.2	21.2	19.3	0.64
25.01.2022	91.3	52.3	20.9	14.1	0.66
31.01.2022	96.1	57.1	23.2	18.2	0.62
01.02.2022	98.4	59.5	26.3	16.5	0.64
07.02.2022	90.1	51.1	25.1	19.4	0.69
08.02.2022	95.3	56.2	22.3	17.5	0.66
14.02.2022	91.2	52.2	20.3	15.7	0.57
15.02.2022	88.8	49.8	18.8	14.8	0.69

VARDAN ENVIROLAB GURUGRAM
(Checked By) Kushal Sharma

VARDAN ENVIROLAB Authorised Signatory
(Approved By) Gaurav Pratap Singh

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Report No:					VEL/AA/185-209
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
21.02.2022	96.3	57.2	23.4	18.3	0.58
22.02.2022	89.1	50.2	24.7	14.1	0.73
28.02.2022	91.5	52.1	20.3	18.3	0.66

Limit as per NAAQS*	Parameter	PM10 ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

*National Ambient Air Quality Standards.

VARDAN ENVIROLAB GURUGRAM

VARDAN ENVIROLAB Gaurav Pratap Singh (Approved By) Authorised Signatory

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/01	**Report No.:**	VEL/W/2203/23/001
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Tap Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sample Location:	Dlf Phase 5 (GW1)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Sampling and Analysis Protocol:	IS 3025 APHA & 23rd Edition 2017	**Sampling Quantity:**	5.0 Ltr + 250ml
Preservation:	Ice Box	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H^+ B Electrometric Method	7.87	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	1.0	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	661.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	211.12	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	313.10	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl B, Argentometric Method	210.02	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	32.62	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	891.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	157.00	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.92	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	33.21	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.56	mg/l	1.0	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

VARDAN ENVIROLAB GURUGRAM (Checked By) Vishal Sharma

VARDAN ENVIROLAB (Approved By) Pratap Singh Authorised Signatory

VEL/E/1/TR/PN39223

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/01			Report No.: VEL/W/2203/23/001			
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1371	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	1.0	No Relaxation
23.	Anionic Detergents as MBAS	Annex K of IS 13428, IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	2.33	mg/l	5	15
25.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.42	mg/l	0.05	1.5
26.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622:1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622:1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

(Checked By) VARDAN ENVIROLAB GURUGRAM Kushal Sharma

(Approved By) VARDAN ENVIROLAB Authorised Signatory

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/02	**Report No.:**	VEL/W/2203/23/002
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Supply Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sample Location:	Village Wazirabad (GW2)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Sampling and Analysis Protocol:	IS 3025 APHA & 23rd Edition 2017	**Sampling Quantity:**	5.0 Ltr + 250ml
Preservation:	Ice Box	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H^+ B Electrometric Method	7.79	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	1.0	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	642.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	198.22	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	307.00	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	217.52	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN^- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	35.83	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	867.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	140.00	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.75	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	30.47	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.48	mg/l	1.0	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Checked By) Kushal Sharma

(Authorised By) Pratap Singh

® Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/02 | Report No.: VEL/W/2203/23/002

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500-2012 Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1334	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	1.0	No Relaxation
23.	Anionic Detergents as MBAS	Annex K of IS 13428, IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	2.19	mg/l	5	15
25.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.38	mg/l	0.05	1.5
26.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622.1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622.1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

VARDAN ENVIROLAB GURUGRAM

(Checked By)

VARDAN ENVIROLAB Authorised Signatory

Gaurav Pratap Singh

(Approved By)

VEL/E/I/TR/PN39226

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/03	**Report No.:**	VEL/W/2203/23/003
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Supply Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sample Location:	Near Dlf Phase 5 (GW3)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Sampling and Analysis Protocol:	IS 3025 APHA & 23rd Edition 2017	**Sampling Quantity:**	5.0 Ltr + 250ml
Preservation:	Ice Box	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H+ B Electrometric Method	7.72	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B, Visual Comparison Method	1.0	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B , Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA . 2340 C. EDTA Titrimetric Method	617.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B, EDTA Titrimetric Method	195.57	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA . 2320 B, Titrimetric Method	298.00	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl- B, Argentometric Method	203.23	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B, Calculation Method	31.36	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C, Gravimetric Method	826.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA . 4500 E, Turbidimetric Method	132.18	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F- D, SPADNS Method	0.69	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) .Chromotropic Method	27.46	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.33	mg/l	1.0	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4
19.	Chromium as	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Checked By) Shalini Sharma

(Approved By) Gaurav Pratap Singh

VEL/E/1/TR/PN39227

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/03 — Report No: VEL/W/2203/23/003

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012 Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1270	μS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	1.0	No Relaxation
23.	Anionic Detergents as MBAS	Annex K of IS 13428, IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	1.96	mg/l	5	15
25.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.31	mg/l	0.05	1.5
26.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622.1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL-Below Detection Limit, **DL- Detection Limit

(Checked by) Kushal Sharma — VARDAN ENVIROLAB GURUGRAM

(Approved by) Gaurav Pratap Singh — VARDAN ENVIROLAB Authorised Signatory

VEL/E/I/TR/PN39228

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/04	**Report No.:**	VEL/W/2203/23/004
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Supply Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sample Location:	Near Arjungarh (GW4)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Sampling and Analysis Protocol:	IS 3025 APHA & 23rd Edition 2017	**Sampling Quantity:**	5.0 Ltr + 250ml
Preservation:	Ice Box	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.69	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	1.0	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	597.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	192.87	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	294.00	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	194.58	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	28.14	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	775.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	110.25	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.65	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	27.12	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.28	mg/l	1.0	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Checked By) Kushal Sharma

VARDAN ENVIROLAB GURUGRAM

(Approved By) Gaurav Pratap Singh

VARDAN ENVIROLAB Authorised Signatory

VEL/E//TR/PN39229

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/04			Report No.: VEL/W/2203/23/004			
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1193	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	1.0	No Relaxation
23.	Anionic Detergents as MBAS	Annex K of IS 13428, IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	1.88	mg/l	5	15
25.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.19	mg/l	0.05	1.5
26.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622.1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622.1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

VARDAN ENVIROLAB GURUGRAM (Checked By) Kushal Sharma

VARDAN ENVIROLAB Authorised Signatory (Approved By) Gaurav Pratap Singh

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/05	Report No.:	VEL/W/2203/23/005
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Tap Water Sample	Period of Analysis:	23/03/2022-28/03/2022
Sample Location:	Near Gwalpahari (GW5)	Receipt Date:	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	22/03/2022
Sampling and Analysis Protocol:	IS 3025 APHA & 23rd Edition 2017	Sampling Quantity:	5.0 Ltr + 250ml
Preservation:	Ice Box	Sampling Type:	Grab

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012 Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.64	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	1.0	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	582.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	184.27	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	276.00	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl⁻ B, Argentometric Method	190.90	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN⁻ D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	29.71	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	753.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	109.22	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F⁻D, SPADNS Method	0.61	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	30.99	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.42	mg/l	1.0	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Checked By) Rajani Sharma

(Approved By) Pratap Singh
Authorised Signatory

VEL/E/I/TR/PN39231

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/05			Report No.: VEL/W/2203/23/005			
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1158	µS/cm	-	
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	1.0	No Relaxation
23.	Anionic Detergents as MBAS	Annex K of IS 13428, IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	1.94	mg/l	5	15
25.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.17	mg/l	0.05	1.5
26.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622.1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622.1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: -*BDL-Below Detection Limit, **DL- Detection Limit

(Checked By) Kushal Sharma

(Approved By) Pratap Singh, Authorised Signatory

VEL/E71/TR/PN39232

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/06	**Report No.:**	VEL/W/2203/23/006
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Supply Tap Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sample Location:	Sector 55 (GW6)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	22/03/2022
Sampling and Analysis Protocol:	IS 3025 APHA & 23rd Edition 2017	**Sampling Quantity:**	5.0 Ltr + 250 ml
Preservation:	Ice Box	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.59	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	1.0	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA . 2340 C. EDTA Titrimetric Method	546.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B. EDTA Titrimetric Method	180.69	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA . 2320 B. Titrimetric Method	270.00	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl- B. Argentometric Method	174.25	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	23.13	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	715.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA . 4500 E. Turbidimetric Method	106.58	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.53	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	24.63	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.26	mg/l	1.0	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Checked By: Rushal Sharma)

Approved By: Gaurav Pratap Singh, Authorised Signatory

VEL/E/1/TR/PN39233

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/06			Report No.: VEL/W/2203/23/006			
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1100	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	1.0	No Relaxation
23.	Anionic Detergents as MBAS	Annex K of IS 13428, IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	1.79	mg/l	5	15
25.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.11	mg/l	0.05	1.5
26.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

(Checked By) Kushal Sharma

(Approved By) Pratap Singh
Authorised Signatory

VEL/E//TR/PN39234

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/07	**Report No.:**	VEL/W/2203/23/007
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Supply Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sample Location:	Village Qadirpur (GW7)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	22/03/2022
Sampling and Analysis Protocol:	IS 3025 APHA & 23rd Edition 2017	**Sampling Quantity:**	5.0 Ltr + 250ml
Preservation:	Ice Box	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.55	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	1.0	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	520.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	160.41	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	259.00	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	164.19	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	29.11	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	677.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	102.55	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.48	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	20.78	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.29	mg/l	1.0	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

VARDAN ENVIROLAB * GURUGRAM * (Checked By) Kushal Sharma

VARDAN ENVIROLAB * Authorised Signatory * (Approved By) Pratap Singh

VEL/E/1/TR/PN39235

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/07 — Report No.: VEL/W/2203/23/007

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1042	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	1.0	No Relaxation
23.	Anionic Detergents as MBAS	Annex K of IS 13428, IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	1.54	mg/l	5	15
25.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.14	mg/l	0.05	1.5
26.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL-Below Detection Limit, **DL- Detection Limit

VARDAN ENVIROLAB GURUGRAM (Checked By) Komal Sharma 23/7/22

VARDAN ENVIROLAB Gaurav Authorised Signatory

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/08	Report No.:	VEL/W/2203/23/008
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Tap Water Sample	Period of Analysis:	23/03/2022-28/03/2022
Sample Location:	Village Bandhwari (GW8)	Receipt Date:	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	22/03/2022
Sampling and Analysis Protocol:	IS 3025 APHA & 23rd Edition 2017	Sampling Quantity:	5.0 Ltr + 250ml
Preservation:	Ice Box	Sampling Type:	Grab

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS: 10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H⁺ B Electrometric Method	7.50	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	1.0	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	500.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	150.11	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	250.00	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl⁻ B, Argentometric Method	157.47	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN⁻ D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	30.49	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	659.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	100.10	mg/l	200	400
14.	Fluoride as F	APHA ,4500-F⁻ D, SPADNS Method	0.41	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	28.79	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.21	mg/l	1.0	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Checked By) Kushal Sharma

(Approved By) Pratap Singh, Authorised Signatory

VEL/E/I/TR/PN39237

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/08			Report No.: VEL/W/2203/23/008			
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1014	µS/cm	-	-
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	1.0	No Relaxation
23.	Anionic Detergents as MBAS	Annex K of IS 13428, IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	1.12	mg/l	5	15
25.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.10	mg/l	0.05	1.5
26.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622:1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622:1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

VARDAN ENVIROLAB GURUGRAM — Checked by: Shubham Sharma 9-3-22

VARDAN ENVIROLAB — Authorised Signatory

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/09	**Report No.:**	VEL/W/2203/23/009
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Surface Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sampling Location:	Pond Near Central Plaza Mall (SW1)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Preservation:	Ice Box	**Sampling Quantity:**	5.0 Ltr + 250ml
Sampling and Analysis Protocol:	IS 3025 & APHA 23rd Edition 2017	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.78	--
2.	Colour	APHA .2120 B, Visual Comparison Method	6.0	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	23.00	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	761.82	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	229.51	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	541.70	mg/l
8.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	314.82	mg/l
9.	Residual free Chlorine	APHA, 4500 Cl B Iodometric Method	*BDL(**DL 0.15mg/l)	mg/l
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	45.97	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1339.00	mg/l
13.	Total Suspended solids	APHA,2540 D Gravimetric Method	52.00	mg/l
14.	Dissolved Oxygen	APHA,4500 O B Iodometric Method	6.2	mg/l
15.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	188.00	mg/l
16.	*Fluoride as F*	*APHA , 4500-F- D, SPADNS Method*	0.25	mg/l
17.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025.P-44	14.00	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	48.00	mg/l

(Checked By) Kushal Sharma

(Approved By) Pratap Singh

VARDAN ENVIROLAB GURUGRAM

VARDAN ENVIROLAB Authorised Signatory

VEL/E/1/TR/PN39239

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/09				Report No.: VEL/W/2203/23/009
S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	2.06	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	34.56	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	195.00	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	6.3	mg/l
23.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.34	mg/l
24.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	IS 3025 (P-65):2014(RA:2019)	0.31	mg/l
26.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004mg/l)	mg/l
28.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	2.31	mg/l
31.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.48	mg/l
32.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622,1981, RA-2019	1600	MPN/100ml
35.	Fecal Coliform	IS 1622,1981, RA-2019	900	MPN/100ml

Note: -#These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit, **DL- Detection Limit

(Checked By: Kushal Sharma)

VARDAN ENVIROLAB GURUGRAM

(Approved By: Gaurav Pratap Singh)

VARDAN ENVIROLAB Authorised Signatory

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/10	**Report No.:**	VEL/W/2203/23/010
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Surface Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sampling Location:	Pond Near Mandi Village (SW2)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Preservation:	Ice Box	**Sampling Quantity:**	5.0 Ltr + 250ml
Sampling and Analysis Protocol:	IS 3025 & APHA 23rd Edition 2017	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H^+ B Electrometric Method	7.81	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	6.0	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	25.00	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	711.52	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	214.42	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	538.00	mg/l
8.	Chloride as Cl	APHA, 4500-Cl B, Argentometric Method	321.51	mg/l
9.	Residual free Chlorine	APHA, 4500 Cl B Iodometric Method	*BDL(**DL 0.15mg/l)	mg/l
10.	#Cyanide as CN	APHA , 4500 CN^- D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	42.90	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1352.00	mg/l
13.	Total Suspended solids	APHA,2540 D Gravimetric Method	56.00	mg/l
14.	Dissolved Oxygen	APHA,4500 O B Iodometric Method	6.3	mg/l
15.	Sulphate as SO^{4}	APHA , 4500 E, Turbidimetric Method	185.00	mg/l
16.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.24	mg/l
17.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025 P-44	17.00	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	60.00	mg/l

(Checked By) Kushal Sharma

(Approved By) Gaurav Pratap Singh

VARDAN ENVIROLAB GURUGRAM

VARDAN ENVIROLAB Authorised Signatory

VEL/E/1/TR/PN3924/1

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/10 — Report No.: VEL/W/2203/23/010

S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	2.07	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	38.82	mg/l
21.	Sodium as Na	APHA.3500 Na B, Flame Photometric Method	220.00	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	6.2	mg/l
23.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.31	mg/l
24.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	IS 3025 (P-65):2014(RA:2019)	0.24	mg/l
26.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004mg/l)	mg/l
28.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	2.19	mg/l
31.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.41	mg/l
32.	Manganese as Mn	IS 3025 (P-65):2014(RA.2019)	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622.1981, RA-2019	1600	MPN/100ml
35.	Fecal Coliform	IS 1622.1981, RA-2019	900	MPN/100ml

Note: -#These parameters are not covered in our NABL scope.
*BDL-Below Detection Limit, **DL- Detection Limit

(Checked By) Kushal Sharma

VARDAN ENVIROLAB GURUGRAM

(Approved By) Gaurav Pratap Singh

VARDAN ENVIROLAB Authorised Signatory

VEL/E//TR/PN39242

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/11	**Report No.:**	VEL/W/2203/23/011
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Surface Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sampling Location:	Pond Near Sukhrali Village (SW3)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Preservation:	Ice Box	**Sampling Quantity:**	5.0 Ltr + 250ml
Sampling and Analysis Protocol:	IS 3025 & APHA 23rd Edition 2017	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.68	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	6.0	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	22.00	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	707.42	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	204.53	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	511.82	mg/l
8.	Chloride as Cl	APHA, 4500-Cl B, Argentometric Method	318.91	mg/l
9.	Residual free Chlorine	APHA, 4500 Cl B Iodometric Method	*BDL(**DL 0.15mg/l)	mg/l
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	47.90	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1300.00	mg/l
13.	Total Suspended solids	APHA.2540 D Gravimetric Method	48.00	mg/l
14.	Dissolved Oxygen	APHA,4500 O B Iodometric Method	6.6	mg/l
15.	Sulphate as SO_4^{-2}	APHA , 4500 E, Turbidimetric Method	179.00	mg/l
16.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.32	mg/l
17.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025.P-44	15.00	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	56.00	mg/l

(Checked By) Kushal Sharma

(Approved By) Pratap Singh
Authorised Signatory

VEL/E/1/TR/PN39243

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/11 — Report No.: VEL/W/2203/23/011

S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	2.00	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	31.41	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	145.00	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	6.0	mg/l
23.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.37	mg/l
24.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	IS 3025 (P-65):2014(RA:2019)	0.29	mg/l
26.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004mg/l)	mg/l
28.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	2.11	mg/l
31.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.38	mg/l
32.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622,1981, RA-2019	1600	MPN/100ml
35.	Fecal Coliform	IS 1622,1981, RA-2019	900	MPN/100ml

Note: -#These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit, **DL- Detection Limit

VARDAN ENVIROLAB GURUGRAM (Checked By) Kushal Sharma

VARDAN ENVIROLAB Authorised Signatory

VEL/E/1/TR/PN39244

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/12	**Report No.:**	VEL/W/2203/23/012
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Surface Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sampling Location:	Pond Near Ghitorni Village (SW4)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Preservation:	Ice Box	**Sampling Quantity:**	5.0 Ltr + 250ml
Sampling and Analysis Protocol:	IS 3025 & APHA 23rd Edition 2017	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.76	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	10.00	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	26.00	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	718.84	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	231.62	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	530.52	mg/l
8.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	320.21	mg/l
9.	Residual free Chlorine	APHA, 4500 Cl B Iodometric Method	*BDL(**DL 0.15mg/l)	mg/l
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	34.25	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1334.00	mg/l
13.	Total Suspended solids	APHA,2540 D Gravimetric Method	50.00	mg/l
14.	Dissolved Oxygen	APHA,4500 O B Iodometric Method	6.4	mg/l
15.	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	180.00	mg/l
16.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.25	mg/l
17.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025,P-44	13.00	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	46.00	mg/l

(Checked) Mohal Sharma

(Approved By) Gaurav Pratap Singh
Authorised Signatory

VEL/E/I/TR/PN39245

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/12				Report No.: VEL/W/2203/23/012
S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	2.05	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	33.24	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	210.00	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	8.3	mg/l
23.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.56	mg/l
24.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	IS 3025 (P-65):2014(RA:2019)	0.33	mg/l
26.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004mg/l)	mg/l
28.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	2.55	mg/l
31.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.49	mg/l
32.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622.1981, RA-2019	900	MPN/100ml
35.	Fecal Coliform	IS 1622,1981, RA-2019	500	MPN/100ml

Note: -#These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit, **DL- Detection Limit

VARDAN ENVIROLAB GURUGRAM (Checked By) Kushal Sharma 31/07

VARDAN ENVIROLAB (Approved By) Pratap Singh Authorised Signatory

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/13	**Report No.:**	VEL/W/2203/23/013
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Surface Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sampling Location:	Pond Near Dera Mandi Village (SW5)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Preservation:	Ice Box	**Sampling Quantity:**	5.0 Ltr + 250ml
Sampling and Analysis Protocol:	IS 3025 & APHA 23rd Edition 2017	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA .4500-H+ B Electrometric Method	7.60	--
2.	Colour	APHA .2120 B, Visual Comparison Method	3.0	Hazen
3.	Turbidity	APHA, 2130 B. Nephlelometric Method	28.00	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	721.24	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	232.52	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	538.41	mg/l
8.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	215.00	mg/l
9.	Residual free Chlorine	APHA, 4500 Cl B Iodometric Method	*BDL(**DL 0.15mg/l)	mg/l
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	34.29	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1170.00	mg/l
13.	Total Suspended solids	APHA,2540 D Gravimetric Method	60.00	mg/l
14.	Dissolved Oxygen	APHA,4500 O B Iodometric Method	5.8	mg/l
15.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	178.00	mg/l
16.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.26	mg/l
17.	BOD (3 Days at 27°C)	*APHA, 5210 C / IS 3025.P-44*	*12.00*	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	44.00	mg/l

(Checked By) Sharma

(Approved By) Pradeep Singh

Authorised Signatory

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/13 | Report No.: VEL/W/2203/23/013

S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1.80	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	36.51	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	145.00	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	5.6	mg/l
23.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.31	mg/l
24.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	IS 3025 (P-65):2014(RA:2019)	0.24	mg/l
26.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004mg/l)	mg/l
28.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	1.91	mg/l
31.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.28	mg/l
32.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622,1981, RA-2019	900	MPN/100ml
35.	Fecal Coliform	IS 1622,1981, RA-2019	500	MPN/100ml

Note: -#These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit, **DL- Detection Limit

(Checked By)

VARDAN ENVIROLAB GURUGRAM 23/12/22 Kushal Sharma

VARDAN ENVIROLAB Gaurav Pratap Singh (Approved By) Authorised Signatory

VEL/E/1/TR/PN39248

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/14	**Report No.:**	VEL/W/2203/23/014
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Surface Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sampling Location:	Pond Near Bhaundsi Village (SW6)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Preservation:	Ice Box	**Sampling Quantity:**	5.0 Ltr + 250ml .
Sampling and Analysis Protocol:	IS 3025 & APHA 23rd Edition 2017	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H^+ B Electrometric Method	7.58	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	6.0	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	20.00	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	689.00	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	204.20	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	516.00	mg/l
8.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	187.82	mg/l
9.	Residual free Chlorine	APHA, 4500 Cl B Iodometric Method	*BDL(**DL 0.15mg/l)	mg/l
10.	#Cyanide as CN	APHA , 4500 CN^- D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	43.62	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1063.00	mg/l
13.	Total Suspended solids	APHA,2540 D Gravimetric Method	47.00	mg/l
14.	Dissolved Oxygen	APHA,4500 O B Iodometric Method	6.3	mg/l
15.	Sulphate as SO^{-4}	APHA , 4500 E, Turbidimetric Method	160.35	mg/l
16.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.29	mg/l
17.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025.P-44	11.00	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	40.00	mg/l

VARDAN ENVIROLAB GURUGRAM

(Checked By)
Kushal Sharma

(Approved By)
Pratap Singh
Authorised Signatory

VEL/E/1/TR/PN39249

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/14				Report No.: VEL/W/2203/23/014
S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1.64	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ;Chromotropic Method	30.60	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	120.00	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	6.8	mg/l
23.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.32	mg/l
24.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	IS 3025 (P-65):2014(RA:2019)	0.18	mg/l
26.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004mg/l)	mg/l
28.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	1.75	mg/l
31.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.22	mg/l
32.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622,1981, RA-2019	1600	MPN/100ml
35.	Fecal Coliform	IS 1622,1981, RA-2019	900	MPN/100ml

Note: -#These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit, **DL- Detection Limit

Checked By

Gaurav (Authorised Signatory)

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/W/15	**Report No.:**	VEL/W/2203/23/015
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
Sample Description:	Surface Water Sample	**Period of Analysis:**	23/03/2022-28/03/2022
Sampling Location:	Pond Near Badshahpur (SW7)	**Receipt Date:**	23/03/2022
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	21/03/2022
Preservation:	Ice Box	**Sampling Quantity:**	5.0 Ltr + 250ml
Sampling and Analysis Protocol:	IS 3025 & APHA 23rd Edition 2017	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.52	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	10.00	Hazen
3.	Turbidity	APHA, 2130 B. Nephlelometric Method	32.00	NTU
4.	Odour	APHA, 2150 B . Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	658.21	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B. EDTA Titrimetric Method	189.62	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	495.52	mg/l
8.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	180.85	mg/l
9.	Residual free Chlorine	APHA, 4500 Cl B Iodometric Method	*BDL(**DL 0.15mg/l)	mg/l
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B. Calculation Method	44.98	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1029.00	mg/l
13.	Total Suspended solids	APHA,2540 D Gravimetric Method	68.00	mg/l
14.	Dissolved Oxygen	APHA,4500 O B Iodometric Method	6.2	mg/l
15.	Sulphate as SO_4^{2-}	APHA , 4500 E, Turbidimetric Method	154.00	mg/l
16.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.32	mg/l
17.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025.P-44	16.00	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	56.00	mg/l

VARDAN ENVIROLAB GURUGRAM (Compiled By) Kushal Sharma

VARDAN ENVIROLAB Gaurav Pratap Singh (Approved By) Authorised Signatory

VEL/E/I/TR/PN39251

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/DLF/W/15 | Report No.: VEL/W/2203/23/015

S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	1.58	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	29.24	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	117.00	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	16.3	mg/l
23.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.26	mg/l
24.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	IS 3025 (P-65):2014(RA:2019)	0.19	mg/l
26.	Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004mg/l)	mg/l
28.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	1.86	mg/l
31.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	0.37	mg/l
32.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622,1981, RA-2019	1600	MPN/100ml
35.	Fecal Coliform	IS 1622,1981, RA-2019	900	MPN/100ml

Note: -#These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit, **DL- Detection Limit

VARDAN ENVIROLAB * GURUGRAM * (Checked By) Kushal Sharma

VARDAN ENVIROLAB * Authorised Signatory * (Approved By) Pratap Singh

VEL/E//TR/PN39252

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/AN/01	**Report No.:**	VEL/AN/2203/21/001
Name & Address of Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	24/03/2022
		Receipt Date:	21/03/2022
Sample Description:	AMBIENT NOISE LEVEL MONITORING		

General Information:-

Sample collected by	: Vardan Envirolab Representative
Sampling Location	: **Project Site (N1)**
Instrument Used	: Sound Level Meter- 02
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 16/03/2022 To 17/03/2022
Time of Monitoring	: 06:00 AM to 06:00 AM
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS 9989:1986 (RA-2014) & CPCB Guidelines
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

RESULT

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989:1986 (RA-2014)	60.4	51.8	dB(A)
2.	L_{min}	IS 9989:1986 (RA-2014)	44.8	37.2	dB(A)
3.	L_{eq}	IS 9989:1986 (RA-2014)	52.97	41.82	dB(A)
4.	Limits in dB(*A) Leq (Residential Area)	-	55.0	45.0	dB(A)

Note:*The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E), dated 11.10.2002, under the Environment (Protection) Act, 1986.

(Checked By) Kushal Sharma

(Approved By) Gaurav Pratap Singh, Authorised Signatory

VEL/E/1/TR/PN30253

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/AN/02	**Report No.:**	VEL/AN/2203/21/002
Name & Address of Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	24/03/2022
		Receipt Date:	21/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	Open Scrub near Haiderpur (N2)
Instrument Used	:	Sound Level Meter- 03
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	16/03/2022 To 17/03/2022
Time of Monitoring	:	06:00 AM to 06:00 AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS 9989:1986 (RA-2014) & CPCB Guidelines
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

RESULT

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989:1986 (RA-2014)	62.7	51.2	dB(A)
2.	L_{min}	IS 9989:1986 (RA-2014)	46.2	37.1	dB(A)
3.	L_{eq}	IS 9989:1986 (RA-2014)	53.55	42.69	dB(A)
4.	Limits in dB(*A) Leq (Residential Area)	-	55.0	45.0	dB(A)

Note'*The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E), dated 11.10.2002, under the Environment (Protection) Act, 1986.

Checked By: Kushal Sharma

Approved By: Pradeep Singh

VEL/E/1/TR/PN39254

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/DLF/AN/03
Name & Address of Project: M/s DLF Ltd.
Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana

Report No.: VEL/AN/2203/21/003
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 24/03/2022
Receipt Date: 21/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	Near Emaar The Palm Spring (N3)
Instrument Used	:	Sound Level Meter- 04
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	16/03/2022 To 17/03/2022
Time of Monitoring	:	06:00 AM to 06:00 AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS 9989:1986 (RA-2014) & CPCB Guidelines
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

RESULT

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989:1986 (RA-2014)	63.4	50.3	dB(A)
2.	L_{min}	IS 9989:1986 (RA-2014)	43.5	36.2	dB(A)
3.	L_{eq}	IS 9989:1986 (RA-2014)	52.75	43.55	dB(A)
4.	Limits in dB(A) Leq (Residential Area)		55.0	45.0	dB(A)

Note*The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E), dated 11.10.2002, under the Environment (Protection) Act, 1986.

VARDAN ENVIROLAB GURUGRAM — Checked By: Kushal Sharma 24/03

VARDAN ENVIROLAB — Approved By: Authorised Signatory

VEL/E/1/TR/PN39255

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/AN/04	**Report No.:**	VEL/AN/2203/21/004
Name & Address of Project:	M/s DLF Ltd.	**Format No.:**	7.8 F-01
	Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Party Reference No.:**	NIL
		Reporting Date:	24/03/2022
		Receipt Date:	21/03/2022
Sample Description:	AMBIENT NOISE LEVEL MONITORING		

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	Near Gwalpahari (N4)
Instrument Used	:	Sound Level Meter- 02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	17/03/2022 To 18/03/2022
Time of Monitoring	:	06:00 AM to 06:00 AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS 9989:1986 (RA-2014) & CPCB Guidelines
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

RESULT

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989:1986 (RA-2014)	64.6	48.6	dB(A)
2.	L_{min}	IS 9989:1986 (RA-2014)	45.2	35.9	dB(A)
3.	L_{eq}	IS 9989:1986 (RA-2014)	51.96	41.93	dB(A)
4.	Limits in dB(A) Leq (Residential Area)	-	55.0	45.0	dB(A)

Note*The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E), dated 11.10.2002, under the Environment (Protection) Act, 1986.

(Checked By) Kushal Sharma

Gaurav Authorised Signatory

VEL/E/1/TR/PH39256

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/AN/05	**Report No.:**	VEL/AN/2203/21/005
Name & Address of Project:	M/s DLF Ltd.	**Format No.:**	7.8 F-01
	Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Party Reference No.:**	NIL
		Reporting Date:	24/03/2022
		Receipt Date:	21/03/2022
Sample Description:	AMBIENT NOISE LEVEL MONITORING		

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	Sector 54 (N5)
Instrument Used	:	Sound Level Meter- 03
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	17/03/2022 To 18/03/2022
Time of Monitoring	:	06:00 AM to 06:00 AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS 9989:1986 (RA-2014) & CPCB Guidelines
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

RESULT

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989:1986 (RA-2014)	63.2	54.7	dB(A)
2.	L_{min}	IS 9989:1986 (RA-2014)	44.9	38.1	dB(A)
3.	L_{eq}	IS 9989:1986 (RA-2014)	50.82	43.16	dB(A)
4.	Limits in dB(A) Leq (Residential Area)	-	55.0	45.0	dB(A)

Note**The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E), dated 11.10.2002, under the Environment (Protection) Act, 1986.

VARDAN ENVIROLAB GURUGRAM (Checked By)

VARDAN ENVIROLAB Gaurav Authorised Signatory (Approved By)

VEL/E/1/TR/PN39257

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/AN/06	**Report No.:**	VEL/AN/2203/21/006
Name & Address of Project:	M/s DLF Ltd.	**Format No.:**	7.8 F-01
	Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Party Reference No.:**	NIL
		Reporting Date:	24/03/2022
		Receipt Date:	21/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	Near Arjungarh (N6)
Instrument Used	:	Sound Level Meter- 04
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	17/03/2022 To 18/03/2022
Time of Monitoring	:	06:00 AM to 06:00 AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS 9989:1986 (RA-2014) & CPCB Guidelines
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

RESULT

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989:1986 (RA-2014)	60.2	47.3	dB(A)
2.	L_{min}	IS 9989:1986 (RA-2014)	42.2	35.5	dB(A)
3.	L_{eq}	IS 9989:1986 (RA-2014)	49.52	40.15	dB(A)
4.	Limits in dB(A) Leq (Residential Area)	-	55.0	45.0	dB(A)

Note:*The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E) dated 14.10.2002, under the Environment (Protection) Act, 1986.

(Checked By) Kushal Sharma

(Approved By) Pratap Singh

Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/AN/07	**Report No.:**	VEL/AN/2203/21/007
Name & Address of Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	24/03/2022
		Receipt Date:	21/03/2022
Sample Description:	AMBIENT NOISE LEVEL MONITORING		

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	Near Dlf Phase 5 (N7)
Instrument Used	:	Sound Level Meter- 02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	18/03/2022 To 19/03/2022
Time of Monitoring	:	06:00 AM to 06:00 AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS 9989:1986 (RA-2014) & CPCB Guidelines
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

RESULT

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989:1986 (RA-2014)	61.2	52.6	dB(A)
2.	L_{min}	IS 9989:1986 (RA-2014)	43.4	36.2	dB(A)
3.	L_{eq}	IS 9989:1986 (RA-2014)	51.22	41.26	dB(A)
4.	Limits in dB(A) Leq (Residential Area)	-	55.0	45.0	dB(A)

*Note**The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E), dated 11.10.2002, under the Environment (Protection) Act, 1986.

VARDAN ENVIROLAB GURUGRAM — Authorised Signatory

VARDAN ENVIROLAB — (Approved Signatory) — Authorised Signatory

VEL/E//TR/PN39259

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/AN/08	**Report No.:**	VEL/AN/2203/21/008
Name & Address of Project:	M/s DLF Ltd.	**Format No.:**	7.8 F-01
	Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Party Reference No.:**	NIL
		Reporting Date:	24/03/2022
		Receipt Date:	21/03/2022
Sample Description:	AMBIENT NOISE LEVEL MONITORING		

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	**Near Qutab Plaza (N8)**
Instrument Used	:	Sound Level Meter- 03
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	18/03/2022 To 19/03/2022
Time of Monitoring	:	06:00 AM to 06:00 AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS 9989:1986 (RA-2014) & CPCB Guidelines
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

RESULT

S.No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989:1986 (RA-2014)	59.7	48.1	dB(A)
2.	L_{min}	IS 9989:1986 (RA-2014)	41.9	35.2	dB(A)
3.	L_{eq}	IS 9989:1986 (RA-2014)	50.38	39.96	dB(A)
4.	Limits in dB(A) Leq (Residential Area)	-	55.0	45.0	dB(A)

Note*The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E), dated 11.10.2002, under the Environment (Protection) Act, 1986.

VARDAN ENVIROLAB GURUGRAM (Issued By) 24/03/22

VARDAN ENVIROLAB Authorised Signatory (Approved By)

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/S/01	**Report No.:**	VEL/S/2203/23/001
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
		Period of Analysis:	23/03/2022-28/03/2022
		Receipt Date:	23/03/2022
		Sampling Date:	21/03/2022
Sample Description:	Soil Sample	**Sampling Quantity:**	2.0 Kg
Sample Location:	Project Site (S1)	**Packing Status:**	Sealed Packed
Sample Collected by:	Vardan Enviro Lab Representative	**Parameter Required:**	As Per Work Order
Sampling and Analysis Protocol:	IS 2720 , USEPA &SOP	**Sampling Type:**	Composite

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26) by pH Meter	7.79	-
2.	Conductivity	IS:14767, 2000, RA	0.385	mS/cm
3.	Soil Texture	SOP, SP-87,Issue No.-01	Sand – 54 Silt - 30 Clay – 16	
4.	Color	SOP, SP-78,Issue No.-01	Yellowish Brown	-
5.	Water holding capacity	SOP, SP-81,Issue No.-01	32.53	%
6.	Bulk density	SOP, SP-80,Issue No.-01	1.53	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No.-01	35.66	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No.-01	32.62	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No.-01	38.21	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No.-01	108.00	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method, RA	0.32	%
12.	Magnesium as Mg	SOP, SP-83,Issue No.-01	10.13	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method, RA	136.11	kg./hec.
14.	Available Phosphorus	SOP, SP-86,Issue No.-01	10.76	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	0.84	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	8.70	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.50	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.47	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.29	mg/kg
20.	Copper (as Cu)	USEPA 3050B	0.80	mg/kg

Note- SOP-Laboratory Standard Operating Procedure

VARDAN ENVIROLAB GURUGRAM

(Checked By)
Kushal Sharma

VARDAN ENVIROLAB Authorised Signatory

(Approved By)
Gaurav Pratap Singh

VEL/E/1/TR/PN3926

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/S/02	**Report No.:**	VEL/S/2203/23/002
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
		Period of Analysis:	23/03/2022-28/03/2022
		Receipt Date:	23/03/2022
		Sampling Date:	21/03/2022
Sample Description:	Soil Sample	**Sampling Quantity:**	2.0 Kg
Sample Location:	Near Village Haiderpur (S2)	**Packing Status:**	Sealed Packed
Sample Collected by:	Vardan EnviroLab Representative	**Parameter Required:**	As Per Work Order
Sampling and Analysis Protocol:	IS 2720 , USEPA &SOP	**Sampling Type:**	Composite

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26) by pH Meter	7.52	--
2.	Conductivity	IS:14767, 2000, RA	0.273	mS/cm
3.	Soil Texture	SOP, SP-87,Issue No.-01	Sand – 50 Silt - 37 Clay – 13	--
4.	Color	SOP, SP-78,Issue No.-01	Yellowish Brown	--
5.	Water holding capacity	SOP, SP-81,Issue No.-01	35.12	%
6.	Bulk density	SOP, SP-80,Issue No.-01	1.48	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No.-01	32.42	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No.-01	28.52	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No.-01	36.07	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No.-01	155.00	kg/hec
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method, RA	0.34	%
12.	Magnesium as Mg	SOP, SP-83,Issue No.-01	14.15	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method, RA	167.00	kg./hec.
14.	Available Phosphorus	SOP, SP-86,Issue No.-01	16.12	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	0.96	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	8.66	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.46	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.43	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.25	mg/kg
20.	Copper (as Cu)	USEPA 3050B	0.76	mg/kg

Note- SOP-Laboratory Standard Operating Procedure

(Checked By) Kushal Sharma

(Approved By) Gaurav Pratap Singh

Authorised Signatory

VEL/E/1/TR/PN39262

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/S/03	**Report No.:**	VEL/S/2203/23/003
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
		Period of Analysis:	23/03/2022-28/03/2022
		Receipt Date:	23/03/2022
		Sampling Date:	21/03/2022
Sample Description:	Soil Sample	**Sampling Quantity:**	2.0 Kg
Sample Location:	Near Village Wazirabad (S3)	**Packing Status:**	Sealed Packed
Sample Collected by:	Vardan EnviroLab Representative	**Parameter Required:**	As Per Work Order
Sampling and Analysis Protocol:	IS 2720 , USEPA &SOP	**Sampling Type:**	Composite

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.76	--
2.	Conductivity	IS:14767, 2000, RA	0.380	mS/cm
3.	Soil Texture	SOP, SP-87,Issue No.-01	Sand – 53 Silt - 32 Clay – 15	--
4.	Color	SOP, SP-78,Issue No.-01	Yellowish Brown	--
5.	Water holding capacity	SOP, SP-81,Issue No.-01	31.86	%
6.	Bulk density	SOP, SP-80,Issue No.-01	1.51	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No.-01	37.23	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No.-01	34.63	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No.-01	41.96	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No.-01	142.00	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method, RA	0.32	%
12.	Magnesium as Mg	SOP, SP-83,Issue No.-01	11.23	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method, RA	141.86	kg./hec.
14.	Available Phosphorus	SOP, SP-86,Issue No.-01	12.82	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	0.77	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	7.62	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.49	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.46	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.28	mg/kg
20.	Copper (as Cu)	USEPA 3050B	0.68	mg/kg

Note: SOP: Laboratory Standard Operating Procedure

(Checked By) Kushal Sharma

(Approved By) Pratap Singh, Authorised Signatory

VEL/E/1/TR/PN39263

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/S/04	**Report No.:**	VEL/S/2203/23/004
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
		Period of Analysis:	23/03/2022-28/03/2022
		Receipt Date:	23/03/2022
		Sampling Date:	21/03/2022
Sample Description:	Soil Sample	**Sampling Quantity:**	2.0 Kg
Sample Location:	Near DLF Phase 5 (S4)	**Packing Status:**	Sealed Packed
Sample Collected by:	Vardan EnviroLab Representative	**Parameter Required:**	As Per Work Order
Sampling and Analysis Protocol:	IS 2720 , USEPA &SOP	**Sampling Type:**	Composite

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.58	-
2.	Conductivity	IS:14767, 2000, RA	0.296	mS/cm
3.	Soil Texture	SOP, SP-87,Issue No.-01	Sand – 51 Silt - 36 Clay – 13	-
4.	Color	SOP, SP-78,Issue No.-01	Yellowish Brown	-
5.	Water holding capacity	SOP, SP-81,Issue No.-01	34.75	%
6.	Bulk density	SOP, SP-80,Issue No.-01	1.49	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No.-01	33.42	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No.-01	29.52	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No.-01	37.07	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No.-01	151.00	kg/hec
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method, RA	0.32	%
12.	Magnesium as Mg	SOP, SP-83,Issue No.-01	13.45	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method, RA	163.00	kg /hec
14.	Available Phosphorus	SOP, SP-86,Issue No.-01	15.78	kg /hec
15.	Zinc (as Zn)	USEPA 3050B	0.92	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	8.67	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.47	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.44	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.26	mg/kg
20.	Copper (as Cu)	USEPA 3050B	0.81	mg/kg

Note- SOP-Laboratory Standard Operating Procedure

(Checked By) Kushal Sharma

(Approved By) Sanjay Pratap Singh

Authorised Signatory

VEL/E/I/TR/PN39264

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/S/05	**Report No.:**	VEL/S/2203/23/005
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
		Period of Analysis:	23/03/2022-28/03/2022
		Receipt Date:	23/03/2022
		Sampling Date:	21/03/2022
Sample Description:	Soil Sample	**Sampling Quantity:**	2.0 Kg
Sample Location:	Near Village Behrampur (S5)	**Packing Status:**	Sealed Packed
Sample Collected by:	Vardan EnviroLab Representative	**Parameter Required:**	As Per Work Order
Sampling and Analysis Protocol:	IS 2720 , USEPA &SOP	**Sampling Type:**	Composite

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.81	--
2.	Conductivity	IS:14767, 2000, RA	0.242	mS/cm
3.	Soil Texture	SOP, SP-87,Issue No.-01	Sand – 55 Silt - 29 Clay - 16	--
4.	Color	SOP, SP-78,Issue No.-01	Yellowish Brown	--
5.	Water holding capacity	SOP, SP-81,Issue No.-01	32.15	%
6.	Bulk density	SOP, SP-80,Issue No.-01	1.55	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No.-01	32.66	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No.-01	25.62	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No.-01	36.21	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No.-01	121.21	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method, RA	0.30	%
12.	Magnesium as Mg	SOP, SP-83,Issue No.-01	9.13	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method, RA	132.86	kg./hec.
14.	Available Phosphorus	SOP, SP-86,Issue No.-01	12.53	kg /hec.
15.	Zinc (as Zn)	USEPA 3050B	0.69	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	6.86	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.51	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.48	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.30	mg/kg
20.	Copper (as Cu)	USEPA 3050B	0.62	mg/kg

Note- SOP-Laboratory Standard Operating Procedure

(Checked By) Kushal Sharma

VARDAN ENVIROLAB GURUGRAM

Gaurav Singh (Authorised By)

VARDAN ENVIROLAB Authorised Signatory

VEL/E/1/TR/PN39265

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/S/06	**Report No.:**	VEL/S/2203/23/006
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
		Period of Analysis:	23/03/2022-28/03/2022
		Receipt Date:	23/03/2022
		Sampling Date:	21/03/2022
Sample Description:	Soil Sample	**Sampling Quantity:**	2.0 Kg
Sample Location:	Near Gwalpahari (S6)	**Packing Status:**	Sealed Packed
Sample Collected by:	Vardan EnviroLab Representative	**Parameter Required:**	As Per Work Order
Sampling and Analysis Protocol:	IS 2720 , USEPA &SOP	**Sampling Type:**	Composite

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26) by pH Meter	7.65	--
2.	Conductivity	IS:14767, 2000, RA	0.286	mS/cm
3.	Soil Texture	SOP, SP-87,Issue No.-01	Sand – 52 Silt - 34 Clay – 14	--
4.	Color	SOP, SP-78,Issue No.-01	Yellowish Brown	--
5.	Water holding capacity	SOP, SP-81,Issue No.-01	34.18	%
6.	Bulk density	SOP, SP-80,Issue No.-01	1.50	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No.-01	34.85	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No.-01	31.73	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No.-01	37.12	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No.-01	147.00	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method, RA	0.33	%
12.	Magnesium as Mg	SOP, SP-83,Issue No.-01	12.45	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method, RA	161.00	kg./hec.
14.	Available Phosphorus	SOP, SP-86,Issue No.-01	15.34	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	0.82	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	8.68	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.48	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.45	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.27	mg/kg
20.	Copper (as Cu)	USEPA 3050B	0.78	mg/kg

Note: SOP- Laboratory Standard Operating Procedure

VARDAN ENVIROLAB GURUGRAM

(Checked By) Kushal Sharma 28/3/22

VARDAN ENVIROLAB Authorised Signatory

(Approved By) Dr. Pradeep Singh

VEL/E/1/TR/PN39266

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/S/07	**Report No.:**	VEL/S/2203/23/007
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
		Period of Analysis:	23/03/2022-28/03/2022
		Receipt Date:	23/03/2022
		Sampling Date:	21/03/2022
Sample Description:	Soil Sample	**Sampling Quantity:**	2.0 Kg
Sample Location:	Near Village Junapur (S7)	**Packing Status:**	Sealed Packed
Sample Collected by:	Vardan EnviroLab Representative	**Parameter Required:**	As Per Work Order
Sampling and Analysis Protocol:	IS 2720 , USEPA &SOP	**Sampling Type:**	Composite

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26) by pH Meter	7.48	--
2.	Conductivity	IS:14767, 2000, RA	0.269	mS/cm
3.	Soil Texture	SOP, SP-87,Issue No.-01	Sand – 47 Silt - 39 Clay – 14	--
4.	Color	SOP, SP-78,Issue No.-01	Yellowish Brown	--
5.	Water holding capacity	SOP, SP-81,Issue No.-01	37.15	%
6.	Bulk density	SOP, SP-80,Issue No.-01	1.40	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No.-01	28.32	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No.-01	24.74	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No.-01	32.42	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No.-01	175.00	kg/hec
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method, RA	0.38	%
12.	Magnesium as Mg	SOP, SP-83,Issue No.-01	15.18	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method, RA	188.00	kg./hec.
14.	Available Phosphorus	SOP, SP-86,Issue No.-01	18.21	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	1.02	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	9.11	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.43	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.38	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.22	mg/kg
20.	Copper (as Cu)	USEPA 3050B	0.89	mg/kg

Note- SOP-Laboratory Standard Operating Procedure

VARDAN ENVIROLAB (Checked By) Kushal Sharma 28/3/22 GURUGRAM

VARDAN ENVIROLAB (Approved By) Gagan Pratap Singh Authorised Signatory

VEL/E/1/TR/PN39267

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/DLF/S/08	**Report No.:**	VEL/S/2203/23/008
Name & Address of the Project:	M/s DLF Ltd. Proposed Group Housing Buildings in Zone 10, DLF-5 at Sector-54, Gurgaon, Haryana	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/03/2022
		Period of Analysis:	23/03/2022-28/03/2022
		Receipt Date:	23/03/2022
		Sampling Date:	21/03/2022
Sample Description:	Soil Sample	**Sampling Quantity:**	2.0 Kg
Sample Location:	Asola Wildlife Sanctuary (S8)	**Packing Status:**	Sealed Packed
Sample Collected by:	Vardan EnviroLab Representative	**Parameter Required:**	As Per Work Order
Sampling and Analysis Protocol:	IS 2720 , USEPA &SOP	**Sampling Type:**	Composite

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26) by pH Meter	7.49	-
2.	Conductivity	IS:14767, 2000, RA	0.212	mS/cm
3.	Soil Texture	SOP, SP-87,Issue No.-01	Sand – 48 Silt - 40 Clay – 12	-
4.	Color	SOP, SP-78,Issue No.-01	Yellowish Brown	-
5.	Water holding capacity	SOP, SP-81,Issue No.-01	36.74	%
6.	Bulk density	SOP, SP-80,Issue No.-01	1.45	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No.-01	30.62	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No.-01	23.86	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No.-01	38.26	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No.-01	152.61	kg/hec
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method, RA	0.31	%
12.	Magnesium as Mg	SOP, SP-83,Issue No.-01	14.74	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method, RA	178.00	kg./hec.
14.	Available Phosphorus	SOP, SP-86,Issue No.-01	16.64	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	0.81	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	7.86	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.45	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.41	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.23	mg/kg
20.	Copper (as Cu)	USEPA 3050B	0.75	mg/kg

Note: SOP: Laboratory Standard Operating Procedure

(Checked By)

(Approved By)

VARDAN ENVIROLAB GURUGRAM

VARDAN ENVIROLAB Authorised Signatory

VEL/E/I//TR/PN39266

DAKSHIN HARYANA BIJLI VITRAN NIGAM
(A Govt. of Haryana Undertaking)
Office of
Superintending Engineer (OP) Circle-II, DHBVN, Gurugram
SCO No. 3&4, HUDA Shopping Complex, Sec-31, Gurugram, Haryana
0124-2582106, 0124-4378109
E-mail – seop2gurugram@dhbvn.org.in Website - www.dhbvn.org.in

To,

M/s DLF Ltd.
DLF Gateway Tower, R-Block,
DLF City, Phase-III, Gurugram.

Memo No. Ch- 60 /DGR- 26B Dated: 5 /04/2022

Sub: Assurance certificate of DHBVN for electrical load requirement for the proposed Group Housing Buildings in Zone-10, DLF-5, Gurugram.

Refer to your letter no. DLF-GRP-HSGZN10DLF5-12040104-2022 dated 01.04.2022, received in this office on 05.04.2022 vide diary no. 1223.

It is here by assured that the power requirement of tentative load of **5874 KW** shall be considered from the nearest sub-station at 11 KV / 33 KV level at the time of actual requirement as per DHBVN Norms, subject to the following conditions:-

1. Subject to availability of power and infrastructure at the time of actual release of connection.
2. Necessary charges will be got deposited by you as per latest Nigam instructions and compliance of all other instructions of Nigam will be ensured as per standing instructions of Nigam / HERC Regulations.
3. The necessary infrastructure will be laid by you at your own cost. The piece of land will be provided by you for the switching station / sub-station as per instructions of the Nigam.
4. The validity of this letter will be till the validity of licenses issued by Town & Country Planning, Haryana in view of Sales Circular no. D-6/2022 issued by CE/Commercial, DHBVN, Hisar vide memo no. Ch-06/SE/C/R-16/380/Vol-I dated 10.03.2022.

S.E (OP) Circle –II
DHBVN, Gurugram

Copy to:-

The Xen 'OP' Sub-Urban Divn. DHBVN, Gurugram for information, please.

DLF Ltd.
DLF Centre, Sansad Marg, New Delhi-110 001, India
Tel.: (+91-11) 23719300, 42102030
Fax: (+91-11) 23719344, 23719212

DLF
BUILDING INDIA

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED BY THE FINANCE COMMITTEE OF THE BOARD OF DIRECTORS OF DLF LIMITED IN ITS MEETING HELD ON SEPTEMBER 12, 2012 AT 10TH FLOOR, DLF CENTRE, SANSAD MARG, NEW DELHI-110001.

"**RESOLVED THAT** Mr. Devinder Singh, Sr. Executive Director,Mr. Alok Kumar, Chief Architect, Mr. J. K. Chandra, Advisor, DLF Home Developers Limited, Mr. R.S.Kachru, Director, DLF India Limited and Mr. Aakash Ohri, Vice President, DLF Golf Resorts Limited, subsidiary companies, be and are hereby jointly and/or severally authorized on behalf of the Company to sign, execute and issue various work orders / contracts related to appointment of consultants for various projects of the Company at Phase-V, Gurgaon .

RESOLVED FURTHER THAT the above signatories be and are hereby jointly and/or severally authorized on behalf of the company to sign, execute and submit/present, various application(s), agreement(s), MOU's, affidavit(s), drawings, building plans, document(s), writing(s), letter(s), undertaking(s), declaration(s), certificate(s), bond(s), deed(s) (including making and accepting any amendments/ modifications thereto) with Central and State Government Authorities including Ministry of Environment & Forest (MOEF), State Environment Impact Appraisal Authority (SEIAA), Haryana, Haryana State Pollution Control Board (HSPCB), Central Ground Water Board (CGWB), Offices of Senior Town Planner (STP), and Directorate of Town & Country Planning (DTCP), Airport Authority of India (AAI) etc., to provide information, reports and to represent the Company to obtain License, NOC(s), clearance(s), clarification(s), sanction(s), approval(s) from the concerned authority(ies) in connection with the projects Situated at Phase-V, Gurgaon.

RESOLVED FURTHER THAT the Common Seal of the Company may be affixed, if required, on any of such documents as per the provisions contained in the Articles of Association of the Company.

RESOLVED FURTHER THAT the aforesaid powers entrusted to the above executive shall be valid, effective and exercisable by him, so long as they are in the employment of the Company or its associate/subsidiary companies unless revoked earlier by the Board or this Committee.

RESOLVED FURTHER THAT all acts, deeds and things done and documents executed aforesaid shall be deemed to be valid and enforceable only if the same are consistent with this Resolution and that the Board or this Committee shall not be responsible for any illegal and invalid acts and any other act beyond the scope of the aforesaid powers executed by the above executive(s) and shall not bind the Company against any third parties or before any authorities in any manner and that the Board or this Committee shall not be answerable in that behalf.

RESOLVED FURTHER THAT a certified Copy of this Resolution be furnished to any one concerned or interested in the matter under the signatures of any Director or the Company Secretary."

CERTIFIED TRUE COPY
For DLF LIMITED

COMPANY SECRETARY

DLF LIMITED
DLF Gateway Tower, R Block,
DLF City Phase - III, Gurugram - 122 002, Haryana (India)
Tel. :+91-124-4769000, Fax:+91-124-4769250

DLF
BUILDING INDIA

Ref : DLF-SEIAA-AUTH-LTR-GRPHSGZN10DLF5-01320203-2022 **March 2, 2022**

To
The Member Secretory
State Expert Impact Assessment Authority (SEIAA)
Bays No.: 55-58, Paryatan Bhawan,
I[st] Floor, Sector-2, Panchkula, Haryana

Subject: Authorization Letter for Consultant

Dear Sir,

DLF Ltd. having its registered Office at DLF Shopping Mall. 3rd Floor. Arjun Marg, DLF City, Phase-1. Gurugram-122002 Haryana is undertaking for Proposed Group Housing Buildings in Zone 10, DLF 5, at Sector-54, Gurugram, and Haryana is being developed by M/s DLF Ltd.

We have appointed **M/s Vardan Environet,** having its Corp. office at Plot no.82A, Sector-5, IMT Manesar, Gurugram, Haryana as **our Environmental Consultant. Mr. R.S. Yadav and Mr. Aman Sharma of M/s Vardan Environet** are hereby authorized as our representatives for all matters related to this case from SEIAA and SEAC, including submission of all documents and shortcomings to SEIAA, presentation before SEAC and collecting of final EC from SEIAA.

Thanking You

Yours Sincerely,

For DLF Ltd.
DLF Limited
Authorised Signatory
ALOK KUMAR
(Authorized Signatory)

QUALITY COUNCIL OF INDIA
Creating an Ecosystem for Quality

National Accreditation Board for Education and Training

Certificate of Accreditation

Vardan Environet

Plot No. 82-A, Sector 5, IMT Manesar, Gurgaon-122051, Haryana

The organization is accredited as ***Category-A*** *under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast/ underground mining	1	1 (a) (i)	A
2	Offshore & Onshore Oil and gas exploration, development & production	2	1 (b)	A
3	River Valley projects	3	1 (c)	A
4	Thermal power plants	4	1 (d)	B
5	Coal washeries	6	2 (a)	A
6	Mineral beneficiation	7	2 (b)	A
7	Metallurgical industries (ferrous & nonferrous)- both primary & secondary	8	3 (a)	A
8	Cement Plants	9	3(b)	A
9	Coke oven plants	11	4 (b)	A
10	Synthetic organic chemicals industry	21	5 (f)	A
11	Distilleries	22	5 (g)	A
12	Sugar Industry	25	5 (i)	B
13	Oil & gas transportation, passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	27	6 (a)	A
14	Isolated storage & handling of hazardous chemicals	28	-	B
15	Airports	29	7 (a)	A
16	Bio-medical waste treatment facilities	32A	7 (d a)	B
17	Highways	34	7 (f)	A
18	Common effluent treatment plants (CETPs)	36	7 (h)	B
19	Common municipal solid waste management facility (CMSWMF)	37	7 (i)	B
20	Building and construction projects	38	8 (a)	B
21	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated Mar. 16, 2022 posted on QCI-NABET website

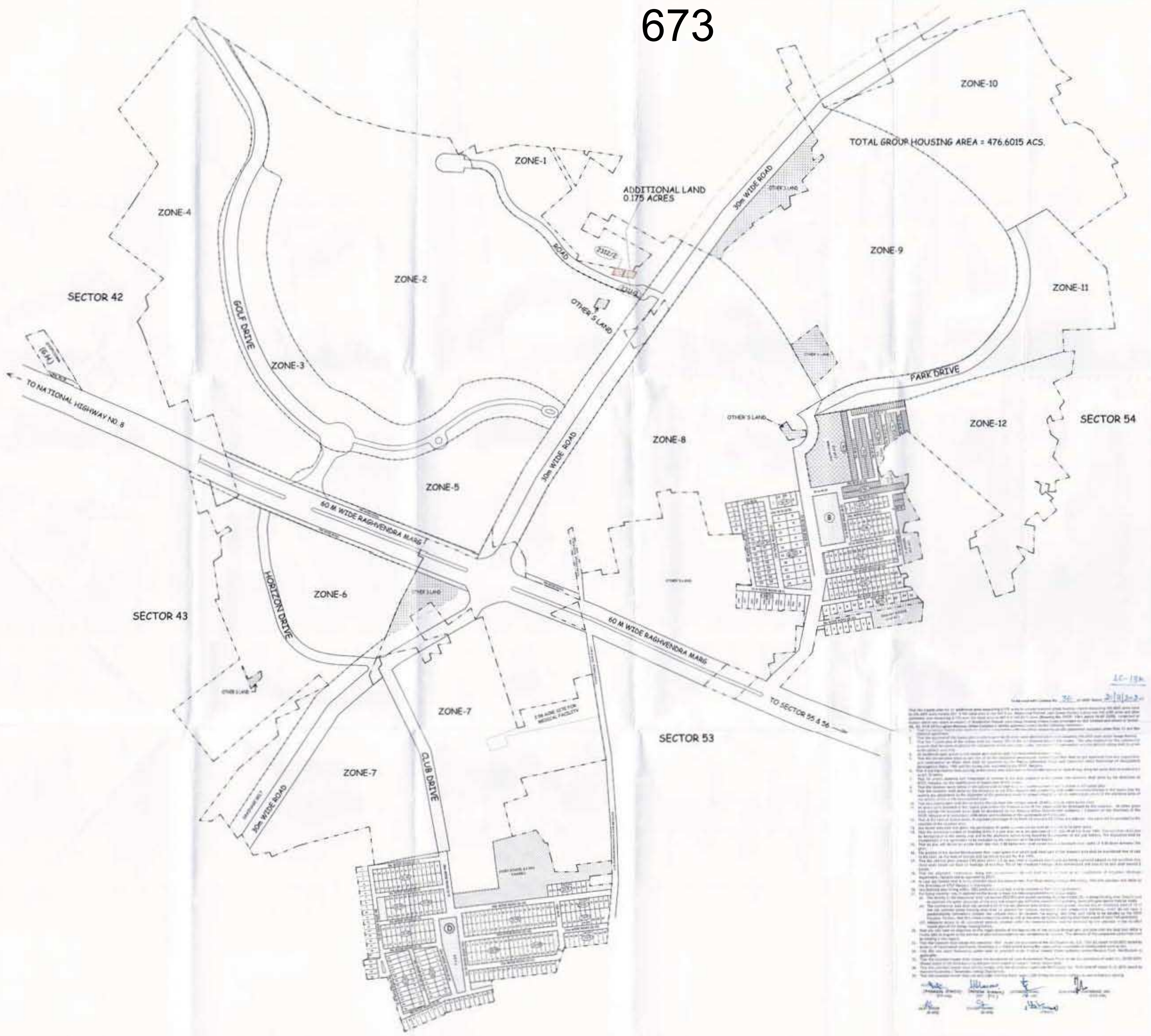
The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2311 dated Apr. 13, 2022. The accreditation needs to be renewed before the expiry date by Vardan Environet, Gurgaon following due process of assessment.

Sr. Director, NABET
Dated: Apr. 13, 2022

Certificate No.
NABET/EIA/2023/SA 0158

Valid up to
May. 05, 2023

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.



DLF BUILDING INDIA

DETAIL OF PLOTS

Type	Size (in mtrs)	Area in Sqm	Area in Sqyds	Nos	Total area (in Sqm)	%age
B1	15.00 X 28.00	420.00	502.32	24	10080.00	
B2	12.50 X 33.60	420.00	502.32	19	7980.00	
B3	10.00 X 30.00	300.00	358.80	13	3900.00	
C	10.00 X 22.50	225.00	269.10	127	28575.00	
C1	9.15 X 24.59	225.00	269.10	108	24300.00	
C2	10.00 X 24.59	245.90	294.09	172	42294.80	
C3	10.00 X 30.44	304.40	364.06	18	5479.20	
E	4.00 X 12.50	50.00	59.80	252	12600.00	34.38%
			Total	733	135209.00	
					33.41	

DETAILS OF AREA	AREA (in acres)	% AGE
Total area of Land	542.8515	
Area under Group Housing	476.6015	
Area under Plotted Colony	66.25	
Area under plots	33.41	50.43 %
Area under Shopping/ Commercial	2.65	4.0 %
Total saleable area	36.06	54.43 %

POPULATION OF THE PLOTTED COLONY

Type	Nos./Area in Acs.	Persons/Plot	Total
NOT-EWS	481	@ 13.5 ppp	6494
EWS	252	@ 9.0 ppp	2268
Group Housing	Under special zone		
	470.2835 acs	@ 250 PPA	1,17,571
	Outside special zone		
	6.318 acs	@ 140 PPA	885
		Total Population =	1,27,218 Persons

Area Under High Density Zone

Total area of Land	542.8515 acs	
Area of D Block	34.76 acs	Total = 34.76 + 6.318 = 41.078 acres
Area out of High Density Zone	6.318 acs	
Net area under High Density Zone	501.7735 acs	

Population Achieved		
Out of High Density Zone		
298 Nos x 13.5 Persons	4023 Persons	
6.318 x 140 PPA	885 Persons	
Total	4908 Persons	4908/41.078 = 119.48 PPA
Within High Density Zone		
Total Population	1,27,218 Persons	
Population out of High Density Zone	4,908 Persons	
Net Population	1,22,310 Persons	122310/501.7735 = 243.75 PPA

PROVISION OF INFRASTRUCTURE

S.NO.	DESCRIPTION	REQD. NOS.	NOS. PROVIDED	NOS. PROVIDED
1	Nursery School	26	4	22
2	Primary School	17	2	15
3	High School	8	1	7
4	Community Centre	8	0	8
5	Dispensary	4	0	4
6	Creche	8	0	8
7	Religious Building	8	0	8
8	Health Centre	4	0	4
9	Police Post	4	0	4
10	Electric Sub Station	4	0	4
11	Sub Post Office	8	0	8
	Total	99	7	92

LEGEND:

1. Scheme Boundary
2. Site Line
3. Other's Land
4. Existing Plotted & Group Housing Colonies
5. Area applied for Licence = 0.175 acs.

KEY PLAN

FOR DLF LIMITED

REVISED LAYOUT PLAN OF DLF 5

DLF CITY, GURGAON.

GROUP HOUSING AREA = 476.6015 ACS.

प्रभागीय वन अधिकारी द्वारा स्पष्टीकरण पत्र
Clarification letter by
Concerned Divisional Forest Officer
हरियाणा सरकार / Government of Haryana

गैर-वन भूमि पर वन कानून उपयुक्तता के विषय में स्पष्टीकरण पत्र।
Clarification letter regarding applicability of forest laws on non forest land.

नाम Name	अलोक कुमार Alok Kumar
संगठन का नाम Organisation Name	Dlf Limited
वर्तमान पता Current Address	2nd Floor, Gateway Tower, Dlf Cyber City
भूमि स्थान Land Location	WAZIRABAD,Gurgaon,Wazirabad
भूमि मापन Land Measurements	12.043 (Acre)
आयत नम्बर / मुरबा नम्बर Rectangle No./ Murba No.	Rectangle No Not Applicable And Applicable Khasra Nos. 2046/1/1 (1-12-19), 2046/1/2 (1-2-14), 2046/2 (1-6-7), 2047/1 (1-19-3), 2047/2 (1-11 17), 2048 (3-7-0), 2049 (4-4-0), 2050/1 (1-7-10), 2050/2 (2-13-18) ;

Reference No. (SRN):- X9K-1GW-FVMK
जारी करने की तिथि / Date of Issuance: 01-04-2022
जारी करने का स्थान / Place of Issuance: Gurgaon
जारी करने वाला प्राधिकरण / Issuing Authority: Divisional Forest Officer

This is a Digitally Signed Certificate and does not require physical signature. The authenticity of this certificate can be verified from the verification link mentioned below:
https://164.100.137.243/eservices/mobileapi/verify/clarification/X9K1GWFVMK

प्रभागीय वन अधिकारी द्वारा स्पष्टीकरण पत्र
Clarification letter by Concerned Divisional Forest Officer
हरियाणा सरकार / Government of Haryana

गैर-वन भूमि पर वन कानून उपयुक्तता के विषय में स्पष्टीकरण पत्र।
Clarification letter regarding applicability of forest laws on non forest land.

किला नम्बर Killa Number	Killa No Not Applicable, The Applicable Khasra Nos Are : 2046/1/1 (1-12-19), 2046/1/2 (1-2-14), 2046/2 (1-6-7), 2047/1 (1-19-3), 2047/2 (1-11-17), 2048 (3-7-0), 2049 (4-4-0), 2050/1 (1-7-10), 2050/2 (2-13-18)

प्रयोजन Purpose	Building Construction

जारी करने की तिथि / Date of Issuance: 01-04-2022
जारी करने का स्थान / Place of Issuance: Gurgaon
जारी करने वाला प्राधिकरण / Issuing Authority: Divisional Forest Officer

This is a Digitally Signed Certificate and does not require physical signature. The authenticity of this certificate can be verified from the verification link mentioned below:

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प्रभागीय वन अधिकारी द्वारा स्पष्टीकरण पत्र
Clarification letter by
Concerned Divisional Forest Officer
हरियाणा सरकार / Government of Haryana

गैर-वन भूमि पर वन कानून उपयुक्तता के विषय में स्पष्टीकरण पत्र।
Clarification letter regarding applicability of forest laws on non forest land.

Applicant Alok Kumar located at village /city WAZIRABAD district Gurgaon made a proposal to use this land for Building Construction. It is made clear that:

a) As per records available above said land is not part of notified Reserved Forest, Protected Forest under Indian Forest Act, 1927 or any area closed under section 4 of Punjab Land Preservation Act, 1900.

b) It is clarified that by the Notification No. S.O.8/P.A 2/1900/S. 4/2013 dated 4th January, 2013, all Revenue Estate of Gurgaon is notified u/s 4 of PLPA 1900 and S.O.81/PA.2/1900/S.3/2012 u/s 3 of PLPA 1900. The area is however not recorded as forest in the Government record but felling of any tree is strictly prohibited without the permission of Divisional Forest Officer, Gurgaon.

c) If approach is required from Protected Forest by the user agency, the clearance/ regularization under Forest Conservation Act 1980 will be required. Without prior clearance from Forest Department, the use of Forest land for approach road is strictly prohibited. M/s Dlf Limited whose land is located at village/city, WAZIRABAD District Gurgaon must obtain clearance as applicable under Forest Conservation Act 1980.

d) As per the records available with the Forest Department, Gurgaon the area does not fall in areas where plantations were raised by the Forest Department under Aravalli project.

e) All other statutory clearances mandated under the Environment Protection Act. 1986, as per the notification of Ministry of Environment and Forests, Government of India, dated 07-05-1992 or any other Act/ order shall be obtained as applicable by the project proponents from the concerned authorities.

f) The project proponent will not violate any Judicial Order/ direction issued by the Hon'ble Supreme Court/ High Courts.

g) It is clarified that the Hon'ble Supreme Court has issued various judgments dated 07.05.2002, 29.10.2002, 16.12.2002, 18.03.2004, 14.05.2008 etc. pertaining to Aravalli region in Haryana, which should be complied with.

h) It shall be the responsiblity of user agency/ applicant to get necessary clearances/ permissions under various Acts and Rules applicable if any, from the respective authorities/ Department.

i) This certificate is not applicable in case of Environment Department notification dated 10.03.2016 for Screening Plant, and notification dated 11.05.2016 for Stone Crusher. Investor/Applicant has to take clearance from Environment Department in case of Screening Plant and Stone Crusher .

It is subject to the following conditions:

1.Clarification Is Hereby Issued Subject To The Conditions Mentioned Above And Proposed Site Falls Within 5 Km Of Delhi Boundary Hence Necessary Permission May Be Obtained From Competent Authority As Per Supreme Court Various Judgements Regarding Aravali Region In Haryana.

Date: 01-04-2022
Place: Gurgaon

Rajeev Tejyan,
(Divisional Forest Officer)

This is a Digitally Signed Certificate and does not require physical signature. The authenticity of this certificate can be verified from the verification link mentioned below:

https://164.100.137.243/eservices/mobileapi/verify/clarification/X9K1GWFVMK

677

491

SHYAM D.
STAMP VENDOR
GURGAON
25 APR 2022
Sr. No. 1465
Purpose
Signature

TEN RUPEES
SPECIAL ADHESIVE

AFFIDAVIT CUM UNDERTAKING

I, Alok Kumar, Authorized Signatory of **M/s DLF Ltd.,** having its registered office at DLF Shopping Mall. 3rd Floor. Arjun Marg, DLF City, Phase-1. Gurugram, Haryana , for the project – Proposed Group Housing Buildings in Zone 10, DLF 5, at Sector-54, Gurugram, and Haryana do hereby solemnly affirm, declare and undertake as under:-

- That we has not commenced any Construction work at the project site & we shall commence Construction work only after obtaining EC from Govt. & the receipt of NOC's / permission from the prescribed competent authorities of state and central Govt.
- That suitable norm of ECBC will be incorporated during the Construction of building for thermal insulation.
- That we shall not use ground water for construction and will use treated water confirming the ISI standards for building construction.
- The infrastructure will not obstruct or divert the natural flow of water covered or open nallah, drainage of rainwater as per natural flow of water.
- **Sultanpur National Park and Asola Bhatti Wildlife Sanctuary** is at a distance of approx. 21 km in WNW direction and approx. 5.7 km in East direction respectively.
- No litigation pending against our project site.

DEPONENT

VERIFICATION:

The Contents of the above undertaking is true and correct to the best of my knowledge as per record & nothing has been concealed therein.

DEPONENT

Date: 25-04-2022

Place: Gurgaon

NOTARY GOVT. OF INDIA
RAM NIWAS MALIK, GGM. (Reg. No. 8224)
25 APR 2022

ATTESTED
RAM NIWAS MALIK, ADVOCATE
NOTARY, GURUGRAM (HR.) INDIA

DLF LIMITED
DLF Gateway Tower, R Block,
DLF City Phase - III, Gurugram - 122 002, Haryana (India)
Tel. :+91-124-4769000, Fax:+91-124-4769250

DLF
BUILDING INDIA

UNDERTAKING

I, Alok Kumar, Authorized Signatory of DLF Ltd., having its registered office at **DLF Shopping Mall. 3rd Floor. Arjun Marg, DLF City, Phase-1. Gurugram, Haryana , India,** declare and undertake following: -

That we will supply 10 KLD domestic water on daily basis for labors during construction phase and 260 KLD domestic water on daily basis for Operation phase of the Proposed Group Housing Buildings from water tanks of DLF for our project.

DLF Limited

ALOK KUMAR
Authorized Signatory

Date : 25/04/2022

Place: Gurgaon

DLF LIMITED
DLF Galway Tower, R Block, DLF City, Phase-III, Gurgaon-122002

DLF
BUILDING INDIA

Date: 19.04.2022

UNDERTAKING

I, Alok Kumar, Authorized Signatory of DLF Ltd., having its registered office at **DLF Shopping Mall. 3rd Floor. Arjun Marg, DLF City, Phase-1. Gurugram, Haryana , India,** declare and undertake following:-

That 20 KLD of tertiary treated water on daily basis for construction purposes/activities, and 140 KLD tertiary treated water on daily basis during Operation phase for activities such as flushing and horticulture will be supplied from common STP of capacity 15MLD situated at DLF Phase V, Gurugram for Proposed Group Housing Buildings in Zone 10, DLF 5, at Sector-54, Gurugram, and Haryana.

M/s DLF Limited

For DLF Limited

Authorised Signatory

(Authorized Signatory)

GEOTECHNICAL REPORT

PROPOSED "CREST II" GROUP HOUSING BUILDING PROJECT AT DLF PHASE-5, SECTOR-54, GURUGRAM, HARYANA

SUBMITTED TO:

M/S. DLF LIMITED

DLF Gateway Tower, 7th Floor, R Block, DLF City,
Phase-III, Gurugram, Haryana – 122 002

Project No. 22054 | Dated. April, 2022 | Revision-0

RAO ENGINEERING ENTERPRISES

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Address:
91-D-3, Street-1, East Moti Bagh, Old Rohtak Road,
Sarai Rohilla, New Delhi - 110007

Phone :
011-23698806, 23691434
9310502435, 9811108174

E-mail :
raogr@yahoo.com,
raoraoengg@rediffmail.com

April 26th, 2022 Project No. 22054

M/s. DLF Limited
DLF Gateway Tower, 7th Floor,
R Block, DLF City, Phase-III,
Gurugram, Haryana – 122 002

Sub: Final Report on Soil Investigation Work for Proposed "Crest II" Group Housing Building Project at DLF Phase-5, Sector-54, Gurugram, Haryana

We have carried out the soil investigation work for the captioned project. We thank you for your business and hope that you are satisfied with our services rendered.

This Final Report presents our findings based on the soil investigation conducted by us at the project site. This report presents the field and laboratory test data along with our engineering recommendations, which shall help you in deciding the optimum foundation arrangement for use on site.

We have prepared this report based on our findings on site as well as our experience gained in our previous projects completed over the past 15 years. We appreciate the opportunity to perform this investigation for you and have pleasure in submitting this report. Please contact us when we can be of further service to you.

Yours faithfully,
RAO ENGINEERING ENTERPRISES

Rao Engineering Enterprises New Delhi

(G.R.RAO)

TABLE OF CONTENTS

ILLUSTRATIONS

1.0 INTRODUCTION

1.1 Project Description

This soil investigation work, whose results are being presented herewith, has been carried out for Proposed "Crest II" Group Housing Building Project at DLF Phase-5, Sector-54, Gurugram, Haryana. We understand that the proposed structure shall consist of Ground + multi-storeys with four basement.

The geotechnical investigation work on site has been carried out in accordance with drawing issued to us by the client. A layout plan illustrating the borehole locations of our field investigation is presented on Sheet No. 1.

1.2 Aim of Soil Investigation

Soil investigation has been conducted at the site in order to evaluate the parameters required for design of foundations. These parameters are:

a) Type of foundation on which the proposed super structure will be supported.

b) Depth of foundation, and

c) Allowable bearing pressure at the founding level.

To evaluate these parameters, following engineering properties of the Sub-Soil have been studied:

Sub-soil penetration resistance characteristics which have been determined insitu. Properties like particle size distribution, atterberg's limits, bulk density, moisture content, and shear strength parameters; which have been determined in the laboratory by conducting testing of both disturbed as well as undisturbed samples.

1.3 Scope of Work

The stipulated scope of work comprised of the following:

1. Mobilization of equipment and personnel to the site and back.

2. Sinking six (6) boreholes to specified depth or refusal (N>100) whichever encountered earlier), observing ground water table levels, conducting required field and laboratory tests and their analysis.

3. Preparation and submission of technical report in triplicate.

2.0 FIELD INVESTIGATIONS

2.1 Soil Borings

The boreholes were progressed using mechanized shell and auger drilling rig to the specified depth. The diameter of the borehole was 150 mm. Where caving of the borehole occurred, casing was used to keep the borehole stable. The work was in general accordance with IS: 1892-1979.

Standard Penetration Tests (SPT) were conducted in the boreholes at 1.5 m depth interval up to 15 m depth and 3 m depth interval below it. The tests were conducted by connecting a split spoon sampler to 'A' rods and driving it by 45 cm using a 63.5 kg hammer falling freely from a height of 75 cm. The tests were conducted in accordance with IS: 2131-1981.

The number of blows for each 15 cm of penetration of the split spoon sampler was recorded. The blows required to penetrate the initial 15 cm of the split spoon for seating the sampler is ignored due to the possible presence of loose materials or cuttings from the drilling operation. The cumulative number of blows required to penetrate the balance 30 cm of the 45 cm sampling interval is termed the SPT value or the 'N' value.

Where the split spoon sampler did not penetrate the initial 15 cm seating in a total of 100 blows, it is indicated "Ref" for an indicated amount of penetration. The 'N' values are presented on the soil profile for each borehole.

Disturbed samples were collected from the split spoon after conducting SPT. The samples were preserved in transparent polythene bags. Undisturbed soil samples were collected by attaching 75 mm diameter thin walled 'Shelby' tubes and driving the sampler by light-hammering using a 63.5 kg hammer in accordance with IS: 2132-1986. The tubes were sealed with wax at both ends. All samples were transported to our laboratory for further examination and testing.

2.2 Groundwater

Groundwater level was measured in the boreholes after drilling and sampling was completed. The measured water levels are recorded on the individual soil profiles.

3.0 LABORATORY TESTS

Laboratory tests have been conducted on various selected soil samples in the laboratory:

Laboratory Test	IS Code Referred
Bulk Density	By calculations
Natural Moisture Content	IS : 2720 (Part-2)-1973, RA-2010
Specific Gravity	IS : 2720 (Part-3)-1980, RA-2007
Grain Size Analysis	IS : 2720 (Part-4)-1985, RA-2010
Liquid Limit and Plastic Limit	IS : 2720 (Part-5)-1985, RA-2010
Consolidated Drained Direct Shear Test	IS : 2720 (Part-13)-1986, RA-2010

4.0 GENERAL SITE CONDITIONS

4.1 Site Stratigraphy

The surficial soils at the site consist of silty sand / sandy silt to the final explored depth of 60.45 m depth below EGL.

The field SPT N-values range from 7 to 12 to about 3.0 m depth and range from 12 to 29 to about 7.5 m depth below EGL. Further, SPT N-values range from 30 to 47 to about 13.5 m depth, range from 36 to 59 to about 21 m depth and range from 51 to 88 to about 33 m depth below EGL.

Below this, SPT N-values range from 90 to 95 to about 42 m depth, range from 56 to 74 to about 51 m depth and range from 69 to 83 to the final explored depth of 60.45 m depth below EGL.

All test results are presented on the individual soil profiles on Sheet No. 2 to 22. A summary of the borehole profiles is illustrated on Sheet No. 23 & 24. Plots of field and corrected SPT values versus depth are presented on Sheet No. 25 to 28.

4.2 Groundwater

Based on our measurements in the completed boreholes, groundwater was not met to the maximum explored depth of 60.45 m below EGL during the period of our field investigations (April, 2022).

Fluctuations may occur in the measured ground levels due to seasonal variations in rainfall, surface evaporation rates.

5.0 FOUNDATION ANALYSIS

5.1 General

For designing the foundation system, the following parameters are required:

a) Suitable type of foundation on which the proposed super-structure can be supported.

b) Depth of these foundations, and

c) Allowable bearing pressure at the founding level corresponding to various footing sizes.

A suitable foundation for any structure should have an adequate factor of safety against exceeding the bearing capacity of the supporting soils. Also the vertical movements due to compression of the soils should be within tolerable limits for the structure. We consider that foundation designed in accordance with the recommendations given herein will satisfy these criteria.

5.2 Foundation Type and Depth

Type of foundation to be adopted for a particular structure depends upon the loading intensity at the foundation level and the configuration of loading points.

Reviewing the stratigraphy of the site on the basis of boreholes data, SPT values, we are of the opinion that raft foundation is feasible foundation scheme to support the structural load of basement area. Open foundation is also a suitable foundation scheme for the non-tower basement area.

Our recommended values of net and corresponding gross allowable bearing pressures at various depths for open / raft foundation are presented in Section 6.0.

Interconnecting beams should be provided either at plinth level or at foundation level in order to restrict differential settlements and to provide rigidity to the structure during earthquakes.

5.3 Method of Analysis (Open / Raft Foundation)

Bearing capacity analysis for open / raft foundations has been done in general accordance with IS: 6403-1981. The bearing capacity equation used is as follows:

$$q_{net\ safe} = \frac{1}{F}\left[cN_c\zeta_c\, d_c + q(N_q-1)\,\zeta_q d_q + 0.5\, B\gamma N_\gamma \zeta_\gamma\, d_\gamma R_w\right]$$

where:

Q	=	*lateral load*
$q_{net\ safe}$	=	*safe net bearing capacity of soil based on the shear failure criterion.*
Q	=	*overburden pressure*
R_w	=	*water table correction factor*
F	=	*Factor of safety, taken as equal to 2.5*
$\zeta_c,\zeta_q,\zeta_\gamma$	=	*Shape factors.* *For Strip footings,* $\zeta_c = \zeta_q = \zeta_\gamma = 1$ *For Square footing*, $\zeta_c = 1.3$, $\zeta_q = 1.2$, $\zeta_\gamma = 0.6$
d_c,d_q,d_γ	=	*Depth factors* For $\phi \le 10$, dc = 1 + 0.2 tan (45+ϕ/2) D/B, $d_q = d_\gamma = 1$ For $\phi > 10$, $d_q = d_\gamma$ = 1 + 0.1 tan (45+ϕ/2) D/B

Appropriate values have been substituted into the bearing capacity equation given above to compute the safe net bearing capacity. The values have been checked to determine the settlement of the foundation under the safe bearing pressure. The allowable bearing pressure has been taken as the lower of the two values computed from the bearing capacity shear failure criterion as well as that computed from the tolerable settlement criterion.

Settlement analysis has been performed based on the SPT values in accordance with Clause 9.1.4 of IS 8009 (Part 1)-1976 RA 2003 Fig.9.

6.0 RECOMMENDATIONS

The following table presents our recommended values of net and corresponding gross allowable bearing pressures for open / raft foundation are various depths below EGL:

➢ **Open Foundation: -**

Foundation Type	Foundation Depth below EGL, m	Safe Net Bearing Capacity, T/m²	Recommended Net Allowable Bearing Pressure, T/m²		Corresponding Gross Allowable Bearing Pressure, T/m²	
		Shear Criteria	Total settlement = 50 mm	Total settlement = 60 mm	Total settlement = 50 mm	Total settlement = 60 mm
Open Foundation	12.0	59.2	29.5	35.4	50.2	56.1
	14.0	82.3	33.0	39.6	57.4	64.0
	16.0	116.6	36.0	43.2	64.2	71.4
	18.0	152.0	39.0	46.8	71.0	78.8

➢ **Raft Foundation: -**

Foundation Type	Foundation Depth below EGL, m	Safe Net Bearing Capacity, T/m²	Corresponding Gross Bearing Capacity, T/m²	Recommended Net Allowable Bearing Pressure, T/m²		Corresponding Gross Allowable Bearing Pressure, T/m²	
		Shear Criteria		Total settlement = 50 mm	Total settlement = 60 mm	Total settlement = 50 mm	Total settlement = 60 mm
Raft Foundation	12.0	64.6	72.7	31.5	47.3	52.2	68.0
	14.0	86.5	98.3	34.5	51.8	58.9	76.1
	16.0	123.7	134.8	39.0	58.5	67.2	86.7
	18.0	157.5	172.4	42.5	63.8	74.5	95.7

The recommended values include a bearing capacity safety factor of 2.5. The appropriate net bearing pressures may be selected for the deflection/settlement as computed from soil-structure interaction.

Net bearing pressure for foundations at intermediate depths may be interpolated linearly between the values given above. Fill placed above EGL should be treated as surcharge load. Foundation should be seated 0.5 into natural strata.

7.0 BASEMENT DESIGN

The basement should be adequately waterproofed and designed to resist lateral earth pressure due to backfill and saturation of soils as well as hydrostatic uplift pressure.

Groundwater was not met to the maximum explored depth of 60.45 m below EGL at the time of our field investigation (April, 2022). Therefore, hydrostatic uplift is unlikely. However, there is a possibility that the soils at shallow depth may get saturated temporarily due to seepage from surface sources, leaking water pipes, etc.

Therefore, we suggest that a hydrostatic uplift equivalent to 1 m head of water be considered in the design to account for the worst condition.

The basement retaining wall should be designed to resist horizontal earth pressure as well as hydrostatic pressure. We recommend the following values of coefficients of earth pressures for active, passive and rest conditions for the purpose of basement design:

Depth below EGL, m		k_a	k_p	k_0
From	To			
0.0	3.0	0.38	2.64	0.55
3.0	6.0	0.37	2.70	0.54
6.0	9.0	0.35	2.85	0.52
9.0	12.0	0.33	3.00	0.50
12.0	18.0	0.32	3.08	0.49

where:

k_a = Co-efficient of active earth pressure
k_p = Co-efficient of passive earth pressure
k_0 = Co-efficient of earth pressure at rest

A suitable safety factor should be applied on the passive earth pressure as well as hydrostatic uplift.

8.0 CHEMICAL ATTACK

Results of chemical test on selected soil samples are presented on Page No. 58. The results indicate that the soils contain 0.08-0.13 percent sulphates and 0.01-0.03 percent chlorides. The pH value of soil is 7.4-7.6.

IS: 456-2000 recommends that precautions should be taken against chemical degradation of concrete if

- sulphates content of the soils exceeds 0.2 percent, or
- groundwater contains more than 300 mg / litre of sulphates (SO3).

Comparing the test results with these specified limits, the sulphate content of the soil is lower than the specified limit. Groundwater was not met and is not likely to influence foundation concrete. Therefore, strata at the site may be treated in Class-1 category as described on IS: 456-2000.

In our opinion, the soils at site are not aggressive to foundation concrete. We recommend the following as a good practice to limit the potential for chemical attack:

(1) The cement content in open foundations concrete should be at least 280 kg/m^3.

(2) Water cement ratio in foundation concrete should generally not exceed 0.55.

(3) A clear concrete cover over the reinforcement steel of at least 50 mm should be provided for all foundations.

(4) Foundation concrete should be densified adequately using a vibrator so as to form a dense impervious mass.

9.0 FOUNDATION CONSTRUCTION CONSIDERATIONS

9.1 Temporary Excavation

Based on the boreholes drilled during our field investigation in April-2022, we suggest that temporary open cut excavations for foundation constructions may be excavated as per details given below in table:

Depth below EGL, m		*Vertical*	*Horizontal*
From	To		
0.0	3.0	1	1.0-1.2
3.0	6.0	1	0.9-0.8
6.0	9.0	1	0.8-0.7
9.0	12.0	1	0.7-0.6
12.0	18.0	1	0.6-0.5

A 1.5 m wide horizontal berm should be provided at about 2~3 m depth interval for stability purpose. In case excessive sloughing or caving occurs, the slopes may be flattened further to ensure stability. The engineer should monitor the excavation slopes.

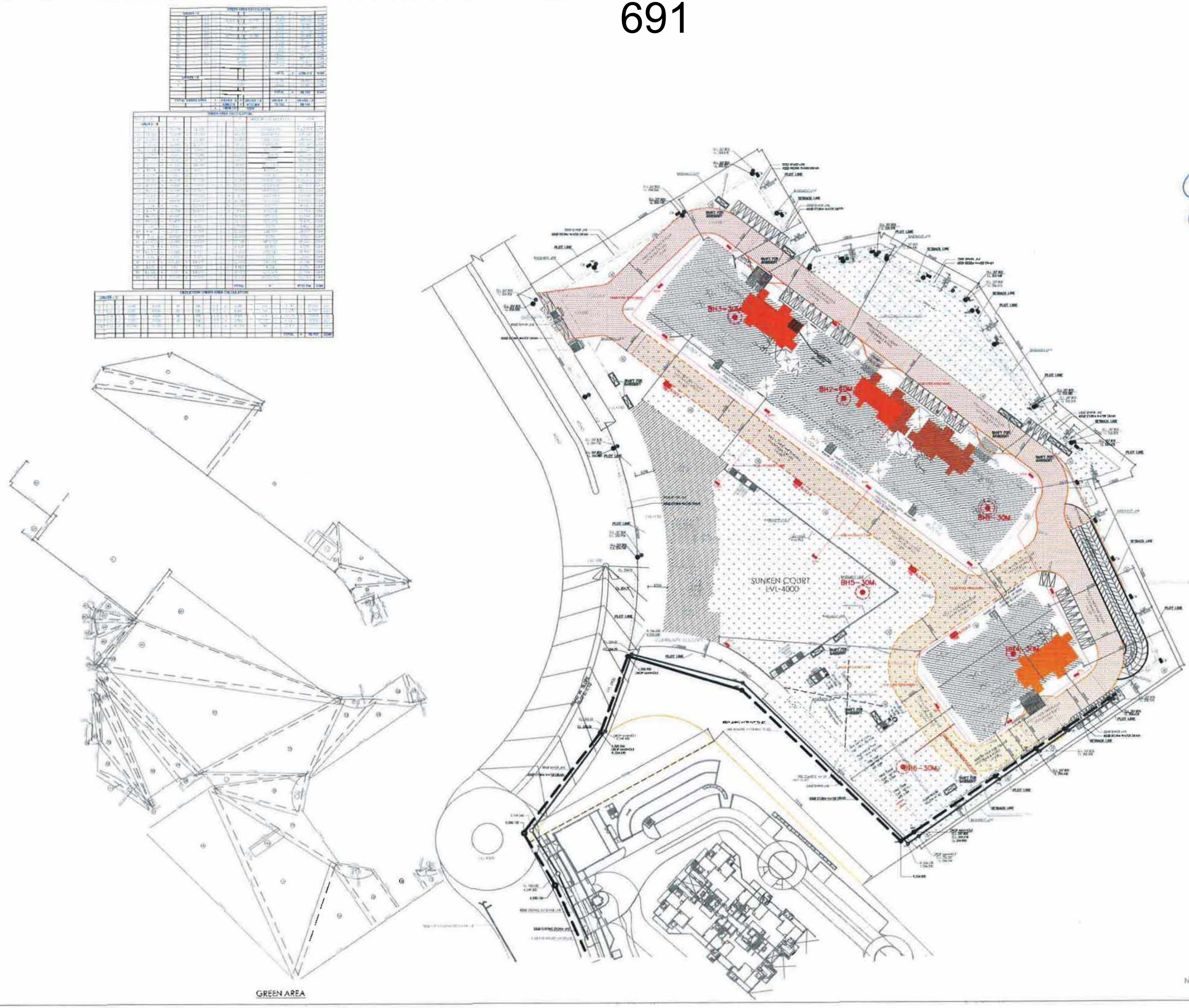
If sufficient space is not available for sloped excavation, consideration may be given to provision of sheet piles / diaphragm walls or contiguous / secant piles as a temporary / permanent earth retention system for excavation. Special care should be taken to ensure that adjacent structures beyond the excavation line are not affected by the deep excavation.

9.2 Backfill Above Foundation

Natural soils at the site is suitable for the backfill. The fill should be placed in layers not exceeding 15 cm at a moisture content of ±1% of the optimum moisture content. It should be compacted to at least 95% of the maximum dry density determined in accordance with IS 2720 (Part 7) – 1980 RA 2007.

10.0 VARIABILITY IN SUBSURFACE CONDITIONS

Subsurface conditions encountered during construction may vary somewhat from the conditions encountered during the site investigation. In case significant variations are encountered during construction, we request to be notified so that our engineers may review the recommendations in this report in light of these variations.



Not...

1. BU... WI... DE...ED (STRUCTURES)
AS PER RELEVENT IS CODES FOR EARTH QUAKE RESISTANCE.

2. BUILDING IS HAS AUTOMATIC SPRINKLER SYSTEM ON ALL FLOORS.

LEGEND: –

(1) BH2 – 60 M depth

(2) BH1 | BH3 | BH4 / BH5 | BH6 – 30 m d...

Project:

PROPOSED GROUP HOUSING BUILDINGS IN PART OF DLF 5, SECTOR-54, GURUGRAM.

Associate Architects

RSMS ARCHITECTS

RSMS ARCHITECTS PVT. LTD.
69,Nora Niwas Bhawani Kunj
(Behind D2), Vasant Kunj,
New Delhi-110070.
Tel.: 011-26898616, 26898617
www.rsms-arch.com

OWNER: DLF
DLF LIMITED
THE SHOPPING MALL, DLF
QUTAB ENCLAVE(PHASE-I)
GURGAON, HARYANA 122002

OWNER'S SEAL & SIGNATURE

ARCHITECT'S SEAL & SIGNATURE

FEB.-2022.	Scale : 1:400	
Drawing Title - SITE PLAN (IRRIGATION LINE, EXTERNAL FIRE LINE, WATER SUPPLY LINE, SEWRAGE SCHEME, STORM WATER SCHEME)		Drawing No.- ST-02
	351	DLF5

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Borehole Log (BH-1)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

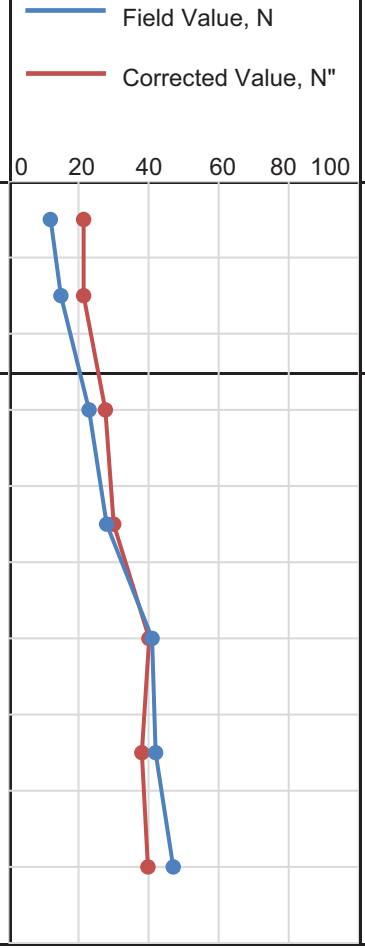
Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 03-Apr-22

Finish Date : 03-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	0.5	SPT1	-	12	21		Light brown silty sand (SM)			0	63	35	2									
	1.5	SPT2		15	21																	
	2.3	UDS1															2.68	1.60	1.49	7.4	0.0	29.0
								3.0														
	3.0	SPT3		23	28		Light brown sandy silt, low plastic (ML-CL)							23.8	17.9	5.9						
	4.5	SPT4		28	30																	
	5.3	UDS2																1.65	1.53	8.1		
	6.0	SPT5		41	40					3	31	58	8									
	7.5	SPT6		42	38																	
	8.3	UDS3																1.69	1.55	9.3	0.0	31.0
	9.0	SPT7		47	40									24.3	18.2	6.1						



Borehole Log (BH-1)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 03-Apr-22

Finish Date : 03-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	10.5	SPT8		43	34																	
	11.3	UDS4															2.64	1.71	1.56	9.7		
	12.0	SPT9		51	38		Light brown sandy silt, low plastic (ML-CL)	13.5		4	34	55	7									
	13.5	SPT10		55	39					4	53	39	4									
	14.3	UDS5																1.71	1.58	8.4		
	15.0	SPT11		50	34																	
	17.3	UDS6					Light brown silty sand (SM)											1.72	1.58	9.0		
	18.0	SPT12		59	36					4	63	30	3									
	20.3	UDS7																1.76	1.60	10.3	0.0	33.0

Borehole Log (BH-1)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 03-Apr-22

Finish Date : 03-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Bulk Density (gm/cm^3)	Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
							Light brown silty sand (SM)	**21.0**														
	21.0	SPT13		77	43		Light brown sandy silt, low plastic (ML-CL)							23.5	18.6	4.9						
	23.3	UDS8								4	30	59	7				1.68	1.81	1.61	12.5		
	24.0	SPT14		70	36																	
	26.3	UDS9						**27.0**						22.8	17.0	5.8		1.83	1.62	13.2		
	27.0	SPT15		81	38		Light brown silty sand (SM)			5	55	36	4									
	29.3	UDS10																1.83	1.62	12.7		
	30.0	SPT16		94	43			**30.5**		6	66	27	1									

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Borehole Log (BH-2)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 60.45 m

Drilling : Shell & Auger

Start Date : 08-Apr-22

Finish Date : 09-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT: Field Value, N	SPT: Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	0.5	SPT1	-	9	16		Light brown silty sand (SM)			0	69	29	2									
	1.5	SPT2		7	10																	
	2.3	UDS1																1.57	1.48	6.4		
	3.0	SPT3		12	14																	
	4.5	SPT4		17	18																	
	5.3	UDS2						6.0		0	58	39	3				2.68	1.61	1.50	7.6	0.0	29.0
	6.0	SPT5		19	19		Light brown sandy silt, low plastic (ML-CL)							22.9	17.6	5.3						
	7.5	SPT6		30	27																	
	8.3	UDS3						9.0		2	29	62	7					1.67	1.53	8.9		
	9.0	SPT7		42	36		Light brown sandy silt, no plastic (ML)			3	40	53	4									

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Borehole Log (BH-2)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 60.45 m

Drilling : Shell & Auger

Start Date : 08-Apr-22

Finish Date : 09-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	10.5	SPT8		52	41																	
	11.3	UDS4												21.8	N.P			1.72	1.56	10.0	0.0	32.0
	12.0	SPT9		43	32		Light brown sandy silt, no plastic (ML)															
	13.5	SPT10		36	26																	
	14.3	UDS5						15.0		3	38	55	4				2.66	1.72	1.55	10.8		
	15.0	SPT11		36	24		Light brown silty sand (SM)			3	52	41	4									
	17.3	UDS6						18.0										1.72	1.58	9.0	0.0	34.0
	18.0	SPT12		56	34		Light brown sandy silt, low plastic (ML-CL)							24.1	18.6	5.5						
	20.3	UDS7																1.74	1.59	9.7		

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Borehole Log (BH-2)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 60.45 m

Drilling : Shell & Auger

Start Date : 08-Apr-22

Finish Date : 09-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT: Field Value, N	SPT: Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	21.0	SPT13		66	37		Light brown sandy silt, low plastic (ML-CL)			4	35	56	5									
	23.3	UDS8						24.0						22.7	17.5	5.2		1.79	1.60	12.0		
	24.0	SPT14		58	30					4	53	39	4									
	26.3	UDS9															1.69	1.83	1.62	13.2		
	27.0	SPT15		82	39		Light brown silty sand (SM)															
	29.3	UDS10																1.84	1.63	12.8		
	30.0	SPT16		88	40					5	69	25	1									

Borehole Log (BH-2)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 60.45 m

Drilling : Shell & Auger

Start Date : 08-Apr-22

Finish Date : 09-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis				Atterberg Limits			Specific Gravity	Density		Moisture Content (%)	Shear Tests	
				Field Value, N	Corrected Value, N"				Field Value, N / Corrected Value, N" (0 20 40 60 80 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gm/cm^3)	Dry Density (gm/cm^3)		Cohesion Intercept, 'c' (kg/cm^2)	Angle of Internal Friction, 'Φ' (degrees)
	32.3	UDS1	-				Light brown silty sand (SM)			3	71	24	2				2.69	1.86	1.62	14.6		
	33.0	SPT1		92	42																	
	35.3	UDS2																1.88	1.62	15.8		
	36.0	SPT2		90	41																	
	38.3	UDS3																1.90	1.63	16.3		
	39.0	SPT3		95	44					4	69	25	2									

Borehole Log (BH-2)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 60.45 m

Drilling : Shell & Auger

Start Date : 08-Apr-22

Finish Date : 09-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis				Atterberg Limits			Specific Gravity	Density		Moisture Content (%)	Shear Tests	
				Field Value, N	Corrected Value, N"					Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gm/cm^3)	Dry Density (gm/cm^3)		Cohesion Intercept, 'c' (kg/cm^2)	Angle of Internal Friction, 'Φ' (degrees)
	41.3	UDS4																1.90	1.63	16.6		
	42.0	SPT4		93	43					5	72	22	1									
	44.3	UDS5															2.70	1.89	1.62	16.8		
	45.0	SPT5		74	34		Light brown silty sand (SM)															
	47.3	UDS6																1.89	1.62	16.5		
	48.0	SPT6		66	30					3	75	21	1									
	50.3	UDS7																1.89	1.61	17.1		

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Borehole Log (BH-2)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 60.45 m

Drilling : Shell & Auger

Start Date : 08-Apr-22

Finish Date : 09-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	51.0	SPT7		56	26																	
	53.3	UDS8								4	78	18	0					1.89	1.61	17.4		
	54.0	SPT8		69	32																	
							Light brown silty sand (SM)															
	56.3	UDS9															2.69	1.90	1.62	17.3		
	57.0	SPT9		74	34																	
	59.3	UDS10								4	81	15	0					1.91	1.62	17.9		
	60.0	SPT10		83	38			60.5														

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Borehole Log (BH-3)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 07-Apr-22

Finish Date : 27-Jan-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Bulk Density (gm/cm^3)	Dry Density (gm/cm^3)	Moisture Content (%)	Cohesion Intercept, 'c' (kg/cm^2)	Angle of Internal Friction, 'Φ' (degrees)
	0.5	SPT1	-	8	14		Light brown silty sand (SM)															
	1.5	SPT2		12	17					0	65	32	3									
	2.3	UDS1																1.60	1.48	8.3	0.0	28.0
	3.0	SPT3		20	24			4.5														
	4.5	SPT4		26	28		Light brown sandy silt, low plastic (ML-CL)							24.0	18.7	5.3						
	5.3	UDS2																1.63	1.50	8.9		
	6.0	SPT5		45	44																	
	7.5	SPT6		42	38																	
	8.3	UDS3								2	31	60	7				2.65	1.69	1.54	9.7		
	9.0	SPT7		46	39			10.5														

Field Value, N

Corrected Value, N"

0 20 40 60 80 100

Borehole Log (BH-3)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 07-Apr-22

Finish Date : 27-Jan-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	10.5	SPT8		46	37		Light brown sandy silt, no plastic (ML)			3	39	53	5									
	11.3	UDS4																1.71	1.55	10.0		
	12.0	SPT9		49	37																	
	13.5	SPT10		50	36																	
	14.3	UDS5						15.0						20.6	N.P			1.72	1.56	10.3		
	15.0	SPT11		43	29		Light brown silty sand (SM)			4	54	39	3									
	17.3	UDS6															2.69	1.75	1.58	11.0	0.0	33.0
	18.0	SPT12		60	37																	
	20.3	UDS7								4	63	31	2					1.77	1.60	10.9		

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Borehole Log (BH-3)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 07-Apr-22

Finish Date : 27-Jan-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
							Light brown silty sand (SM)	**21.0**														
	21.0	SPT13		81	45		Light brown sandy silt, low plastic (ML-CL)							23.1	18.5	4.6						
	23.3	UDS8						**24.0**		5	29	60	6					1.81	1.61	12.5		
	24.0	SPT14		73	37					4	56	37	3									
	26.3	UDS9																1.83	1.62	13.2	0.0	35.0
	27.0	SPT15		86	41		Light brown silty sand (SM)															
	29.3	UDS10															2.70	1.83	1.62	12.7		
	30.0	SPT16		91	42			**30.5**		5	69	25	1									

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

Borehole Log (BH-4)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 04-Apr-22

Finish Date : 04-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	0.5	SPT1	-	8	14		Light brown silty sand (SM)															
	1.5	SPT2		15	21					0	60	37	3									
	2.3	UDS1						3.0									2.68	1.61	1.49	8.3		
	3.0	SPT3		24	29		Light brown sandy silt, low plastic (ML-CL)							23.4	18.0	5.4						
	4.5	SPT4		31	33																	
	5.3	UDS2															2.66	1.66	1.52	9.0	0.0	31.0
	6.0	SPT5		30	29																	
	7.5	SPT6		33	30					1	33	60	6									
	8.3	UDS3						9.0										1.68	1.53	9.9		
	9.0	SPT7		42	36		Light brown sandy silt, no plastic (ML)			3	39	53	5									

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

Borehole Log (BH-4)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 04-Apr-22

Finish Date : 04-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT: Field Value, N	SPT: Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	10.5	SPT8		40	32		Light brown sandy silt, no plastic (ML)															
	11.3	UDS4						12.0										1.71	1.55	10.4		
	12.0	SPT9		41	31					3	54	39	4									
	13.5	SPT10		46	33																	
	14.3	UDS5															2.69	1.71	1.56	9.8	0.0	32.0
	15.0	SPT11		52	35		Light brown silty sand (SM)															
	17.3	UDS6																1.73	1.57	10.1		
	18.0	SPT12		58	36					3	65	30	2									
	20.3	UDS7																1.74	1.58	10.3		

Borehole Log (BH-4)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 04-Apr-22

Finish Date : 04-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
							Light brown silty sand (SM)	**21.0**														
	21.0	SPT13		51	29		Light brown sandy silt, low plastic (ML-CL)							23.9	17.8	6.1						
	23.3	UDS8																1.76	1.59	11.0		
	24.0	SPT14		63	32					3	29	60	8									
	26.3	UDS9						**27.0**						23.2	18.0	5.2		1.77	1.60	10.8		
	27.0	SPT15		70	33		Light brown silty sand (SM)			3	56	38	3									
	29.3	UDS10																1.80	1.61	12.1		
	30.0	SPT16		90	41			**30.5**		6	72	22	0									

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

Borehole Log (BH-5)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 06-Apr-22

Finish Date : 06-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT: Field Value, N	SPT: Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	0.5	SPT1	-	12	21		Light brown silty sand (SM)															
	1.5	SPT2		15	21					0	65	33	2									
	2.3	UDS1						3.0										1.60	1.49	7.3	0.0	28.0
	3.0	SPT3		19	23		Light brown sandy silt, low plastic (ML-CL)							22.9	17.4	5.5						
	4.5	SPT4		29	31																	
	5.3	UDS2																1.63	1.51	7.9		
	6.0	SPT5		34	33			7.5		2	33	58	7									
	7.5	SPT6		39	35		Light brown silty sand (SM)			2	53	41	4									
	8.3	UDS3															2.66	1.66	1.53	8.6	0.0	31.0
	9.0	SPT7		52	44			10.5														

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

Borehole Log (BH-5)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 06-Apr-22

Finish Date : 06-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	10.5	SPT8		56	45									23.5	17.7	5.8						
	11.3	UDS4																1.68	1.54	9.3		
	12.0	SPT9		52	39		Light brown sandy silt, low plastic (ML-CL)	13.5		3	34	57	6									
	13.5	SPT10		61	44					3	57	37	3									
	14.3	UDS5																1.73	1.57	10.0		
	15.0	SPT11		54	37																	
	17.3	UDS6					Light brown silty sand (SM)										2.69	1.73	1.58	9.5		
	18.0	SPT12		66	40					3	68	27	2									
	20.3	UDS7																1.76	1.59	10.9		

Borehole Log (BH-5)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 06-Apr-22

Finish Date : 06-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
							Light brown silty sand (SM)	**21.0**														
	21.0	SPT13		77	43		Light brown sandy silt, low plastic (ML-CL)			4	29	59	8	24.0	18.2	5.8						
	23.3	UDS8																1.80	1.61	11.7	0.0	34.0
	24.0	SPT14		80	41																	
	26.3	UDS9												23.6	18.4	5.2		1.82	1.62	12.4		
								27.0														
	27.0	SPT15		92	43		Light brown silty sand (SM)			6	62	30	2									
	29.3	UDS10																1.84	1.62	13.8		
	30.0	SPT16		94	43			**30.5**														

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Borehole Log (BH-6)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

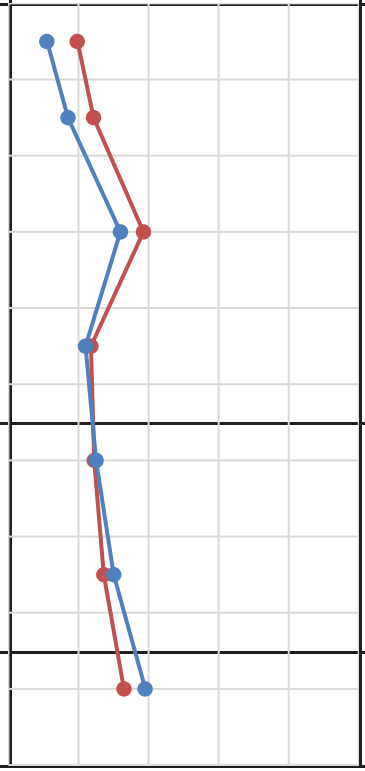
Drilling : Shell & Auger

Start Date : 05-Apr-22

Finish Date : 05-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT: Field Value, N	SPT: Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	0.5	SPT1	-	11	20		Light brown silty sand (SM)														
	1.5	SPT2		17	24				0	70	29	1									
	2.3	UDS1														2.67	1.62	1.50	8.2		
	3.0	SPT3		32	39																
	4.5	SPT4		22	24																
	5.3	UDS2						6.0	1	56	40	3					1.64	1.51	8.9	0.0	30.0
	6.0	SPT5		25	24		Light brown sandy silt, low plastic (ML-CL)						23.9	18.1	5.8						
	7.5	SPT6		30	27																
	8.3	UDS3						9.0	2	32	59	7					1.68	1.53	9.5		
	9.0	SPT7		39	33		Light brown sandy silt, no plastic (ML)		2	37	56	5									

Standard Penetration Test Results



Borehole Log (BH-6)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

Drilling : Shell & Auger

Start Date : 05-Apr-22

Finish Date : 05-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT: Field Value, N	SPT: Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	10.5	SPT8		37	29		Light brown sandy silt, no plastic (ML)										2.65	1.71	1.55	10.2		
	11.3	UDS4																				
	12.0	SPT9		36	27																	
	13.5	SPT10		43	31																	
	14.3	UDS5						15.0		3	39	54	4					1.71	1.56	9.8		
	15.0	SPT11		48	33		Light brown silty sand (SM)			3	56	37	4									
	17.3	UDS6						18.0										1.72	1.56	10.3		
	18.0	SPT12		61	37		Light brown sandy silt, low plastic (ML-CL)							22.9	17.6	5.3						
	20.3	UDS7								3	29	60	8					1.76	1.59	10.9		

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

Geotechnical Consultants, Land Surveyors, Piling Contractor & GPR Surveyors

Borehole Log (BH-6)

Location : Sector-54, Phase-V_Gurugram

Ground Water Level : Not met

Termination Depth : 30.45 m

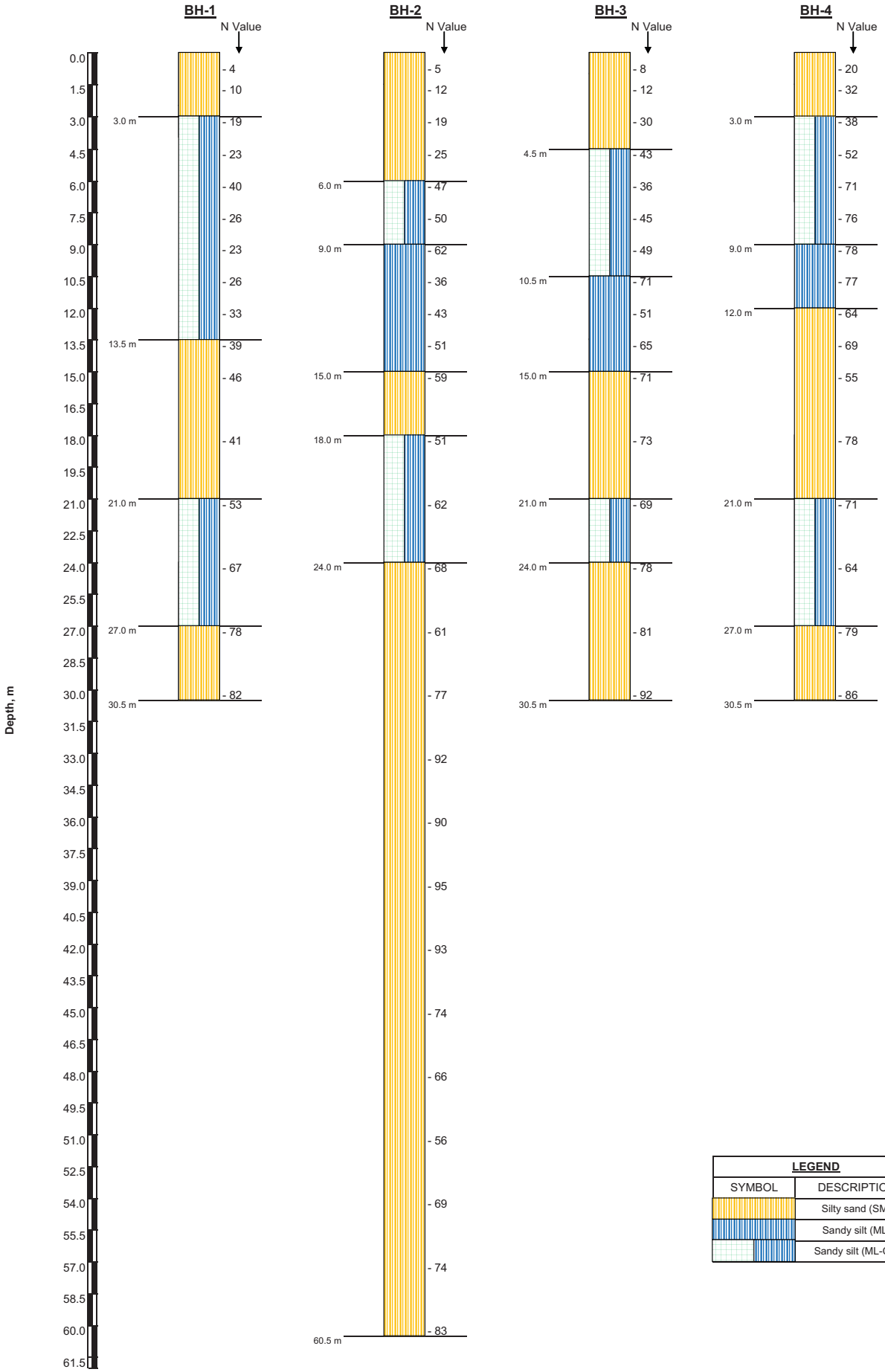
Drilling : Shell & Auger

Start Date : 05-Apr-22

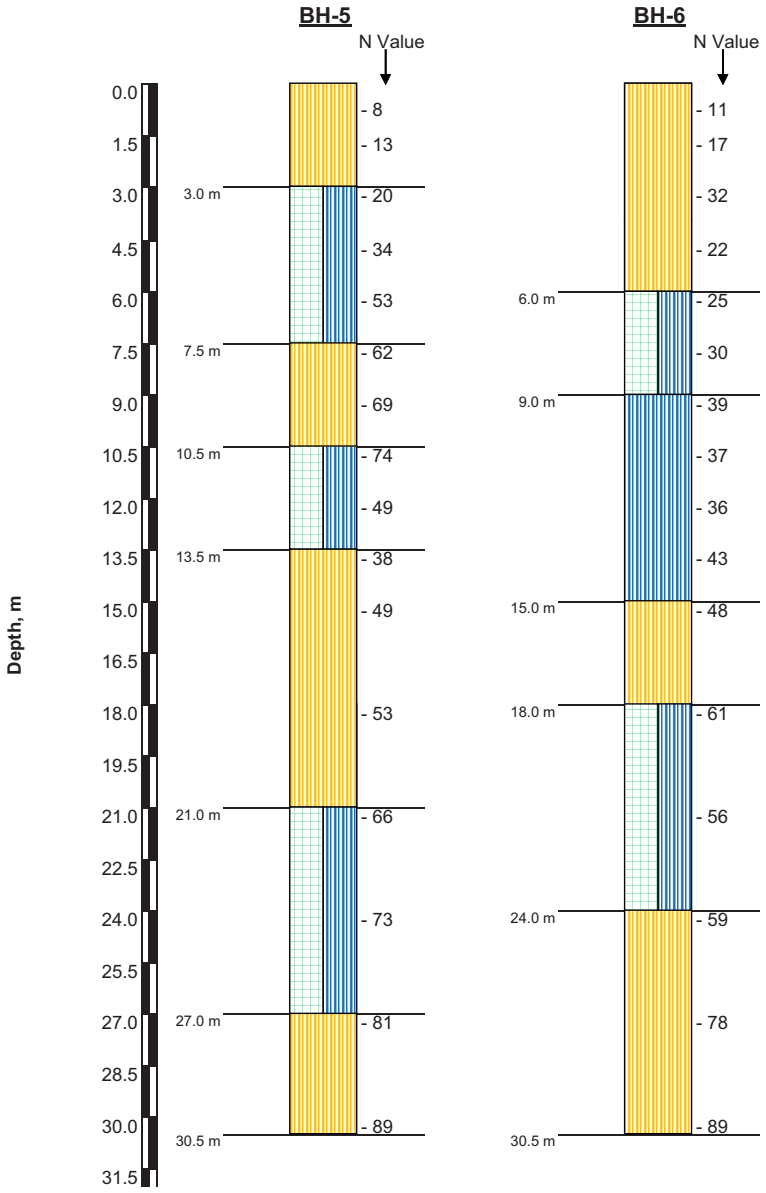
Finish Date : 05-Apr-22

Scale	Depth, m	Sample Designation	Groundwater depth, m	SPT Field Value, N	SPT Corrected Value, N"	Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Standard Penetration Test Results	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)	Specific Gravity	Density: Bulk Density (gm/cm^3)	Density: Dry Density (gm/cm^3)	Moisture Content (%)	Shear Tests: Cohesion Intercept, 'c' (kg/cm^2)	Shear Tests: Angle of Internal Friction, 'Φ' (degrees)
	21.0	SPT13		56	31		Light brown sandy silt, low plastic (ML-CL)															
	23.3	UDS8						24.0						23.6	18.0	5.6	2.67	1.78	1.59	11.7		
	24.0	SPT14		59	30					3	55	39	3									
	26.3	UDS9																1.81	1.61	12.7		
	27.0	SPT15		78	37		Light brown silty sand (SM)															
	29.3	UDS10																1.84	1.62	13.3	0.0	34.0
	30.0	SPT16		89	41			30.5		6	66	27	1									

Standard Penetration Test Results: Field Value, N; Corrected Value, N"; 0 20 40 60 80 100

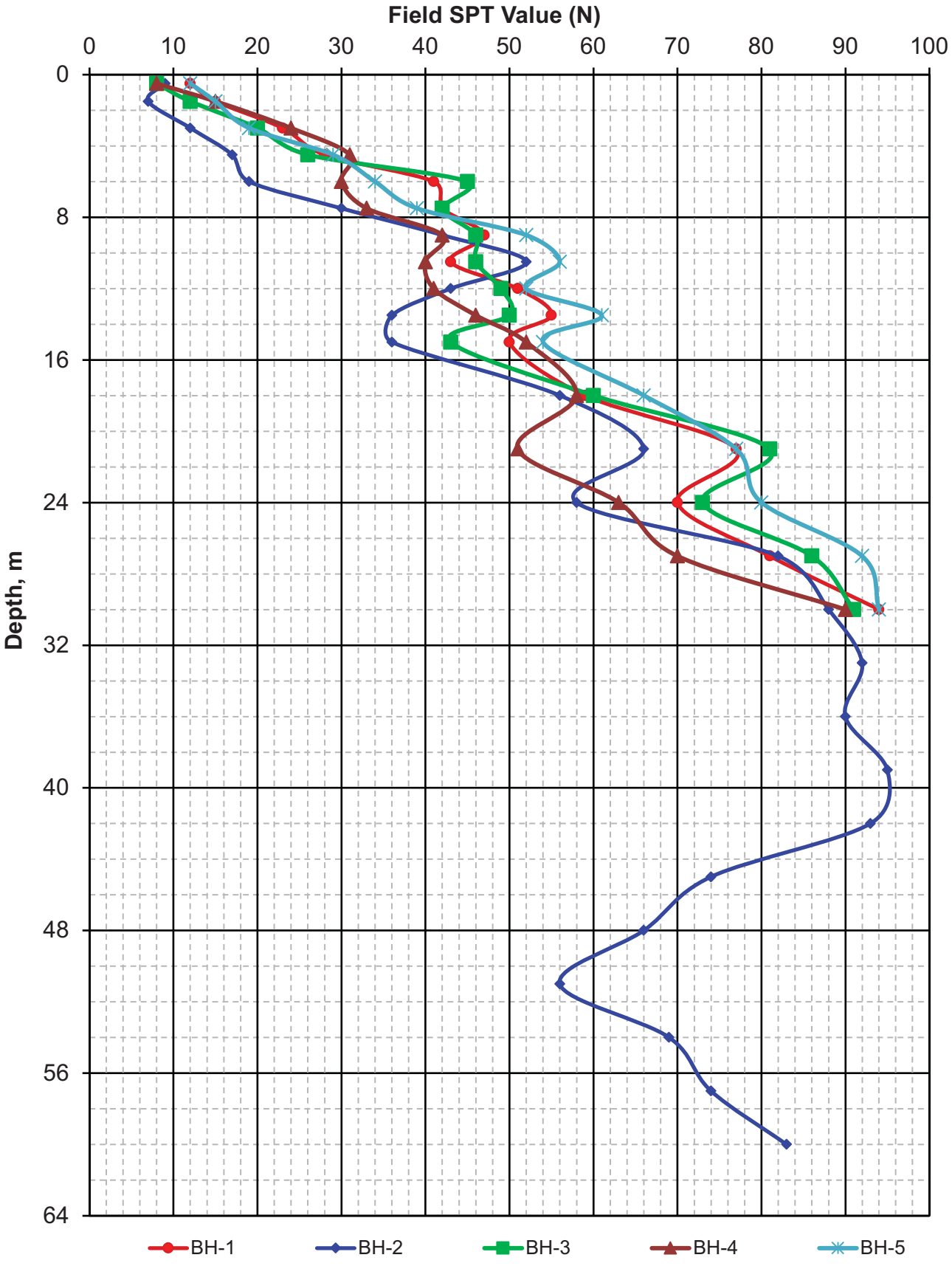


Cross Section of Boreholes

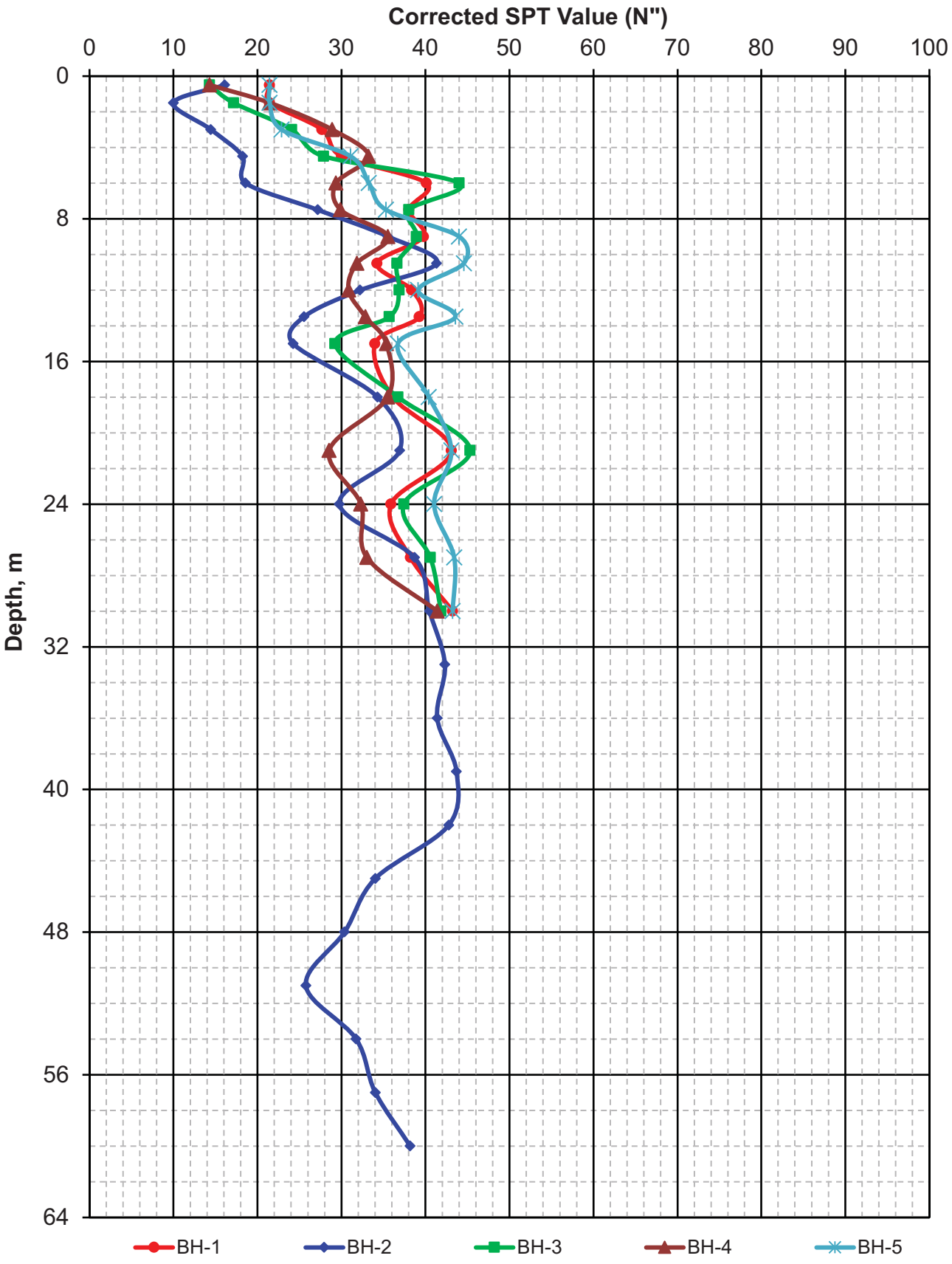


LEGEND	
SYMBOL	DESCRIPTION
	Silty sand (SM)
	Sandy silt (ML)
	Sandy silt (ML-CL)

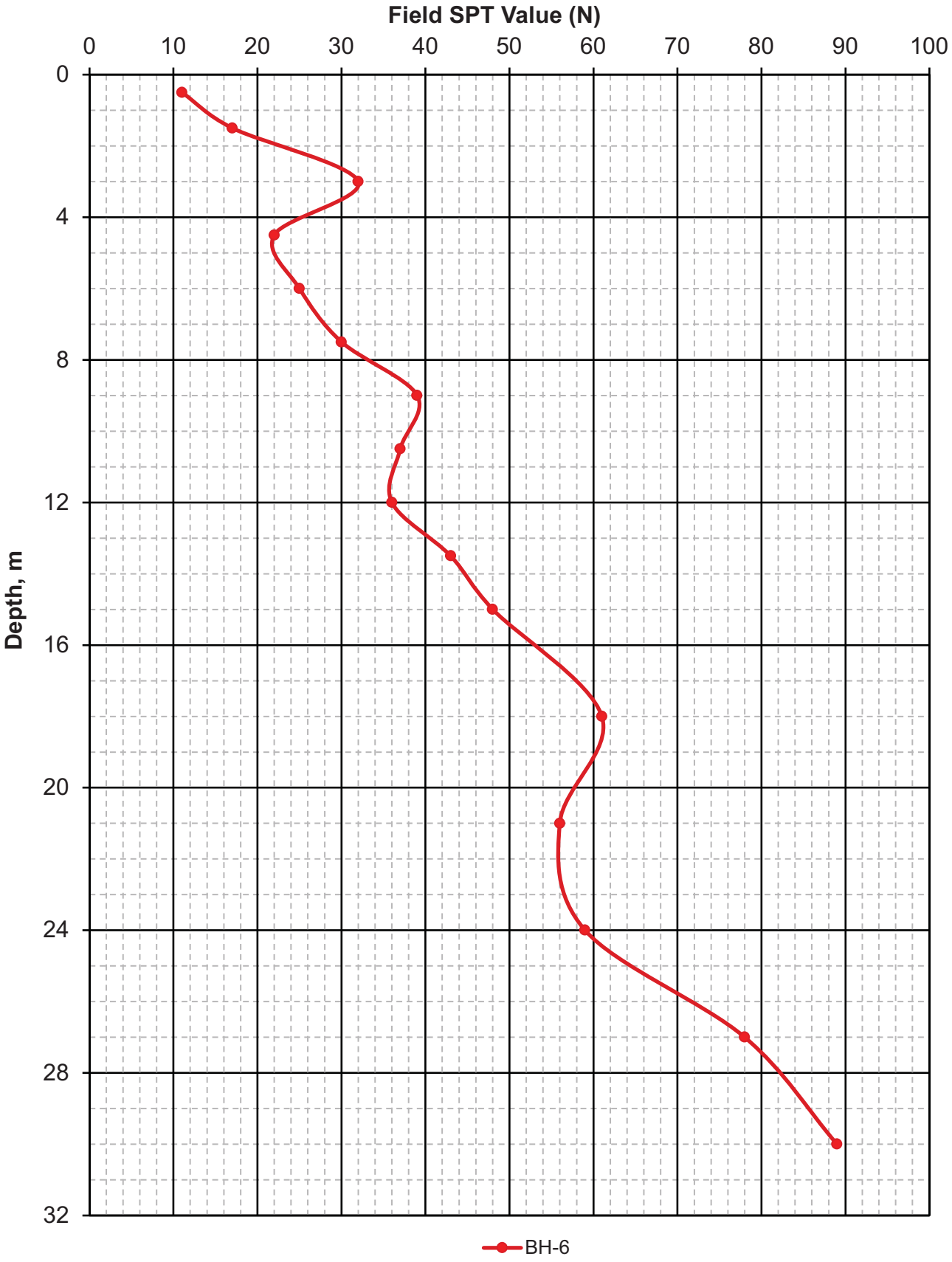
Cross Section of Boreholes



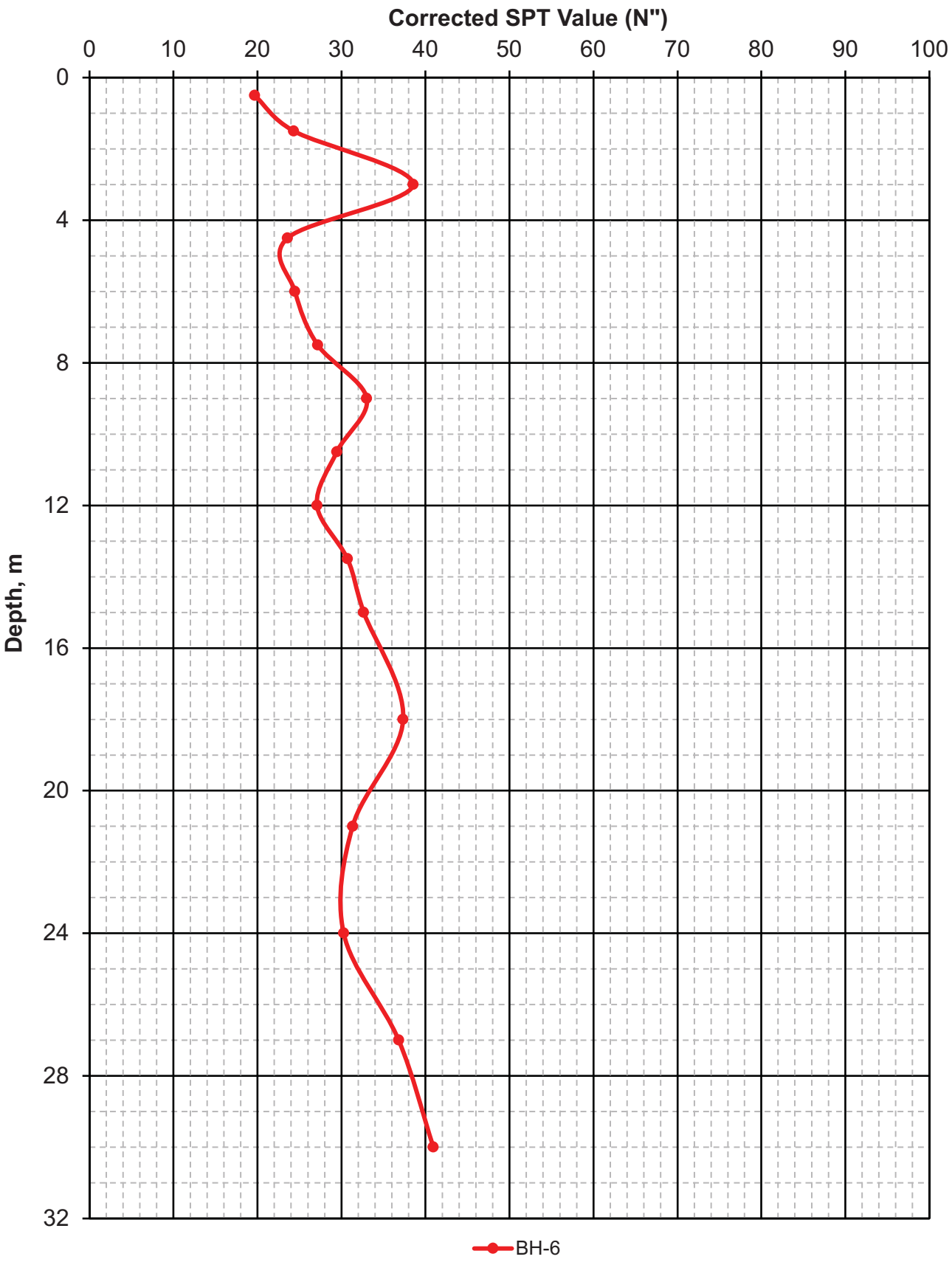
Plot of Field SPT-N value v/s depth



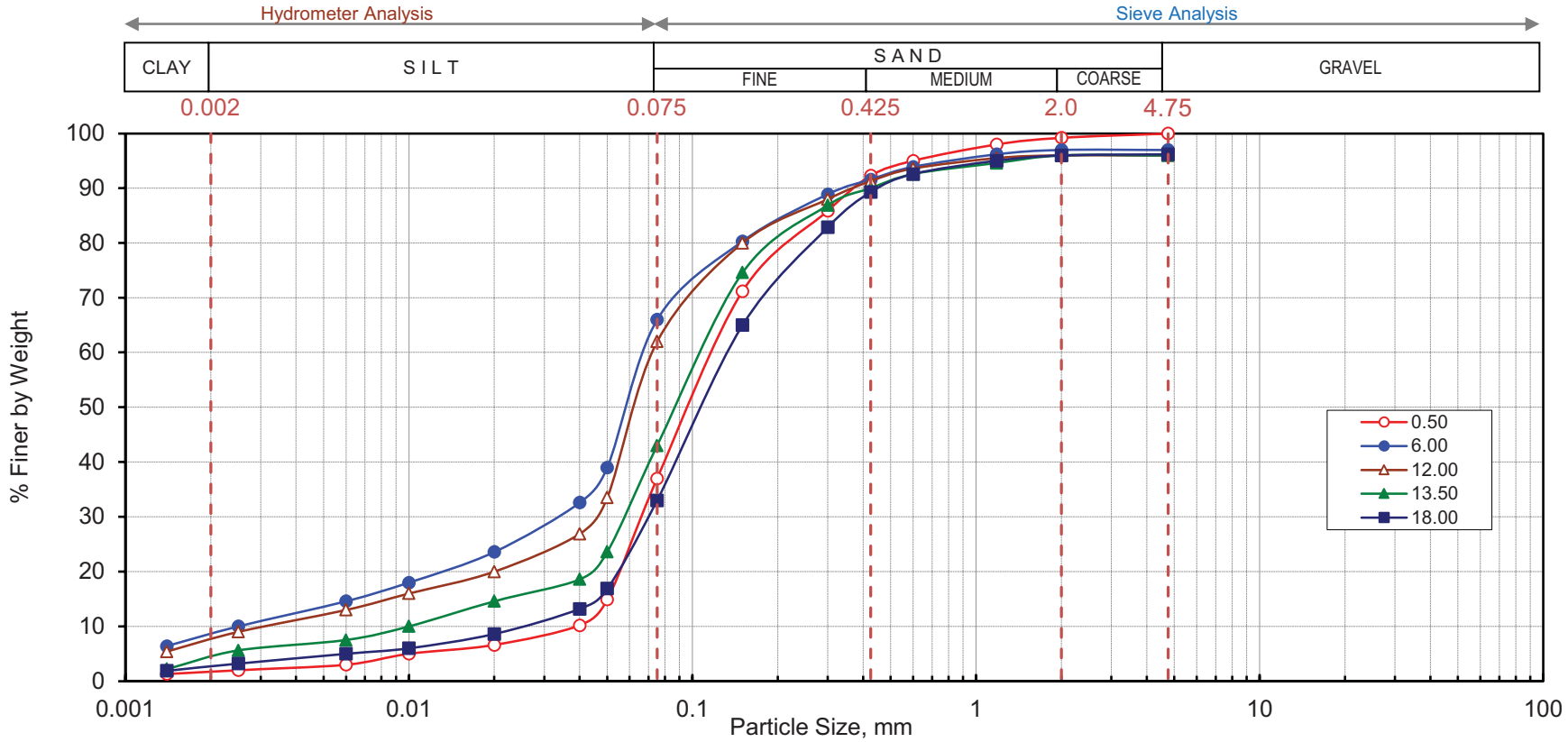
Plot of Corrected SPT-N" value v/s depth



Plot of Field SPT-N value v/s depth

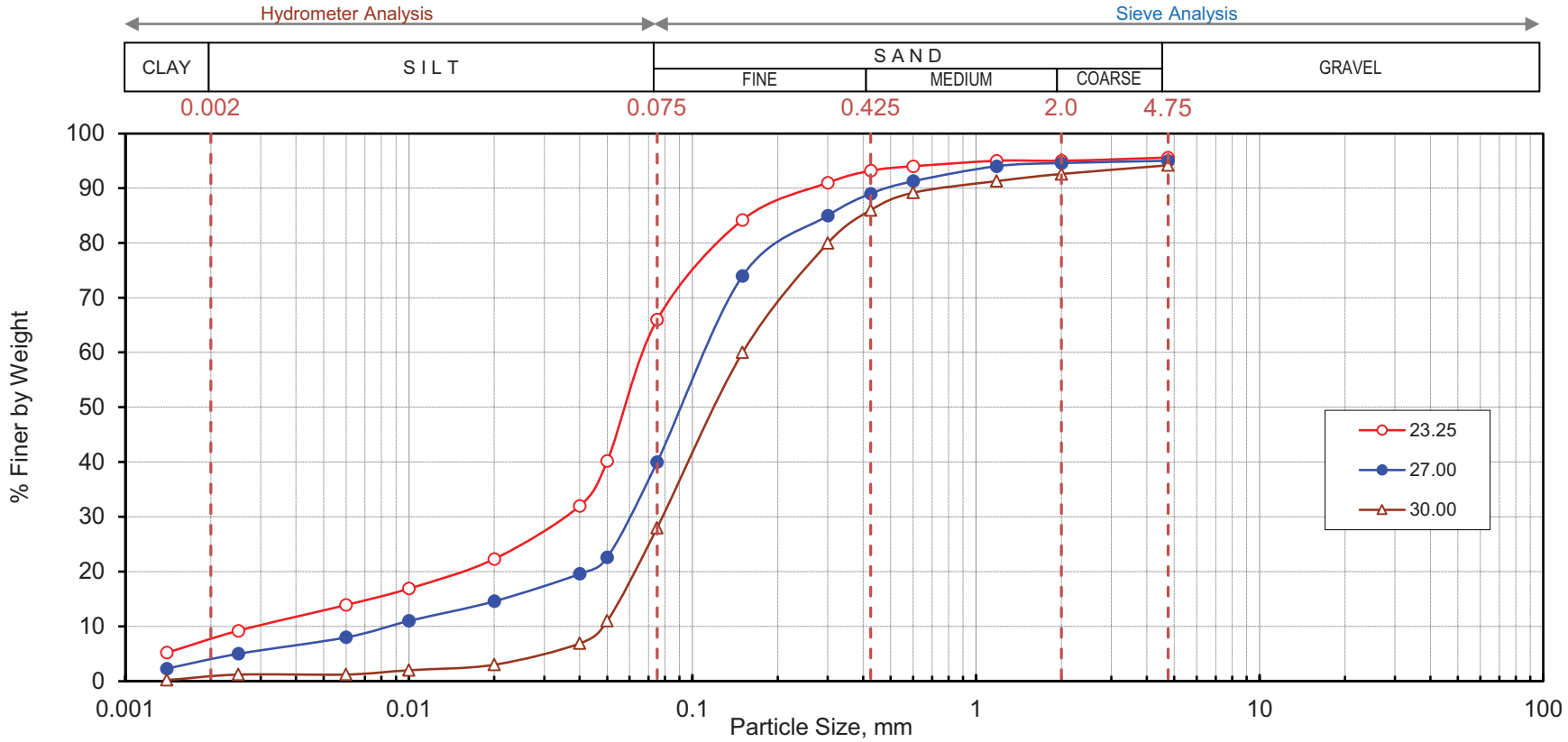


Plot of Corrected SPT-N" value v/s depth



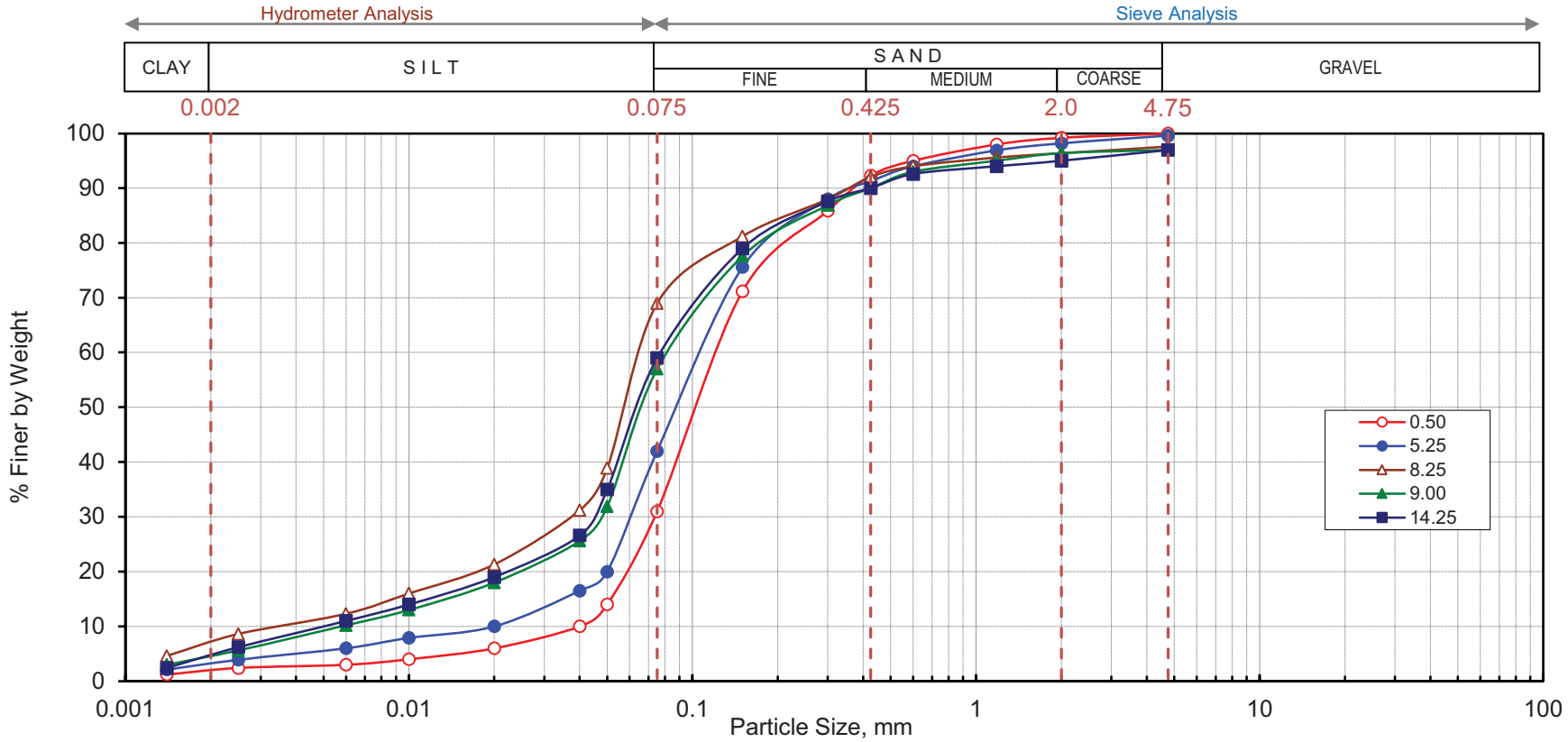
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-1	0.50	Silty sand (SM)	0	63	35	2		0.125	0.067	0.039	3.2	0.92
	BH-1	6.00	Sandy silt (ML-CL)	3	31	58	8		0.069	0.034			
	BH-1	12.00	Sandy silt (ML-CL)	4	34	55	7		0.073	0.045	0.003	21.7	8.08
	BH-1	13.50	Silty sand (SM)	4	53	39	4		0.115	0.058	0.010	11.5	2.94
	BH-1	18.00	Silty sand (SM)	4	63	30	3		0.138	0.070	0.026	5.3	1.37

Grain Size Distribution



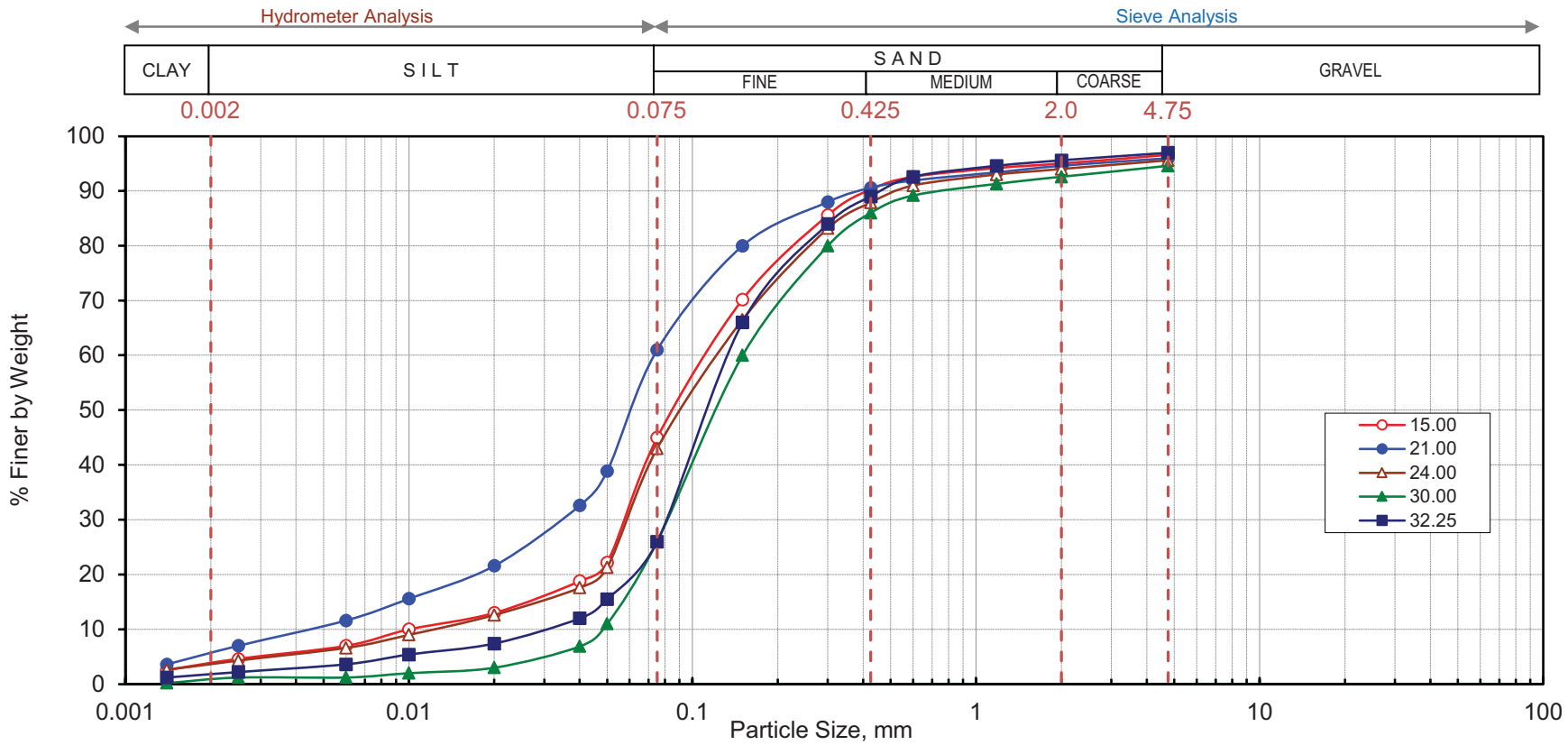
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-1	23.25	Sandy silt (ML-CL)	4	30	59	7		0.069	0.036	0.003	22.4	6.01
	BH-1	27.00	Silty sand (SM)	5	55	36	4		0.119	0.061	0.009	13.7	3.56
	BH-1	30.00	Silty sand (SM)	6	66	27	1		0.150	0.080	0.048	3.2	0.89

Grain Size Distribution



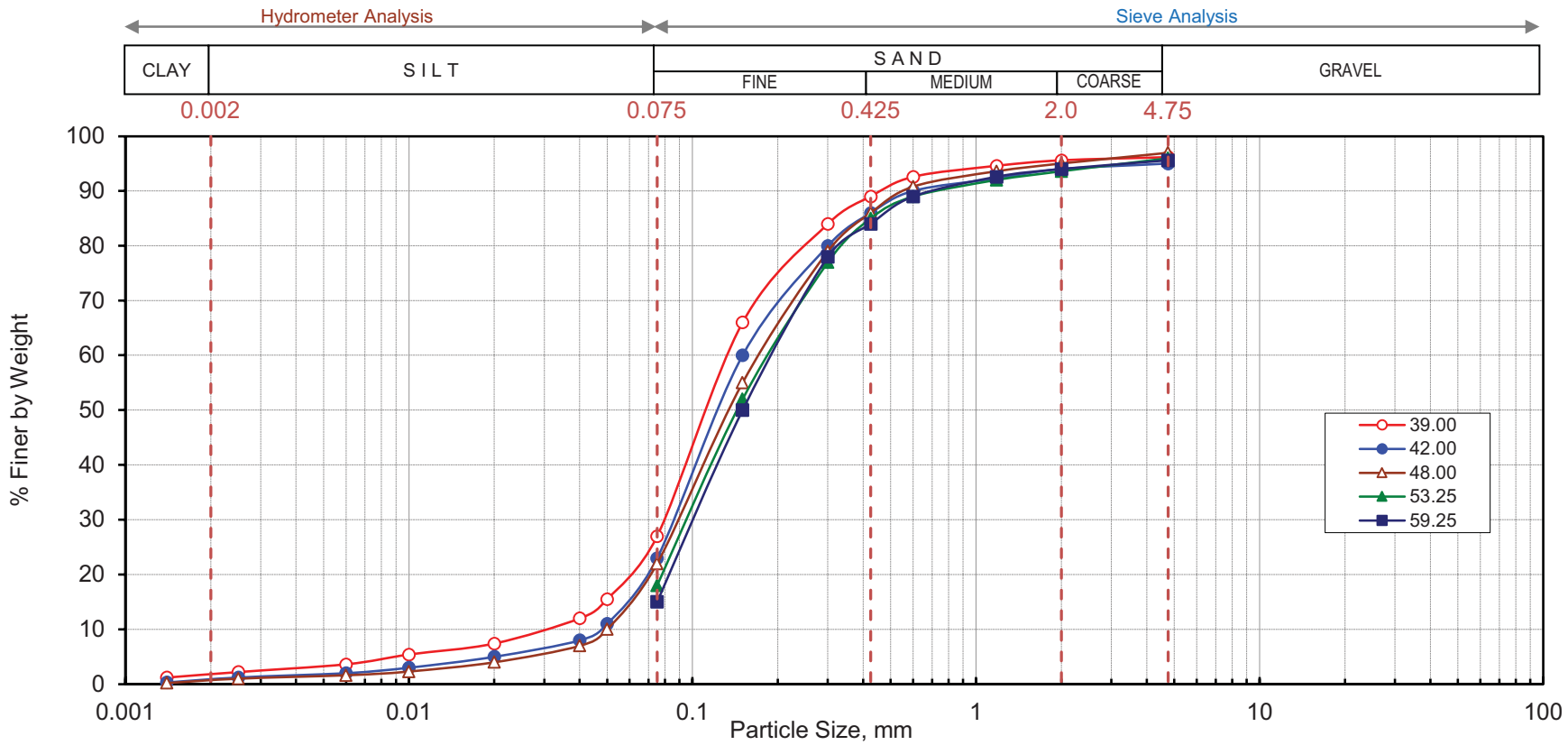
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-2	0.50	Silty sand (SM)	0	69	29	2		0.129	0.074	0.040	3.2	1.05
	BH-2	5.25	Silty sand (SM)	0	58	39	3		0.115	0.061	0.020	5.8	1.63
	BH-2	8.25	Sandy silt (ML-CL)	2	29	62	7		0.068	0.038	0.004	17.7	5.47
	BH-2	9.00	Sandy silt (ML)	3	40	53	4		0.086	0.047	0.006	14.7	4.39
	BH-2	14.25	Sandy silt (ML)	3	38	55	4		0.079	0.044	0.005	14.9	4.67

Grain Size Distribution



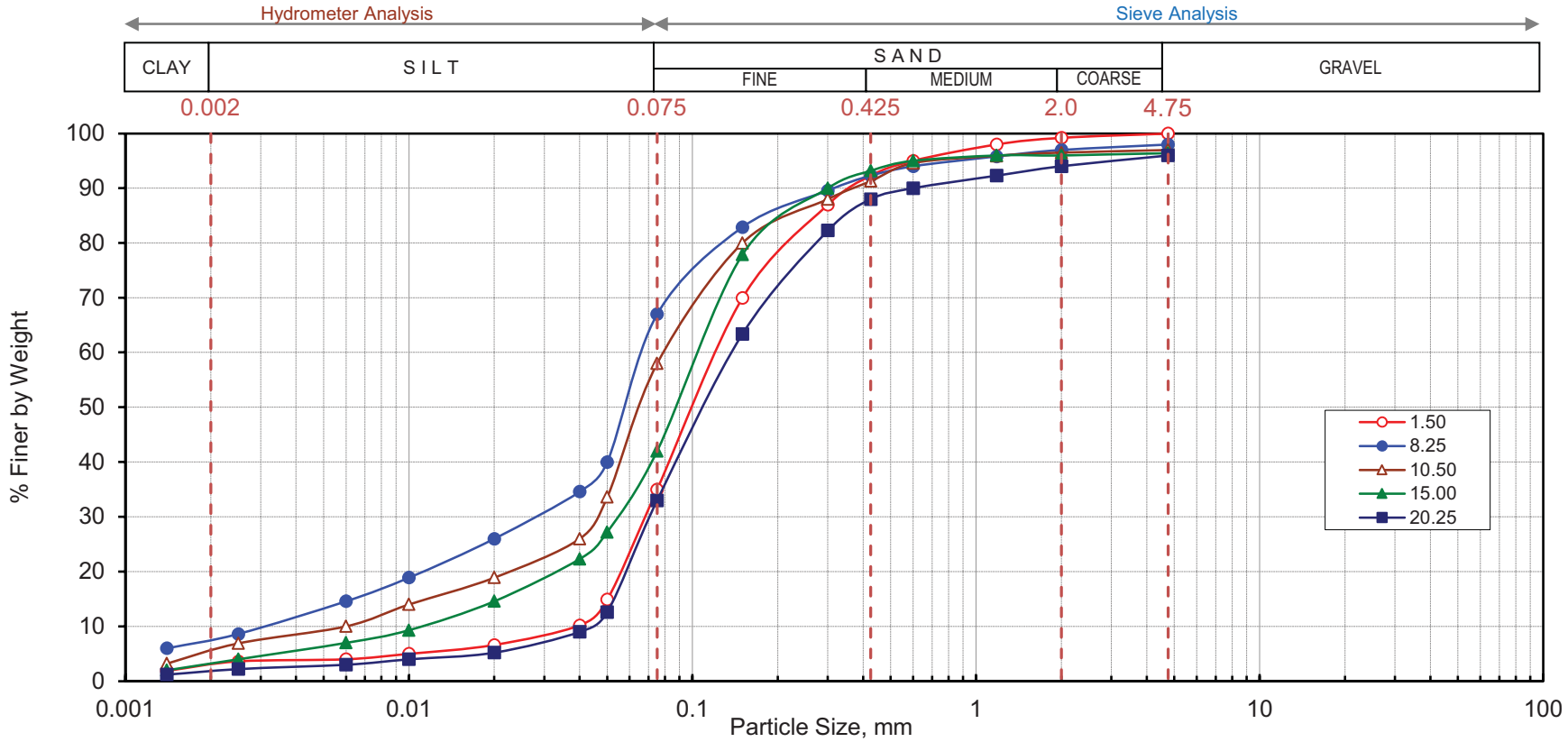
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-2	15.00	Silty sand (SM)	3	52	41	4		0.120	0.059	0.010	12.0	2.87
	BH-2	21.00	Sandy silt (ML-CL)	4	35	56	5		0.074	0.035	0.005	15.5	3.52
	BH-2	24.00	Silty sand (SM)	4	53	39	4		0.129	0.060	0.013	10.1	2.18
	BH-2	30.00	Silty sand (SM)	5	69	25	1		0.150	0.084	0.048	3.2	0.98
	BH-2	32.25	Silty sand (SM)	3	71	24	2		0.139	0.083	0.031	4.4	1.57

Grain Size Distribution



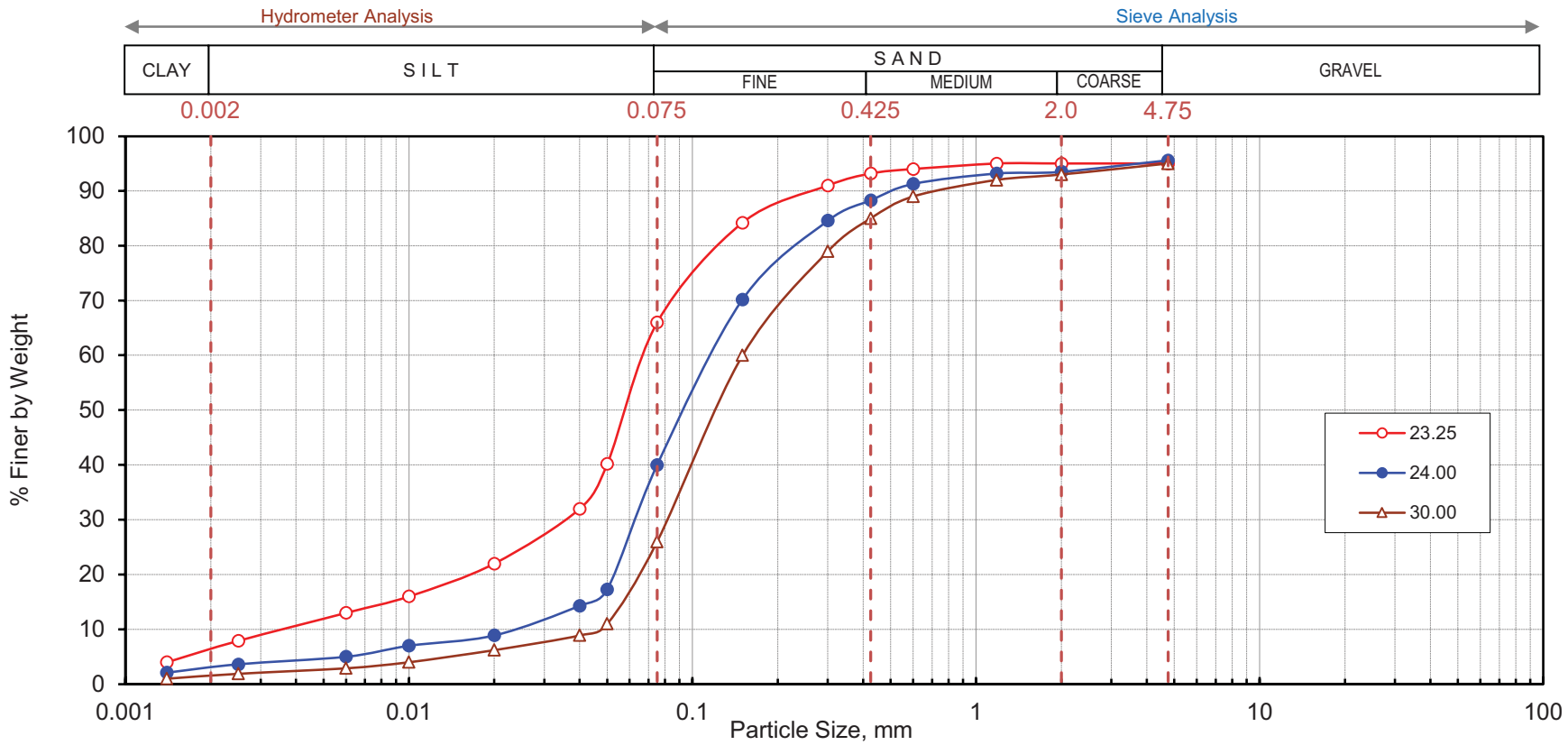
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-2	39.00	Silty sand (SM)	4	69	25	2		0.138	0.081	0.031	4.4	1.51
	BH-2	42.00	Silty sand (SM)	5	72	22	1		0.150	0.089	0.047	3.2	1.14
	BH-2	48.00	Silty sand (SM)	3	75	21	1		0.181	0.093	0.050	3.6	0.96
	BH-2	53.25	Silty sand (SM)	4	78	18	0		0.198	0.101			
	BH-2	59.25	Silty sand (SM)	4	81	15	0		0.204	0.107			

Grain Size Distribution



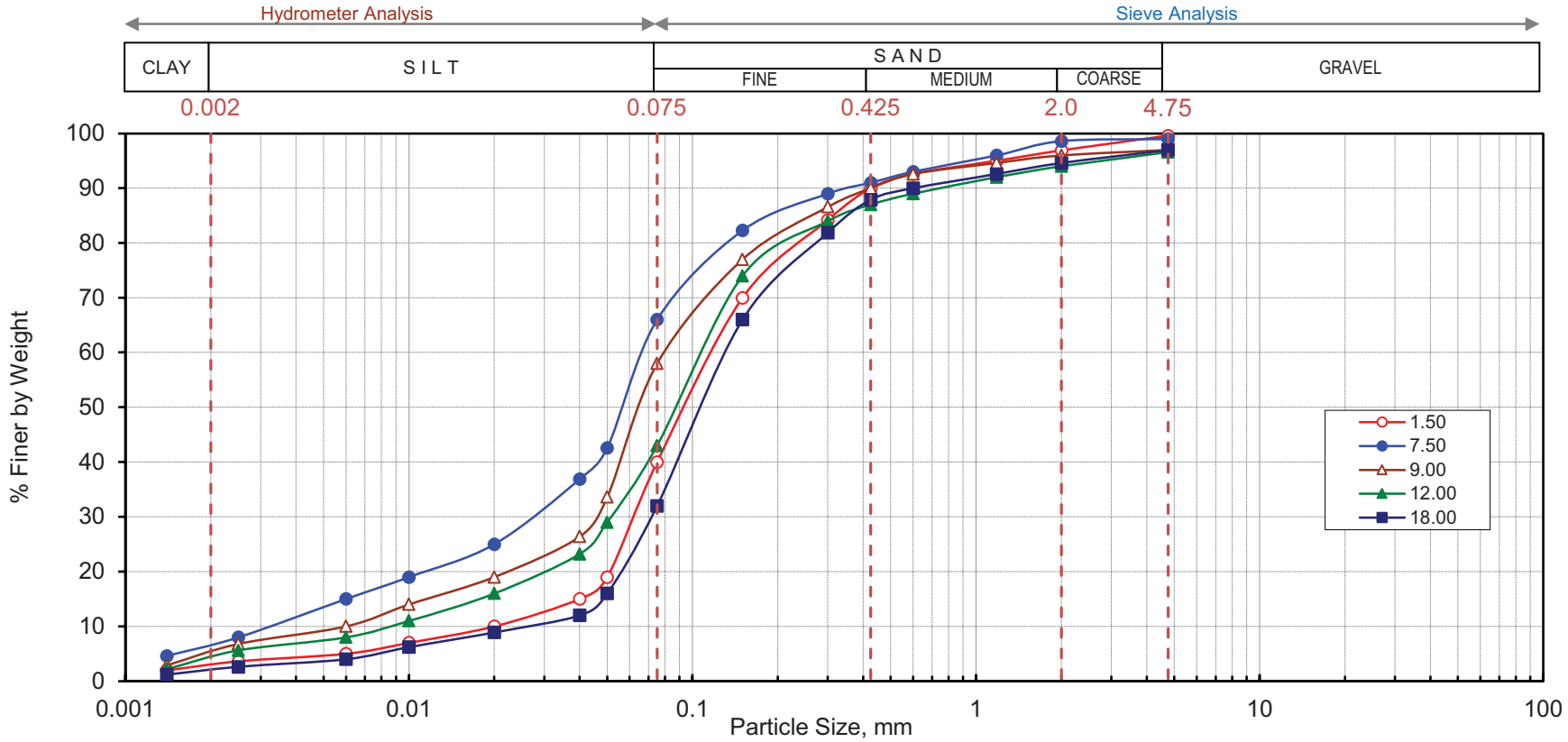
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-3	1.50	Silty sand (SM)	0	65	32	3		0.129	0.069	0.039	3.3	0.95
	BH-3	8.25	Sandy silt (ML-CL)	2	31	60	7		0.069	0.029	0.003	20.7	3.78
	BH-3	10.50	Sandy silt (ML)	3	39	53	5		0.082	0.045	0.006	13.6	4.17
	BH-3	15.00	Silty sand (SM)	4	54	39	3		0.113	0.055	0.011	10.0	2.35
	BH-3	20.25	Silty sand (SM)	4	63	31	2		0.142	0.071	0.043	3.3	0.84

Grain Size Distribution



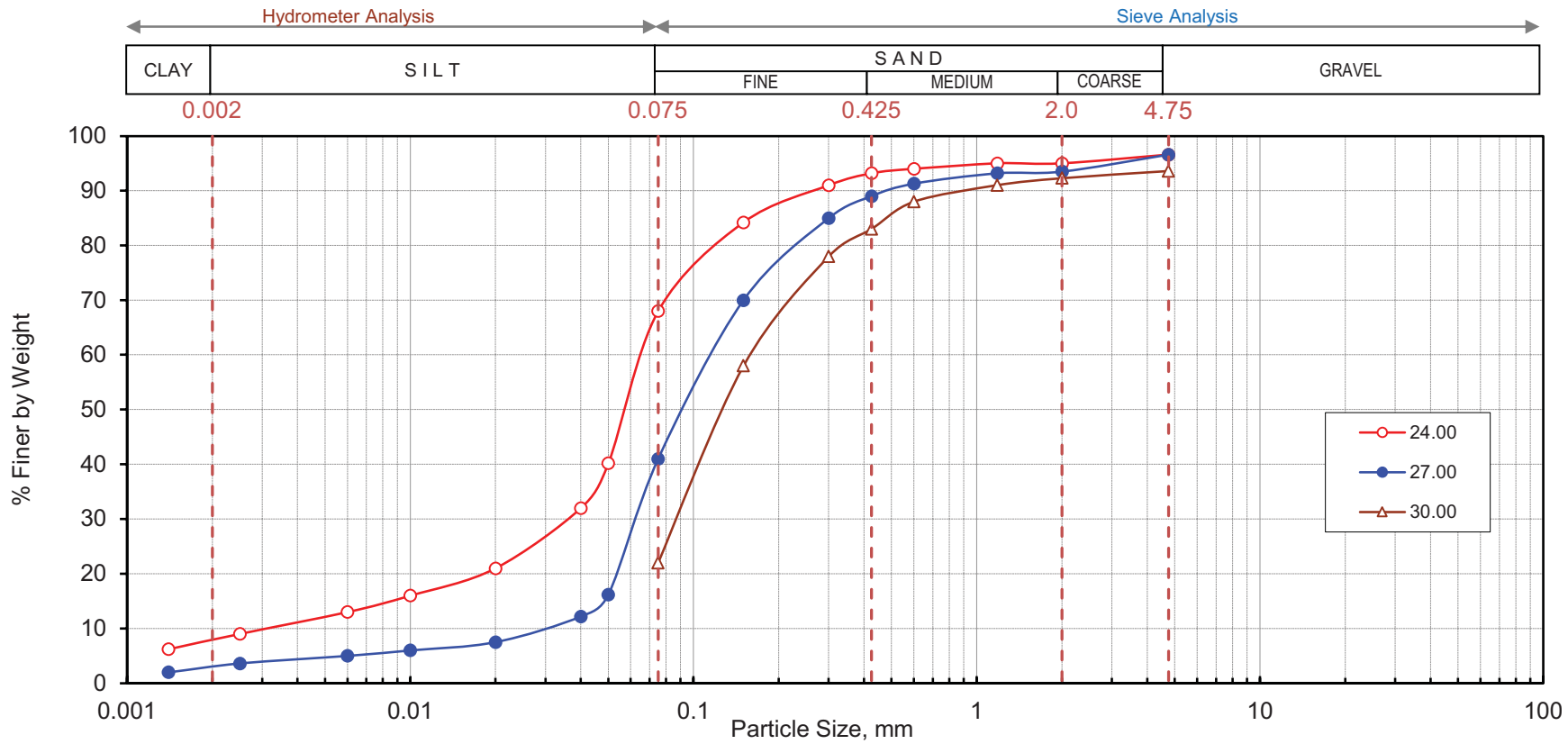
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-3	23.25	Sandy silt (ML-CL)	5	29	60	6		0.069	0.036	0.004	17.6	4.75
	BH-3	24.00	Silty sand (SM)	4	56	37	3		0.125	0.064	0.024	5.2	1.36
	BH-3	30.00	Silty sand (SM)	5	69	25	1		0.150	0.084	0.045	3.3	1.04

Grain Size Distribution



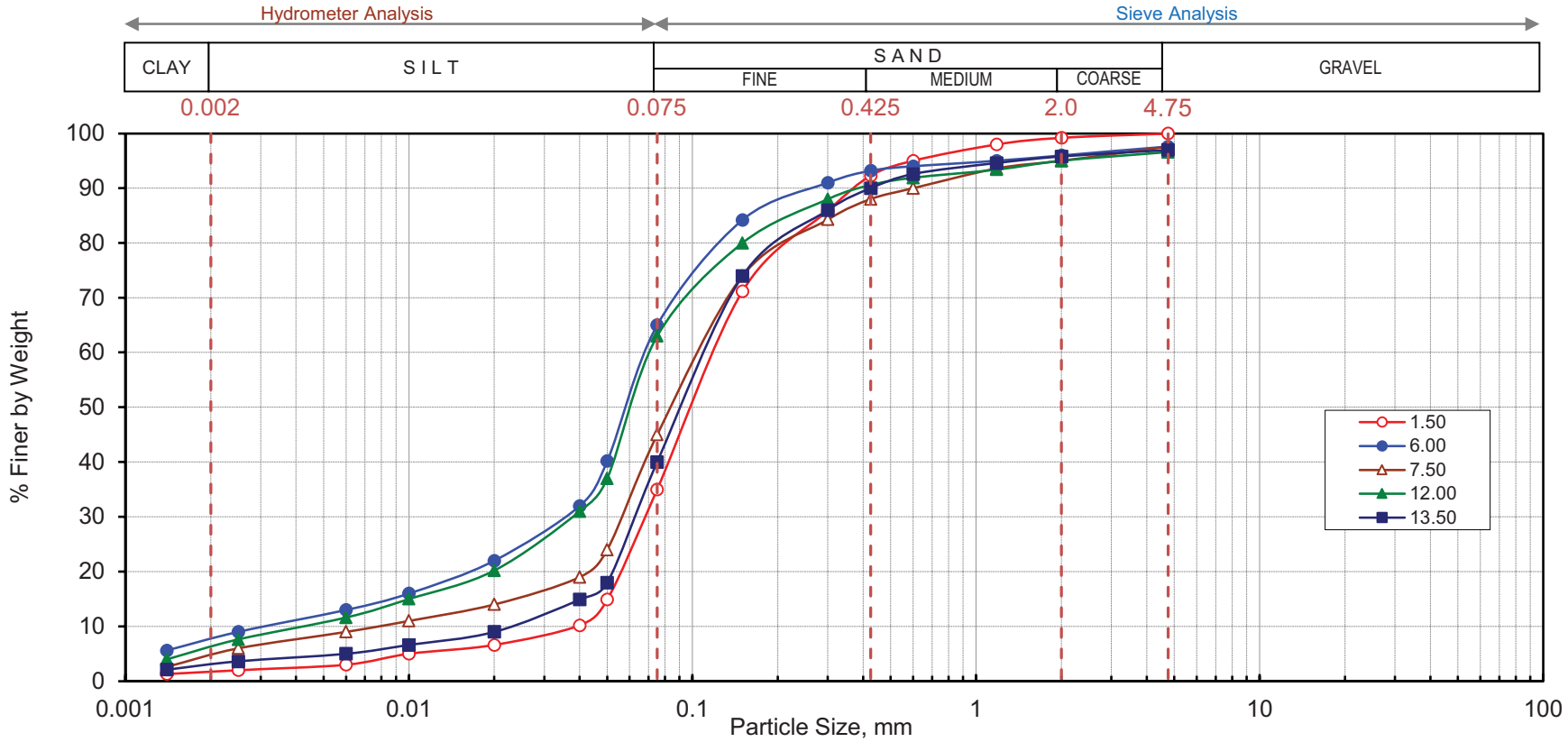
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-4	1.50	Silty sand (SM)	0	60	37	3		0.125	0.063	0.020	6.3	1.59
	BH-4	7.50	Sandy silt (ML-CL)	1	33	60	6		0.069	0.028	0.004	19.6	3.36
	BH-4	9.00	Sandy silt (ML)	3	39	53	5		0.083	0.045	0.006	13.8	4.07
	BH-4	12.00	Silty sand (SM)	3	54	39	4		0.116	0.052	0.009	13.4	2.66
	BH-4	18.00	Silty sand (SM)	3	65	30	2		0.137	0.072	0.027	5.1	1.39

Grain Size Distribution



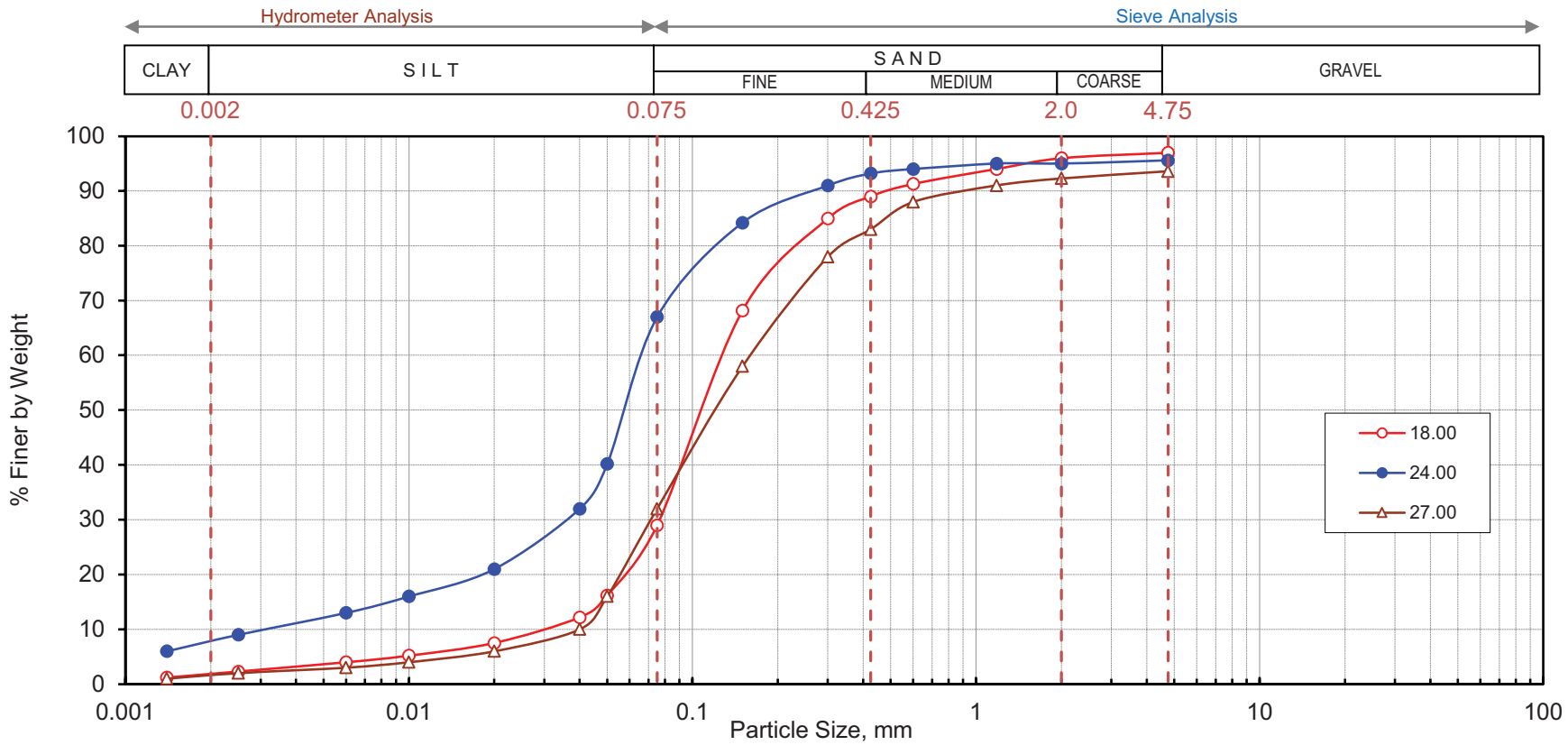
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-4	24.00	Sandy silt (ML-CL)	3	29	60	8		0.068	0.036	0.003	20.1	5.78
	BH-4	27.00	Silty sand (SM)	3	56	38	3		0.124	0.064	0.031	4.1	1.07
	BH-4	30.00	Silty sand (SM)	6	72	22	0		0.165	0.092			

Grain Size Distribution



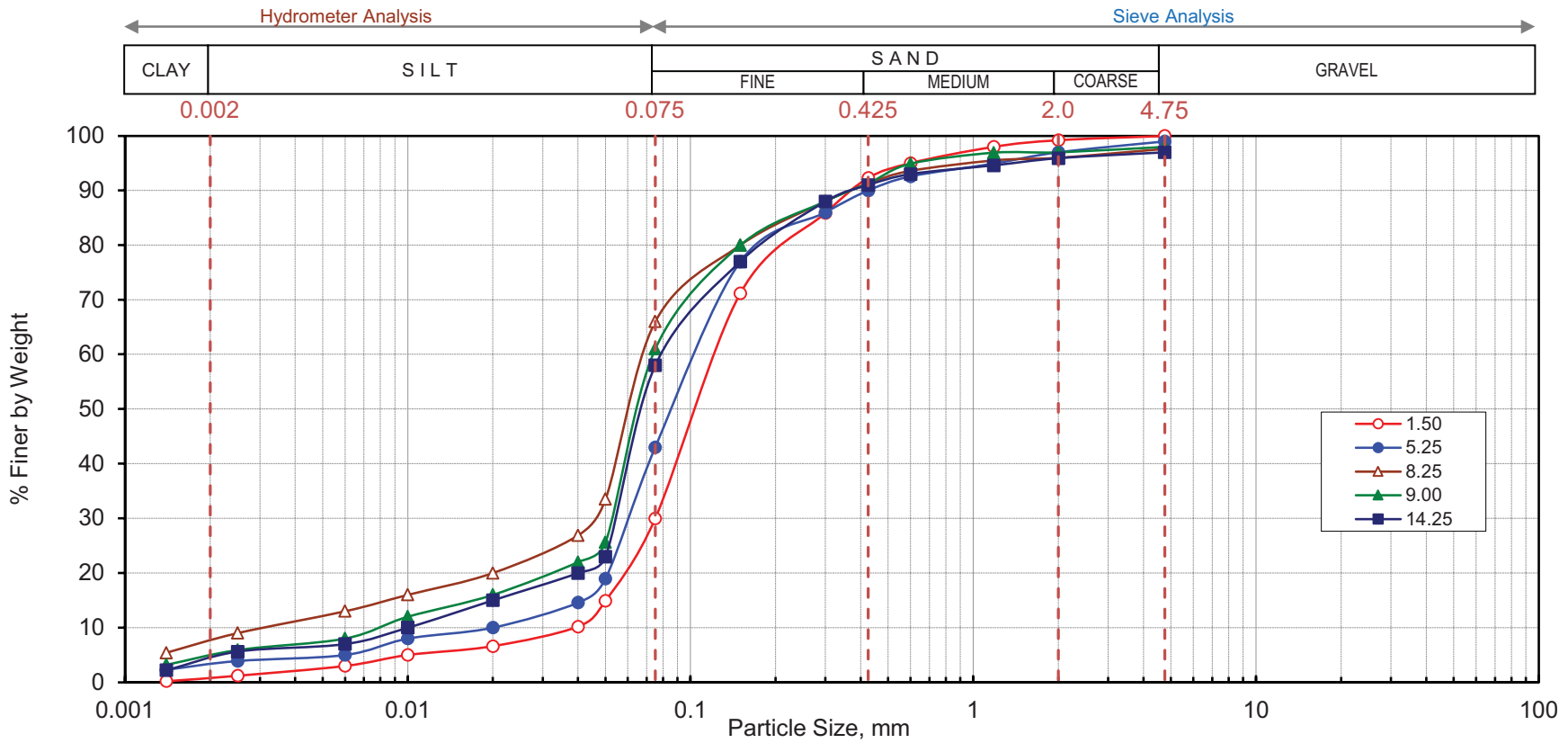
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-5	1.50	Silty sand (SM)	0	65	33	2		0.127	0.069	0.039	3.3	0.96
	BH-5	6.00	Sandy silt (ML-CL)	2	33	58	7		0.070	0.036	0.003	20.7	5.49
	BH-5	7.50	Silty sand (SM)	2	53	41	4		0.114	0.057	0.008	14.2	3.59
	BH-5	12.00	Sandy silt (ML-CL)	3	34	57	6		0.072	0.038	0.005	15.7	4.39
	BH-5	13.50	Silty sand (SM)	3	57	37	3		0.119	0.064	0.023	5.1	1.45

Grain Size Distribution



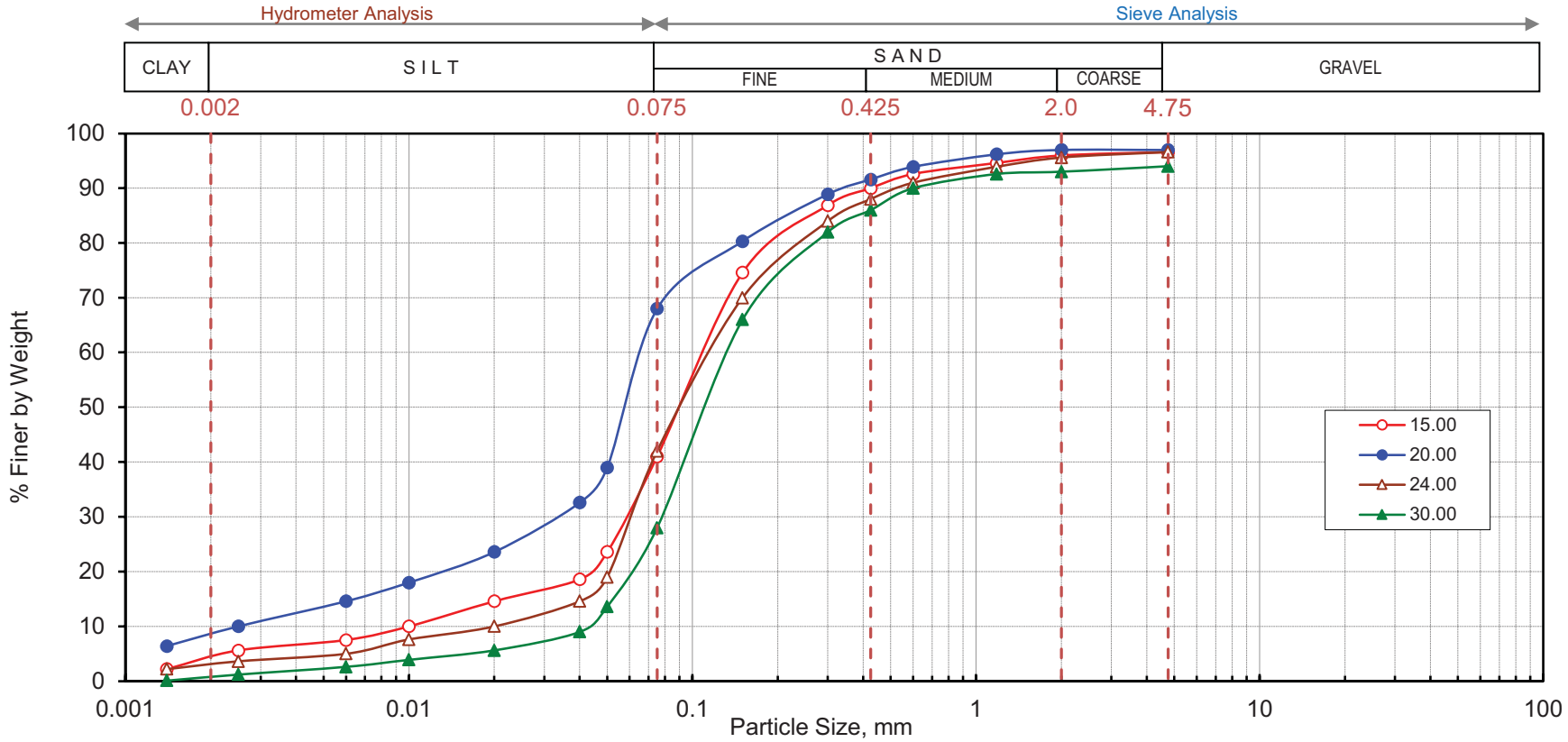
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-5	18.00	Silty sand (SM)	3	68	27	2		0.134	0.077	0.031	4.4	1.44
	BH-5	24.00	Sandy silt (ML-CL)	4	29	59	8		0.068	0.036	0.003	20.3	5.72
	BH-5	27.00	Silty sand (SM)	6	62	30	2		0.165	0.072	0.040	4.1	0.78

Grain Size Distribution



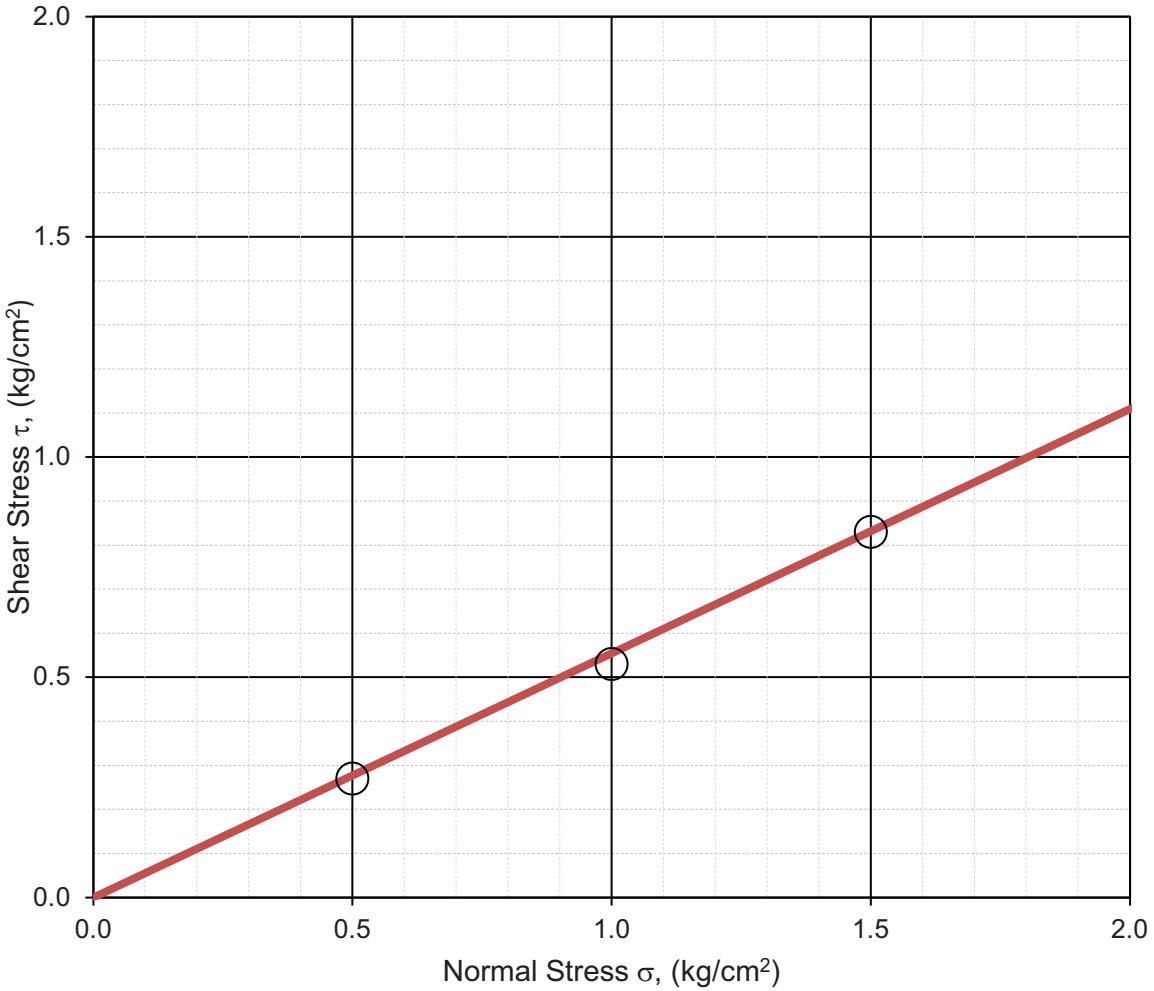
Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-6	1.50	Silty sand (SM)	0	70	29	1		0.130	0.075	0.039	3.3	1.12
	BH-6	5.25	Silty sand (SM)	1	56	40	3		0.113	0.061	0.020	5.6	1.68
	BH-6	8.25	Sandy silt (ML-CL)	2	32	59	7		0.070	0.045	0.003	20.9	8.41
	BH-6	9.00	Sandy silt (ML)	2	37	56	5		0.074	0.053	0.008	9.3	4.75
	BH-6	14.25	Sandy silt (ML)	3	39	54	4		0.083	0.055	0.010	8.3	3.65

Grain Size Distribution



Sample Details				Test Results									
Location	Borehole Number	Sample Depth, m	Sample Description	Gravel %	Sand %	Silt %	Clay %		D_{60}	D_{30}	D_{10}	C_u	C_c
Sec-54, Gurugram	BH-6	15.00	Silty sand (SM)	3	56	37	4		0.117	0.059	0.010	11.7	2.98
	BH-6	20.00	Sandy silt (ML-CL)	3	29	60	8		0.068	0.034			
	BH-6	24.00	Silty sand (SM)	3	55	39	3		0.123	0.062	0.020	6.2	1.56
	BH-6	30.00	Silty sand (SM)	6	66	27	1		0.138	0.079	0.042	3.3	1.07

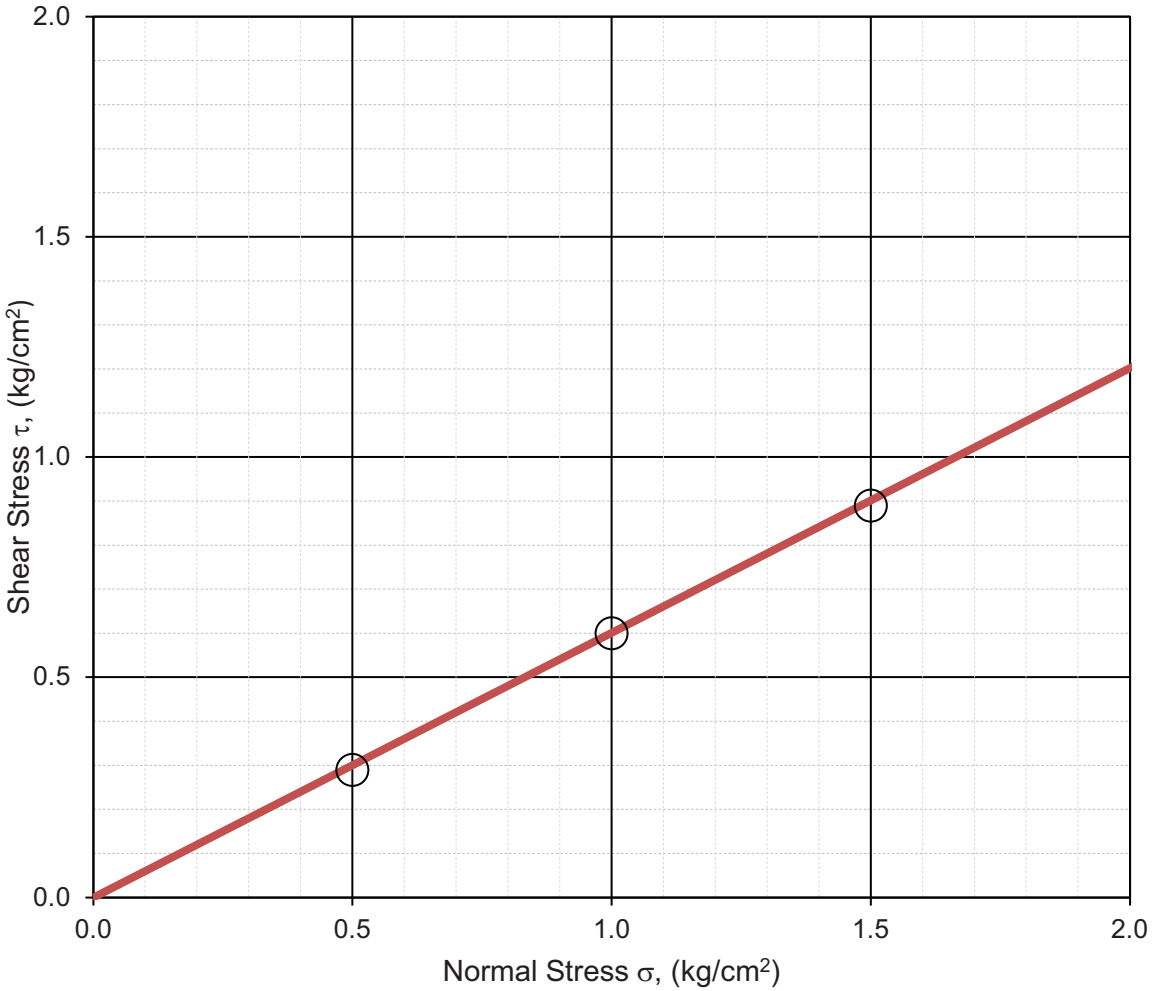
Grain Size Distribution



Borehole No.	=	1
Sample Depth, m	=	2.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**29**

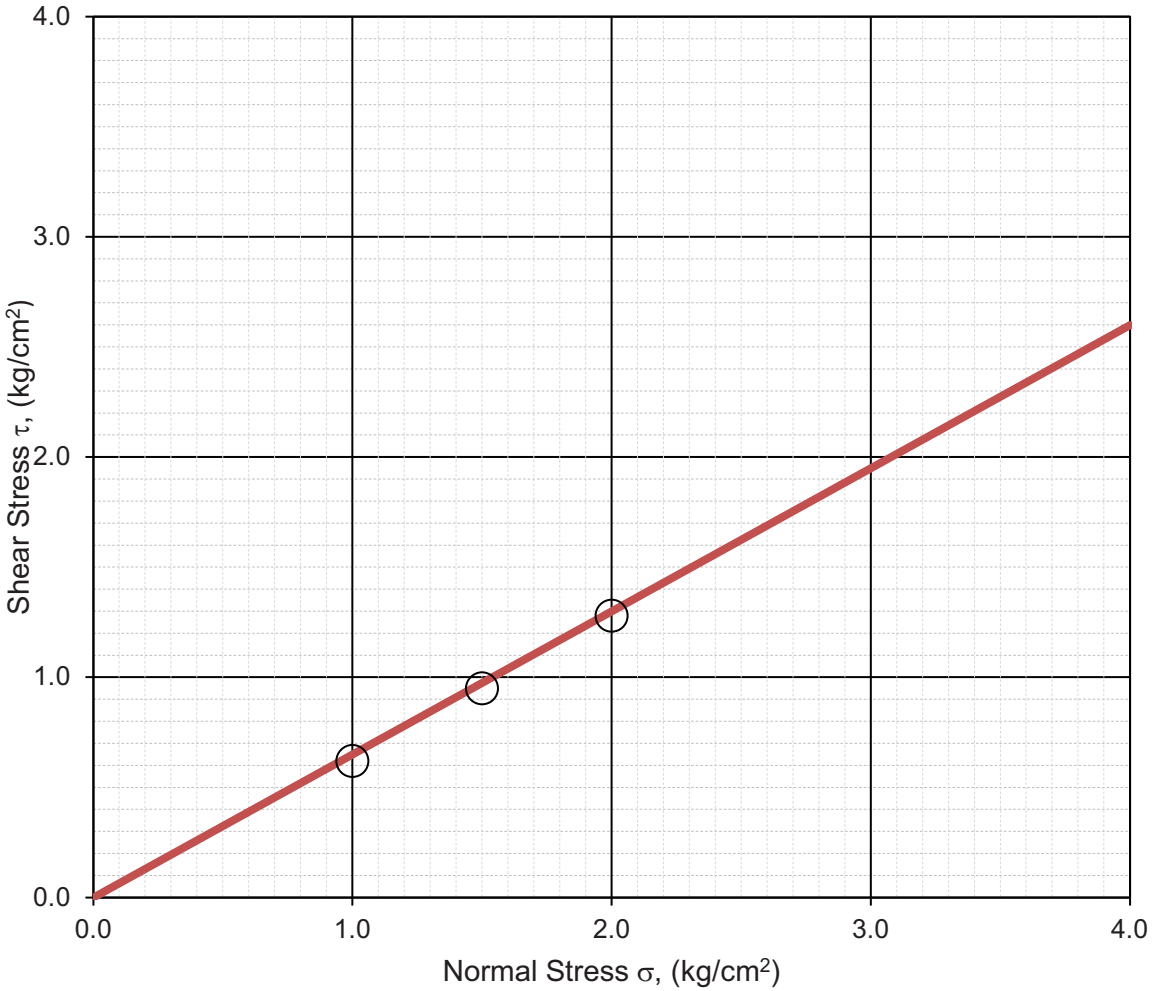
Consolidated Drained Direct Shear Test



Borehole No.	=	1
Sample Depth, m	=	8.25
Sample Description	=	Sandy silt

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**31**

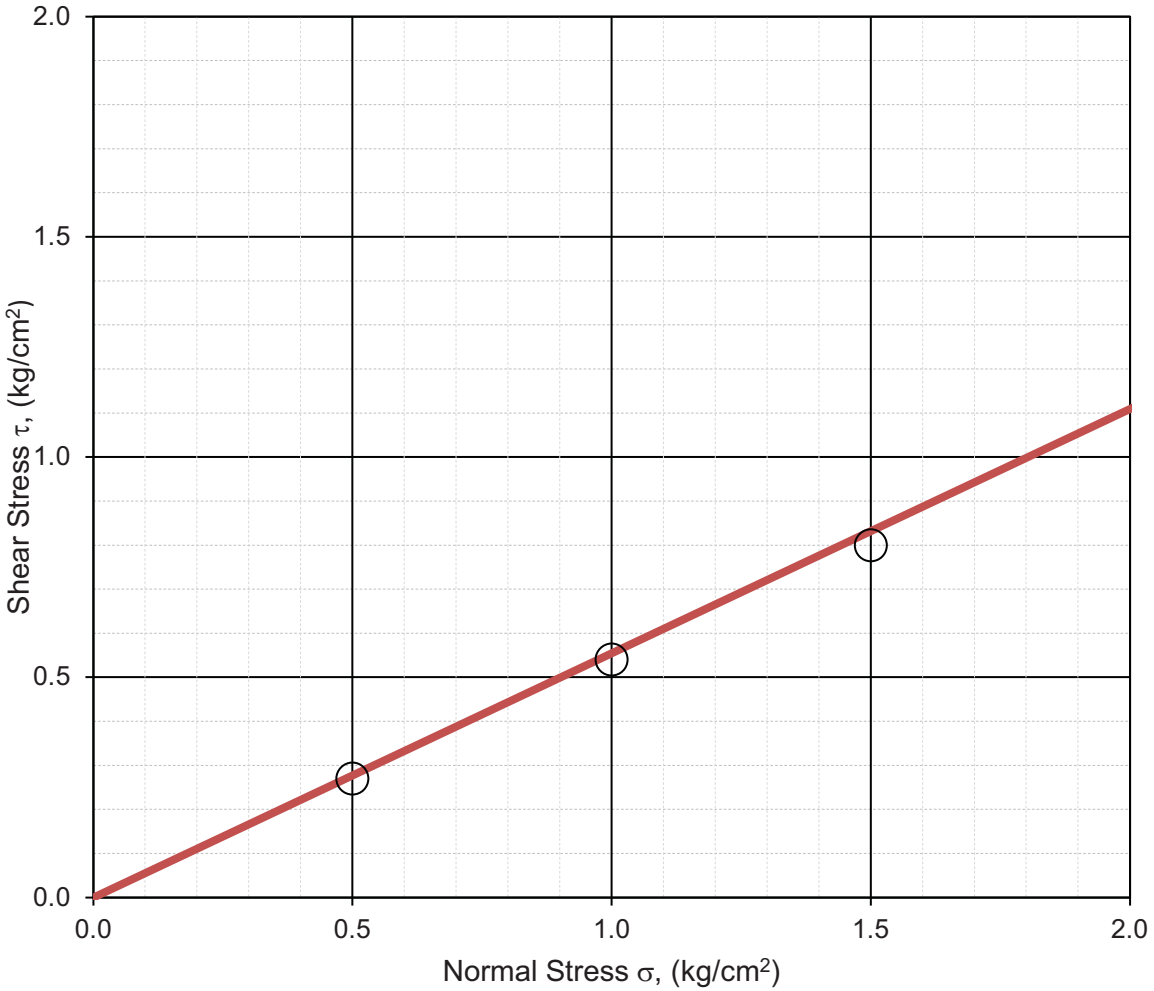
Consolidated Drained Direct Shear Test



Borehole No.	=	1
Sample Depth, m	=	20.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	=	**0**
Angle of Internal Friction, ø (degrees)	=	**33**

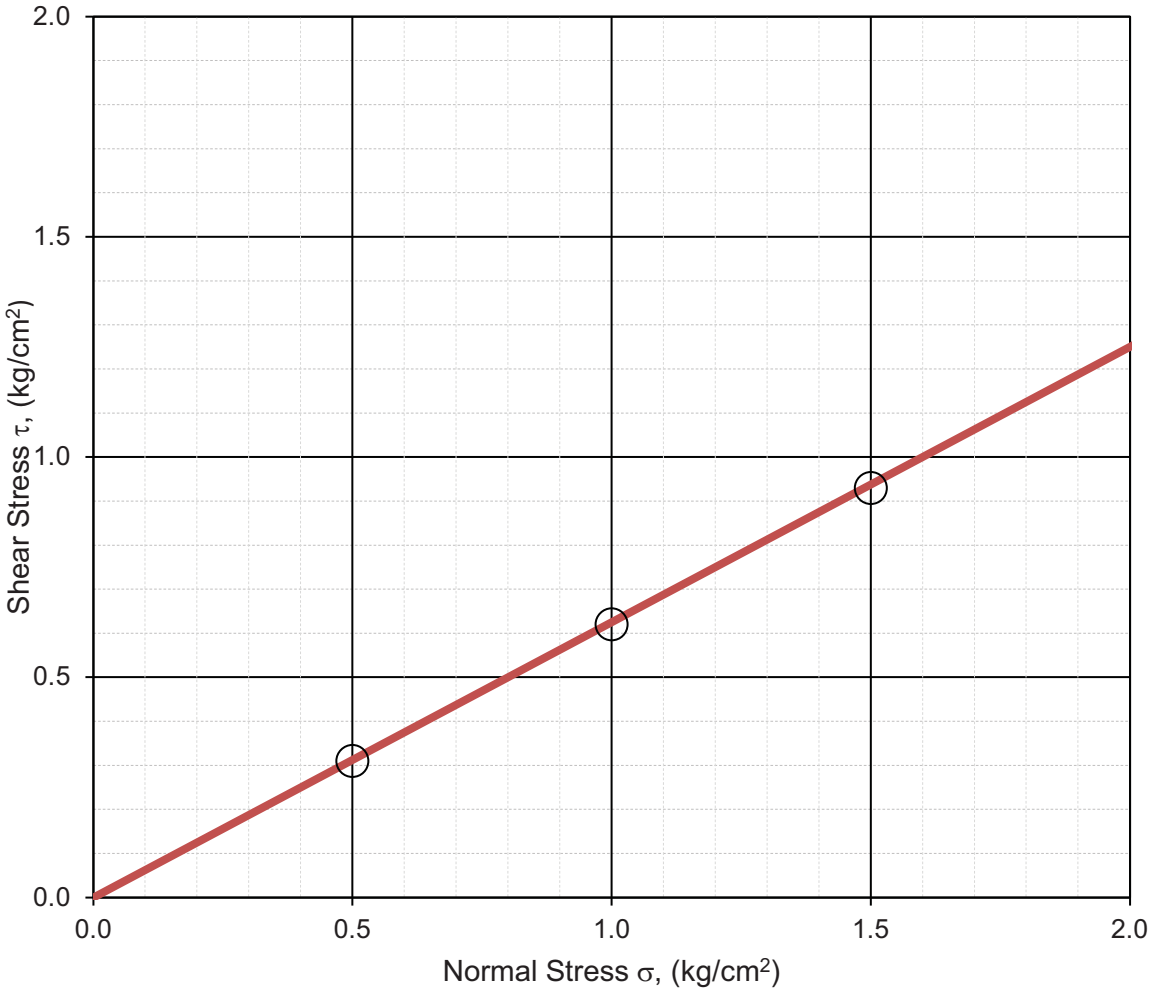
Consolidated Drained Direct Shear Test



Borehole No.	=	2
Sample Depth, m	=	5.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**29**

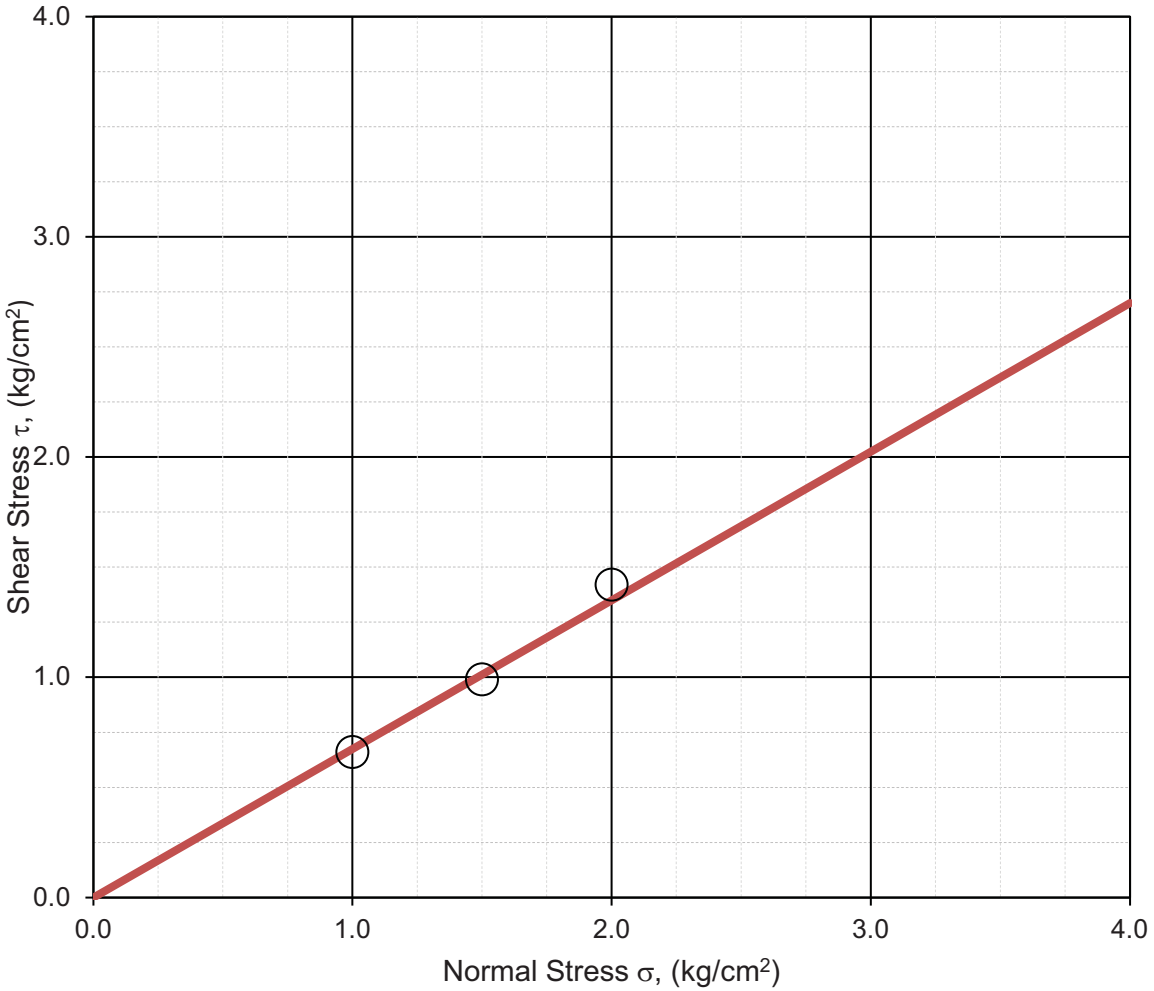
Consolidated Drained Direct Shear Test



Borehole No.	=	2
Sample Depth, m	=	11.25
Sample Description	=	Sandy silt

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**32**

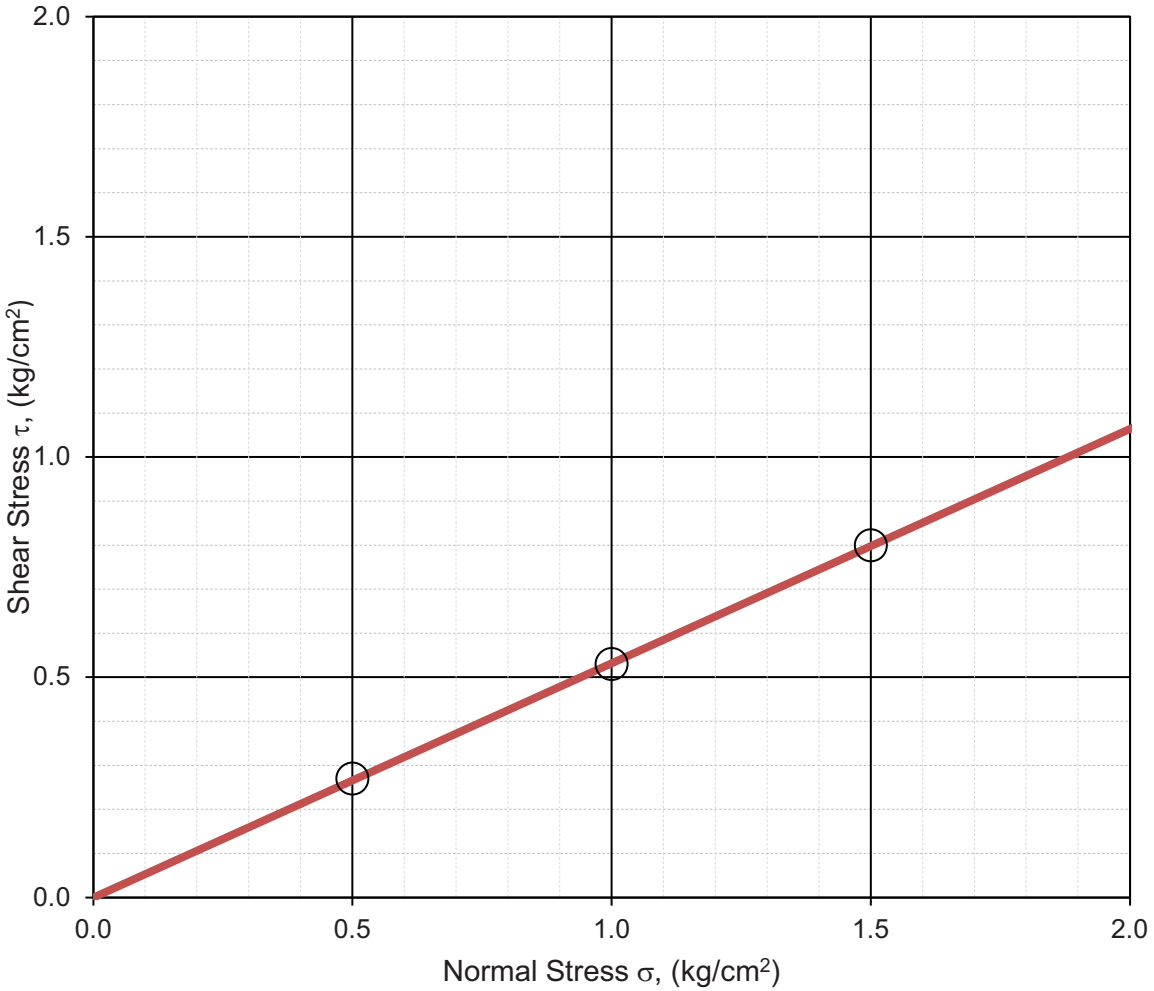
Consolidated Drained Direct Shear Test



Borehole No.	=	2
Sample Depth, m	=	17.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**34**

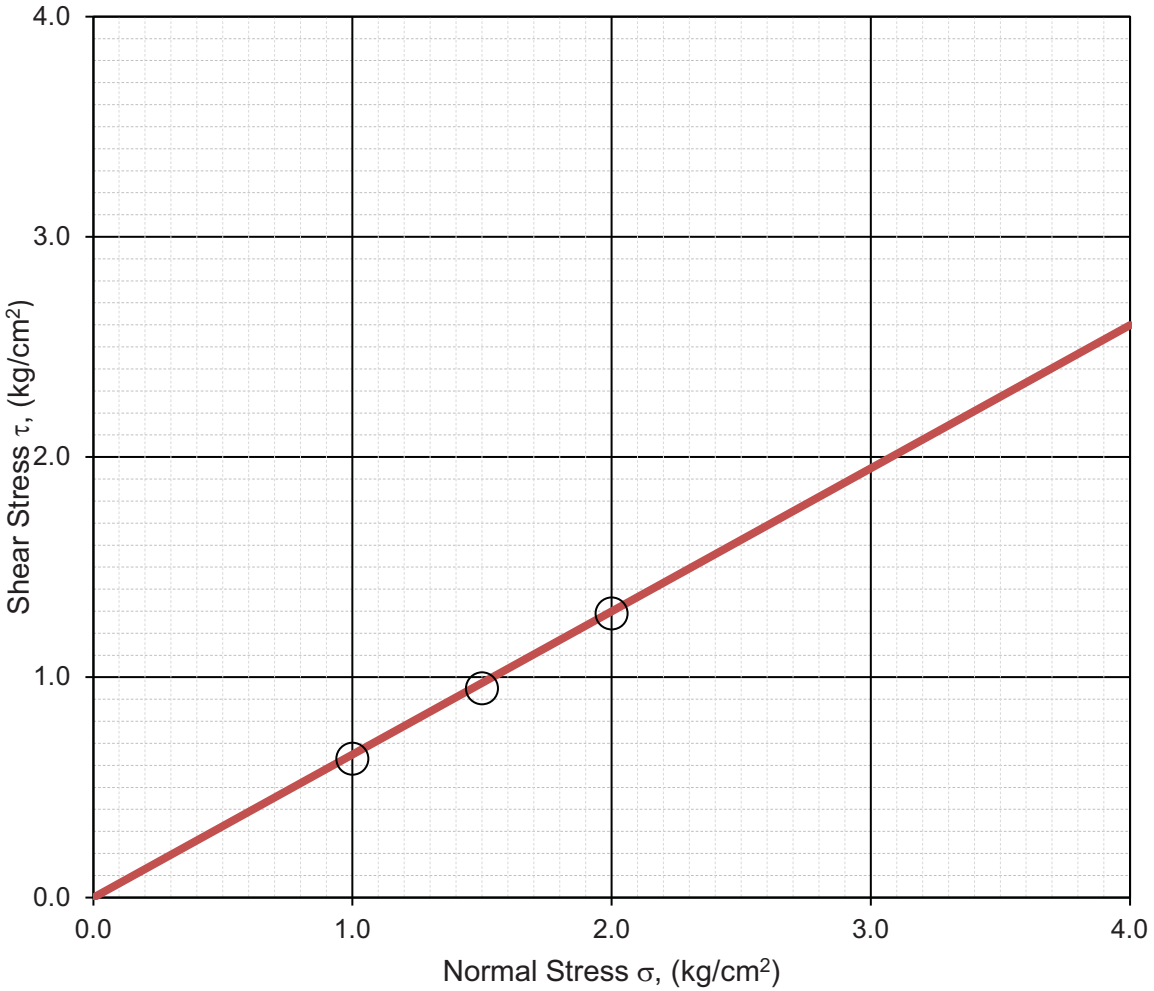
Consolidated Drained Direct Shear Test



Borehole No.	=	3
Sample Depth, m	=	2.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**28**

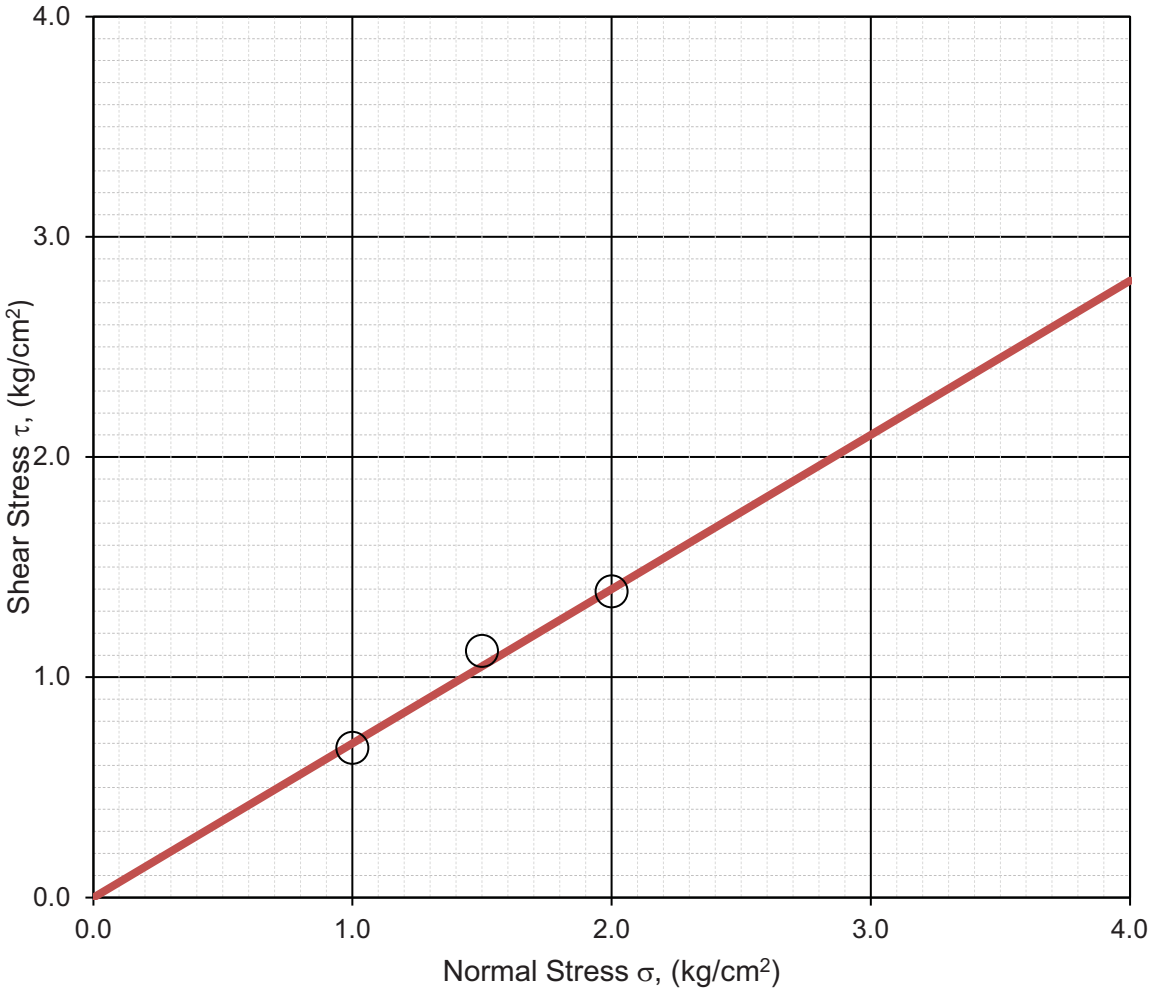
Consolidated Drained Direct Shear Test



Borehole No.	=	3
Sample Depth, m	=	17.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm²)	=	**0**
Angle of Internal Friction, ø (degrees)	=	**33**

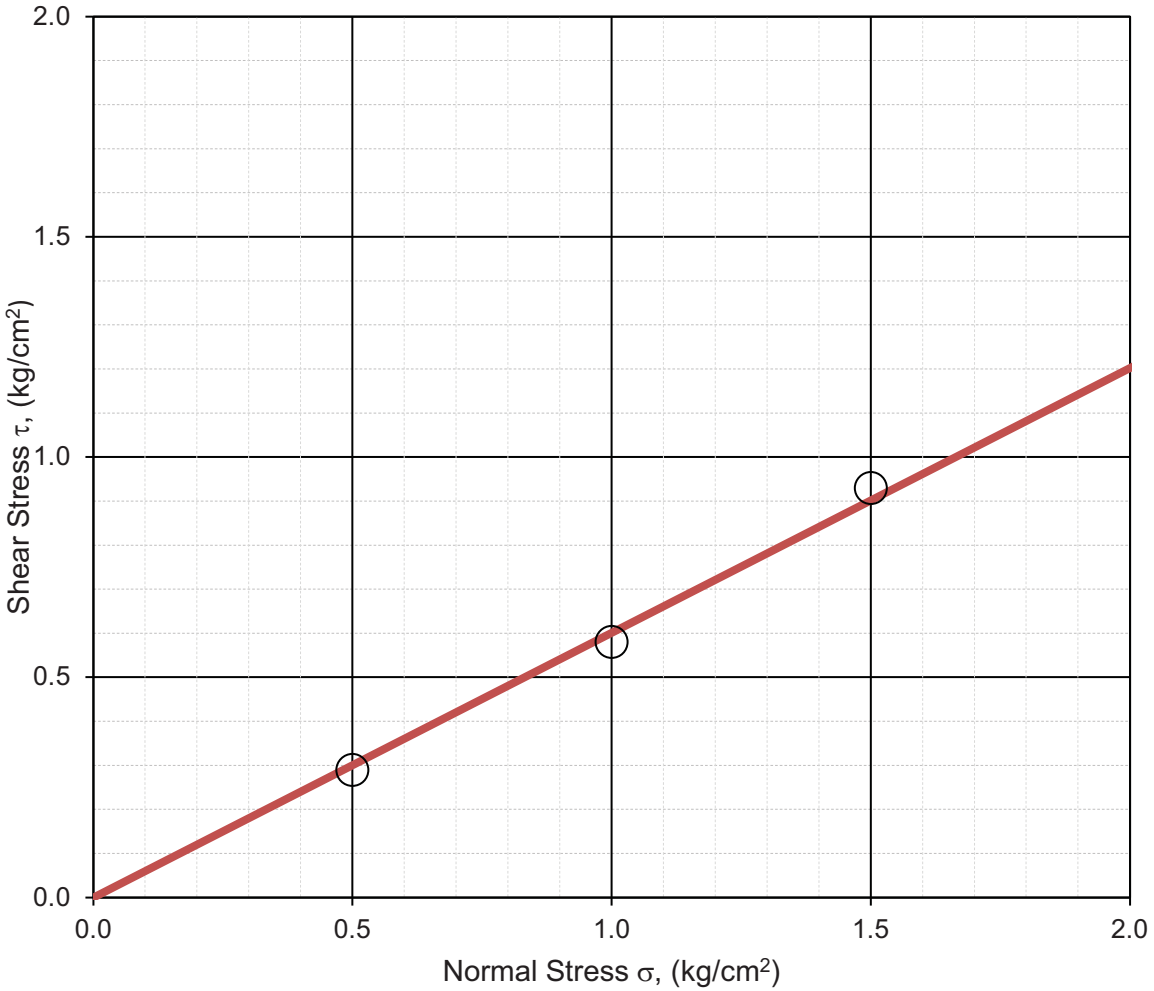
Consolidated Drained Direct Shear Test



Borehole No.	=	3
Sample Depth, m	=	26.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm²)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**35**

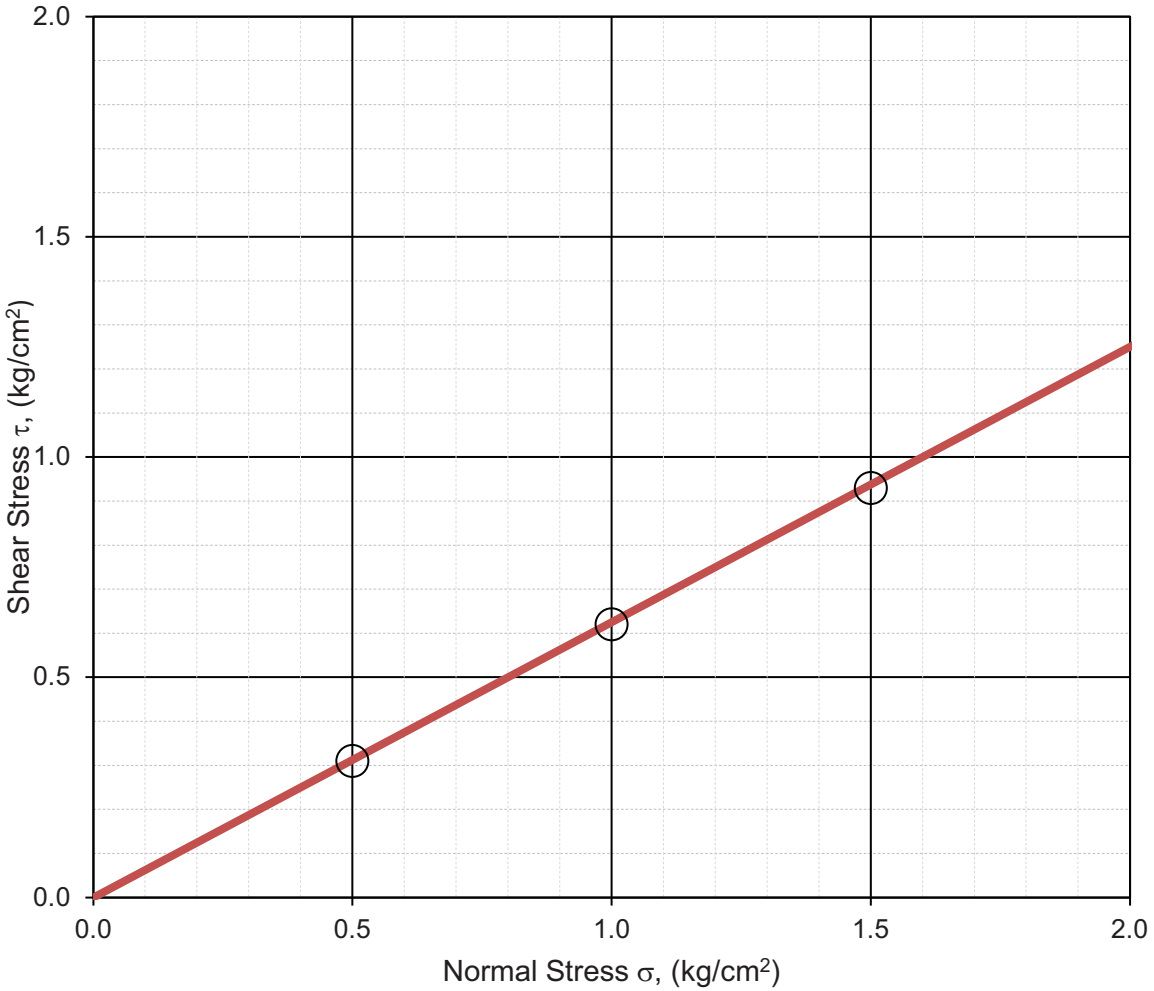
Consolidated Drained Direct Shear Test



Borehole No.	=	4
Sample Depth, m	=	5.25
Sample Description	=	Sandy silt

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**31**

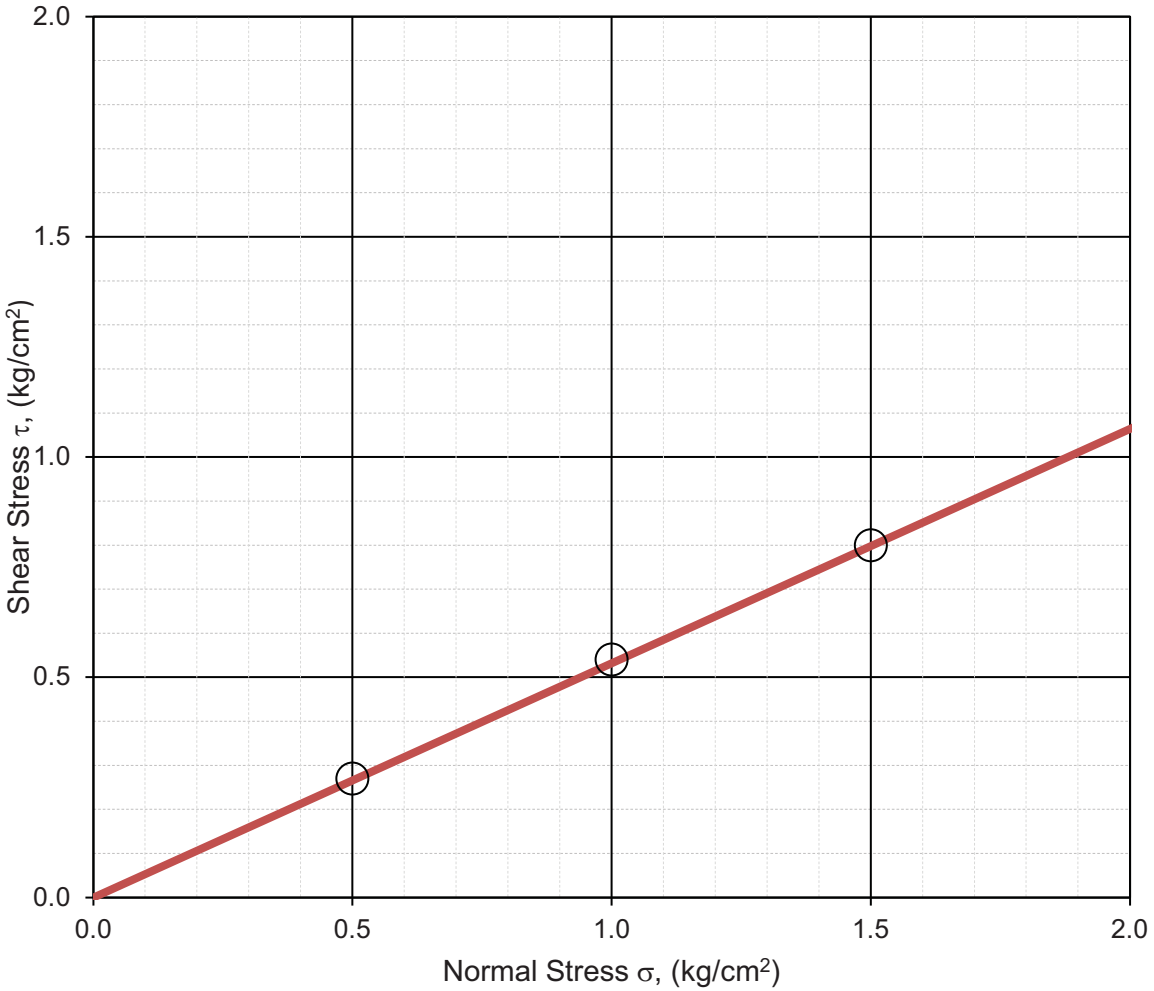
Consolidated Drained Direct Shear Test



Borehole No.	=	4
Sample Depth, m	=	14.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	=	**0**
Angle of Internal Friction, ø (degrees)	=	**32**

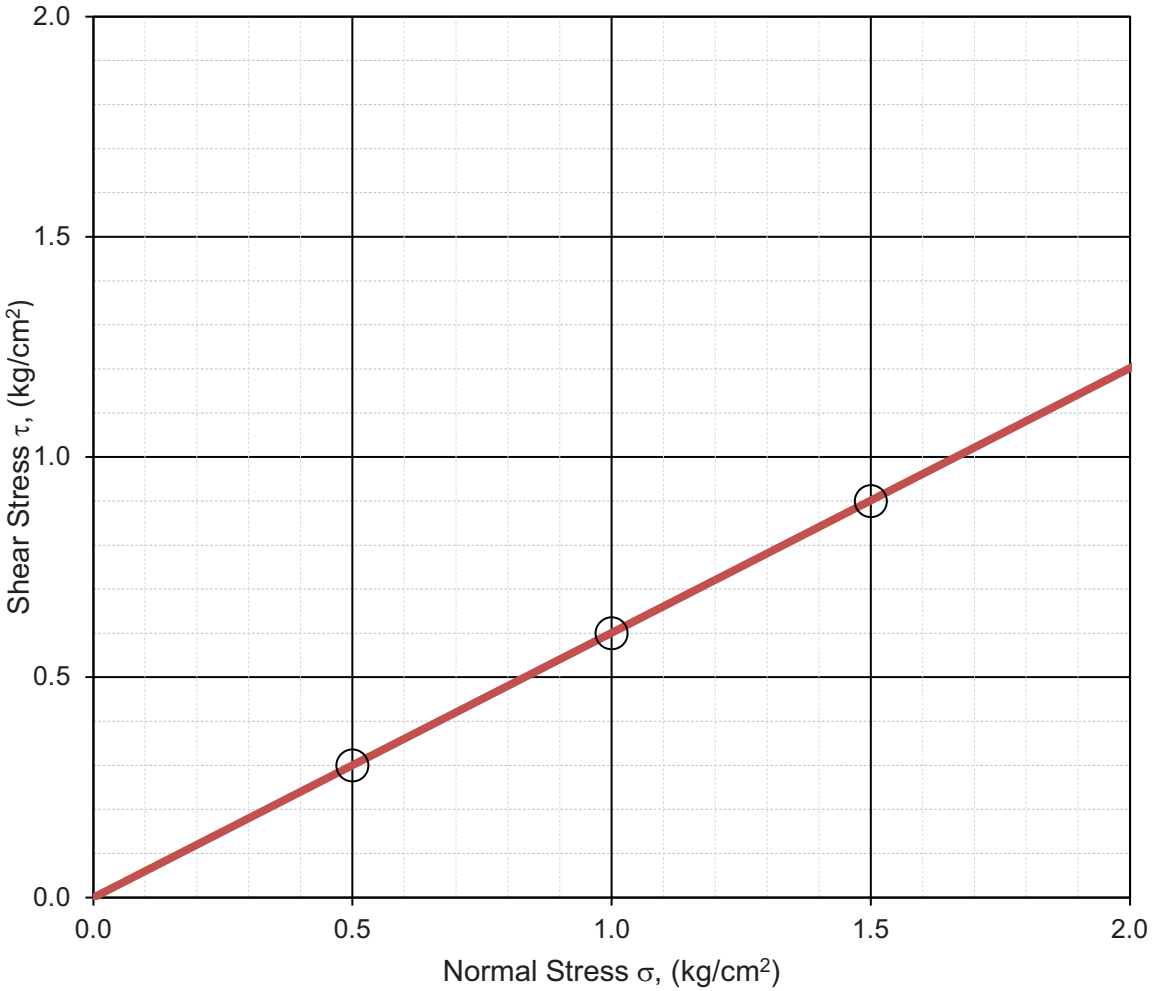
Consolidated Drained Direct Shear Test



Borehole No.	=	5
Sample Depth, m	=	2.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**28**

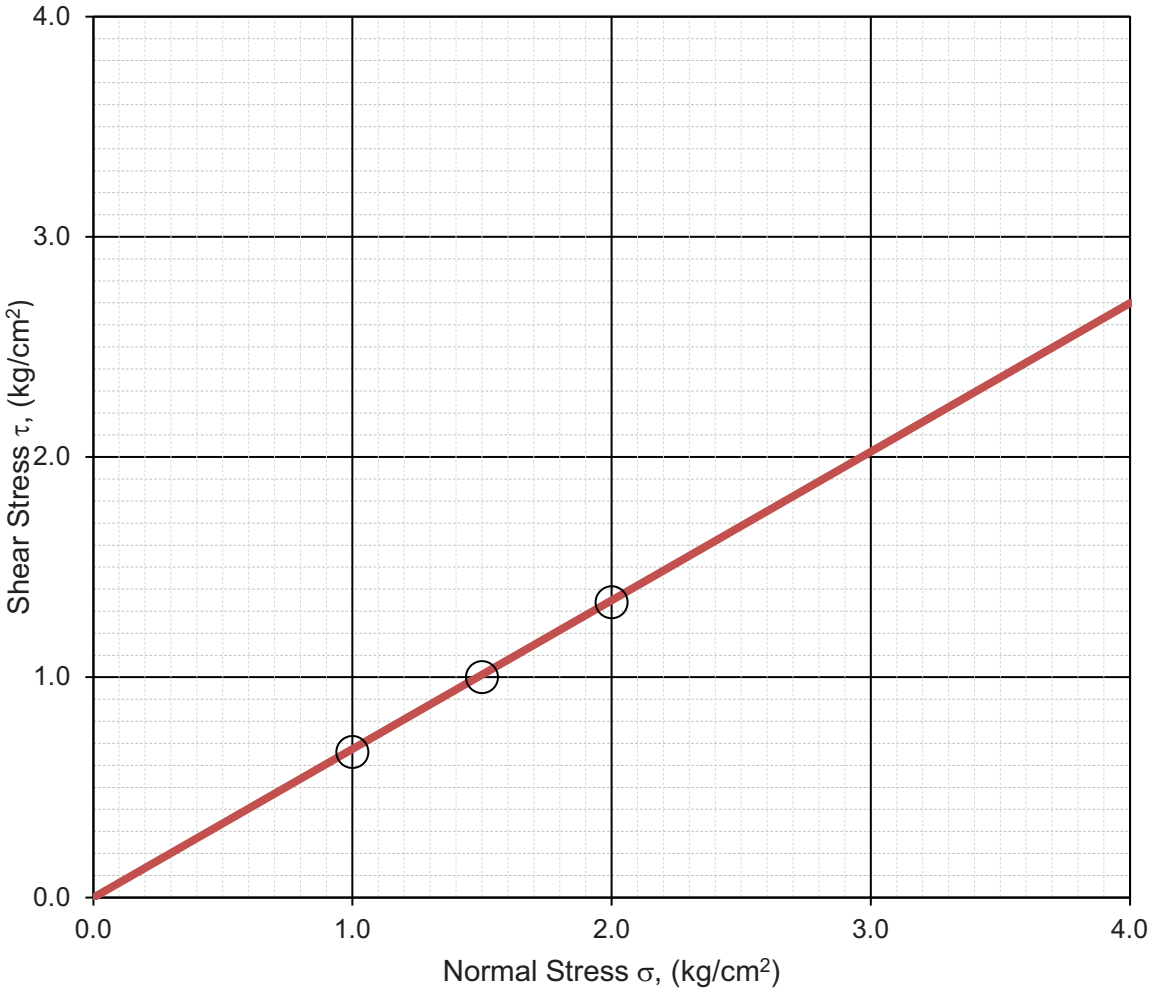
Consolidated Drained Direct Shear Test



Borehole No.	=	5
Sample Depth, m	=	8.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**31**

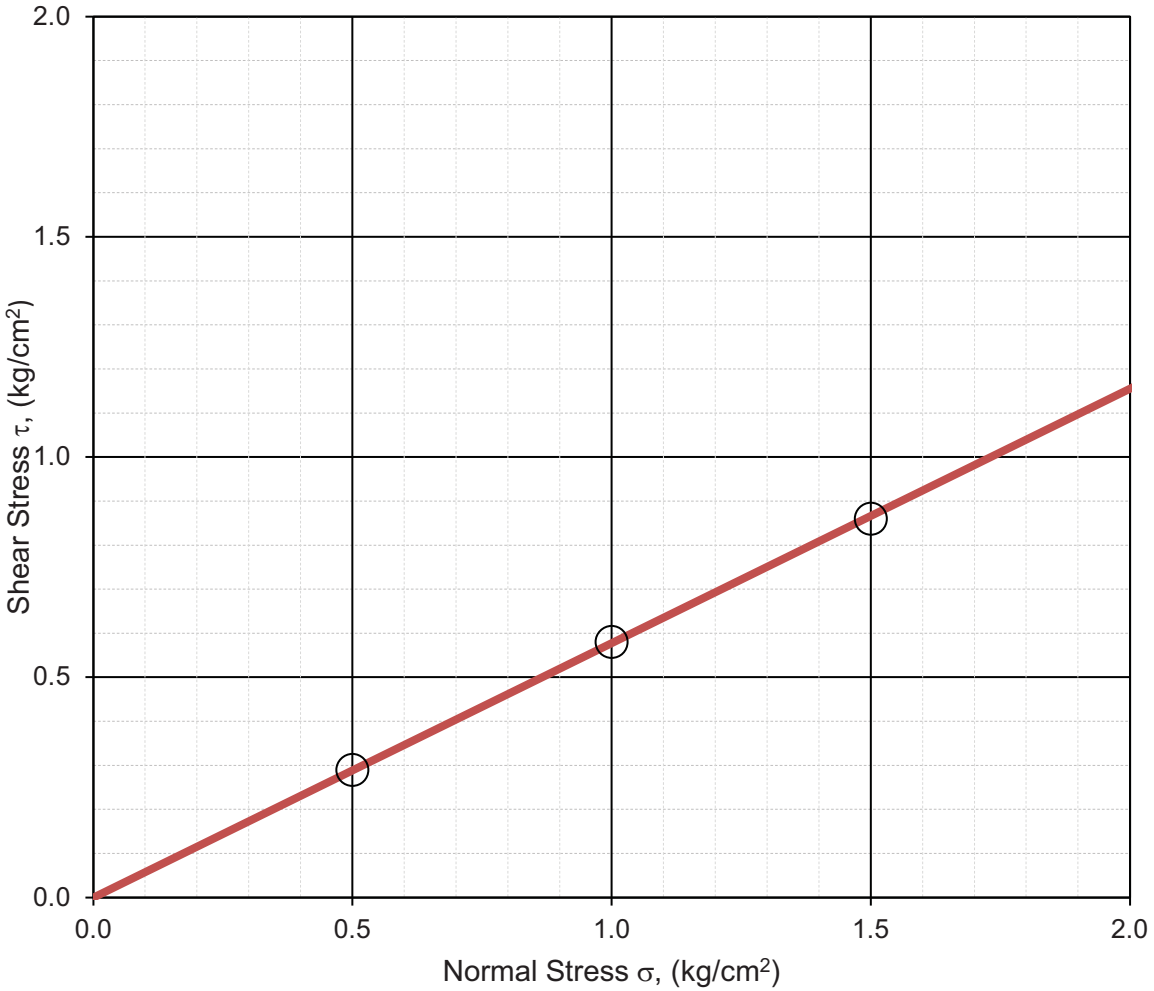
Consolidated Drained Direct Shear Test



Borehole No.	=	5
Sample Depth, m	=	23.25
Sample Description	=	Sandy silt

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**34**

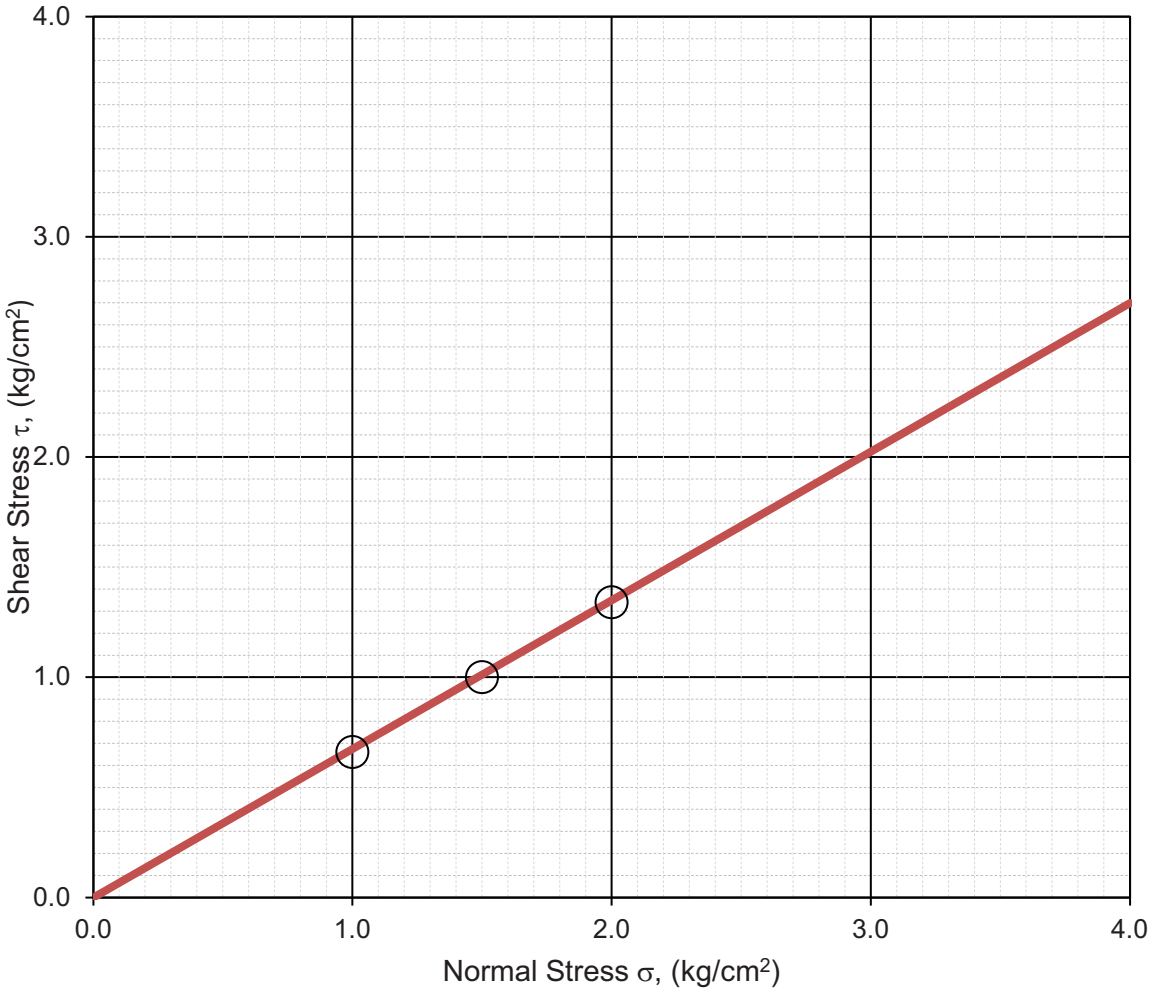
Consolidated Drained Direct Shear Test



Borehole No.	=	6
Sample Depth, m	=	5.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**30**

Consolidated Drained Direct Shear Test



Borehole No.	=	6
Sample Depth, m	=	29.25
Sample Description	=	Silty sand

Cohesion Intercept, c (kg/cm^2)	**=**	**0**
Angle of Internal Friction, ø (degrees)	**=**	**34**

Consolidated Drained Direct Shear Test

CHEMICAL TEST RESULTS

SOIL-EXTRACT WATER:

Borehole No.	Depth, m	Sulphate Content (SO_3), %	Chloride Content (CL), %	pH Value
BH-1	0.50	0.08	0.03	7.6
BH-2	1.50	0.10	0.03	7.4
BH-3	4.50	0.13	0.01	7.4
BH-4	3.00	0.12	0.02	7.5
BH-5	1.50	0.09	0.01	7.6
BH-6	6.00	0.13	0.02	7.5

TYPICAL CALCULATIONS

FAILURE CRITERIA : **AVERAGE** OF LOCAL & GENERAL SHEAR FAILURE

GENERAL SHEAR FAILURE N_c = 30.14
c = **0.0** T/m^2 N_q = 18.40
ϕ = **30.0** degrees N_g = 22.40

LOCAL SHEAR FAILURE N_c' = 15.87
c' = 0.0 T/m^2 N_q' = 7.11
ϕ' = 21.1 degrees N_g' = 6.24

Bulk Density Profile

From, m	To, m	γ, T/m^3
0.0	7.5	
7.5	13.5	1.80
13.5	21.0	1.90
21.0	33.0	1.95
33.0	42.0	2.00
42.0	60.0	2.10

Factor of safety (FOS) = **2.5**
Design Water Table Depth = **Not Met**
R_w *factor*:Calculate (**C**) based on water table depth / Fixed Value(**V**) for worst condition = **V**
Rw factor for design = **0.6**

Depth factor to be considered ? **Y**
For computation of Depth Factor, depth below GL to be ignored to account for loose soils,poorly compacted backfill above foundation, scour etc. = **10.0**

A. Bearing capacity analysis for shallow foundations

as per as per IS 6403-1981

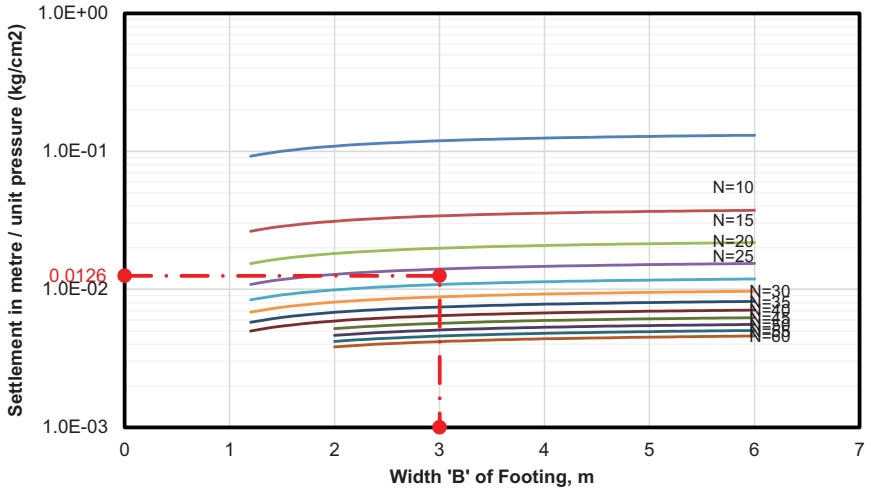
$$q_{net\ safe} = (1/FS)\{cNcz_cd_c+q(N_q-1)z_qd_q+0.5BgN_gz_gd_gR_w\}$$

Foundation Size B, m	Foundation Size L, m	Shape	Depth, m	Depth factors (GSF) d_c	Depth factors (GSF) d_q	Depth factors (GSF) d_g	Depth factors (LSF) d_c'	Depth factors (LSF) d_q'	Depth factors (LSF) d_g'
3.0	**3.0**	***Square***	**12.0**	1.23	1.12	1.12	1.19	1.10	1.10
6.0	**6.0**	***Square***	**12.0**	1.12	1.06	1.06	1.10	1.05	1.05

B. Settlement analysis for shallow foundations based on N-values

as per IS:8009 (Part 1)-1976, Clause 9.1.4

$$q_{allowable} = \{(\Delta_{permissible} / \Delta_{unit}) * R_w\} / d_f * d_r$$



Foundation Dimensions B, m	Foundation Dimensions L, m	FOUN-DATION SHAPE	Depth,m	R_w	Shape Factors z_c	Shape Factors z_q	Shape Factors z_g	$q_{net\ safe}$, T/m^2 GSF	$q_{net\ safe}$, T/m^2 LSF	Safe Net Bearing Capacity T/m^2 ①	Gross Bearing Capacity (Safe) T/m^2	Design N-Value	Design Net Bearing Pressure, T/m^2 ②	Settlement @ 1kg/cm^2 (as read off from graph), mm	Fox's Depth Factor, d_f	Rigidity Factor, d_r	Computed Settlement, mm	Recommended Net Allowable Bearing Pressure, T/m^2 - min. of ① & ②
3.0	3.0	*Square*	12.0	0.60	1.30	1.20	0.80	88.7	29.7	**59.2**	67.3	22.0	**29.5**	12.6	0.80	1.0	49.4	**29.5**
6.0	6.0	*Square*	12.0	0.60	1.30	1.20	0.80	97.2	32.0	**64.6**	72.7	23.0	**31.5**	13.1	0.91	0.8	49.9	**31.5**

Self-Contained Note

The details of Environment clearances granted for the project DLF phase 5 for an area measuring 476.6015 Acres is as follows:

1. First EC was granted by MOEF GOI vide letter no.21-435/2007-IA.III. Dated: 08.01.2008.
2. Second Environment Clearance for expansion of DLF city Phase-V Group Housing including's community facilities (Expansion of Magnolias, Belaire and Park place and addition of proposed park place EWS, Club Building-1, Club Building-2 and Golf Course) has been granted by SEIAA, Haryana vide letter no. SEIAA/HR/2010/813 Dated 05.10.2010 for plot area of 18,73,798.792 sqm (463.0265 Acres) and Built-up area of 16,67,104.035 sqm.
3. Third Environment Clearance for proposed Group Housing **"Super Luxury Estate" "The Camelias"** in the DLF City Phase-V has been granted by SEIAA, Haryana vide letter no. SEIAA/HR/2013/607 Dated 04.09.2013 for plot area of 72,155.34 sqm (17.829 Acres) and Built-up area of 3,88,302.02 sqm.
4. Fourth Environment Clearance for construction of proposed Luxury Residential Group Housing **"The Crest"** in Zone-11 & 12, DLF City Phase-V for the project has been granted by SEIAA Haryana vide letter no. SEIAA/HR/2013/823 Dated 01.10.2013 for plot area of 35,701.311 sqm (8.821 Acres) and Built-up area of 3,27,338. Sqm.

Now we are proposing to develop Group Housing Buildings in Zone 10, DLF Phase-5 on the land area measuring 7.574 Acres (30,653.317 sqm) for which we submitted our EC application through proposal number SEI/HR/MIS/73368/2022 Dated: 09.03.2022.

SCHEME OF COMMON STP IN DLF5
LOCATED AT DLF5, SECTOR-43, GURGAON, HARYANA.

1.0 INTRODUCTION

Sewage Treatment Plant (STP) of 15 MLD Capacity" is a Common STP located in Zone-6, DLF5, Sector-43, Gurgaon, Haryana, to treat the sewage of all buildings located in DLF5. The STP is under operation. It is operated & maintained by DLF Limited. The location of the STP is shown in Figure 1. The total capacity of Common STP is 15 MLD (9 MLD based on SBR technology & 6 MLD based on MBR technology).

2.0 TREATMENT TECHNOLOGY AND CAPACITY OF STP

2.1 Wastewater Treatment Technology

The total capacity of Common STP is 15 MLD (9 MLD based on SBR technology & 6 MLD based on MBR technology).

Technology	Capacity (MLD)
Sequential Batch Reactor (SBR)	9.0
Membrane Bio-reactor (MBR)	6.0
Total	15.0

2.2 Schematic Flow Diagram of STP

The raw sewage from various buildings reaches to the STP through sewer lines. At the STP the raw sewage first passes through coarse & fine screens before entering the lifting sump. From the sump one part of sewage is pumped into the equalization tank and SBR. After treatment in SBR the decanted water is subjected to tertiary treatment through MGF, ACF & chlorination/ ozonation, ultra-filtration etc. and stored in treated water tanks for recycle. The other part from the lifting sump enters into MBR system (pre-anoxic, aeration, post-anoxic & membrane tank). The treated sewage from MBR is subjected to chlorination before storing in treated water tanks for recycle. The schematic flow diagram of the overall treatment process is given below.

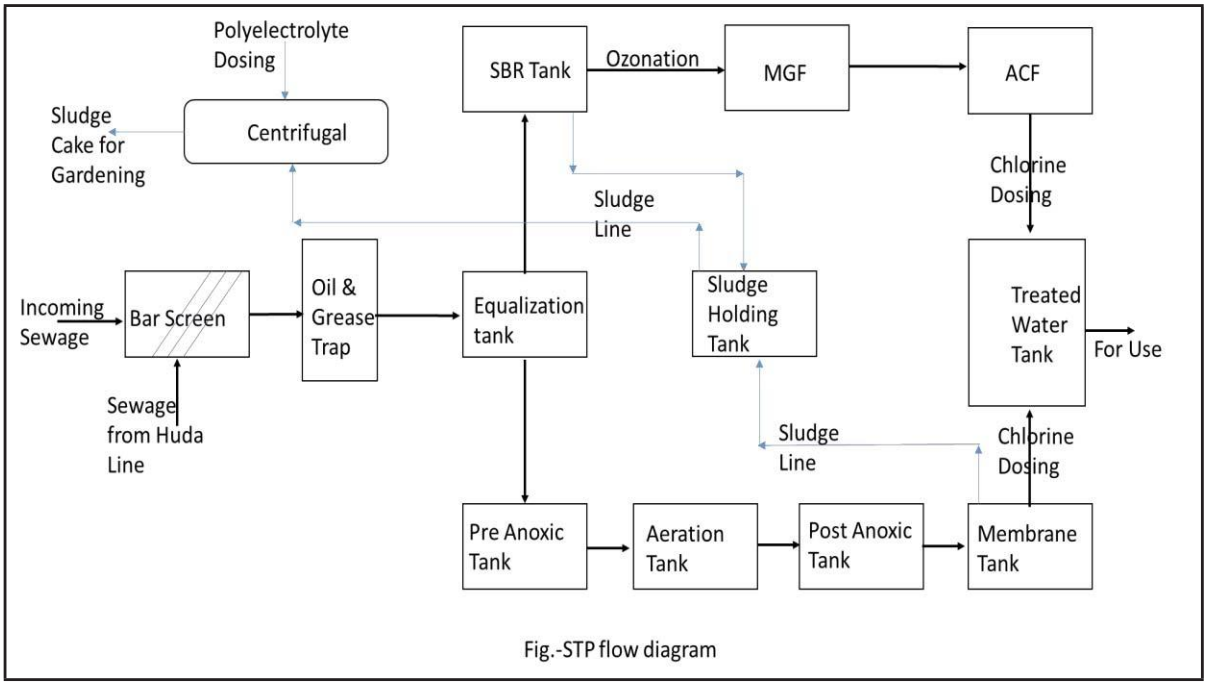


Fig.-STP flow diagram

3.0 DETAILS OF SBR PROCESS (9 MLD)

3.1 Design Parameters

Capacity	9.0 MLD
Process	Aerobic treatment in SBR reactor

3.2 Estimated Characteristics of Raw & Treated Sewage

Parameter	Raw Sewage (Influent)	Treated Sewage (After Secondary Treatment)	Treated Sewage (After Tertiary Treatment)
pH	6.5-8.5	6.5-8.5	6.5-8.5
BOD_3 at 27℃ (mg/l)	250-300	<15	<5
COD (mg/l)	600-800	<100	<30
TSS (mg/l)	300-400	<20	<10
Nitrogen (mg/l)	20-25	<10	<5
Phosphorus (mg/l)	up to 10	<5	<5
Oil & grease (mg/l)	Up to 100	<5	<2

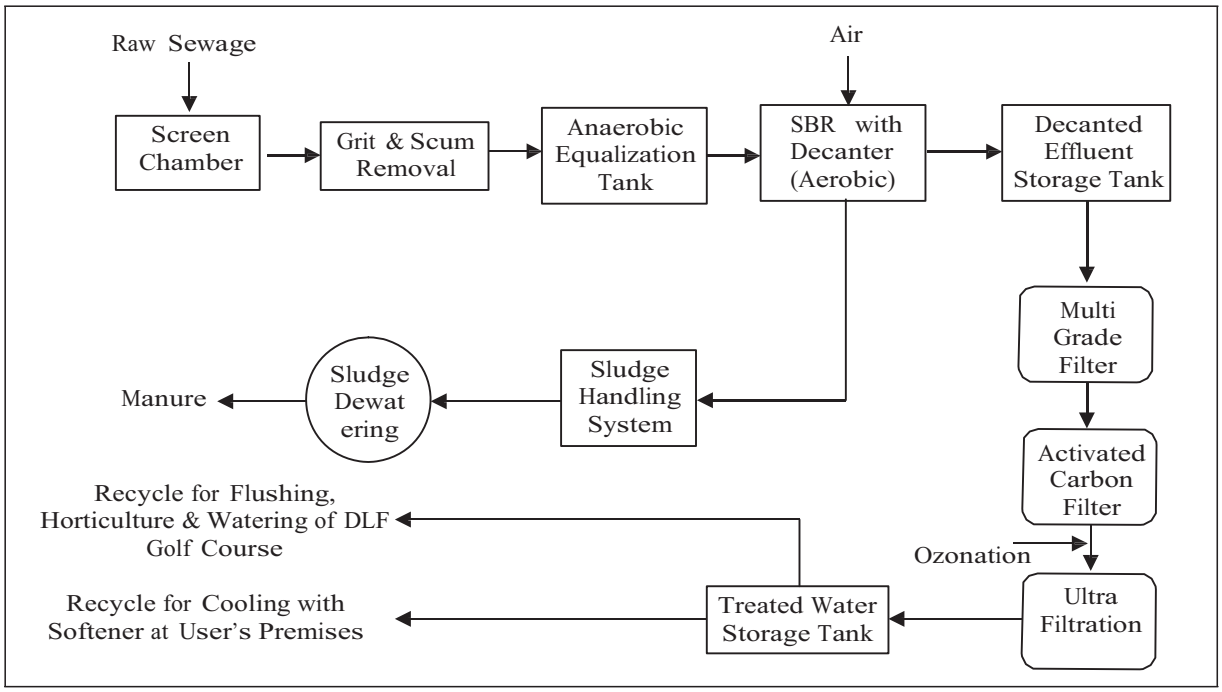
3.3 Treatment Units

The STP includes the following unit operations:

- Primary treatment : Bar Screen, Grit Removal, Scum Removal and Equalization Tank
- Secondary treatment: Batch Reactors (SBR) with Floating Decanters
- Tertiary treatment : Ozonation, Multigrade Filter, Activated Carbon Filter, Ultra Filtration
- Sludge conditioning : Sludge Thickener, Centrifuge

3.4 Process Flow Diagram

The schematic flow diagram of the STP is shown in the following Figure.



Schematic Flow Diagram of Sewage Treatment Plant (STP)

3.5 Process Description

The treatment process includes:

- Screening of influent through trash rack and fine screen
- Lifting of sewage and grit and scum removal
- Anaerobic equalization tank
- Aerobic biological treatment in 4 nos. of batch reactors (SBRs)
- Ozonation for odour control
- Filtration through multi-grade filter (MGF) and polishing in activated carbon filter (ACF)
- Sludge dewatering by centrifuge and sludge disposal

Technology

Sequential Batch Reactor (SBR) is simple yet a controlled process with good degree of automation to perform the functions in batches. The SBR has four major steps, as discussed below, completed in about 4 hours per batch:

Fill : 0.5 hours
React/Aerate : 2.5 hours
Settle : 0.5 hours
Decant : 0.5 hours

Total time for a single batch is 4 hours.

Capacity = 450 kl per reactor x 4 reactors = 1.8 MLD per batch x 5 batches = 9 MLD

- Inlet line, trash rack, screen, lifting sump, grit removal, scum removal and equalization tank are designed for 14 MLD capacity.
- Batch process tanks are designed for 9 MLD in 5 batches.
- Equipments could be added later on for capacity expansion along with one additional batch reactor tanks.

In order to conserve water, the STP has been designed to ensure that the treated effluent quality is well within the permissible limits, even under the varying flow conditions which are typical for such systems. The main components of the process adopted for the STP include the following:

Primarytreatment:

- Sewage from various buildings in DLF City Phase-V flows into the intake chamber of the STP by gravity for treatment. The pipe line size selected is adequate to meet the requirement. In this chamber Bioculture, if required, can be added to control odor (as the whole plant is being installed in the basement).

- The raw sewage then passes through a motorized valve (to regulate the flow) to trash rack, where large size undesirable material is trapped. The motorized valve is interlinked with the level sensor of lifting sump for maintaining uniform/proper conditions.

- The trash rack retains material larger than 50 mm size, which is lifted to a trolley by an automatic mechanism with vertical hoist. After removal of large particles from trash rack, the sewage passes through fine mechanical screen to retain particles below 50 mm but larger than 2-3 mm. The mechanical screen is equipped with an arrangement to scrap the particles mechanically and transport the same for disposal in to the hoist bucket. Operation of screen and the operation of motorized valve of intake line are interlinked to maintain proper water level in the intake chamber and prevent flooding in the screening section. The screen operates in a way so as to ensure that it is free from surface clogging.

- After removal of trash and fine screening, sewage flows to lifting sump. The lifting sump is designed with the proper retention time to avoid settling. From the lifting sump, sewage is pumped to the receiving tank of the grit chamber. These pumps are special pumps having cutter attachment to prevent any choking problem/flow reduction.

- The grit chamber is designed to reduce the sewage velocity and give adequate retention time for the grit and silt to settle down. In order to avoid turbulence, the sewage overflows from receiving tank to the grit chamber, maintaining a linear flow and hence allowing the grit particles to settle down in the grit chamber. The grit chamber has a screw mechanism starting from the bottom for removal of grit periodically. The separated grit is lifted by a hoist and loaded in a trolley.

- From the grit separators, sewage overflows to scum trap which takes care of scum, oil and grease. The scum trap is designed with proper retention time. The separated scum and grease/oil is collected in a drum for disposal by a suitable method.

- The sewage relatively free from trash, grit, scum and oil and grease is collected in anaerobic equalization tank. Bioculture is added, if required, in the intake chamber (discussed above) which reduces/ controls the odor. The rate of Bioculture addition governs the extent of biodegradation and odor control. This anaerobic equalization is designed on 8 hours retention time basis. Submersible mixers have been provided in this tank to prevent settling of any suspended particles.Air dispersion grid have also been provided in equalization tank for mixing of sewage with air.

Secondarytreatment:

- The sewage from the anaerobic equalization tank is lifted by dry pit pumps to the Sequential Batch Reactors (SBRs). These pumps have enough capacity to pump the entire batch of 450 kl in half an hour, as per the time cycle.

- The SBR system has four numbers of reactors, each designed with time cycle to handle over 5 batches per day. The time cycle is: filling 0.5 hours, settling 0.5 hours, reaction time 2.5 hours and decanting time 0.5 hours.

- Aeration in SBR tank is done by diffused aeration system with the help of air blower and diffusers. For better monitoring of process parameters, one DO sensor is mounted in each tank. After filling the SBR tank with sewage, blower starts and once bio degradation has taken place, blower is shut off for some time to allow settling of the sludge. After settling, the sludge decanting process is started. Decanter is well designed to decant one batch in 0.5 hours. Floating type decanter is designed to obtain the desired efficiency.

- Decanter is designed for half hour decanting time and to take care of sufficient lifting up of mix liquor, when aeration is going on.

- Aeration system and decanting system are automated for smooth operation. Level sensor is mounted in SBR tank to prevent overloading and under loading.

Tertiarytreatment:

- Decanted treated effluent is stored in intermediate storage tank for uniform feeding in filters. Six numbers of working filters is selected, each with a flow rate of 80 m^3/h for uniform operation during a day. Decanted treated effluent is first fed into multigrade filter (MGF) for removing any suspended particles, followed by activated carbon filter (ACF) for color and odor removal. Filtered water is recycled for horticulture in various group housings in DLF City Phase-V and irrigation of DLF Golf Course, and also for use of cooling tower makeup purpose in commercial buildings in DLF City Phase-V. Filtered water is passed through softener (located in the premises of end user) for reduction of hardness.

- Ozonation is done for disinfection of decanted water after SBR and additional reduction of BOD and COD. Ozonation is done online in filtered water.

- After passing through softener, water is ready for cooling tower makeup but some residual chlorine is maintained to prevent bio-fouling in cooling tower. For this purpose, some chlorine is dosed in soft water tank (located in the premises of end user).

Sludgehandling:

- Total sludge generated from plant is dewatered by Centrifuge. Liquid form centrifuge is recycled to the equalization tank and the solid sludge cakes are used as manure in horticulture. Sludge wasted from batch reactor can be directly fed into centrifuge or stored in sludge thickener.

3.6 Automation

- SBR process is a fully automatic process; to avoid manual mistakes, certain level sensors are used to sense the level and release some feed back to controller.
- Motorized sluice knife valve is used for inlet isolation in case of any miss happening in plant, or in case of overloading of lifting sump or equalization tank. Level sensors mounted in lifting sump and equalization tank give feedback to controller, and controller gives some command to the motorized valve for opening or closing of valve.
- Mechanical screen with auto operation is installed for smooth operation. Also, operation of screen is interlinked with motorized valve. If motorized valve is fully closed then operation of screen should stop.
- Trash lifting assembly is installed for automatic lifting of the trash collected in trash rack, to the hoist bucket.
- Vertical hoist with load cell arrangement is installed for lifting of grit, and particles collected in trash rack and screen.

- Grit and scum removal from grit chamber and scum trap is automatic, having mechanical systems interlinked with operation of lifting sump pumps.
- Submersible mixers in anaerobic equalization tank is provided for homogeneity of sewage water in the tank. The operation of mixers is either continuous or periodic depending on the requirement. Operation of mixers is interlinked with timer (if operation is periodic) and level sensor of equalization tank.
- Biological treatment process is controlled by level and time process along with DO and sludge blanket motoring. Filling and decanting of batch is level controlled and operation of batch is time controlled. All the phases of batch process is in auto mode but sludge disposal is in manual mode.
- Filtration and ozonation is done in auto mode.

4.0 DETAILS OF MBR PROCESS (6 MLD)

4.1 Basis of Design

The installed ZeeWeed® Membrane Bio-reactor (MBR) System for DLF5 Project is offered based on MBR permeate requirement of 6 MLD.

4.2 Design Influent Flow Data to MBR System

Parameter	Unit	Design
Average influent daily flow at inlet	m3/d	6000
Average daily MBR permeate flow when one train down for 24 hr	m3/d	5250
Feed Temperature	Deg C	15-35
Design Bioreactor Temperature	Deg C	15-35
Approximate Sludge generated from MBR system	m3/day	136 @ 1% consistency

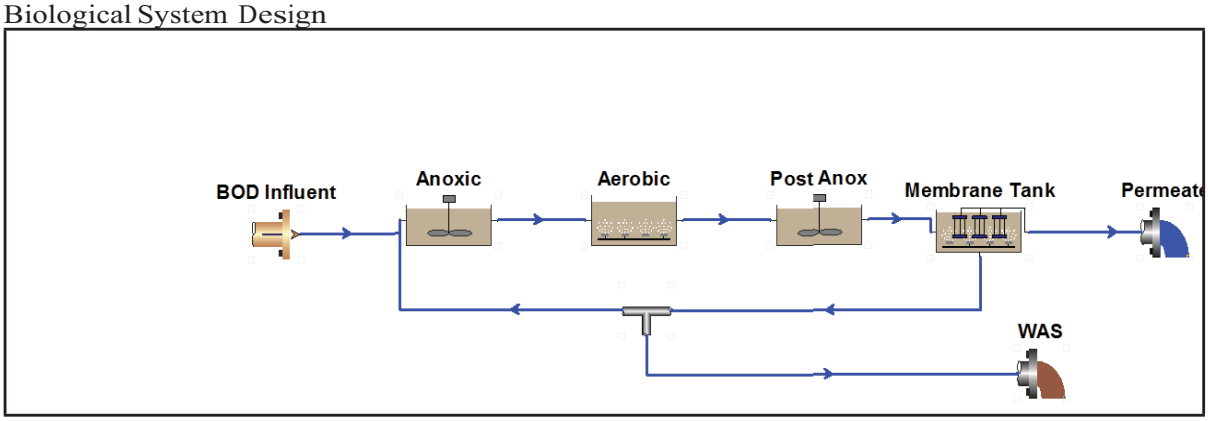
4.3 Design Influent & Effluent Quality

Parameter	Unit	Influent	Expected Treated Effluent
pH	NU	7.5	
Turbidity	NTU		< 0.3
Biological Oxygen Demand (BOD5)	mg/L	250	< 5
COD	mg/L		< 20
Total Suspended Solids (TSS)	mg/L	300	< 5
TKN	mg/L	35	TN < 5
Ammonical Nitrogen (NH4 as N)	mg/L	30	< 1
Nitrate	mg/L	< 1	
Total Phosphorous	mg/L	7	< 0.5
Oil and grease	mg/L	10	

4.4 Operation Basis

Hours per day of operation	24 hrs for MBR
Days per year of operation	330 days (Consider maintenance time and twice a year, once in six months the plant will be shut down for recovery cleans)
Redundancy	N-1 condition (one train down for maintenance, for <1 days period, the remaining train will produce 5.25 MLD MBR permeate.

4.5 Biological System Design



4.6 GEWPT's Recommended Preliminary Biological Process Design Parameter

Parameter	LEAP	Unit
Flow basis of biological design	6000	m3/day
Number of MBR trains	2	Nos
Pre-anoxic tank working volume per train	400	m3
Aerobic working volume (excluding membranes) per train	830	m3
Post-anoxic tank working volume per train	155	m3
Membrane tank working volume per train	90	m3
Total bioreactor working volume including membrane tank (400+830+155+180) = 1565	1565	m3
Specific sludge yield	0.6	kg/kg BOD
Observed sludge yield	53.0%	kg VSS/kg BOD
Design HRT	6	hrs
Design SRT	9	days
F/M Ratio	0.18	kg BOD/kg MLSS/d
Design MLSS in aeration tank	8,400	mg/L
Minimum water depth in aeration tank	6.5	M
Recirculation rate from membrane tank to pre-anoxic zone	5.5Q	
Total oxygen requirement for design aerobic zone	2100	kg of O2/day
Total oxygen requirement for operating aerobic zone	2100	kg of O2/day
Total waste sludge from MBR	136	m3/day

4.7 Membrane System Design

Parameter	LEAP MBR
Net permeate flow rate	6 MLD
Number of membrane trains	2
Number of cassettes installed per train	3
Number of spare cassette spaces per train	0
Numbers of cassettes fully filled / max. no. of module spaces per cassette	2/48
Number of membrane modules installed per train	136 (2*48+1*40)
Total number of cassettes in plant	6 (2*3)
Total number of modules installed in plant	272 (136*2)
Surface area of each membrane module	34.37 m2
Design Net Flux @ Average Daily Flow (lmh)	26.7
N-1 Net Flux @ 5000 m3/d (lmh) for 24 hr	46.7
Spare space	5.5%
Membrane tank simensions per train (LxWxH) m	2.74 x 8.8 x 3.96
Operating membrane tank liquid depth	3.0 m
Membrane blower design capacity per train	1087 dm3/hr

4.8 Process Description

The following gives an overview of various unit operations considered for the 6.0 MLD MBR system.

1) Coarse Screens
6 mm automatic motorized screens are recommended for removal of suspended particles greater than 6 mm.

2) Fine Screens
Drum screens with <2mm punched hole screens are recommended for removal of suspended particles greater than 2mm, which otherwise would enter membrane tank and cause damage to membranes.

3) Bio Reactor
A two train system with each train having a pre-anoxic followed by aerobic reactor followed by post-anoxic tank is considered. The pre and post anoxic zones shall be provided with submersible mixers to ensure complete mixing of MLSS. Fine bubble diffusers shall be provided in the aerobic tank to diffuse air for oxygen supply. MLSS up to 8400 mg/l shall be maintained in the bioreactor. The mixed liquor shall overflow from post anoxic chamber to membrane tank.

4) Membrane Tank
Six trains of membrane systems are considered. Each membrane tank shall have 3 Nos. of 48 module cassettes loaded with 136 number of ZW500 370 ft2 modules.

5) Permeate/Backpulse Equipment
One permeate pump per membrane train plus one common store standby for all membrane trains is employed to draw water through the membranes. Clean water (permeate) is suctioned through ZW500D membranes by variable-speed centrifugal permeate pumps. Same permeate pumps will be used for back pulse purpose.

6) Membrane Scour Aeration System
The membranes are air scoured with six duty membrane aeration and one common standby membrane aeration blowers. Three blowers shall be operated during operation.

7) Mixed Liquor Recirculation Equipment
Recirculation pumps are used to transfer mixed liquor from the Membrane Tank to Bioreactor at the rate of 5×ADF.There are two numbers of recirculation pumps for recirculation. The sludge recirculation transfers solids away from the membranes and provides proper distribution within the bioreactor. The same pumps are also used for sludge wasting.

8) Sodium Hypochlorite Dosing System
The Sodium Hypochlorite Dosing system is used during membrane cleaning applications to remove organic fouling from the membrane surface.

9) Citric Acid Dosing System
The Citric Acid Dosing system is used during membrane cleaning applications to remove inorganic scaling from the membrane surface.

10) Effluent Turbidity Analyzer
An effluent turbidity analyzer can monitor effluent water quality and alert operators if effluent turbidity rises beyond acceptable parameters. For optimal performance monitoring, one turbidity analyzer per train is recommended.

11) Sludge Wasting System
Sludge wasting is accomplished by periodically diverting mixed liquor from the recirculation return line, via manual control or by pulling directly from the bioreactor. The frequency of wasting is a function of influent characteristics, reactor design and operator preference.

12) Centrifuge System
A centrifuge system is recommended to concentrate the sludge and recycle the concentrate to bioreactor. The concentrated sludge will be sent for final disposal.

13) Programable Logic Control (PLC)

The ZeeWeed® membrane filtration system will be controlled by a Programmable Logic Control (PLC). All valves and control devices will be interlocked through the PLC to allow smooth and continuous automatic operation. Valves will open, close and/or modulate, depending on signals from the PLC. These signals will be predetermined through PLC programming and allow the system to operate at optimal conditions. Variable speed pumps will also be controlled by the PLC and vary their vacuum/flow output based on level signals from the process tanks.

All operating parameters will be continuously monitored by the PLC. If an alarm or emergency condition occurs, the PLC program will instruct the various components to change operation conditions and/or shut down the system and alert the operator. The system control logic will be designed with the ability to shut down the system in the event of an alarm condition that could be detrimental to the equipment.

5.0 SIZE AND CAPACITY OF STP PROCESS UNITS

5.1 Size and Capacity of Various Process Units

SN	Process Unit	Number	Size	Capacity	Material
	A) Common Units:				
1.	Coarse Screen	2	1.7m x 2.5m		SS
2.	Fine Mechanical Screen	2			
3.	Lifting Sump	1			
3.	Sludge Thickener	1		90 KL	RCC
4.	Intermediate Clear Water Tank	2		554.4 KL	RCC
5.	Treated Water Tank (TWT)	4			
	B) Units for SBR Process:				
1.	Anaerobic Equalization Tank	1		5391.65 KL	RCC
2.	SBR Tank (Reactor)	4		1170.12 KL	RCC
3.	Multi Grade Filter (MGF)	8	2.6m dia x 2.2m ht	80.0 m^3/hr	MSEP
4.	Activated Carbon Filter (ACF)	8	2.6m dia x 2.2m ht	80.0 m^3/hr	MSEP
	B) Units for MBR Process:				
1.	Pre-anoxic Tank	1		400 KL	RCC
2.	Aeration Tank	1		940 KL	RCC
3.	Post-anoxic Tank	1		155 KL	RCC
4.	Membrane Tank	1	3.05m x 6.6m x 4.0m		RCC

5.2 Size and Capacity of Various Pumps & Blowers

SN	Process Unit	Number	Capacity (m^3/hr)	Head (m)	Motor Capacity	Material of Const
	A) Common:					
1.	Lifting Sump Pump	3 (2w+1s)	135 m^3/hr	15 m	22 kW	CI
2.	Raw Transfer Pump	3 (2w+1s)	690 m^3/hr			
3.	SBR Feed Pump	3 (2w+1s)	450 m^3/hr	8 m	20 hp	CI
4.	Air Blower	6 (5w+1s)	1000 Nm^3/hr		50 hp	CI
5.	Process Blower	2 (1w+1s)	2820 Nm^3/hr			
6.	Membrane Blower	3 (2w+1s)	570 Nm^3/hr			
7.	Sludge Feed Pump	4 (2w+2s)	50 m^3/hr	12 m	7.5 hp	CI
8.	Screw Pump	2 (1w+1s)	10 m^3/hr	25 m	3 hp	CI
9.	Filter Feed Pump	10 (8w+2s)	80 m^3/hr	30 m	15 hp	CI
10.	Ozonator Pump	10 (8w+2s)	80 m^3/hr	30 m	15 hp	CI
11.	Re-circulation Pump	2 (1w+1s)	15 m^3/hr	5 m	1 hp	CI
12.	Drain Pit-1 Pump	2 (1w+1s)	132 m^3/hr	16 m	9.5 kW	CI
13.	Drain Pit-2 Pump	2 (1w+1s)	132 m^3/hr	16 m	9.5 kW	CI
14.	Centrifugal Pump	2	10 m^3/hr		20 hp	CI

SN	Process Unit	Number	Capacity (m^3/hr)	Head (m)	Motor Capacity	Material of Const
15.	Electro Magnetic flow meter	2	80 m^3/hr			
16.	Electric control panel	2				

5.3 Size and Capacity of Units Pertaining to MBR System

SN	Description	Qty	Capacity for LEAP Option	Operation Hours (Avg)
1.	Membrane Aeration Blowers	3 Nos (2W+1S)	Design: 1060 dm3/hr/blower @ 0.45 bar Operating: 894 dm3/hr/blower @ 0.35 bar	24
2.	Permeate/ Backpulse Pumps	3 Nos (2W+1SS)	Design: 152-305 m3/hr/pump @ 10 mwc Operating permeate flow: 152 m3/hr @ 6.0 m, Operating backpulsing flow: 256 m3/hr @ 7.5 m	Permeation: 21.5 hrs Backpulsing: 2.5 hrs
3.	RAS (Recycle from Membrane tank to Aerobic 5 Q submersible)	3 Nos (2W+1S)	687.5 m3/hr/pump @ 5 mwc	24
4.	Anoxic mixer in pre-anoxic tank	1	To suit pre-anoxic tank size-400 m3	24
5.	Anoxic mixer for post-anoxic tank	1	To suit post-anoxic tank size-155 m3	24
6.	Sodium Hypo Dosing pump	2(1W+1S)	168-1600 LPH @ 2 bar	During MC/RC
7.	Citric Acid Dosing pump	2 (1W+1S)	325-600 LPH @ 2 bar	During MC/RC
8.	EQ tank transfer Pumps-submersible	2 (1W+1S)	250 m3/hr @ 5mwc	24
9.	Back pulse tank	1 No	Eff. Capacity: 20 m3	
10.	Process Blowers	2 (1W+1S)	2618 Nm3/hr @0.7 bar	24

6.0 Photographs of Various Treatment Units


Bar Screen


Equalization Tank


SBR Tank


MGF & ACF


Centrifugal Sludge Thickener

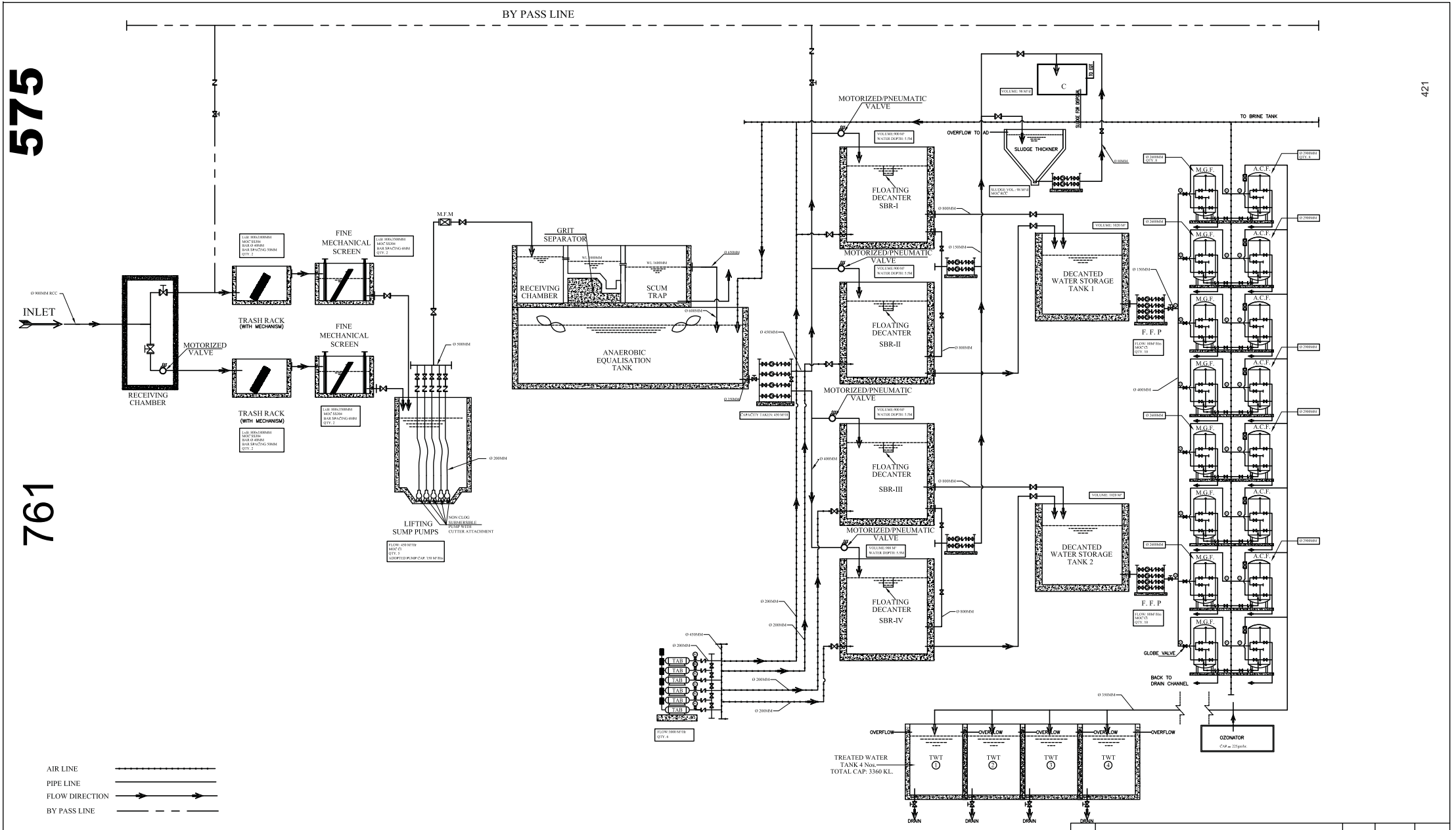

Sludge Holding Tank


MBR Tank

7.0 STP DRAWINGS

Following STP drawings are enclosed.

- Hydraulic Flow Diagram (9 MLD SBR)
- Hydraulic Flow Diagram (6 MLD MBR)



S. NO.	CODE NO.	DESCRIPTION
1.	M. G. F.	MULTIGRADE FILTER
2.	A. G. F.	ACTIVATED CARBON FILTER
3.	S. B. R.-1	SEQUENTIAL BATCH REACTOR-1
4.	S. B. R.-2	SEQUENTIAL BATCH REACTOR-2
5.	S. B. R.-3	SEQUENTIAL BATCH REACTOR-3
6.	S. B. R.-4	SEQUENTIAL BATCH REACTOR-4
7.	T.W.T.	TREATED WATER TANK
8.	F. F. P.	FILTER FEED SUMP PUMP
9.	A. D.	ANAEROBIC DIGESTER
10.	T.A.B.	TWIN LOBE AIR BLOWER
11.	S.F.P.	SOFTENER FEED PUMP

LEGENDS:-	
	BUTTERFLY VALVE
	GLOBE VALVE
	SLUICE VALVE
	NON RETURN VALVE
	MOTORIZED VALVE
	PUMP
M.F.M	MAGNETIC FLOW METER
	BALL VALVE
S	SAMPLING POINT
P	PRESSURE GAUGE

LIST OF CIVIL UNITS (FOR 9 MLD)		
DESCRIPTION	VOLUME L x B x W.L.	WAT. DEPTH
ANAEROBIC DIGESTER	4152.51 M³	5.5
SEQUENCING BATCH REACTOR-1,2,3	1106.87 M³	5.5
SEQUENCING BATCH REACTOR-4	1162.53 M³	5.5
DECANTED WATER STORAGE TANK-1	532.00 M³	3.5
DECANTED WATER STORAGE TANK-2	507.47 M³	3.5
TREATED WATER STORAGE TANKS(1+2+3+4)	3360.00 M³	4.0

ISSUE	MODIFICATION	DATE	SIGN.	APPROV.

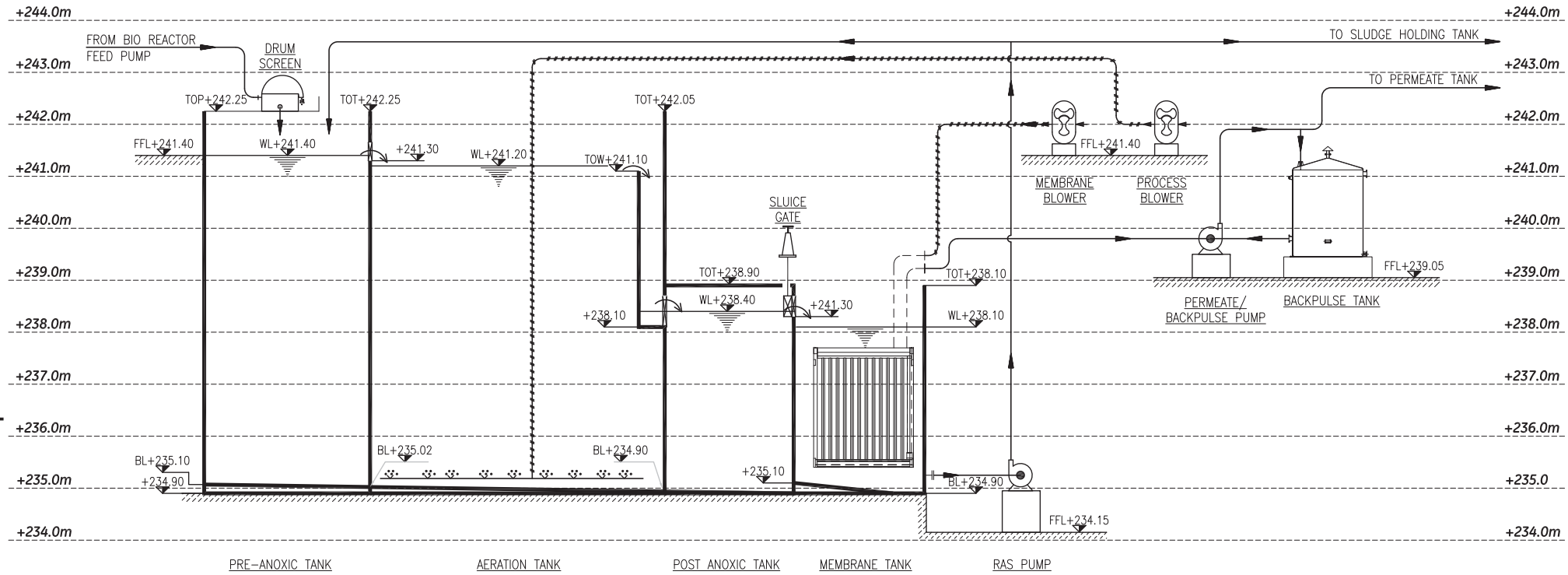
CLIENT:– DLF

CONSULTANT:–
EXERGY ENGINEERS (I) PVT. LTD.
44E/9, KISHANGARH, VASANT KUNJ NEW DELHI -70
TEL:- 26123505, 26133995, 26897483, FAX :- 26131911

PROJECT:– GURGAON 9 MLD SBR BASED

SIZE	SCALE	DIMN.	TITLE:–
A1	N.T.S.	MM	SCHEMATIC DIAGRAM

DRN. BY	CHD. BY	APP. BY	DATE	DRG NO.	REV. NO.
VINOD	V.DAYAL		09-12-08	DRG/MC/STP/01/02	0



LEGEND
FFL : FINISHED FLOOR LEVEL
TOP : TOP OF PLATFORM
TOT : TOP OF TANK
TOW : TOP OF OVERFLOW WEIR
WL : WATER LEVEL
BL : BOTTOM LEVEL

REV	DESCRIPTION	ECO	DWN	APVD	DATE	CHKD
A	RELEASED FOR REFERENCE		AK	MB	18NOV15	PA

TOLERANCES UNLESS NOTED
DECIMALS ANGLES
X ± ±
.X ±
DIMENSIONS IN MILLIMETERS DO NOT SCALE
FIRST ANGLE

DRAWN BY AK	DATE 18NOV15
CHECKED BY PA	DATE 18NOV15
APPROVED BY MB	DATE 18NOV15
APPROVED BY	DATE

CLIENT/JOB	DLF LIMITED 6MLD STP MBR RETROFIT SYSTEM
FILE	AUTOCAD
TITLE	HYDRAULIC FLOW DIAGRAM
MATERIAL	
SIZE	A3
DRAWING NO.	5383670-AH-01
REV	A
PROJECT	5383670
SCALE	NTS
SHEET	422 1OF1

P/N 1300102-RCP01

792
576


3/2022
Summit
DELHI
Crest Tower A
Park Place main gate
DLF The Crest
DLF Park Place M block
Image © 2022 Maxar Technologies
Google
28°26'58.21" N 77°06'41.72" E elev 262 m eye alt

DLF Limited
DLF Gateway Tower, R Block, DLF City,
Phase III, Gurugram-122 002, Haryana
Tel.: (+91-124) 4396000

DLF
BUILDING INDIA

February 15, 2022

The Director,
Town & Country Planning,
Haryana, Chandigarh

Subject: **Approval of Building Plans for Proposed Group Housing Buildings in Zone 10, DLF5, Sector 54, Gurugram: Payment of advance Labor Cess**

Sir,

1. Kindly refer to our BR I dated 15.02.2022, wherein we have applied for approval of the building plans for proposed group housing in Zone 10, DLF5, Sector 54, Gurugram alongwith Scrutiny fee of Rs. 23,34,000 paid through e-payment. Copy of E-challan is attached as **Annexure 'A'**.

2. As per policy circulated vide FCTCP memo no. 2057-5/25/2008-2TCP dated 25.02.10, *"where the duration of the project is likely to exceed more than one year, the amount of cess at the rate of 1% is payable on the estimated cost of construction incurred during one year, and further amount of cess shall be paid, subsequently".* It is also submitted that the validity period of the BR III, in this case, is likely to be five years, as the height of the building exceeds 15 meters.

3. Accordingly, we are making payment of advance labor cess of **Rs. 96,27,000** in favor of **"Director, Town & Country Planning, Haryana, Chandigarh"** through e-payment. Copy of the e-challan is attached as **Annexure 'B'**.

4. In view of the above, it is requested that the building plans for proposed group housing in Zone 10, DLF5, Gurugram, may kindly be approved, at an early date.

Thanking you,

Yours faithfully,
For DLF Limited.

(DEEPAK BHANDARI)
Authorised Signatory

DIRECTOR TOWN & COUNTRY PLANNING
17-2-2022
HARYANA CHANDIGARH

Email: dlf-tcphry@dlf.in
Mob: +919711080232

Encl: As above

Acle

765

579

FORM BR-I

[See Code 2.1(1)]

Form of application

Class of Building-

Residential	☑	Warehousing	☐
Commercial	☐	Industrial	☐
Educational	☐	Any other	☐
Institutional	☐		

From

DLF Limited
DLF Shopping Mall,
3rd Floor, Arjun Marg, DLF City, Phase-I,
Gurgaon-122002, Haryana, India

To

The Director,
Town and Country Planning, Haryana,
Chandigarh.

Sir

I/We apply for permission to erect/re-erect a building in accordance with the plans submitted herewith for proposed **Group Housing Buildings in part of DLF 5, Sector 54, Gurugram.**

2. I/We attach:
   - **a)** Site plan (in triplicate) showing the position of site proposed to be built upon as required by the Code along with an un-editable Compact Disc/ DVD or any other electronic medium permissible by competent authority from time to time containing the drawings so submitted.
   - **b)** Plans, elevations and sections (in triplicate) as required by the Code along with an un-editable Compact Disc/ DVD or any other electronic medium permissible by competent authority from time to time containing the drawings so submitted.
   - **c)** Drainage plans (in triplicate), as required by Code along with an un-editable Compact Disc/ DVD or any other electronic medium permissible by Director from time to time containing the drawings so submitted.
   - **d)** Structural drawings (for record) as per **Form BR-V(A1)/BR-V(A2)**, as may be applicable .
   - **e)** Specifications of the proposed building (in triplicate) in **Form BR-II;**
   - **f)** Certificate of conformity to regulation and structural safety for the relevant Buildings (depending upon type and height) in Form **BR-V(A1) or BR-IV(A2)**; and
   - **g)** Scrutiny fee @ Rs 10 per square metre deposited as per prescribed mode Rs.23,34,000/-

3. The construction of the building will be undertaken as per the approved building plans, structural design given by the Structural Engineer, and got supervised through the following Architect/ Engineer :

A. Architect:

(i)	Name of Architect	: **Ardamanjit Singh Sandhu**
(ii)	Council of Architect Registration No.	: CA/90/12848 valid upto 31-12-2030.
(iii)	Complete Address.	:69 Nora Niwas Bhawani Kunj, Behind D-2,Vasant Kunj, New Delhi - 110070
(iv)	E-mail	: ardamanjit.sandhu@rsms-arch.com
(v)	Mobile no.	: 9810791652

DIRECTOR TOWN & COUNTRY PLANNING
Diary No. AM
Date 1.7.02.2021
HARYANA CHANDIGARH

FORM BR-II

See Code 2.1(1) (iv))

Specifications

The materials to be used in the construction to be clearly specified under the following heads:-

Items	Specifications
(a) Foundations	R.C.C footing/Raft foundation/ Piles
(b) Walls	Stone/Brick Masonry in cement Sand Plaster/ Concrete Block work
(c) Damp-proof course	40 mm PCC with water proofing compound/ Basement R.C.C. retaining wall to go up to ground floor slab
(d) Floors	IPS/Marble/Tiles/Laminated Wooden/kota/ Terrazo/ Cement Concrete
(e) Roofs	R.C.C. Slab /Tiles
(f) Windows, Doors and & others woodwork	Mild Steel/Aluminum/UPVC/wooden frames and glazed aluminum /MS/wooden shutters
(g) Steel Work	Reinforcement in Tor steel. Railings, gates etc in mild steel.
(h) Internal finish	Cement Plaster with distemper/ Premium emulsion Whitewash.
(i) External Finish	Cement plaster and paint/Stone Masonry

Signature of Architect/Engineer

Signature of applicant

(No digital signatures are required)

I. Complete Address:- : 69, Bhawani Kunj,Behind D-2, Vasant Kunj, New Delhi -110070

II. E-Mail :- : ardamannjit.sandhu@rsms-arch.com

III. Mobile no.:- : 9810791652

Dated_____

Signature of Owner

(No digital signature is required)
Mobile no.
E-mail

Signature of Architect

Signature of Structural Engineer

Er.R.K.Singh
M.Tech(Structure)
Regd. No.M-084(IASE)

The structure design has been checked and has been found to be in order. The design is in accordance with the provisions of the National Building code and the relevant Bureau of Indian Standard Codes (with latest amendments) including Bureau of Indian standard codes for structures resistant to earthquake and other natural hazards. The local soil conditions, its load bearing capacity and the underground water table etc. have been kept in view while designing the same.

Date: 15/02/2022

Signature of Proof Consultant along with Mob. No. & E-mail

B. K. SINGH
H-6/316, Aggarwal Tower, N.S.P., Delhi-34
M.TECH (Structure)

Mob. No. - 9811038352
e-mail - ablscog@gmail.com.

Indian Association of Structural Engineers

Certificate of Membership

Issued for Group Housing of DLF-5 Sector-54 Gurgaon

RAMESH KUMAR SINGH

Has Been Elected

MEMBER

Of The

Indian Association of Structural Engineers

on 16 June 2006

with

Er. R.K. Singh
M.Tech(Structure)
Regd. No. M-084(IASE)

* All its associated rights and privileges
* Membership Number M-084
* Valid up to 31st March 2022

President

ENVIRONMENTAL CLEARANCE

PARIVESH

(Pro-Active and Responsive Facilitation by Interactive, and Virtuous Environmental Single-Window Hub)

Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), Haryana)

To,

The Authorized Signatory
DLF LIMITED
At DLF Shopping Mall, 3rd Floor,Arjun Marg, DLF City, Phase-1, Gurugram, Haryana -122002

Subject: Grant of Environmental Clearance (EC) to the proposed Project Activity under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC) in respect of project submitted to the SEIAA vide proposal number SIA/HR/MIS/76126/2022 dated 28 Apr 2022. The particulars of the environmental clearance granted to the project are as below.

1.	**EC Identification No.**	**EC22B039HR111216**
2.	**File No.**	SEIAA/HR/2022/181
3.	**Project Type**	New
4.	**Category**	B1
5.	**Project/Activity including Schedule No.**	8(b) Townships and Area Development projects.
6.	**Name of Project**	Proposed Group Housing Buildings in Zone 10, DLF 5, at Sector-54 Gurugram, Haryana by M/s DLF Ltd
7.	**Name of Company/Organization**	DLF LIMITED
8.	**Location of Project**	Haryana
9.	**TOR Date**	08 Apr 2022

The project details along with terms and conditions are appended herewith from page no 2 onwards.

Date: 17/08/2022

(e-signed)
S. Narayanan, IFS
Member Secretary
SEIAA - (Haryana)

Note: A valid environmental clearance shall be one that has EC identification number & E-Sign generated from PARIVESH.Please quote identification number in all future correspondence.

This is a computer generated cover page.

State Environment Impact Assessment Authority, Haryana,
Bays No.55-58, Prayatan Bhawan, Sector-2 Panchkula.

Tel: 0172-2565232, 4043956
E-mail Id: seiaa-21.env@hry.gov.in

Subject: **EC for Proposed Group Housing Buildings in Zone 10, DLF 5 at Sector 54, Gurgaon, Haryana by M/s DLF Limited.**

This has reference to your Proposal No. SIA/HR/MIS/76126/2022 dated 28.04.2022 and subsequent letter dated 09.07.2022 for seeking prior Environmental Clearance (EC) for the above project under the EIA Notification, 2006 along with submission of required Scrutiny Fee amounting of Rs. 2,00,000/- vide DD No. 520455 dated 09.03.2022 in compliance of Haryana Government, Environment & Climate Change Notification No. DE&CCH/3060 dated 14th October, 2021. The proposal has been appraised as per prescribed procedure in the light of provisions under the EIA Notification, 2006 on the basis of the mandatory documents enclosed with the application viz., Form-1, Form1-A, Conceptual Plan, EIA/EMP Report and additional clarifications furnished in response to the observations of the State Expert Appraisal Committee (SEAC) constituted by MoEF & CC, GoI vide their Notification dated 21.02.2022, in its meeting held on 08.07.2022 awarded **"Gold"** rating / grading to the Project.

2. It is inter-alia, noted that the project involves in Proposed Group Housing Buildings in Zone 10, DLF 5 at Sector 54, Gurgaon, Haryana.

3. The details of project are as under:

Table 1 Summary of Far

Sr. No.	Particulars		
1	Permissible FAR	32122149.73 sqm	A
2.	EC obtained till date for earlier project upto the ground housing (The CREST) falling in DLF5 as per plan submitted	1975616.401 sqm	B
3.	Balance FAR for (A-B)	1146524.33 sqm	C
4.	Proposed FAR for the Group Housing Zone-10, DLF5	143937.51 sqm	D
5.	Net Balance FAR (C-D)	1002586.82 sqm	E

Table 2 – Basic Details

Sr. No.	Particulars	
1.	**Online Project Proposal Number**	**SIA/HR/MIS/76126/2022, Dated 28.04.2022**
2.	Latitude	28°26'44.55"N
3.	Longitude	77°06'48.93"E
4.	Plot Area	30,653.317m^2 (7.574 acres)
5.	Proposed Ground Coverage	6,369.381 m^2 (20.77%)
6.	Proposed FAR	1,43,937.510 m^2
7.	Non FAR Area	89,440.488 m^2
8.	Total Built Up area	2,33,377.998 m^2
9.	Total Green Area with Percentage	9,195.995 m^2 (30% plot area)
10.	Rain Water Harvesting Pits	8 Nos.
11.	STP Capacity	DLF-5 Common STP of 15 MLD
12.	Total Parking	1,615 ECS

13.	Organic Waste Converter		Total 1 nos. of Organic waste converters of capacity 1,500 Kg/day
14.	Maximum Height of the Building (till terrace)		109.350 m
15.	Power Requirement		5,874 KW (DHBVN)
16.	Power Backup		9 DG sets of total capacity 8,250 KVA (7×1,000 KVA + 2×625 KVA).
17.	Total Water Requirement		391 KLD
18.	Domestic Water Requirement		255 KLD
19.	Fresh Water Requirement		255 KLD
20.	Treated Water		136 KLD
21.	Waste Water Generated		294 KLD
22.	Solid Waste Generated		2,069 kg/day
23.	Biodegradable Waste		1,241 kg/day
24.	Number of Blocks		4 nos
25.	No. of Floors for Blocks		S+33
26.	Dwelling Units		520 nos
27.	Service personnel units		50 nos
28.	Basement		4 nos
29.	Community Building		1483.404 m^2
30.	Stories		S+33 Floors
31.	R+U Value of Material used (Glass)		U-Value: <2.8 W/m^2K SHGC: <0.60
32.	Total Cost of the project:	i) Land Cost	1,076 Cr.
		ii) Construction Cost	
33.	EMP Cost/Budget		3,130.09 Lakhs
34.	Incremental Load in respect of:	PM 2.5	0.00794 $\mu g/m^3$
		PM 10	0.00983$\mu g/m^3$
		SO_2	0.0994 $\mu g/m^3$
		NO_2	0.0631 $\mu g/m^3$
		CO	0.0000049 mg/m^3
35.	Construction Phase	Power Back-up	Temporary Connection
		Water Requirement & Source	DLF Water Tanks+ STP WATER (common STP Plan DLF Phase V)
		STP (Modular)	5 KLD
		Anti-Smoke Gun	1

Table 3 EMP

Total Project Cost:	**107600**	**Lakhs**
Total EMP Proposed Budget	**3,130.09**	**Lakhs**

During Construction Phase				**During Operation Phase**			
Description	**Capital Cost (In Lakhs)**	**Recurring Cost**		**Description**	**Capital Cost (in Lakhs)**	**Recurring Cost**	
		(In Lakhs for 3 Year)	**Per Annum**			**(In Lakhs for 10 Year)**	**Per Annum**
Sanitation and Wastewater Management	2	3	1	Solid Waste Management	27	30	3
Mobile STP	3	6	2	(Dust bins &			

				OWC)			
Disinfection / pest control	0	3	1				
Dust Mitigation Measures Including site barricading, water sprinkling and anti-smog gun, Wheel Washing	417	36	3	Green Belt Development	100	250	25
Traffic management	3	1.5	0.5	Monitoring for Air, Water, Noise & Soil	0	50	5
Waste Management	1.5	2	0.5				
PPE for workers & welfare	2	1.5	0.5	Rainwater harvesting system	48	15	1.5
Medical cum First Aid facility	2	1.5	0.5	DG Sets including stack height and acoustics	638.09	875	87.5
wheel washing	1	1.5	0.5	Sewerage Treatment plant	200	300	30
				Solar lighting / solar Panel (158.6kwp)	70	35	3.5
Monitoring / testing (air, noise, water, soil, stack emission, STP effluent, DG noise)	0	4.5	1.5				
Total	**431.5**	**60.5**	**11**	**Total**	**1083.09**	**1555**	**155.5**

4. The State Expert Appraisal Committee, Haryana after due consideration of the relevant documents submitted by the project proponent and additional clarification furnished in response to its observations, have recommended this project for grant of environmental clearance. Accordingly, the State Environment Impact Assessment Authority in its **144th meeting held on 8th – 9th August 2022** decided to agree with the recommendations of SEAC to accord necessary Environmental Clearance for the project under **Category 8(b)** of EIA Notification 2006 subject to the **strict compliance with the following stipulations depicted below:-**

A. Specific conditions:-

1. Sewage shall be treated in the STP based on latest Technology to achieve standards ordered by NGT. The Treated effluent from STP shall be recycled /reused for flushing. DG cooling and Gardening
2. The PP shall also develop the Miyawaki Forest as proposed in the EMP with the capital cost and maintain the same. The Miyawaki forest shall be developed under the guidance of MD Forest Corporation Haryana.
3. PP shall submit revised Solar panel capacity as per HAREDA norms.
4. The Project Proponent would devise a monitoring plan to the satisfaction of the State Pollution Control Board so as to continuously monitor the treated waste water being used for flushing in terms of faecal coli forms and other pathogenic bacteria.
5. The PP shall ensure that total 2% of the cost of project shall be spent on EMP Budget. However, the amount and component shown in EMP table above shall also be included for the purpose of 2% amount. The EMP cost on Socio Economic activities shall be used before the commencement of the project & EMP recurring inside the project shall be implemented throughout the operation of the project. The PP shall establish Environment monitoring cell as per documents submitted.
6. The PP shall not carry out any construct above and below revenue rasta if passing through the project and ensure that permission of the competent authority shall be obtained before carry out any construction above or below the revnue rasta. The PP shall put notice board on the revenue rasta for the passer byes.
7. The project proponent shall upload the status of compliance of the basic details (given in above tables), stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
8. The Project Proponents would commission a third party study on the implementation of conditions related to quality and quantity of recycle and reuse of treated water, efficiency of treatment systems, quality of treated water being supplied for flushing (specially the bacterial counts), comparative bacteriological studies from toilet seats using recycled treated waters and fresh waters for flushing, and quality of water being supplied through spray faucets attached to toilet seats.
9. Separate wet and dry bins must be provided in each unit and at ground level for facilitating segregation of waste. Solid Waste shall be segregated into wet garbage and inert materials. Wet Garbage shall be composted in Organic waste convertor. Adequate area shall be provided for solid waste management within the premises which will include area for segregation, composting. The Inert waste from the project will be sent to solid waste dumping site through authorized vender.
10. Traffic management plan as submitted shall be implemented in letter and spirit. Apart, a detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is marinated and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habilitation being carried out or purpose to be carried out by the project or other agencies in this 05kms radius of the site in different scenarios of space and time
11. No tree cutting has been proposed in the instant project. A minimum of 1 tree for every 80 sqm of land should be planted and maintained. The Existing trees will be counted for this purpose. The landscape planning should include plantation of native species. The species with heavy foliage, broad leaves and wide canopy cover are desirable. Water intensive and/or invasive species should not be used for landscaping. As proposed 9,195.995 m^2 (30% plot area) shall be provided for Green Area development for whole project, excluding plot areas.
12. The Project Proponent shall obtain all necessary clearance/permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws.
13. Consent to establish/operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of pollution) Act, 1981 and the Water (Prevention and control of pollution) Act, 1974.
14. The Approval of the Competent Authority shall be obtained for structural safety of building code due to earthquakes, adequacy of fire fighting equipments etc. as per National Building Code including protection measures from lightening etc.
15. The PP shall obtain the Fire NOC from the Competent Authority before taking the occupation of the building.
16. The PP shall install the Eco Friendly Green Transformer based on ester oil to reduce the carbon footprint. The PP shall shift to gas based generator set when the gas is available. The PP shall install APCM for the DG set. The PP shall reduce the So2 load by 30% if HSD is used. The DG sets will be operated for maximum 04 hours during power failure through Executing Agency
17. The PP shall not give occupation or possession before the water supply and sewage connection permitted by the competent authority.
18. The PP shall not give occupation or possession before the electricity connection permitted by the competent Authority.
19. The PP shall obtain the permission regarding withdrawal of ground water, if any from HWRA/CGWA before the start of the project and also obtained the CTO from HSPCB after the approval from HWRA/CGWA.
20. The PP shall carry out the quarterly awareness programs for the stakeholders of the project.

21. 08 Rain water harvesting recharge pits shall be provided for ground water recharging as per the CGWB norms
22. The PP shall install Digital water level recorder for monitoring the water recharge and carry out quarterly maintenance and cleaning of 08 RWH pits
23. The PP shall ensure the compliance of provisions of Plastic Waste Management (Amendment) Rules, 2022 relevant for the project.
24. The PP may provide electric charging stations to facilitate electric vehicle commuters.
25. The PP shall provide the Anti smog gun mounted on vehicle in the project for suppression of dust during construction & operational phase and shall use the treated water, if feasible.
26. The PP shall take all preventive measures including water sprinkles to control dust during construction and operational phase.
27. Any change in stipulations of EC will lead to Environment Clearance void-ab-initio and PP will have to seek fresh Environment Clearance

B. Statutory Compliance:

[1] The project proponent shall obtain all necessary clearance/ permission from all relevant agencies including town planning authority for ground coverage, FAR and should be in accordance with zoning plan approved by Competent Authority before commencement of work. All the construction shall be done in accordance with the local building byelaws.

[2] The approval of the Competent Authority shall be obtained for structural safety of buildings due to earthquakes, adequacy of firefighting equipment etc as per National Building Code including protection measures from lightening etc.

[3] The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for nonforest purpose involved in the project.

[4] The project proponent shall obtain clearance from the National Board for Wildlife, if applicable. [5] The project proponent shall obtain Consent to Establish/Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the Haryana State Pollution Control Board.

[6] The project proponent shall obtain the necessary permission for drawl of ground water /surface water required for the project from the competent authority.

[7] A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project should be obtained.

[8] All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department shall be obtained, as applicable, by project proponents from the respective competent authorities.

[9] The provisions of the Solid Waste (Management) Rules, 2016, e-Waste (Management) Rules, 2016, the Plastics Waste (Management) Rules, 2016 and Batteries waste (Management Handling Rules2001 as amended in 2020) shall be followed.

[10] The project proponent shall follow the ECBC Act/ECBC-Rules prescribed by Bureau of Energy Efficiency, Ministry of Power strictly in addition of bylaws of the State Government.

I Air Quality Monitoring and Preservation

Notification GSR 94(E) dated 25.01.2018 of MoEF&CC regarding Mandatory Implementation of Dust Mitigation Measures for Construction and Demolition Activities for projects requiring Environmental Clearance shall be complied with.

2) A management plan shall be drawn up and implemented to contain the current exceedance in ambient air quality at the site.
3) The project proponent shall install system to carryout Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM2.5) covering upwind and downwind directions during the construction period.
4) Diesel power generating sets proposed as source of backup power should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use of ultra low sulphur diesel. The location of the DG sets may be decided with in consultation with State Pollution Control Board
5) Construction site shall be adequately barricaded before the construction begins. Dust, smoke & other air pollution prevention measures shall be provided for the building as well as the site. These measures shall include screens for the building under construction, continuous dust/ wind breaking walls all around the site (at least 3 meter height). Plastic/tarpaulin sheet covers shall be provided for vehicles bringing in sand, cement, murram and other construction materials prone to causing dust pollution at the site as well as taking out debris from the site.

6) Sand, murram, loose soil, cement, stored on site shall be covered adequately so as to prevent dust pollution.
7) Wet jet shall be provided for grinding and stone cutting.
8) Unpaved surfaces and loose soil shall be adequately sprinkled with water to suppress dust.
9) All construction and demolition debris shall be stored at the site (and not dumped on the roads or open spaces outside) before they are properly disposed. All demolition and construction waste shall be managed as per the provisions of the Construction and Demolition Waste Rules 2016.
10) The diesel generator sets to be used during construction phase shall be ultra low sulphur diesel type and shall conform to Environmental (Protection) prescribed for air and noise emission standards.
11) The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Ultra low sulphur diesel shall be used. The location of the DG set and exhaust pipe height shall be as per the provisions of the Central Pollution Control Board (CPCB) norms.
12) For indoor air quality the ventilation provisions as per National Building Code of India.

II Water Quality Monitoring and Preservation

1) The natural drain system should be maintained for ensuring unrestricted flow of water. No construction shall be allowed to obstruct the natural drainage through the site, on wetland and water bodies. Check dams, bio-swales, landscape, and other sustainable urban drainage systems (SUDS) are allowed for maintaining the drainage pattern and to harvest rain water.
2) Buildings shall be designed to follow the natural topography as much as possible. Minimum cutting and filling should be done.
3) Total fresh water use shall not exceed the proposed requirement as provided in the project details. The per capita supply should adhere to NBC 2016 and CGWA Notification dated 12.12.2018.
4) The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office, MoEF&CC along with six monthly Monitoring reports.
5) A certificate shall be obtained from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users.
6) At least 20% of the open spaces as required by the local building bye-laws shall be pervious. Use of Grass pavers, paver blocks with at least 50% opening, landscape etc. would be considered as pervious surface.
7) Installation of dual pipe plumbing for supplying fresh water for drinking, cooking and bathing etc and other for supply of recycled water for flushing, landscape irrigation, car washing, thermal cooling, conditioning etc. shall be done.
8) Use of water saving devices/ fixtures (viz. low flow flushing systems; use of low flow faucets tap aerators etc) for water conservation shall be incorporated in the building plan.
9) Separation of grey and black water should be done by the use of dual plumbing system. In case of single stack system separate recirculation lines for flushing by giving dual plumbing system be done.
10) Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.
11) The local bye-law provisions on rain water harvesting should be followed. If local byelaw provision is not available, adequate provision for storage and recharge should be followed as per the Ministry of Urban Development Model Building Byelaws, 2016. Rain Water Harvesting pits shall be provided for ground water recharging as per the CGWB norms.
12) A rain water harvesting plan needs to be designed where the recharge bores of minimum one recharge bore per 5,000 square meters of built up area and storage capacity of minimum one day of total fresh water requirement shall be provided. In areas where ground water recharge is not feasible, the rain water should be harvested and stored for reuse. The ground water shall not be withdrawn without approval from the Competent Authority.
13) All recharge should be limited to shallow aquifer.
14) No ground water shall be used during construction phase of the project.
15) Any ground water dewatering should be properly managed and shall conform to the

approvals and the guidelines of the CGWA in the matter. Formal approval shall be taken from the CGWA for any ground water abstraction or dewatering.

16) The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office, MoEF&CC along with six monthly Monitoring reports.
17) Sewage shall be treated in the STP with tertiary treatment. The treated effluent from STP shall be recycled/re-used for flushing, AC make up water and gardening. As proposed, no treated water shall be disposed in to municipal drain.
18) No sewage or untreated effluent water would be discharged through storm water drains.
19) Onsite sewage treatment of capacity of treating 100% waste water to be installed. The installation of the Sewage Treatment Plant (STP) shall be certified by an independent expert and a report in this regard shall be submitted to the Ministry before the project is commissioned for operation. Treated waste water shall be reused on site for landscape, flushing, cooling tower, and other end-uses. Excess treated water shall be discharged as per statutory norms notified by Ministry of Environment, Forest and Climate Change. Natural treatment systems shall be promoted.
20) Periodical monitoring of water quality of treated sewage shall be conducted. Necessary measures should be made to mitigate the odour problem from STP.
21) Sludge from the onsite sewage treatment, including septic tanks, shall be collected, conveyed and disposed as per the Ministry of Urban Development, Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Sewerage and Sewage Treatment Systems, 2013.

III Noise Monitoring and Prevention

1) Ambient noise levels shall conform to residential area/commercial area both during day and night as per Noise Pollution (Control and Regulation) Rules, 2000. Incremental pollution loads on the ambient air and noise quality shall be closely monitored during construction phase. Adequate measures shall be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB / SPCB.
2) Noise level survey shall be carried as per the prescribed guidelines and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report.
3) Acoustic enclosures for DG sets, noise barriers for ground-run bays, ear plugs for operating personnel shall be implemented as mitigation measures for noise impact due to ground sources.

IV Energy Conservation Measures

1) Compliance with the Energy Conservation Building Code (ECBC) of Bureau of Energy Efficiency as per ECBC Act, 2017 read with ECBC Rules, 2018 shall be ensured. Buildings in the States which have notified their own ECBC, shall comply with the State ECBC also which is in no case should be less than 25% as prescribed.
2) Outdoor and common area lighting shall be LED.
3) Concept of passive solar design that minimize energy consumption in buildings by using design elements, such as building orientation, landscaping, efficient building envelope, appropriate fenestration, increased day lighting design and thermal mass etc. shall be incorporated in the building design. Wall, window, and roof R & U-values shall be as per ECBC specifications.
4) Energy conservation measures like installation of CFLs/ LED for the lighting the area outside the building should be integral part of the project design and should be in place before project commissioning.
5) Solar, wind or other Renewable Energy shall be installed to meet electricity generation equivalent to 1% of the demand load or as per the state level/ local building bye-laws requirement, whichever is higher.
6) Solar power shall be used for lighting in the apartment to reduce the power load on grid. Separate electric meter shall be installed for solar power. Solar water heating shall be provided to meet 20% of the hot water demand of the commercial and institutional building or as per the requirement of the local building bye-laws, whichever is higher. Residential buildings are also recommended to meet its hot water demand from solar water heaters, as far as possible.

7) The PP will submit report indicating compliance of each parameter of ECBC requirement and submit quantification saving report for each component.

V Energy Conservation Measures

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7) The PP will submit report indicating compliance of each parameter of ECBC requirement and submit quantification saving report for each component.

VI Waste Management

1) A certificate from the competent authority handling municipal solid wastes, indicating the existing civic capacities of handling and their adequacy to cater to the M.S.W. generated from project shall be obtained.
2) Disposal of muck during construction phase shall not create any adverse effect on the neighboring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.
3) Separate wet and dry bins must be provided in each unit and at the ground level for facilitating segregation of waste. Solid waste shall be segregated into wet garbage and inert materials.
4) Organic Waste Converter within the premises with a minimum capacity of 0.5 kg /person/day must be installed. Leaves to be put in earmarked pits for converting them into compost to be used as manure
5) All non-biodegradable waste shall be handed over to authorized recyclers for which a written tie up must be done with the authorized recyclers.
6) Any hazardous waste generated during construction phase, shall be disposed of as per applicable rules and norms with necessary approvals of the State Pollution Control Board.
7) Use of environment friendly materials in bricks, blocks and other construction materials, shall be required for at least 20% of the construction material quantity. These include Fly Ash bricks, hollow bricks, AACs, Fly Ash Lime Gypsum blocks, Compressed earth blocks, and other environment friendly materials.
8) Fly ash should be used as building material in the construction as per the provision of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003 and 25th January, 2016.Ready mixed concrete must be used in building construction.
9) Any wastes from construction and demolition activities related thereto shall be managed so as to strictly conform to the Construction and Demolition Rules, 2016.
10) Used CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/rules of the regulatory authority to avoid mercury contamination.

VII Green Cover

1) No tree can be felled/transplant unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned regulatory authority. Old trees should be retained based on girth and age regulations as may be prescribed by the Forest Department. Plantations to be ensured species (cut) to species (planted).
2) A minimum of 1 tree (5' tall) for every 80 sqm of land should be planted and maintained. The existing trees will be counted for this purpose. The landscape planning should include plantation of native species. The species with heavy foliage, broad leaves and wide canopy cover are desirable. Water intensive and/or invasive species should not be used for landscaping.
3) Where the trees need to be cut with prior permission from the concerned local Authority, compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). Area for green belt development shall be provided as per the details provided in the project document.
4) Topsoil should be stripped to a depth of 20 cm from the areas proposed for buildings, roads, paved areas, and external services. It should be stockpiled appropriately in designated areas and reapplied during plantation of the proposed vegetation on site.

VIII Transport

1) A comprehensive mobility plan, as per MoUD best practices guidelines (URDPFI), shall be prepared to include motorized, non-motorized, public, and private networks. Road should be designed with due consideration for environment, and safety of users. The road system can be designed with these basic criteria.
   a) Hierarchy of roads with proper segregation of vehicular and pedestrian traffic.
   b) Traffic calming measures.
   c) Proper design of entry and exit points.
   d) Parking norms as per local regulation.
2) Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards be operated only during non-peak hours.
3) A detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is maintained and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or proposed to be carried out by the project or other agencies in this 05 Kms radius of the site in different scenarios of space and time and the traffic management plan shall be duly validated and certified by the State Urban Development department and the P.W.D./ competent authority for road augmentation and shall also have their consent to the implementation of components of the plan which involve the participation of these departments.

IX Human Health Issues

1. All workers working at the construction site and involved in loading, unloading, carriage of construction material and construction debris or working in any area with dust pollution shall be provided with dust mask.
2. For indoor air quality the ventilation provisions as per National Building Code of India.
3. Emergency preparedness plan based on the Hazard Identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.
4. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
5. Occupational health surveillance of the workers shall be done on a regular basis.
6. A First Aid Room shall be provided in the project both during construction and operations of the project.

X Corporate Environment Responsibility

1) The project proponent shall comply with the provisions of CER, as applicable.
2) The company shall have a well laid down environmental policy duly approved by the Board

of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions. The company shall have defined system of reporting infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions and/ or shareholders/ stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.

3) A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.
4) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.

XI Miscellaneous

1) The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEFCC/SEIAA website where it is displayed.
2) The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.
3) The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
4) The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.
5) The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.
6) The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.
7) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
8) The project proponent shall abide by all the commitments and recommendations made in the form-IA, Conceptual Plan and also that during their presentation to the Expert Appraisal Committee.
9) No further expansion or modifications in the plan shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC)/SEIAA, Haryana. The project proponent shall seek fresh environmental clearance under EIA notification 2006 if at any stage there is change of area of this project.
10) Any change in planning of the approved plan will leads to Environment Clearance voidab-initio and PP will have to seek fresh Environment Clearance
11) The PP should give unambiguous affidavit giving land promoters in accordance with your ownership and possession of land legal the case referred for Environment Clearance to SEIAA.
12) Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.
13) The Ministry/SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
14) The Ministry/SEIAA reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
15) The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

16) The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.

17) The validity of this environment clearance letter is valid up to 10 years from the date of issuance of EC letter (As per MoEF & CC, GoI Notification dated 12.04.2022). The environment clearance conditions applicable till life space project will continue to apply. In case of violation the action would be taken as per the laid down law of land. Compliance report should be sent to this office till life of the project.

18) If project is not completed within the validity period then the project proponent shall submit the application for extension of validity within one month before the lapse of validity period of Environment Clearance i.e. 10 years.

19) The Project Proponent should intimate to the Authority as well as to the quarter concerned in case of any change in the present communication address.

(S. Narayanan, IFS)
Member Secretary,
State Level Environment Impact
Assessment Authority, Haryana, Panchkula.

A copy of the above is forwarded to the following:

1. Director (IA Division), MoEF & CC, GoI, Indira Paryavaran Bhavan, Zor bagh Road-New Delhi-110003.
2. Chairman, State Environment Impact Assessment Authority, Bay No. 55-58, Prayatan Bhawan, Sector-2, Panchkula, Haryana
3. Chairman, Haryana State Pollution Control Board, C-11, Sector-6, Panchkula.
4. Director, Environment & Climate Change Department, Haryana, Bay No. 55-58, Prayatan Bhawan, Sector-2, Panchkula, Haryana
5. Director General, Town & Country Planning Haryana, Plot No. 3, Sector - 18A, Madhya Marg, Chandigarh- 160018.
6. Regional Office, Ministry of Environment, Forests & Climate Change, Govt. of India, Bay's No. 24-25, Sector 31-A, Dakshin Marg, Chandigarh-160018.
7. Concerned File/ Office Copy

(S. Narayanan, IFS)
Member Secretary,
State Level Environment Impact
Assessment Authority, Haryana, Panchkula.

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