



भारतीय रिज़र्व बैंक
संपदा विभाग
जम्मू

दूसरी मंजिल, भारतीय रिज़र्व बैंक
रेल हेड कॉम्प्लेक्स, जम्मू - 180012
फोन: 0191 2472481, ई-मेल: estate@rbi.org.in
RBI/Jammu/Estate/405/22-23/ET/625

भारतीय रिज़र्व बैंक (आरबीआई) के अधिकारियों के लिए सेक्टर 9 और सेक्टर 1ए, त्रिकुटा नगर, जम्मू में सिविल, इलेक्ट्रिकल, प्लम्बिंग, फायर फाइटिंग, जल आपूर्ति, आंतरिक और बाह्य विकास कार्य, सेनिटरी इंस्टालेशन, सीवरेज सिस्टम, लिफ्ट, सबस्टेशन सहित आवासीय क्वार्टरों के निर्माण हेतु ई-निविदा

भाग-1 (तकनीकी वाणिज्यिकी बोली)

बोलीदाता का नाम _____

पता _____

अनुमानित लागत: ₹ 83.19 करोड़

बोली पूर्व बैठक (ऑफलाइन) की तारीख: स्थान: 01 मार्च, 2023 को सुबह 11.00 बजे जम्मू

ई-निविदा प्रस्तुति की नियत तारीख और समय: 13 मार्च, 2023 को दोपहर 2.00 बजे

ई-निविदा खुलने की तारीख: 13 मार्च 2023 को दोपहर 3.00 बजे

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दावा- अस्वीकरण / DISCLAIMER

भारतीय रिज़र्व बैंक, संपदा विभाग, जम्मू ने इस दस्तावेज को इच्छुक पार्टियों को प्रोजेक्ट की पृष्ठभूमि के बारे में जानकारी देने के लिए तैयार किया है। जबकि बैंक ने इसमें निहित सूचना तैयार करने में सावधानी बरती है और इसे ठीक माना है, फिर भी न तो बैंक और न ही इसके कोई अधिकारी या एजेंसी और न ही उनके संबंधित अधिकारी, कर्मचारी, एजेंट या सलाहकार इस दस्तावेज़ में निहित जानकारी या इससे संबद्ध देने योग्य किसी अन्य जानकारी की पूर्णता या सटीकता के बारे में कोई वारंटी या अभ्यावेदन (व्यक्त रूप में हो या निहित हो) प्रदान करते हैं।

जरूरी नहीं है कि यह जानकारी संपूर्ण हो। इच्छुक पक्षों को स्वयं पूछताछ कर लेनी चाहिए और निविदा में भाग लेने वालों को लिखित रूप में यह पुष्टि करने की आवश्यकता होगी कि उन्होंने ऐसा किया है और वे निविदा प्रस्तुत करने में केवल बैंक द्वारा प्रदान की गई जानकारी पर भरोसा नहीं करते हैं। यह जानकारी इस आधार पर प्रदान की जा रही है कि यह भारतीय रिज़र्व बैंक या इसके किसी अधिकारी या एजेंसी या उनके किसी संबंधित अधिकारियों, कर्मचारियों, एजेंटों या सलाहकारों के लिए गैर-बाध्यकारी है। भारतीय रिज़र्व बैंक अनुबंध पर आगे न बढ़ने या अनुबंध के विन्यास को बदलने, इस दस्तावेज़ में वर्णित टाइम टेबल को बदलने या अपनाई जाने वाली प्रक्रिया/पद्धति को बदलने का अधिकार सुरक्षित रखता है। यह इस निविदा में रुचि व्यक्त करने वाले किसी पक्ष के साथ इस मामले में और अधिक चर्चा की मनाही का अधिकार भी रखता है। रुचि व्यक्त करने वाले व्यक्तियों या संस्थाओं को किसी भी प्रकार की लागत की प्रतिपूर्ति का भुगतान नहीं किया जाएगा।

भारतीय रिज़र्व बैंक
ई-निविदा आमंत्रण सूचना : प्रेस नोटिस

क्षेत्रीय निदेशक, भारतीय रिज़र्व बैंक, रेल हेड कॉम्प्लेक्स, जम्मू-180012 एमएसटीसी पोर्टल के माध्यम से पात्र संविदाकारों से निम्नलिखित कार्य के लिए दो बोली प्रणाली में प्रतिशत दर ई-निविदा आमंत्रित करते हैं :

क्रम सं.	मद	विवरण
1	ई-निविदा संख्या	RBI/Jammu/Estate/405/22-23/ET/625
2	कार्य का नाम	भारतीय रिज़र्व बैंक (आरबीआई) के अधिकारियों के लिए सेक्टर 9 और सेक्टर 1ए, त्रिकुटा नगर, जम्मू में सिविल, इलेक्ट्रिकल, प्लम्बिंग, फायर फाइटिंग, जल आपूर्ति, आंतरिक और बाह्य विकास कार्य, सेनिटरी इंस्टालेशन, सीवरेज सिस्टम, लिफ्ट, सबस्टेशन सहित आवासीय क्वार्टर के निर्माण
3	निविदा का प्रकार	ई-निविदा (ऑनलाइन भाग I - तकनीकी-वाणिज्यिक बोली और भाग II - मूल्य बोली) । निविदा प्रक्रिया केवल एमएसटीसी लिमिटेड (http://mstcecommerce.com/eprochome/rbi) के ई-निविदा पोर्टल के माध्यम से की जाएगी। सभी इच्छुक बोलीदाताओं को निविदा प्रक्रिया में भाग लेने के लिए उपर्युक्त वेबसाइट के माध्यम से एमएसटीसी लिमिटेड के साथ स्वयं को पंजीकृत करना होगा ।
4	अनुमानित लागत	₹ 83.19 करोड़ (सिविल कार्य ₹71.10 करोड़ + इलेक्ट्रिकल कार्य ₹12.09 करोड़)
5	बयाना जमा राशि	कार्य की अनुमानित लागत का @2% अर्थात ₹ 1.66 करोड़
6	पूर्ण होने की अवधि	40 महीनें
7	पक्षकारों के लिए एनआईटी डाउनलोड करने की तिथि	02 फरवरी 2023 को शाम 05:00 बजे से
8	बोली पूर्व बैठक	सम्मेलन कक्ष, दूसरी मंजिल, भारतीय रिज़र्व बैंक, रेल हेड कॉम्प्लेक्स, जम्मू -180012 में 01 मार्च, 2023 को सुबह 11.00 बजे

न्यूनतम पात्रता और मूल्यांकन मानदंड सहित निविदा प्रपत्र और अन्य विवरण बैंक की वेबसाइट

www.rbi.org.in/Scripts/BS_ViewTenders.aspx

अथवा

MSTC

पोर्टल

www.mstcecommerce.com/eprochome/rbi/ से प्राप्त किए जा सकते हैं।

बैंक न्यूनतम निविदा को स्वीकार करने के लिए बाध्य नहीं है और किसी भी निविदा के पूर्ण या आंशिक भाग को स्वीकार करने का अधिकार रखता है। बैंक बिना कोई कारण बताए सभी निविदाओं को अस्वीकार करने का अधिकार भी रखता है।

क्षेत्रीय निदेशक
भारतीय रिज़र्व बैंक
जम्मू

ई-निविदा अनुसूची

क्रम सं.	मद	विवरण
1	ई-निविदा सं.	RBI/Jammu/Estate/405/22-23/ET/625
2	निविदा आमंत्रित करने वाला प्राधिकरण	क्षेत्रीय निदेशक भारतीय रिज़र्व बैंक संपदा विभाग रेल हेड कॉम्प्लेक्स, जम्मू टेलिफोन नं.: 0191 2472481 फैक्स नं.: ईमेल आईडी: estate@rbi.org.in
3	कार्य का नाम	भारतीय रिज़र्व बैंक (आरबीआई) के अधिकारियों के लिए सेक्टर 9 और सेक्टर 1ए, त्रिकुटा नगर, जम्मू में सिविल, इलेक्ट्रिकल, प्लम्बिंग, फायर फाइटिंग, जल आपूर्ति, आंतरिक और बाह्य विकास कार्य, सेनिटरी इंस्टालेशन, सीवरेज सिस्टम, लिफ्ट, सबस्टेशन सहित आवासीय क्वार्टर के निर्माण
4	लोकेशन	सेक्टर -9 और सेक्टर-1ए, त्रिकुटा नगर, जम्मू
5	निविदा का प्रकार	ई-निविदा (ऑनलाइन भाग I - तकनीकी-वाणिज्यिक बोली और भाग II - मूल्य बोली)। निविदा प्रक्रिया केवल एमएसटीसी लिमिटेड (http://mstcecommerce.com/eprochome/rbi) के ई-निविदा पोर्टल के माध्यम से की जाएगी। सभी इच्छुक बोलीदाताओं को निविदा प्रक्रिया में भाग लेने के लिए उपर्युक्त वेबसाइट के माध्यम से एमएसटीसी लिमिटेड के साथ स्वयं को पंजीकृत करना होगा।
6	अनुमानित लागत	₹83.19 करोड़ (सिविल कार्य ₹71.10 करोड़ + इलेक्ट्रिकल कार्य ₹12.09 करोड़)

7	पक्षकारों के लिए डाउनलोड हेतु उपलब्ध एनआईटी की तिथि	02 फरवरी 2023 को शाम 05:00 बजे से
8	बोली पूर्व बैठक	सम्मेलन कक्ष, दूसरी मंजिल, भारतीय रिज़र्व बैंक, रेल हेड कॉम्प्लेक्स, जम्मू – 180012 में 01 मार्च, 2023 को सुबह 11.00 बजे
9	बयाना जमा राशि (ईएमडी)	@ कार्य की अनुमानित लागत का 2% अर्थात ₹1.66 करोड़। निविदाकारों/बोलीदाताओं के लिए सामान्य नियम और निर्देश का विवरण मद संख्या 14 में दिया गया है।
10	ईएमडी प्रस्तुत करने की अंतिम तारीख	13 मार्च, 2023 को दोपहर 2.00 बजे
11	www.mstcecommerce.com/eprochome/rbi पर ऑनलाइन तकनीकी-वाणिज्यिक बोली और मूल्य बोली प्रस्तुत करने के लिए ई-निविदा शुरू होने की तिथि	02 फरवरी 2023 को शाम 05:00 बजे से
12	तकनीकी-वाणिज्यिक बोली और मूल्य बोली प्रस्तुत करने के लिए ऑनलाइन ई-निविदा बंद होने की तिथि	13 मार्च, 2023 को दोपहर 2.00 बजे
13	भाग I बोली अर्थात तकनीकी-वाणिज्यिक बोली खुलने की तिथि और समय	13 मार्च 2023 को दोपहर 3.00 बजे
14	भाग-II (मूल्य बोली) खोलने की तिथि	तकनीकी-बोली के लिए प्रस्तुत दस्तावेजों की जांच के बाद निविदा का भाग II (मूल्य बोली) बाद की तारीख में खोला जाएगा और इसकी सूचना योग्य बोलीदाताओं को दी जाएगी।
15	निविदा की वैधता	भाग I (तकनीकी-वाणिज्यिक बोली) के खुलने की तारीख से छह महीने
16	लेनदेन शुल्क	MSTC लिमिटेड के पक्ष में MSTC भुगतान गेटवे / NEFT / RTGS के माध्यम से MSTC पोर्टल में उल्लिखित लेनदेन शुल्क का भुगतान।

ई-निविदा आमंत्रण सूचना

स्थान:

दिनांक:

क्षेत्रीय निदेशक
संपदा विभाग
भारतीय रिज़र्व बैंक
जम्मू- 180012

भारतीय रिज़र्व बैंक (आरबीआई) के अधिकारियों के लिए सेक्टर 9 और सेक्टर 1ए, त्रिकुटा नगर, जम्मू में सिविल, इलेक्ट्रिकल, प्लम्बिंग, फायर फाइटिंग, जल आपूर्ति, आंतरिक और बाह्य विकास कार्य, सेनिटरी इंस्टालेशन, सीवरेज सिस्टम, लिफ्ट, सबस्टेशन सहित आवासीय क्वार्टर्स के निर्माण हेतु प्रतिस्पर्धी ई-निविदा आमंत्रित की जाती है। विस्तृत जानकारी निम्न प्रकार है :

एनआईटी संख्या / ई-निविदा संख्या	RBI/Jammu/Estate/405/22-23/ET/625
कार्य का नाम	भारतीय रिज़र्व बैंक (आरबीआई) के अधिकारियों के लिए सेक्टर 1ए और सेक्टर 9, त्रिकुटा नगर, जम्मू में सिविल, इलेक्ट्रिकल, प्लम्बिंग, फायर फाइटिंग, जल आपूर्ति, आंतरिक और बाह्य विकास कार्य, सेनिटरी इंस्टालेशन, सीवरेज सिस्टम, लिफ्ट, सबस्टेशन सहित आवासीय क्वार्टर्स के निर्माण
प्रोजेक्ट की लोकेशन	सेक्टर 1ए और सेक्टर 9, त्रिकुटा नगर, जम्मू
कार्य की अनुमानित लागत	₹ 83.19 करोड़ (सिविल कार्य ₹71.10 करोड़ + इलेक्ट्रिकल कार्य ₹12.09 करोड़)
निविदा का प्रकार	एमएसटीसी लिमिटेड www.mstcecommerce.com/eprochome/rbi के माध्यम से ई-प्रोक्योरमेंट सिस्टम (ऑनलाइन भाग I - तकनीकी-वाणिज्यिक बोली और भाग II - मूल्य बोली) ।

	निविदा प्रक्रिया केवल एमएसटीसी लिमिटेड (http://mstcecommerce.com/eprochome/rbi) के ई-निविदा पोर्टल के माध्यम से की जाएगी। सभी इच्छुक बोलीदाताओं को निविदा प्रक्रिया में भाग लेने के लिए उपर्युक्त वेबसाइट के माध्यम से एमएसटीसी लिमिटेड के साथ स्वयं को पंजीकृत करना होगा।
लेनदेन शुल्क	MSTC पोर्टल पर बताए अनुसार एमएसटीसी लिमिटेड को एमएसटीसी पेमेन्ट गेटवे/एनईएफटी/ आरटीजीएस के माध्यम से किया जाना है। महत्वपूर्ण नोट: कृपया ध्यान दें कि एमएसटीसी लिमिटेड, कोलकाता के पक्ष में एनईएफटी द्वारा लेनदेन शुल्क प्राप्त होने के बाद ही विक्रेताओं के पास ऑनलाइन ई-निविदा तक पहुंच होगी।
पक्षकारों के लिए डाउनलोड हेतु उपलब्ध एनआईटी की तिथि	02 फरवरी 2023 को शाम 05:00 बजे से
बयाना जमा राशि (ईएमडी)	कार्य की अनुमानित लागत के 2% के बराबर राशि के लिए ईएमडी अर्थात् ₹1.66 करोड़ एनईएफटी/आरटीजीएस/डिमांड ड्राफ्ट/बैंक गारंटी के माध्यम से जमा किया जाना है। निविदाकर्ताओं/बोलीदाताओं हेतु सामान्य नियमों और अनुदेशों का विवरण मद संख्या 14 में दिया गया है।
भाग II /मूल्य बोली खुलने के लिए निविदाकारों की संक्षिप्त सूची	निविदाकर्ताओं की तकनीकी बोली जो निविदाकर्ताओं / बोलीदाताओं के लिए सामान्य नियमों और अनुदेशों की मद संख्या 2(ए) और 2 (बी) की न्यूनतम पात्रता आवश्यकता को पूरा करती है तथा मूल्यांकन मानदंड में न्यूनतम 50 अंक प्राप्त करते हैं, को निविदा के भाग II / मूल्य बोली खुलने के लिए शॉर्टलिस्ट किया जाएगा।
निष्पादन बैंक गारंटी (पीबीजी)	सफल निविदाकार द्वारा किसी अनुसूचित बैंक से संविदा मूल्य के 5% के बराबर राशि की निष्पादन बैंक गारंटी कार्य देने के 14 दिनों के भीतर प्रस्तुत की जाएगी। निविदाकर्ताओं /बोलीदाताओं हेतु सामान्य नियमों और अनुदेशों का विवरण मद संख्या 23 में दिया गया है।
प्रतिधारण जमा राशि (आरएमडी) / प्रतिभूति जमा राशि	संविदाकार को किए जाने वाले प्रत्येक भुगतान से किए गए कार्य के मूल्य की 5% राशि को प्रतिधारण जमा राशि के लिए भारतीय रिज़र्व बैंक द्वारा काट लिया जाएगा। निविदाकर्ताओं /बोलीदाताओं हेतु सामान्य नियमों और अनुदेशों का विवरण मद संख्या 24 में दिया गया है।

पूर्ण करने की अवधि /	40 (चालीस) माह
क्षतिपूर्ण दायित्व अवधि (डीएलपी)	कार्य पूर्ण होने की तिथि से 12 (बारह) माह
भाग I (तकनीकी-वाणिज्यिक बोली) की अनुसूची XIII में अनुबंध 1 पर चेकलिस्ट के अनुसार ऑनलाइन निविदा प्रस्तुत करने और तकनीकी बोली दस्तावेजों को भौतिक रूप से प्रस्तुत करने की अंतिम तिथि और समय । नोट: मूल्य बोली केवल ऑनलाइन प्रस्तुत की जानी है और इसके भौतिक प्रस्तुतीकरण पर विचार नहीं किया जाएगा और यह निविदाकर्ता/ओं की अयोग्यता के अधीन होगा ।	13 मार्च, 2023 को दोपहर 2.00 बजे
बोली पूर्व बैठक की तिथि और समय	01 मार्च, 2023 को सुबह 11.00 बजे जम्मू
पात्रता दस्तावेज / पूर्व-अर्हता मानदंड, भाग- I (अर्थात् तकनीकी-वाणिज्यिक बोली) खोलने की तिथि और समय	13 मार्च 2023 को दोपहर 3.00 बजे
भाग - II (मूल्य बोली) खुलने की तारीख और समय	भाग-II (मूल्य बोली) खोलने की तारीख और समय का निर्धारण पात्रता दस्तावेजों/ पूर्व-अर्हता मानदण्डों और भाग-I के सत्यापन के पश्चात किया जाएगा और इसे पात्र बोलीकर्ताओं को सूचित किया जाएगा ।
बोली की वैधता	तकनीकी-वाणिज्यिक बोली खोलने की तारीख से छह (06) महीनें अथवा पारस्परिक सहमति से इसे आगे बढ़ाया जा सकता है।

3. इच्छुक निविदाकारों को नियमों और शर्तों को ध्यानपूर्वक पढ़ लेना चाहिए। उन्हें अपनी बोली केवल तभी प्रस्तुत करनी चाहिए जब वे स्वयं को पात्र मानते हों और उनके पास सभी आवश्यक दस्तावेज हों।

2. बोली दस्तावेज जिसमें योजनाओं, विनिर्देशों, निष्पादित की जाने वाली विभिन्न प्रकार की वस्तुओं की मात्रा की अनुसूची और पालन किए जाने वाले अनुबंध के नियमों और शर्तों तथा अन्य आवश्यक दस्तावेजों को बैंक की वेबसाइट www.rbi.org.in/Scripts/BS_ViewTenders.aspx से अथवा

एमएसटीसी पोर्टल: www.mstcecommerce.com/eprochome/rbi/ से देखा और डाउनलोड किया जा सकता है ।

2. इच्छुक निविदाकर्ता के पास वैध **श्रेणी-III प्रकार डिजिटल हस्ताक्षर** होना चाहिए और बोली प्रस्तुत करने के लिए एमएसटीसी लिमिटेड के साथ पंजीकृत होना चाहिए।
3. वे निविदाकर्ता जो ऊपर बताए अनुसार एमएसटीसी पोर्टल पर पंजीकृत नहीं हैं, उन्हें पहले से अपना पंजीकरण कराना आवश्यक है। यदि आवश्यक हो तो वे वेबसाइट पर दी गई जानकारी के अनुसार ऑनलाइन बोली प्रक्रिया का प्रशिक्षण प्राप्त कर सकते हैं।
4. निविदा के खुलने की तिथि पर, निविदाकर्ता लॉगिन कर सकते हैं और बोली खोलने की प्रक्रिया देख सकते हैं।
5. निविदाकर्ता दस्तावेज को **पीडीएफ** फॉर्मेट में अपलोड कर सकते हैं।
6. निविदाकार को अपनी बोली फ्लोर प्राइस से ऊपर, बराबर या नीचे प्रतिशत के रूप में उद्धृत करना चाहिए।
7. सर्वप्रथम पात्रता (तकनीकी) बोली को उपर्युक्त उल्लिखित नियत तिथि और समय पर खोला जाएगा। शॉर्टलिस्ट किए गए निविदाकर्ताओं की वित्तीय बोली खोलने का समय और तारीख केवल वेबसाइट पर अपलोड की जाएगी और किसी भी समाचार पत्र में प्रकाशित नहीं की जाएगी ।
8. इच्छुक निविदाकारों की शंका (यदि कोई हो) को दूर करने के लिए भारतीय रिज़र्व बैंक, जम्मू में दिनांक **01 मार्च, 2023 को सुबह 11.00 बजे** पात्र और इच्छुक निविदाकारों के साथ बोली पूर्व बैठक आयोजित की जाएगी। निविदाकर्ताओं को अपने सभी प्रश्नों को बोली-पूर्व बैठक से एक दिन पहले अर्थात् 28 फ़रवरी 2023 को 10.30 बजे तक भारतीय रिज़र्व बैंक, जम्मू के कार्यालय में (दूरभाष: 0191 2472481) , ई-मेल: Estate@rbi.org.in) भेज देना चाहिए। इस बोली प्रक्रिया के संबंध में जारी किए गए सभी संशोधन/परिशिष्ट/शुद्धिपत्र केवल वेबसाइट पर अपलोड किए जाएंगे और किसी भी समाचार पत्र में प्रकाशित नहीं किए जाएंगे।
9. यदि न्यूनतम निर्धारित मानदंडों को पूरा करने वाली बहुत अधिक बोलियाँ प्राप्त होती हैं तो बैंक बिना कोई कारण बताए किसी भी संभावित आवेदन को अस्वीकार करने और योग्य निविदाकर्ताओं की सूची को उसके द्वारा उपयुक्त समझी जाने वाली किसी भी संख्या तक सीमित करने का अधिकार सुरक्षित रखता है।

10. बोली प्रस्तुत करने के पश्चात एजेंसी कितनी भी बार संशोधित बोली फिर से प्रस्तुत कर सकती है लेकिन इसे बोली प्रस्तुत करने हेतु अधिसूचित अंतिम तारीख और समय से पहले प्रस्तुत किया जाना है।
11. संशोधित बोली प्रस्तुत करते समय, एजेंसी एक या एक से अधिक मर्दों की दर को कितनी भी बार संशोधित कर सकती है (उसे सभी वस्तुओं की दर फिर से दर्ज करने की आवश्यकता नहीं है) लेकिन इसे बोली प्रस्तुत करने हेतु अधिसूचित अंतिम तारीख और समय से पहले प्रस्तुत किया जाना है।
12. तकनीकी-वाणिज्यिक बोली (भाग-I), मूल्य बोली (भाग-II) की हस्ताक्षरित प्रति और भाग-I (तकनीकी-वाणिज्यिक बोली) की अनुसूची XIII के अनुबंध-1 में निर्दिष्ट दस्तावेज/अनुलग्नक, एनईएफटी विवरण/बीडी/डीडी आदि (सभी विधिवत हस्ताक्षरित) को एसओटी/एनआईटी में दिए गए निर्धारित समय के भीतर अपलोड किया जाएगा/बोली के साथ प्रस्तुत किया जाएगा। सीलबंद लिफाफे में मूल्य बोली (भाग-II) को छोड़कर उक्त दस्तावेजों (विधिवत हस्ताक्षरित) की भौतिक प्रति भी निर्धारित समय के भीतर संपदा विभाग, भारतीय रिज़र्व बैंक, जम्मू को प्रस्तुत की जाएगी। मूल्य बोली केवल ऑनलाइन प्रस्तुत की जानी है और इसके भौतिक प्रस्तुतीकरण पर विचार नहीं किया जाएगा और भौतिक प्रस्तुतीकरण निविदाकर्ता/ओं को आयोज्य कर देगा। न्यूनतम पात्रता और मूल्यांकन मानदंड सहित निविदा प्रपत्र और अन्य विवरण बैंक की वेबसाइट www.rbi.org.in/Scripts/BS_ViewTenders.aspx या एमएसटीसी पोर्टल: www.mstcecommerce.com/eprhome/rbi/ से प्राप्त किए जा सकते हैं। बैंक सबसे कम बोली की निविदा स्वीकार करने के लिए बाध्य नहीं है और किसी भी निविदा को पूर्ण रूप से अथवा आंशिक रूप से स्वीकार करने का अधिकार उसके पास सुरक्षित है। बैंक के पास बिना कोई कारण बताए सभी निविदाओं को अस्वीकार करने का अधिकार सुरक्षित है।

क्षेत्रीय निदेशक

भारतीय रिज़र्व बैंक

जम्मू

IMPORTANT INSTRUCTIONS FOR

e-PROCUREMENT

This is an e-procurement event of Reserve Bank of India, Jammu. The e-procurement service provider is MSTC Limited.

The Tenderer is advised to read and understand the Notice Inviting Tender and subsequent Corrigendum, if any, before submitting their tenders online. The tenderers who do not comply with the conditions with documentary proof (wherever required) will be disqualified:

1. Procedure for E – Tender

Registration: The process involves vendor's registration with MSTC e-procurement portal which is free of cost. Only after registration, the vendor(s) can submit his/their bids electronically. Electronic Bidding for submission of Techno-Commercial Bid as well as Price Bid over the internet will be done. The Vendor should possess Class III signing type digital certificate. Vendors are to make their own arrangement for bidding from a P.C. connected with Internet. MSTC/RBI, Jammu is not responsible for making such arrangement. (Bids will not be recorded without Digital Signature).

SPECIAL NOTE: THE PRICE BID AND THE COMMERCIAL BID HAS TO BE SUBMITTED ON-LINE ONLY AT www.mstcecommerce.com/eprochome/rbind

1) Vendors are required to register themselves online with www.mstcecommerce.com → e-Procurement → PSU / govtdepts → RBI → Register as Vendor – Filling up details and creating own user id and password → Submit.

2) Vendors will receive a system generated mail confirming their registration in their email which has been provided while filling the registration form.

In case of any clarification, please contact MSTC/RBI, JAMMU, (before the scheduled time of the e- tender).

Contact person (MSTC):

Mr. Dinesh
Manager (NRO)

Shri Sanjay Mohanta
Junior Manager (NRO)

Mobile no: 9587892087

Mobile no- 9910302626

Email: dkmeel@mstcindia.co.in

Email- smohanta@mstcindia.co.in

Landline-0172-2583921

Landline-01123217850

Help line : 033-2290-1004

Contact person (RBI Jammu):

Shri Sanjeev Sharma, Assistant General Manager, Estate Department

Phone No :0191-2472481, e-mail: sanjeev@rbi.org.in, Mob: 9419206362

B) System Requirement:

- i) Windows XP-SP3 & above/ Windows 7 Operating System.
- ii) IE-7 and above Internet browser.
- iii) Signing type Digital Signature
- iv) JRE 8 (x86 offline) and above software to be downloaded and installed in the system.

To enable ALL active X controls and disable 'use pop up blocker' under Tools -> Internet Options -> custom level

For more details, vendor may refer to the **Vendor Guide** and **FAQ** available at https://www.mstcecommerce.com/eprochome/rbi/buyer_login.jsp

2. (A) Part I Techno-Commercial bid will be opened electronically on specified date and time as given in the NIT.

(B) Part II Price bid will be opened electronically of only those tenderer(s) whose Part I Techno-Commercial Bid is found to be Techno-Commercially acceptable by RBI, JAMMU. Such tenderer(s) will be intimated date of opening of Part II Price bid, through valid email confirmed by them.

Note:

The tenderers are advised to offer their best possible rates. There would generally be no negotiations hence please submit your most competitive prices while submitting the price bid. However, in case the lowest rate appears to be reasonable taking into account the prevailing market conditions, the order may be awarded to the lowest tenderer and if the rate is still considered high, action as per prevailing instruction/guideline shall be taken.

All entries in the tender should be entered in online Technical & Commercial Formats without any ambiguity.

4. Special Note towards Transaction fee: Transaction fee is required to be paid using e-payment gateway available in your login at www.mstcecommerce.com/eprochome/rbi It can be paid either through NEFT/RTGS using challan or by online payment using credit card/debit card/net banking. Authorization of payment made through NEFT/RTGS takes time of 2 hours to 2 days depending on your bank. However online payment gets authorized immediately in most of the cases.

Further transaction fee payments are authorized by the system itself and there is no manual intervention. Tenderers are advised to make payment of transaction fee well in advance to avoid last minute hassle. After making the payment for transaction fee, the vendor should enter the transaction fee details by using the "Transaction Fee entry" Link under "My Menu" in the vendor login. Here the vendor may select the particular tender in which they want to participate by clicking on the tick box at the right and then Clicking on the "Submit" Button at the bottom of the page. Then the page appears where the vendors are required to fill up the transaction details, namely the UTR No, Date of Transaction, and the Remitting Bank in the given fields and then clicking on the "Confirm" Button.

NOTE : The tenderers should submit the transaction fee well in advance before the last date of submission of tender as they will be activated for bid submission only after receipt of transaction fee by MSTC.

Further please note that the transaction fee mentioned in the tender document may vary slightly by ₹1 or 2 in case of payment made through challan due to approximation error. Whereas in case of online payment, internet handling charges shall be added in the basic amount. Above may please be noted and taken care of while making the payment.

Vendors are advised not to deposit cash in bank as it becomes difficult to ascertain the details of the remitter from such cash transactions.

Tenderers may please note that the transaction fee should be deposited by debiting the account of the bidder only; transaction fee deposited from or by debiting any other party's account will not be accepted. **Transaction fee is non-refundable.**

In case of failure to make payment towards Transaction fee for any reason, the vendor, in term, will not have the access to online e-tender.

5. Tenderer(s) are advised to make remittance of MSTC fee and EMD through separate NEFT/Mobile banking in advance to the Reserve Bank of India Jammu.

Vendors are instructed to use **Upload Documents** link in My menu to upload documents in document library. Multiple documents can be uploaded. Maximum size of single document for upload is 5 MB.

Once documents are uploaded in the library, vendors can attach documents through **Attach Document** link against the particular tender. Please note that if the documents are not attached to any tender, the same cannot be downloaded by RBI Jammu and it will be deemed that the vendor has not submitted the documents. For further assistance please follow instructions of vendor guide.

6. All notices and correspondence to the tenderer(s) shall be sent by email only during the process till finalization of tender by RBI, JAMMU as well as by MSTC (e-procurement service provider). Hence the tenderers are required to ensure that their email address provided is valid and updated at the stage of registration of vendor with MSTC (i.e. Service Provider). Tenderers are also requested to ensure validity of their DSC (Digital Signature Certificate).

7 (i) Please note that there is no provision to take out the list of parties downloading the tender document from the web site mentioned in NIT. As such, tenderers are requested to see the web site once again before the due date of tender opening to ensure that they have not missed any corrigendum uploaded against the said tender after downloading the tender document. **The responsibility of downloading the related corrigendum, if any, will be of the tenderers only.**

(ii) No separate intimation in respect of corrigendum to this NIT (if any) will be sent to tenderer (s) who have downloaded the documents from web site. Please see website www.mstcecommerce.com/eprochome/rbind of MSTC Ltd.

8. E-tender cannot be accessed after the due date and time mentioned in NIT.

9. Bidding in e-tender

- a) Tenderer(s) need to submit necessary EMD, Tender fees (If ANY) and Transaction fees separately for the e-tender. Tender fees and Transaction fees are non-refundable. No interest will be paid on EMD. EMD of the unsuccessful tenderer(s) will be refunded by RBI, JAMMU.

- b) The process involves Electronic Bidding for submission of Techno Commercial Bid as well as Price Bid.
- c) The tenderer(s) who have submitted the above fees can only submit their Techno Commercial Bids and Price Bid through internet in MSTC website www.mstcecommerce.com → e-procurement → PSU /Government Departments →RBI Jammu Login →My menu→ Auction Floor Manager→ live event →Selection of the live event→ Techno Commercial Bid.
- d) The tenderer should allow to run an application namely enApple by accepting the risk and clicking on run. This exercise has to be done twice immediately after reaching the bid floor. If this application is not run then the tenderer will not be able to save/submit his bid.(for details refer vendor guide & FAQ).
- e) First the vendor needs to fill up the Commercial specification if any and save it. Then the vendor should fill up the Techno-commercial bid. After filling the Techno-Commercial Bid, tenderer should click 'save' for recording their Techno-Commercial bid. Once the same is done, the Price Bid link becomes active and the same has to be filled up and then tenderer should click on "save" to record their price bid. Then once both the Techno-Commercial bid & price bid has been saved, the tenderer can click on the "Final Submission" button to register their bid

NOTE: - After clicking the final submission two more options will show up, "Withdraw bid" and "Delete bid". If the vendor wants to withdraw its bid permanently then they should click withdraw bid link. He/she will not be able to bid again. If the vendor wants to delete the bid after final submission and re submit the bid then he/she should click delete bid and resubmit the same and again click final submission.

- f) In all cases, tenderer should use their own ID and Password along with Digital Signature at the time of submission of their bid.
- g) During the entire e-tender process, the tenderers will remain completely anonymous to one another and also to everybody else.
- h) The e-tender floor shall remain open from the pre-announced date & time and for as much duration as mentioned above.
- i) All electronic bids submitted during the e-tender process shall be legally binding on the tenderer. Any bid will be considered as the valid bid offered by that tenderer and

acceptance of the same by the Bank will form a binding contract between the Bank and the Tenderer for execution of work. Such successful tenderer shall be called hereafter **CONTRACTOR**.

- j) It is mandatory that all the bids are submitted with digital signature certificate otherwise the same will not be accepted by the system.
 - k) Buyer reserves the right to cancel or reject or accept or withdraw or extend the tender in full or part as the case may be without assigning any reason thereof.
 - l) No deviation of the terms and conditions of the tender document is acceptable. Submission of bid in the e-tender floor by any tenderer confirms his acceptance of terms & conditions for the tender.
 - m) Unit of Measure (UOM) is indicated in the e-tender Floor. Rate to be quoted should be in Indian Rupee as per UOM indicated in the e-tender floor/tender document.
10. Any order resulting from this open e-tender shall be governed by the terms and conditions mentioned therein.
11. No deviation to the technical and commercial terms & conditions are allowed.
12. RBI, JAMMU has the right to cancel this e-tender or extend the due date of receipt of bid(s) without assigning any reason thereof.
13. The online tender should be submitted strictly as per the terms and conditions and procedures laid down in the website www.mstcecommerce.com/eprochome/rbind of MSTC Ltd.
14. The tenderers must upload all the documents required as per terms of NIT. Any other document uploaded which is not required as per the terms of the NIT shall not be considered.
15. The bid will be evaluated based on the filled-in technical & commercial formats.
16. The documents uploaded by tenderer(s) will be scrutinized. In case any of the information furnished by the tenderer is found to be false during scrutiny, EMD of defaulting tenderer(s) will be forfeited. Punitive action including suspension, banning of business and debarment can also be taken against defaulting tenderers

SECTION-I

BRIEF PRITICALS OF THE WORK

I. Project site at Sector 9, Trikuta Nagar

Address	
How to reach (for site visit)	<p>Transport</p> <p>i. Nearest railway station - JammuTawi</p> <p>ii. Road - Trikuta Nagar Main Street</p> <p>iii. Nearest Airport - Jammu Airport</p>
Plot Area	16530.05 sqm
Existing buildings	4 residential occupied buildings
Details of Proposed construction	
Built – up area	16281.18 sqm
No. of buildings and storeys	<p>(i) RCC framed structures</p> <p>(ii) 2 BHK with storeroom flats</p> <ul style="list-style-type: none"> • G+5 floors – 1 residential block with 12 flats • G/S+5 floors – 4 residential blocks with 11 flats each <p>(iii) 3 BHK with storeroom flats</p> <ul style="list-style-type: none"> • S+5 floors – 3 residential buildings with 10 flats each <p>(iv) VOF/SRA/residential flats</p> <ul style="list-style-type: none"> • G+4 floors – 1 block with common amenities such as dispensary/service provider / caretaker, Visiting officers flat and single room accommodations <p>(v) Club house</p> <ul style="list-style-type: none"> • G+1 floor – 1 block
Parking	117 nos (stilt / covered / open)

II. Project Site at Sector 1A, Trikuta Nagar

Address	
How to reach (for site visit)	<p>Transport</p> <p>i. Nearest railway station - JammuTawi</p> <p>ii. Road - Trikuta Nagar Main Street</p> <p>iii. Nearest Airport - Jammu Airport</p>
Plot Area	5058.75 sqm.
Existing buildings	nil
Details of Proposed construction	
Built – up area	2366.04 sqm
No. of buildings and floors	<p>(i) RCC framed structures</p> <p>(ii) RD's residence</p> <ul style="list-style-type: none"> • G+1 floors – 1 bungalow <p>(iii) 3 BHK and study room flats</p> <ul style="list-style-type: none"> • G/S+3 floors – 1 residential block with 6 flats <p>(iv) Visiting Officers flats</p> <ul style="list-style-type: none"> • G+2 floors – 1 block <p>(v) Club house</p> <ul style="list-style-type: none"> • G+1 floor – 1 block
Parking	21 nos (stilt / covered / open)

SECTION II

FORM OF TENDER

Place:

Date:

To

Regional Director
Estate Department,
Reserve Bank of India
Jammu- 180012

Dear Sir,

Having read and examined the Notice Inviting tender, specifications, designs, schedule of quantities, various schedules, General conditions of contract and clauses, Special conditions of contract, General rules and instructions to tenderers and all other contents in the tender document for the work specified in the memorandum hereinafter set out and having examined the site of the works and having acquired the requisite information relating thereto as affecting the tender, I/We hereby offer to execute the works specified in the said memorandum within the time specified in the said memorandum at the rates mentioned in the attached schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Conditions of Contract, the Articles of Agreement, Special Instructions, Schedule of Quantities and Special Conditions of Contract and with such materials as are provided for, by and in all other respects in accordance with such conditions so far as they may be applicable.

MEMORANDUM

NIT No / e-Tender no.	RBI/Jammu/Estate/405/22-23/ET/625
Name of the Work:	Construction of Residential Quarters for Officers At Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal and External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.

Estimated Cost of the Work	₹ 83.19 Crore (Civil Work ₹ 71.10 Crore + Electrical Work ₹ 12.09 Crore)
Earnest Money Deposit (EMD)	EMD @ 2% of the estimated cost of the work i.e. ₹1.66 Crore
Performance Bank Guarantee (PBG)	Performance Bank Guarantee for an amount equal to 5% of contract value from a scheduled Bank
Retention Money Deposit (RMD) / Security Deposit (SD)	5% of the value of the work done will be deducted by the RBI from each payment to be made to the Contractor towards Retention Money.
Time allowed for completion of work	40 months

2. We agree to keep the tender open for the validity period specified in Schedule 'E' of the tender and not to make any modification in its terms and conditions during the validity period or any other extended period as agreed mutually.

3. A sum of Rs. 1.66crore mentioned as Earnest Money in Schedule 'E' of tender document is hereby forwarded/uploaded in the form specified therein. If I/We, fail to furnish the prescribed performance bank guarantee within the prescribed period specified in Schedule 'F', I/We agree that the Reserve Bank of India or its successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified in Schedule 'F', I/ We agree that Reserve Bank of India or its successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance bank guarantee absolutely. The said Performance Bank Guarantee shall be a guarantee to execute all the works referred to in the tender document upon the terms and conditions contained therein.

4. Further, I/We agree that in case of forfeiture of Earnest Money or Performance Bank Guarantee as aforesaid, I/We shall be debarred from participation in the re-tendering process of the work.

5. I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Reserve Bank of India, then I/We shall be debarred from tendering in Reserve Bank of India in future. Also, if such a violation comes to the notice of Reserve Bank of India before date of start of work, the Employer shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Bank Guarantee.

6. I/We hereby declare that I/We shall treat the tender documents, drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived therefrom to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the Reserve Bank of India.

7. Should this tender be accepted, I/We hereby agree to abide by and fulfil the terms and provisions of the said Conditions of Contract annexed hereto so far as they may be applicable or in default thereof to forfeit and pay to the Reserve Bank of India the amount mentioned in the said conditions.

8. Our bankers are (Name and full address)

(i)	
(ii)	

The names of partners of our firm are:

(i)	
(ii)	

Name of the partner of the firm authorized to sign	
OR	

Name of person having power of Attorney to sign the Contract (certified true copy of the Power of Attorney in the prescribed format as per Annex 5 of this tender should be attached)	
---	--

Yours faithfully,

Signature of Tenderer with seal

Signatures and addresses of witnesses

	Signature	Address
(i)		
(ii)		

SECTION III

SCOPE OF WORK

1.1 Description of Work:

Construction of Residential Quarters for Officers At Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal and External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.

The scope of proposed work include construction from start to finish of the buildings (include civil, electrical, plumbing, electro-mechanical, firefighting, water supply, sewage disposal, drainage, site development activities, lifts, substations etc.) as per the approved municipal drawings / layout plans, detailed drawings, design details, schedule of quantities and specifications given in this tender document. Some of the major items of works covered are listed below (in brief):

A) CIVIL WORKS

- i. Earth work including anti-termite treatment
- ii. Concrete and Allied works – Plain, Reinforced Cement Concrete work
- iii. Masonry, Plastering & Painting work
- iv. Water Proofing work
 - (i) Sunken portion of Bath room, Toilet and Kitchen.
 - (ii) Terrace water proofing including insulation.
- v. Flooring and dado work
- vi. Structured Glazing/Windows works
- vii. Metal works & Miscellaneous works
- viii. General carpentry and furnishing works including modular kitchen (Chimney & RO included)
- ix. Sanitary, Water supply and Drainage including Waste water treatment plant & rain water harvesting
 - a. Sanitary and plumbing fittings
 - b. Internal and external water supply
 - c. Internal and External drainage
 - d. Storm water drainage and Rain water harvesting facility
 - e. Waste water treatment plant.
- x. Fire Fighting system

- a. Fire Extinguishers
 - b. Fire Hydrant & Downcomer system.
- xi. External Development including road work

B) ELECTRICAL & Electromechanical WORKS

- i. DG Sets
- ii. Internal Electrical Installation
- iii. Cabling
- iv. External lighting
- v. TV and telephone system
- vi. Earthing and Lightning protection.
- vii. EPABX
- viii. Inverter
- ix. Grid interactive solar power generation system
- x. Boom Barrier
- xi. Water pumping system
- xii. Electric / solar hot water generator
- xiii. Fire Alarm and detection system.
- xiv. Lifts
- xv. Substation equipment
- xvi. Distribution panels.

1.3 It is not the intent to specify completely herein all details of work covered under this enquiry. Scope of work may also include such other related works as indicated in the drawings and /or schedule of quantities although they may not be specifically mentioned in the above paragraphs and all such incidental items of works not specified but reasonably implied and necessary for completion of the job as a whole, as directed by the Engineer-in-Charge. All works shall conform in all respects to high standards of engineering, design and workmanship and shall, fulfil the anticipated performance during the CONTRACTOR's Defect Liability Period / warranty period in a manner acceptable to the Engineer-in-Charge who shall have the power to reject any works or materials which in his judgement are not in full accordance with the specification requirements.

1.4 Various works covered in this specification shall include design of components and systems, furnishing of all materials, labour, tools, plants and equipment, transportation,

fabrication, fixing, installation, supervision and execution as per schedule of quantities, technical specifications, drawings/plans, etc. as provided herein and as directed by the Engineer-in-Charge

I/We hereby declare that I/we have read and understood the above information.

Signature of Tenderer with seal

Place

Date

SECTION IV

GENERAL RULES AND INSTRUCTIONS TO TENDERERS / BIDDERS

1	Bids in Two bid system		
	<p>The tender is in two parts viz., Part I comprising of duly filled tender part I (Techno-commercial bid), complete eligibility criteria, EMD, technical bid / details, literature etc.</p> <p>and</p> <p>part II comprising duly filled in tender part II (Price bid). The bidders are required to submit their bids (part I and part II) electronically on the MSTC Portal, using valid Digital Signature Certificates.</p> <p>The instructions given above under “Important instructions regarding e-tender” are meant to assist the bidders in registering on the MSTC Portal, prepare their bids in accordance with the requirements and submitting their bids online on the MSTC Portal. The duly filled-in tenders, as above, can only be submitted on MSTC Portal not later than the date and time for receipt of tender (as specified in NIT / Schedule of e-tender).</p>		
2	Shortlisting of tenderers for opening of part II of the tender		
	<p>The technical bid of the tenderers who fulfil the minimum eligibility requirement at 2(a) below will be further evaluated as per the evaluation criteria at 2(b) below. Tenderers who score minimum 50 marks in the evaluation criteria shall be eligible / shortlisted to participate in the tendering</p>		
2 (a)	Minimum Eligibility requirement		
	Criteria	Requirement	Forms / Documents to be furnished
	i. Composition of the firm/ organization:	The tenderer can be Sole Proprietorship / Partnership firm / Private Limited / Limited or Co-operative Body etc. Details of Registration of the firm / organization, Name of Registering Authority, Date	Tenderer should fill up information in Format 1 annexed hereto and submit along with the following supporting documents. (i) Copy of registration certificate.

		and Registration number, etc. shall be furnished. Joint Ventures are not allowed	(ii) Copy of the Articles of Association/ Power of Attorney/ other relevant document (iii) copy of Goods and Service Tax registration certificate (iv) Details of registration of labour along with EPF and ESI documents.
	ii. Duration of past experience	The tenderer should have minimum of seven years of experience in executing similar work/s* i.e., the tenderer should have undertaken similar work/s* prior to January 31, 2023 (last day of month previous to the one which applications are invited)	Bidder should fill up the information in Format 2 annexed hereto indicating client-wise names of similar work(s), awarded and actual cost(s), completion date stipulated in contract and actual dated of completion date, etc. and should submit along with the documentary evidence as proof of minimum 7 years of experience of completed similar work/s * viz. copies of detailed work order/s indicating date of award, contract amount, time given for completing the work, etc. and the corresponding completion certificate(s) indicating actual date of completion and actual value of executed similar work/s issued by the client(s) for

			<p>works executed for government /public sector companies and copies of work order, work completion certificate along with Tax Deducted at Source (TDS) certificate(s) issued by the client(s) for works executed for private companies.</p> <p>ii) Bidder should also fill up the information about similar work/s* on-hand in the Format 2A annexed hereto and should submit along with supporting documents, viz. Copies of work order/s with details of items of work, issued by the client(s) for the work/s in progress.</p> <p>(iii)The details along with documentary evidence of previous experience, if any, of carrying out works for the Reserve Bank of India at any centre, should also be given.</p>
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	<p>iii. Minimum value of each completed similar work/s*</p>	<p>The tenderer shall have successfully completed similar work/s* in past seven years ending January 31, 2023 (last day of month previous to the one which application/tender is invited) of value as under:</p> <p>(a) Three similar completed works each of value not less than ₹ 33.27 crore i.e, 40% of estimated cost of the work</p> <p>Or</p> <p>(b) Two similar completed works each of value not less than ₹41.59 crore i.e., 50% of estimated cost of the work.</p> <p>Or</p> <p>One similar completed work of value not less than ₹ 66.55 crore i.e., 80% of estimated cost of the work.</p>	<p>Tenderer should fill up the information in Format 3 annexed hereto and submit along with the following documents as proof of having successfully completed similar work/s * .</p> <p>(i)Copies of detailed work order/s for qualifying works indicating date of award, contract amount, time given for completing the work, etc. and the corresponding completion certificate(s) indicating actual date of completion and actual value of executed similar work/s issued by the client(s) for works executed for government /public sector companies and copies of work order, work completion certificate along with Tax Deducted at Source (TDS) certificate(s) issued by the client(s) for works executed for private companies.</p> <p>(ii) Client certificate/s for each of the qualifying work as per the Format 3A annexed hereto.</p>
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	iv. Annual Financial Turnover	The tenderer shall possess Annual Financial Turnover of ₹ 24.96 crore i.e., 30% of the estimated cost or more during the last three consecutive financial years ending 31 st March. Income Tax Assessment Orders along with the latest final accounts of the business of the contractor duly certified by a Chartered Accountant should be enclosed in proof of their creditworthiness and turnover	Tenderer should fill up the information in Format 4 annexed hereto and certified by Chartered Accountant to be submitted along with the following documents: (i) Copies Audited financial statements/ accounts of the business of the tenderer duly certified by a Chartered Accountant indicating the turnover for financial years referred in the format 4. (ii) Copies of the Income Tax Clearance Certificates / Income Tax Assessment orders along with the latest final accounts of business of the contractor duly certified by a Chartered Accountant as a proof creditworthiness.
	v. Solvency	The tenderers should have a Solvency of value not less than 100% of estimated cost of the work i.e. ₹83.19 crore.	(i) The tenderer should furnish solvency certificate issued by the tenderer's banker specifically issued for this work in Format 5 . (ii) Bidder should submit details of their Banker in Format 5A .
	vi. Registration for GST payment	The bidder should have valid Goods and Service Tax (GST) registration	Copy of GST registration certificate shall be submitted

Notes for minimum eligibility criteria (i) *Similar work shall mean Construction of Multistorey Residential Building having RCC framed structure including Civil and Electrical Works all composite under one contract agreement. Multistoreyed Institutional and Commercial buildings having RCC framed structure including civil and electrical works (all composite under one contract agreement) also will be considered as similar works provided the value of civil component is atleast 60% of the cost of work.

(ii) Cost of work shall mean gross value of the completed work.

(iii) Components of work executed other than those included in definition of similar work shall be deducted while calculating cost of similar work. Bidder shall submit abstract of cost of work in support of this.

(iv) In respect similar work completion certificate(s), client certificate(s) issued by the private companies shall also accompany copy of Tax Deducted at Source (TDS) certificates. Bids received without the specified certificates shall be rejected and the Bank shall have the right to verify/ cause verification of authenticity of the said documents whenever felt necessary.

(v) Regarding client's certificate for qualifying similar completed works carried out for Government/public sector companies, the certificate should be signed by the concerned Executive Engineer or an officer in an equivalent or higher rank. For qualifying similar completed works carried out for private companies, shall accompany Tax Deducted at Source (TDS) certificates has to be submitted for proving the credentials/contract amount.

(vi) Bank reserve its right to obtain the performance reports from the clients for the qualifying work/s, Banker/s report of the Bidders directly, if so desired. The Bank on its own may also conduct inspection of their work eligible/qualifying works referred by the Bidder in their bid.

(vii) It is clarified that the work executed by the applicant for their in-house or capital use will not be considered for the purpose of work experience of completion of similar works.

	<p>Applicant should satisfy the qualifying criteria on their own merits and not as a sum total of their sub-agencies. Power of Attorney given to a person other than the Applicant's own employee shall not be accepted.</p> <p>(viii) All information called for in the formats at Annex 1 should be furnished against the relevant columns in the formats. If for any reason, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even, if no information is to be provided in a column, a 'nil' or 'no such case' entry should be made in that column. If any particulars/query is not applicable in case of the bidder, it should be stated as 'Not applicable'. Tender document shall contain all the enclosures mentioned and copies shall be self-attested.</p> <p>(ix) The bid submitted by a bidder who is found to be not satisfying the minimum eligibility criteria will be disqualified from further processing of the tender.</p> <p>(x) Bids containing false and /or incomplete information are liable for rejection / debarment from future tender etc.</p>		
2(b)	Evaluation Criteria		
	Bids satisfying the minimum eligibility requirement at 2(a) above will be evaluated further as below for shortlisting for opening of part II of the tender. Eligible works / financial standing will be evaluated.		
	Sl.no.	Parameter	Maximum marks
	1	Technical Expertise: A Committee designated by the Bank will inspect eligible works (item 2(a) above) of the tenderer in the following parameters for assessing the quality of works.	
		(i) Quality of RCC works	6
		(ii) Quality of plaster / finishing / flooring	4
		(iii) Quality of wood work	4
		(iv) Quality of steel work / Aluminium work	4
		(v) Quality of plumbing and sanitary installation	4
		(vi) Quality of water proofing	6
		(vii) Quality of internal EI, Fire fighting and other electrical works	8

		(viii) Quality of external development work	4
		Maximum marks for Sl. No. 1	40
		Note: All parameters are compulsory except (iii), (iv) and (viii). If one or more of non-compulsory parameter(s) is/are absent in the work, the total marks will be work out proportionately on 40 marks	
	2	Financial Capability	
		(i) Yearly turnover of ₹ 24.96 cr or more but less than or equal to ₹ 37.44 cr during last 3 financial years ending March 31, 2022 (between 1 to 1.5 times of minimum specified in eligibility criteria at item 2(a) (iv) above)	10
		(ii) Yearly turnover greater than ₹ 37.44 cr but less than or equal to ₹ 49.92 cr during last 3 financial years ending March 31, 2022 (between 1.5 to 2 times of minimum specified in eligibility criteria at item 2(a) (iv) above)	14
		(iii) Yearly turnover greater than ₹ 49.92 cr during last 3 financial years ending March 31, 2022 (more than 2 times of minimum specified in eligibility criteria at item 2(a) (iv) above)	20
		Maximum marks for Sl.No. 2	20
		Note: If the Annual Turnover of the three years are not in one particular sub head, the total marks will be proportionately worked out.	
	3	Professionalism – dealing with project	
	A	Levy of compensation / LD	
		(i) No compensation / LD levied for eligible works	10
		(ii) Compensation / LD levied is less than 5% of tendered amount	4
		(iii) Compensation / LD levied is more than 5% of tendered	0

		Note: If compensation / LD has been levied in one / two / three of the eligible works as applicable, the total marks will be proportionately worked out.	
	B	Contract Performance	
		(i) Successful completion of work without litigation / arbitration	10
		(ii) Completion of work with litigation / arbitration	0
		Note: No proportionate adjustment will be done, even one eligible work undergone litigation / arbitration will get '0' marks	
		Maximum marks for Sl.No. 3	20
	4	Green Building Certificate for eligible works	
		(i) Any eligible work of having any Green Building certification except highest rated certificate	6
		(i) Any eligible work of having highest rated Green Building certificate	10
		Maximum marks for Sl.No. 4	10
	5	Qualifying works done for Govt. organisations or PSUs of equivalent	10
		Maximum marks for Sl.No. 5	10
		Grand total of evaluation criteria	100
		Minimum required marks for shortlisting	50
3	Other requirements		
3.1	Man power resources		
	The tenderer should have minimum strength of qualified / skilled persons required for successful implementation of the project and shall furnish the details in Format 6 .		
3.2	Machinery, tools, plants and other resources		
	The tenderer should furnish details of the items available with him in Format 7		
4	Guidelines for e-procurement		
	The intending tenderers must have valid class III digital signature and are advised to follow 'Guidelines for e-Procurement'.		
5	Clarifications and pre-bid meeting		

	<p>If the bidder shall have any doubt as to the meaning of any portion general rules and instructions to tenderers / bidders, general conditions or the special conditions or the scope of the work or the specifications and drawings or any other matter concerning the work, he shall in good time, before the scheduled date of Pre-bid meeting, put forth the particulars thereof and submit them to the RBI, in writing / email, addressed to the Tender Inviting Authority / representative of the tender inviting authority, specified in Schedule 'E' in order that such doubts may be clarified authoritatively during Pre-bid meeting and shall be conveyed to all the bidders in due course. Once a tender is submitted, the matter will be decided according to tender conditions in the absence of such authentic pre-clarification.</p> <p>In order to explain the scope of work, other details and to clarify any issues/ queries raised by the bidders, a Pre-bid meeting shall be arranged on the date, time and venue specified in Schedule 'E'. The bidders are advised to peruse the tender and visit the site and submit any matter requiring clarification to the RBI latest by 10.30am on the previous working day. In case the bidder wishes to include any condition while tendering for the work, he will have to submit the same before the pre-bid meeting to enable the RBI to examine/ consider the same. RBI's decision in the matter shall be conveyed to all the bidders after pre-bid meeting but before the scheduled date of submission of the tenders. All the bidders are advised to attend the Pre-bid meeting in their own interest.</p> <p>Any tender received with any deviation/ Condition is liable for rejection.</p>
6	Site visit
	<p>The tenderer is advised to visit the site of work, at his own cost, and examine it and its surroundings to himself collect all information that he considers necessary for proper assessment of the prospective assignment.</p>
7	Amendment to Tender document
	<p>(i) At any time prior to the deadline for the submission of tender/bids, RBI may, for any reason, whether at its own initiative or in response to a clarification or query raised by a prospective Bidder, modify any part of the tender document by an amendment and the same will be uploaded on website.</p>
	<p>(ii) The said amendment in the form of the addendum/ corrigendum will be</p>

		made available on website of RBI same shall be binding on the bidders. The Bidders are strongly are advised to regularly visit the website www.rbi.org.in to ensure that they are aware of the amendments, if any. The addendum (s), if any, issued will form part of the contract document.
	(iii)	In order to afford prospective Bidders reasonable time for preparing their Bids after taking into account such amendments, the RBI may, at its discretion, extend the deadline for submission of Bids.
8	Percentage Rate tender	
	The estimated cost and schedule / bill of quantities has been provided at Section IX (Major component) and Section XI (minor component). The tenderer shall quote the price in percentage terms above / below / at par with the estimated cost. The quantities in the schedule of quantities approximately indicate the total extent of work but may vary to any extent and may even be omitted thus altering the aggregate value of the contract. The quoted percentage shall remain firm for a variation of plus (+) or minus (-) 25% of the specified quantities of each item in the Schedule of Quantities.	
9	Integrity pact	
	The bidders/ prospective vendors shall be required to enter in to an agreement with the Reserve Bank of India (RBI) called Integrity Pact (IP). The IP envisages an agreement between the RBI and the bidders/ prospective vendors as per the approved proforma annexed hereto, committing the persons/ officials of both sides not to resort to corrupt practices in any aspect/ stage of the contract. The IP shall be applicable from the stage of invitation of bids till the complete execution of the contract. The tenders of those bidders/ prospective vendors which do not contain the IP in the approved proforma shall be liable for rejection. Integrity pact as per the format at Schedule G Shall be executed in Non- judicial stamp paper.	
9A	Debarment	
	A bidder is liable for debarment/disqualification from bidding on the following grounds:	

1	<p>If it is determined that the bidder has committed the following acts or omissions in contravention of the code of integrity :</p> <p>(i)</p> <p>a. making offer, solicitation or acceptance of bribe, reward or gift or any material benefit, either directly or indirectly, in exchange for an unfair advantage in the procurement process or to otherwise influence the procurement process.</p> <p>b. any omission or misrepresentation that may mislead or attempt to mislead so that financial or other benefit may be obtained or an obligation avoided.</p> <p>c. any collusion, bid rigging or anticompetitive behavior that may impair the transparency, fairness and the progress of the procurement process.</p> <p>d. improper use of information provided by the procuring entity to the bidder with an intent to gain unfair advantage in the procurement process or for personal gain.</p> <p>e. any financial or business transactions between the bidder and any official of the procuring entity related to tender or execution process of contract: which can affect the decision of the procuring entity directly or indirectly.</p> <p>f. any coercion or any threat to impair or harm, directly or indirectly, any party or its property to influence the procurement process.</p> <p>g. obstruction of any investigation or auditing of a procurement process.</p> <p>h. making false declaration or providing false information for participation in a tender process or to secure a contract;</p> <p>(ii) failed to disclose conflict of interest.</p> <p>(iii) failed to disclose any previous transgressions made in respect of the provisions of sub-clause (i) with any public institution / entity in India or any other country during the last three years or of being debarred by any public procuring institution / entity.</p>
2	<p>For any actions or omissions by the bidder other than violation of code of integrity, which in the opinion of the Bank warrants debarment, for the reasons like supply of sub-standard material, non-supply of material, abandonment of works, sub-standard quality of works, failure to abide terms of the tender etc.</p>
3	<p>If the bidder has been convicted of an offence— (a) under the Prevention of Corruption Act, 1988; or (b) the Indian Penal Code or any other law for the time being in force, for causing any loss of life or property or causing a threat to public health as part of execution of a public procurement contract.</p>
	<p>The tenderer has to submit an undertaking in Format 8 at Annex 10 of Schedule XIII</p>
10	<p>Documents Comprising Tender/ Bid</p> <p>Part I: (Techno-Commercial Bid) – Online and offline / physical submission</p>

	i)	Earnest Money Deposit (EMD)/ Bid Security as specified at NIT / Schedule of e-Tender / Schedule E.
	ii)	Checklist
	iii)	Power of Attorney (as per proforma annexed hereto) in favor of person signing the tender / bid
	iv)	Duly Filled-in and signed tender document consisting of:
	a)	Part I: Techno-Commercial bid viz., entire Tender Document duly signed. Each page of the tender document shall be signed.
	b)	Duly filled in, signed and certified as stated in each document / formats / schedules / Annexes
	Part II: (Price Bid) – Online submission only	
11	Preparation of bid and Cost of bidding	
	i)	The bidder must obtain for himself on his own responsibility and at his own expenses all the information which may be necessary for the purpose of making a tender and for entering into a contract and must examine the drawings and must inspect the site of the work and acquaint himself with all local conditions, means of access to the work, nature of the work and all matters pertaining thereto.
	ii)	The Contractor shall be deemed to have carefully examined the work and site conditions including labour, the General rules and instructions to the tenderers, the general and special conditions, the specifications, schedules and drawings and shall be deemed to have visited the site of work, to have fully informed himself regarding the local conditions and carried out his own investigations to arrive at the rates quoted in the tender. In this regard, he will be given necessary information available with the RBI but without any guarantee about its sufficiency and accuracy.
12	Format to be used	

	<p>The bidder must fill up, sign and upload only the tender forms/formats issued by the RBI, stating the percentage rate above / below / at par at what he is willing to undertake the work in MSTC portal. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates, will be liable for rejection. All requisite information, documents etc. shall also be uploaded in the MSTC portal only.</p>	
13	Filling of rates	
	i)	Rates should be quoted for each item of work both in figures and words in columns specified in the Schedule of Quantity. Care shall be taken to avoid discrepancy in the rate given in figures and words. The amount for each item should be worked out and requisite totals should be given in the specified column.
	ii)	In the event, no rate has been quoted for any item(s), leaving space both in figure(s), word(s) and amount blank, the tender shall be considered incomplete and shall not be considered.
	iii)	No advice of any change in rate or conditions after the opening of the tender will be entertained.
14	Earnest Money Deposit	
	i)	The tenderers are required to submit Earnest Money Deposit (EMD)/ Bid Security for an amount equal 2% of the estimated cost of the work i.e. ₹1.66 Crore along with the tender (Part –I)
	ii)	<p>Earnest Money Deposit (EMD) is to be submitted by all the tenderers through NEFT / RTGS to the following account:</p> <p>Beneficiary: in RBI Jammu, Account No.8714295, IFSC Code: RBIS0JMPA01 (0=Zero) (Intimate / forward the transaction details on estate@rbi.org.in)</p> <p>or</p> <p>through Bank Guarantee from a scheduled Bank as per Form -F (validity of BG at least upto validity of bid).</p> <p>Or</p>

		through Demand Draft from a scheduled Bank drawn in favour of Reserve Bank of India
	iii)	Under no circumstances, Earnest Money Deposit will be accepted in any other form than stipulated above.
	iv)	A tender, which is not accompanied by EMD, will not be considered.
	v)	<u>Release of EMD:</u> The Earnest Money Deposit of tenders other than successful tenderer shall be returned/refunded on expiry of bid validity (including extended validity) or on award of work to the successful tenderer whichever is earlier. The EMD amount will not bear any interest. The EMD of successful bidder shall be released after submission of Performance Bank Guarantee(which is 5% of the contract value).
	vi)	<u>Forfeiture of EMD:</u> The EMD will be forfeited (i) if the vendor / contractor withdraws bid after opening of the Price Bid or (ii) if the vendor / contractor fails to commence the work after award within the prescribed time limit (iii) Violation of Integrity Pact
15	Signing of Bid, Power of Attorney	
	i)	Each of the tender documents should be digitally signed as per 'Important instruction for e-Procurement' by the person or persons submitting the tender in token of his/their acquainted himself/themselves with the General Rules and Instructions to bidders including prequalification criteria, General Conditions of Contract, Specifications, Special Conditions and other terms and conditions etc. as laid down.
	ii)	The tender submitted online on behalf of a firm must be digitally signed as per instructions of e-tender specified in 'Important instruction for e-Procurement', it must be digitally signed on his behalf by a person holding a power-of attorney authorizing him to do so, such power of attorney to be uploaded along with the tender, or it must be digitally signed by a partner who has the necessary authority on behalf of the firm to enter into the proposed contract and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952. Otherwise the tender may be rejected by RBI.
	iii)	Bidders shall submit online along with Part-I of the tender, a power of attorney, on a stamp paper of appropriate value and duly notarized, in

	<p>favour of the person digitally signing the Bid documents authorizing him to sign the Bid documents, make corrections/ modifications thereto and interacting with Reserve Bank of India and act as the contact person. The proforma of the power of attorney shall be as annexed hereto.</p>
16	Modification / Substitution / Withdrawal of Bids
	No modification or substitution of the submitted Bid shall be allowed after the due date and time of submission of the tender.
17	Bid Due Date
	Bids should be submitted online as specified in instructions to e-Tender on or before the stipulated time and date as specified in NIT / Schedule of e-Tender. Reserve Bank of India may, in exceptional circumstances, and at its sole discretion, extend the Bid due date.
18	Late bids
	No bid will be received after the due date/last date and time specified for submission of bids in NIT / Schedule of e-Tender or after the extended Bid due date, if any.
19	Opening of bids
	<p>Duly filled tender Part I, accompanied by EMD, prequalification criteria, technical details, literature etc., called Part I of the tender, will be opened on e-Tender mode on the time and date, as specified in NIT / Schedule of e-Tender, at his office, by the tender inviting authority, as specified in Schedule 'E' or his authorized representative in the presence of authorized representatives of the bidders who choose to be present.</p> <p>Duly filled-in tender-Part II, of those bidders, who are shortlisted as per item 2 of the 'General Rules and Instructions to the Tenderers' (after scrutiny of Part I of the tender documents based on satisfying Minimum Eligibility requirements at item 2(a) and scoring minimum 50 marks in the Evaluation criteria at item 2(b)) only will be opened on the time and date, as specified in NIT / Schedule of e-Tender, at his office, by the tender inviting authority, as specified in Schedule 'E' in presence of the authorized representatives of the qualified bidders.</p>
20	Bid Validity

	Tenders shall remain open to acceptance by the RBI for a period as specified in NIT / Schedule of e-Tender from the date of opening of the Part-I of the tender which period may be extended by mutual agreement and the bidder shall not cancel or withdraw the tender during this period.	
21	Clarification and Evaluation of bids	
	RBI would subsequently examine and evaluate bids as below:	
	i)	Only those tenders, which meet the minimum eligibility requirements and scoring minimum of 50 marks in the Evaluation criteria as at item 2(a) and 2(b) in 'General Rules and Instructions to the Bidders', shall be processed further. After verification of the correctness/legality and adequacy of the information and supporting documents furnished and considering firms financial standing, business integrity, record of timely completion of works, quality of work executed, etc. and Price Bids / Part II of only those Bidders who are shortlisted as per part I of tender shall be opened.
	ii)	The price bids of unqualified bidders will not be opened and communication will be sent in this regard.
	iii)	If the percentage written in figures and in words do not tally, then the percentage quoted by the contractor as above / below / at par in words shall be taken as correct.
	iv)	To assist in the examination, evaluation and comparison of the bid, RBI may ask Bidders individually for clarifications. The request for clarification and the response shall be in writing / email. No change in the price or substance of the Bid shall be sought, offered or permitted except as required to during the evaluation of Bids in accordance with tender clauses.
	vi)	In the case of any tender where the percentage quoted above / below appears unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.
	vii)	In case the lowest tendered amount of two or more bidders is same, then such lowest bidders may be asked to submit a revised offer quoting percentage discount on their already quoted tendered amount. The lowest tender shall be decided on the basis of revised offer. Further, if any such

		lowest bidder does not revise his bid on lower side, his original bid shall remain valid for further processing.
	viii)	If the revised tendered amount of two or more bidders received in revised offer is again found to be equal, then the RBI shall decide future course of action which shall be final and binding on all the bidders.
22	Acceptance of Tender and Award of Work	
		On receipt of intimation from the RBI of the acceptance of his/their tender, the successful bidder shall be bound to implement the contract and within fourteen days from the date of issue of work order thereof, the successful bidder shall sign an agreement in accordance with the draft articles of agreement in the format at Annex 2 in Schedule XIII. Further, the written acceptance by the Reserve Bank of India of a tender will constitute a binding contract between the Reserve Bank of India and the person so tendering, whether such formal agreement is or is not executed subsequently.
23	Performance bank Guarantee	
	(i)	Performance Bank Guarantee for an amount equal to 5% of contract value from a scheduled Bank in the proforma at Annex 2 shall be submitted by the successful tenderer within 14 days of award of work.
	(ii)	Maximum allowable extension of time for submission of Performance Guarantee beyond the period specified in (i) above without penalty – 7 days
	(iii)	Maximum allowable extension of time for submission of Performance Guarantee beyond the period specified in (ii) above with late fee @ 0.1% of the amount of Performance Guarantee per day – 7 days
	(iv)	The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 3 months beyond that. In case the time for completion of work gets extended, the contractor shall get the validity of Performance Bank Guarantee extended to cover such extended time for completion of work.
	(v)	Release of PBG: Will be released on issuance of completion certificate by the Bank.

	(vi)	Forfeiture of PBG: In case of (i) non-commencement of work, (ii) non-performance of contract obligations or fails to comply with any of the conditions of the contract and (iii) violation of Integrity Agreement / Pact by Bank under the provisions of the contract and (iv) in the event of contract being determined or rescinded under provision of any of the Clause/Condition of the agreement. PBG will also be forfeited as per provisions under clause 01 of GCC.
24	Retention Money / Security Deposit	
	i)	An amount 5% of the value of the work done will be deducted by the RBI from each payment to be made to the Contractor towards Retention Money.
	ii)	Release of Retention Money: On completion of Defect Liability Period and after rectification of the defects pointed out during the Defects Liability Period.
	iii)	The amounts retained by the RBI shall not bear any interest.
25	Taxes / Duties / Levies	
	(i)	The estimated cost includes all taxes including Goods and Service Tax (GST)
	(ii)	The amount in percentage terms (above / below / at par) shall be inclusive of all taxes including Goods and Service Tax, duties, levies and royalties or any other tax levied by Central and State Governments
	(iii)	Goods and Service Tax, duties, levies and royalties levied by Central and State Governments or any other tax applicable in respect of this contract shall be payable by the Contractor and RBI will not entertain any claim whatsoever in respect of the same
	(iv)	The Bank is not responsible for payment of GST for the service rendered by the contractor. It is the responsibility of the contractor to pay the GST to the tax authority. The Contractor shall strictly comply with submission of GST and other returns also. The documentary evidence should be submitted to the Bank as per extant instructions

	(v)	Income Tax, TDS on GST or any other taxes levied by the Government shall be deducted as applicable and RBI will not entertain any claim whatsoever in respect of the same.
26	Time for completion of work	
		Time is the essence of the contract. The time allowed for carrying out the work is 40 months and the same shall be strictly followed. The completion time shall be reckoned from 14 th day of date of work order.
27	Work Program	
	(i)	The work shall throughout the stipulated period of the contract be proceeded with all due diligence and if the Contractor fails to complete the work within the specified period, he shall be liable to pay compensation as defined in the relevant clause of the General Conditions of Contract.
	(ii)	The bidder shall, before commencing work, prepare a detailed work programme, as specified in the General Conditions of Contract, which shall be approved by the Engineer-In-Charge.
28	RBI/Employer's right to accept or reject any or all the bids	
		Notwithstanding anything mentioned above, RBI reserves the right to accept or reject any Bid at any time prior to award of contract without thereby incurring any liability to the affected Bidder or Bidders. The RBI/Employer shall not assign any reason for rejection of any or all Bids.
29	Building and Other Construction Workers (Regulation of Employment and conditions of Service) Central (Amendment) Rules, 2017	
		Labour Cess as per the above Act has already been paid by the Bank to the concerned authorities. The bidders shall not include the said cess in their quote.
30	Compliance to Office Memorandum issued by Department of Expenditure, Ministry of Finance, Government of India – Rule 144(xi), General Financial Rules (GFR), 2017	
	i)	Compliance with the Rule 144(xi) of GFR 2017 inserted vide Office Memorandum (OM) F. No. 6/18/2019-PPD dated July 23, 2020 issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India, the Public Procurement Orders issued in furtherance thereto, and their subsequent revisions shall be mandatory.

ii)	In this regard, Bidder shall submit a copy of Undertaking / Declaration / Certificate on their letter head duly sealed and signed by the authorized signatory in the format given at Annex 11 / Section XIII
iii)	If the Undertaking / Declaration / Certificate submitted by the bidder is found to be false, his/her/its tender / work order will be immediately terminated, and legal action in accordance with law including forfeiting of Earnest Money Deposit / Performance Bank Guarantee / Security Deposit may be initiated and the Bank may also debar the bidder from participating in the tenders invited by the Bank in future.

SECTION V

GENERAL CONDITIONS OF THE CONTRACT

Definitions	1	<p>The Contract means all the documents forming the tender and acceptance thereof together with any correspondence leading thereto and the formal agreement executed between the competent authority on behalf of the Employer and the Contractor, together with the documents referred to therein including the General Conditions, Special Conditions, General rules and instructions to bidders, the Technical specifications, designs, drawings, correspondences exchanged and instructions issued from time to time by the Engineer-in- Charge. All these documents taken together, shall be deemed to form one contract and shall be complementary to one another.</p>	
	2	<p>In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them:-</p>	
		i)	<p>Works or work shall, unless there be something either in the subject or context repugnant to such renovation /construction be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional, as defined in Schedule 'F'</p>
		ii)	<p>The Site shall mean the land, places on, into or or where work is to be executed under the contract or any adjacent land, path or street or where work is to be executed under the contract or any adjacent land, path or street which may be temporally allotted or used for the purpose of carrying out the contract.</p>
		iii)	<p>The Employer shall mean the Reserve Bank of India represented by the Regional Director, Reserve bank of India Jammu and shall include its assignees and successors</p>
		iv)	<p>RBI shall mean Reserve Bank of India, Jammu having its Central Office at Shahid Bhagat Singh Road, Mumbai – 400001 and having its Regional Offices at various places.</p>

	v)	Tender document shall mean document named as such issued/ uploaded by the Employer to the bidders for inviting Bids for the work.
	vi)	Day shall mean Calendar day
	vii)	Working day shall mean the days when Employer's office is working i.e. Days excluding Public holidays at Jammu, Saturdays and Sundays
	viii)	Month shall mean the calendar month
	ix)	Year shall mean the calendar year
	x)	Tenderer(s) / Bidder (s) shall mean all parties participating in the bidding process pursuant to and in accordance with the terms of the Tender document.
	xi)	The Contractor shall mean the individual, firm or company, whether incorporated or not, undertaking the works and shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.
	xii)	Sub-Contractor means the person or persons, firm or company engaged by the Contractor for executing any part or to whom any part thereof has been sub-let with the consent in writing of the Employer
	xiii)	The Engineer-in-charge means the Engineer Officer employed and paid by the Employer and acting under the orders of the Employer who shall supervise and be in-charge of the work. Bank's Engineer means representative of Engineer-in-charge
	xiv)	The Authorized representatives of Engineer-in-charge means the Engineer officers employed and paid by the Employer and acting under the orders of the Employer who shall supervise day to day execution of work under the direction and guidance of Engineer-in-Charge.

	xv)	Contract Price or Contract Amount shall mean the total amount quoted in the Price Bid and as accepted by the Employer and indicated in the letter of award of work.
	xvi)	Contract Period shall mean the period specified in the tender document for execution of the contract/ completion of the work, including any authorized extended period by the Employer
	xvii)	Contract Agreement shall mean the agreement signed between the Contractor and the Employer for the execution of the Project.
	xviii)	Notice in writing or written notice shall mean a notice in written, typed or printed characters sent (unless delivered personally or otherwise proved to have been received) by registered post to the last known private or business address or registered office of the addressee and shall be deemed to have been received when in the ordinary course of post, it would have been delivered and/or sent. The communication delivered by any accepted electronic means shall also be deemed to be a written notice.
	xix)	Act of Insolvency shall mean any act of insolvency as defined by the Presidency Towns Insolvency Act, or the Provincial Insolvency Act or any Act amending such original.
	xx)	Manufacturer refers to a person or firm who is the producer and furnisher of the material or designer and fabricator of equipment
	xxi)	Contractor's Works or Manufacturer's Works shall mean and include the land and other places which are used by the CONTRACTOR / FABRICATOR or SUB-CONTRACTOR / SUB-FABRICATOR for the manufacture of "Equipment" or performing the "Works".
	xxii)	Market Rate shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour

			at the site where the work is to be executed plus the percentage mentioned in Schedule 'F' to cover all overheads and profits.
		xxiii)	Net Rate/Price – If in arriving at the contract amount the Contractor shall have added to or deducted from the total of the items in the Tender any sum, either as a percentage or otherwise, then the net price of any item in tender shall be the sum arrived at by adding or deducting from the actual figure appearing in the Tender as the price of that item a similar percentage or determining the percentage or proportion of the sum so added or deducted by the contractor the total amount of any Prime Cost items and provisional sums of money shall be deducted from the total amount of the tender. The expression “net rates” or “net prices” when used with reference to the contract or accounts shall be held to mean rates or prices so arrived at.
Scope and performance	3		Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
	4		Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
	5		The contractor shall be furnished, free of cost one certified copy of the contract documents except Indian standard specifications and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.

Works to be carried out	<p>6. The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The Contractor shall provide at his cost everything necessary for the proper execution of the works according to the intent and meaning of the drawings, Schedule of Quantities and Specification taken together, whether the same may or may not be particularly shown or described therein provided that the same can reasonably be inferred there from and if the Contractor finds any discrepancy in the drawings or amongst the drawings, Schedule of Quantities and Specifications, he shall immediately and in writing refer same to the Engineer-in-Charge who shall decide which is to be followed. The descriptions given in the Schedule of Quantities shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labour necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.</p> <p>The Contractor shall carry out and complete the said work in every respect in accordance with this Contract and with the directions of and to the satisfaction of the Engineer-in-Charge. The Engineer-in-Charge may in his absolute discretion and from time to time issue further drawings and/or written instructions, detailed directions and explanations which are hereafter collectively referred to as "Employer's Instructions" in regard to:</p> <ol style="list-style-type: none"> a) The variation or modification of the design, quality or quantity of works or the addition or omission or substitution of any work. b) Any discrepancy in the drawings or amongst the Schedule of Quantities and/or drawings and/or specification.
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		<p>c) The removal from the site of any material brought thereon by the Contractor not fulfilling the tender specifications and the substitution of any other material therefor.</p> <p>d) The removal and/or re-execution of any material/works executed by the Contractor but not fulfilling the tender specifications.</p> <p>e) The dismissal from the works of any persons employed by the contractor thereupon.</p> <p>f) The opening up for inspection of any work covered up.</p> <p>g) The amending and making good of any defects noticed and reported during Defect Liability Period.</p> <p>The Contractor shall forthwith comply with and duly execute any work comprised in such Employer's instructions provided always that verbal instructions, directions and explanations given to the Contractor or his representatives upon the works by the Engineer-in-Charge shall, if involving a variation, be confirmed in writing by the Contractor within seven days, and if the same is not approved/disapproved by the Engineer-in-charge in writing within a further period of seven days, such shall be deemed to be Employer's Instructions within the scope of the Contract.</p>
Sufficiency of Tender	7	The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.
Discrepancies and Adjustment of	8	The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions

Errors (order of preference)		in preference to scale and special conditions in preference to General Conditions.
	8.1	In the case of discrepancy between the schedule of Quantities, the Specifications and/ or the Drawings, the following order of preference shall be observed: -
		i) Description/Nomenclature as per Schedule of Quantities.
		ii) General / Particular Specification and Special Condition, if any.
		iii) CPWD Specifications with up to date correction slip
		iv) Architectural / structural Drawings.
		v) Indian Standard Specifications of BIS
		vi) National Building Code – 2016
		vii) Manufacturer's specifications
		viii) Sound Engineering Practices
		ix) Decision of Engineer-in-Charge
		A reference made to any Indian Standard Specifications in this documents, shall imply to the latest version of that standard, including such revisions / amendments as issued by the Bureau of Indian Standards up to the last date of receipt of tenders. The contractor shall keep at his own cost all such publications of relevant Indian Standard applicable to the work at site.
	8.2	If there are varying or conflicting provisions made in any one document forming part of the contract, the Competent Authority as defined in the schedule 'F' shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.
	8.3	If there is a discrepancy between actual scaled drawing and written dimension (or description) on a drawing, the latter shall be followed.
	8.4	The Schedule of Quantities, unless otherwise stated shall be deemed to have been prepared in accordance with method of measurement specified in Section VI. Any error in description or in quantity in Schedule of Quantities or any omission of items therefrom shall not vitiate the Contract but shall be rectified and the value thereof, as

		ascertained under clause 12 hereof shall be added to, or deducted from the Contract amount (as the case may be) provided that no rectification or errors, if any, shall be allowed in the contractor's Schedule of rates. The above discrepancies in Schedule of Quantities shall not release the Contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.
Signing of Contract	9	The successful Tenderer, on acceptance of his tender by the Employer, shall, within 14 days from the date of issue of work award letter, sign the contract consisting of: -
		i) Articles of agreement in Bilingual on non-judicial stamp paper/s of appropriate values applicable to Jammu. The cost of the stamp paper/s shall be borne by the contractor. One Certified copy of the agreement will be handed over to the contractor by the Employer.
		ii) the notice inviting tender, all the documents including drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
		No payment for the work done will be made unless contract is signed by the successful Tenderer. Thus, the first RA Bill shall not be accepted for making payment before signing off the Agreement in Bilingual Format.

CLAUSES OF CONTRACT

		CLAUSE 1
Performance Bank Guarantee	i)	The contractor shall submit an irrevocable Performance Bank Guarantee of amount indicated in the at item 23 of General Rules and Instructions to Tenderers / bidders in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Schedule 'F' from the date of issue of letter of award. This period can be further extended by the Engineer-in-Charge up to a maximum period as specified in schedule 'F' on written request of the contractor stating the reason for delays in procuring the Performance Bank Guarantee, to the satisfaction of the Engineer-in-Charge. This guarantee shall be in the form of Bank Guarantee issued by any Scheduled Bank in the approved proforma annexed hereto (Annex 4).
	ii)	The Performance Bank Guarantee shall be initially valid up to the stipulated date of completion plus 3 months beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of Performance Bank Guarantee extended to cover such extended time for completion of work. After recording of the virtual completion certificate for the work by the Engineer-in-charge, the performance bank guarantee shall be returned to the contractor, without any interest.
	iii)	The Engineer-in-Charge shall not make a claim under the performance bank guarantee except for amounts to which the Employer is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:
	a)	Failure by the contractor to extend the validity of the Performance Bank Guarantee as described herein above,

		in which event the Engineer-in-Charge may claim the full amount of the Performance Bank Guarantee.
	b)	Failure by the contractor to pay the Employer any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions of the agreement, within 30 days of the service of notice to this effect by Engineer-in-Charge.
	iv)	In the event of the contract being determined or rescinded under provision of any of the Clause/Condition of the agreement, the performance bank guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Employer.
	CLAUSE 1 A	
Recovery of Security Deposit / Retention Money Deposit	i)	The Contractor shall permit Employer at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 5% of the gross amount of each running account and final bill till the sum deducted will amount to security deposit of 5% of the Contract price of the work. Such deductions will be made and held by the Employer by way of Security Deposit till the successful completion of Defect Liability Period.
	ii)	All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from his security deposit or from any sums which may be due to or may become due to the contractor by Employer on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions, the contractor shall within 10 days make good in cash any sum or sums which may have been deducted from his security deposit or any part thereof. The security deposit shall be collected from the running bills and the final bill of the contractor at the rates mentioned above.
	iii)	The security deposit as deducted above can be released against bank guarantee issued by a scheduled bank, on completion of the work and settlement of final bill at the request of the contractor subject to the condition that amount of such Bank

		<p>guarantee is equal to security deposit amount which shall be initially valid till end of defect liability period (DLP) + 3 months. Provided further that the validity of bank guarantee including the one given against the earnest money shall be in conformity with provisions contained in clause 17 which shall be extended from time to time depending upon extension of contract granted under provisions of clause 2 and clause 5.</p>
	CLAUSE 2	
Compensation for Delay		<p>If the contractor fails to maintain the required progress in terms of clause 5 or to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to the Employer on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated in schedule 'F' and as per the authority specified in schedule 'F' (whose decision in writing shall be final and binding) may decide on the amount of contract price of the work for every completed day (as applicable) that the progress remains below that specified in Clause 5 or that the work remains incomplete.</p>
		<p>This will also apply to items or group of items for which a separate period of completion has been specified</p>
	i)	<p>Compensation at the rate as specified in schedule 'F' for delay of work to be computed, Provided always that the total amount of compensation for delay to be paid under this Condition shall not exceed 10% of the Contract Price of work or of the Contract price of the item or group of items of work for which a separate period of completion is originally given.</p>
	ii)	<p>The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the Employer.</p>
	CLAUSE 3	
		<p>Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other</p>

When Contract can be Determined		rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:
	i)	If the contractor has abandoned the contract
	ii)	If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, pull down, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un-workman like manner, shall omit to comply with the requirement of such notice for a period of seven days thereafter or has failed to remove the materials from the site within seven days of the written instructions of the Engineer-in-charge that the same were condemned and rejected by him under these conditions .
	iii)	If the contractor has failed to commence the work or, without any lawful excuse under these conditions suspended the progress of the work for fourteen days after receiving notice from the Engineer-in-charge to proceed or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.
	iv)	If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge.
	v)	If the contractor persistently neglects or fails to carry out his obligations under the contract and/ or commits default in complying with all or any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within

		7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.
	vi)	If the contractor shall offer or give or agree to give to any person in Employer's service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for Employer
	vii)	If the contractor shall enter into a contract with Employer in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-Charge.
	viii)	If the contractor had secured the contract with Employer as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of Integrity Agreement.
	ix)	If the contractor being an individual, or if a firm, any partner thereof commits an "Act of Insolvency" or shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall suffer execution or other process of court attaching property to be issued against the contractor or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors and shall be unable within seven days after notice to him requiring him to do so, to show to the reasonable satisfaction to the Engineer-in-charge that he is able

		to carry out and fulfil the contract and to give security therefor, if so required by the Engineer-in-charge.
	x)	If the contractor being a company shall pass an effective resolution for winding up voluntarily or shall have an order for compulsory winding up made against it or shall subject to the supervision of court and the official Assignee or the liquidator in such acts of insolvency or winding up, as the case may be, or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.
	xi)	If the contractor shall suffer any payment under this contract to be attached by or on behalf of any of the creditors or the contractor or shall charge or encumber this contract or any payments due or which may become due to the contractor hereunder
	xii)	If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.
	xiii)	If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer -in-Charge. When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the Employer shall have powers:
	a)	To determine the contract, notwithstanding any previous waiver, after giving seven days' notice in writing to the Contractor, as aforesaid (of which termination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such

		<p>determination, the Security Deposit already recovered and Performance Bank Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the Employer.</p>
	b)	<p>After giving notice to the contractor measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands. The action will be without thereby affecting the powers of the Engineer-in-charge or the obligations and liabilities of the Contractor, the whole of which shall continue in force as fully as if the Contract had not been so determined, and as if the work subsequently executed had been executed by or on behalf of the Contractor. And further, the Employer by his agents or servants may enter upon and take possession of the works and all plants, tools, scaffoldings, sheds, machinery steam and other power utensils and materials lying upon the premises or the adjoining lands or roads, and use the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completing the works or by employing any other Contractor or other person or persons to complete the works, and the Contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other Contractor or other person or persons employed for completing and finishing or using the materials and plant for the works. When the works shall be completed or as soon thereafter as convenient the Engineer-in-charge shall give a notice in writing to the Contractor to remove his surplus materials and plant, and should the Contractor fail to do so within a period of fourteen days after receipt thereof by him, the Employer may sell the same by public auction, and give credit to the Contractor for the net amount realized. The</p>

		<p>Employer shall thereafter ascertain and certify in writing under his hand what (if anything) shall be due or payable to or by the Employer and expense or loss which the Employer shall have been put to in procuring the works to be completed and the amount, if any, owing to the Contractor and the amount which shall be so certified shall thereupon be paid by the Employer to the Contractor or by the Contractor to the Employer, as the case may be, and the Certificate of the Engineer-in-charge shall be final and conclusive between the parties. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work, if resorted to by the Employer.</p>
		<p>In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.</p>
	<p>CLAUSE 3A</p>	
	<p>a)</p>	<p>In case, the work cannot be started due to reasons not within the control of the contractor within 1/8th of the stipulated time for completion of work or one month whichever is higher, either party may close the contract by giving notice to the other party stating the reasons. In such eventuality, the Performance Bank Guarantee of the contractor shall be refunded within 30 days.</p>

		Neither party shall claim any compensation for such eventuality. This clause is not applicable for any breach of the contract by either party.
	CLAUSE 3B	
Termination of Contract in case of death of Contractor	Without prejudice to any of the rights or remedies under this contract, if the contractor, being an individual, dies, the Employer shall have the option of terminating the contract without any liability for such termination and compensation to the contractor.	
	CLAUSE 4	
Contractor liable to pay Compensation even if action not taken under Clause 3		In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause-3 thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take possession of (at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) or use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work/or any part thereof, paying or allowing for the same in account at the contract rates, or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any

		such requisition, the Engineer-in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.
	CLAUSE 5	
Time and Extension for Delay		The time allowed for execution of the Works as specified in the Schedule 'F' or the authorized extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in schedule 'F'. If the Contractor commits default in commencing the execution of the work as aforesaid, Employer shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the performance bank guarantee absolutely.
		The contractor shall prepare the shop drawings and obtain its approval from Engineer-in-Charge, shall procure samples of all the materials and get it approved from Engineer-in-Charge, shall get the mock up works / flats / furniture ready at factory and organize visit of Engineer-in-Charge to the factory for approval of mock-ups before going into large scale work / production.
	5.1	Contractor shall submit fortnight progress report to the Engineer-in-Charge depicting the target progress as per schedule approved by Engineer-in-Charge and achieved progress.
		PROGRAMME CHART
	i)	The Contractor shall prepare a detailed work programme for the execution of work, showing clearly all activities from the start of work to completion, within 7 (seven) days of award of the contract for approval to the Engineer-in- Charge

	ii)	The programme should include the following:
	a)	Descriptive note explaining sequence of the various activities.
	b)	Network (PERT / CPM / BAR CHART/MS Project).
	iii)	If at any time, it appears to the Engineer-in-Charge that the actual progress of work does not conform to the approved programme referred above or after rescheduling of milestones, on his instructions, the contractor shall produce a revised programme within 7 (seven) days, showing the modifications to the approved programme to ensure timely completion of the work.
	5.2	If the work(s) be delayed by: -
	i)	force majeure, or
	ii)	abnormally bad weather, or
	iii)	serious loss or damage by fire, or
	iv)	civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or
	v)	delay on the part of other contractors or tradesmen engaged by Engineer-in- Charge in executing work not forming part of the Contract, or
	vi)	non-availability of stores, which are the responsibility of Employer to supply or
	vii)	non-availability or break down of tools and Plant to be supplied or supplied by Employer or
	viii)	any other cause which, in the absolute discretion of the Engineer-in-Charge is beyond the Contractor's control.
		Then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the authority as indicated in Schedule 'F' but shall nevertheless use constantly his best endeavours to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.

	5.3	Request for extension of time, to be eligible for consideration with reasons, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay to the authority as indicated in Schedule 'F'. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.
	5.4	In such case the authority as indicated in Schedule 'F' may give a fair and reasonable extension of time for completion of work. Such extension shall be communicated to the Contractor by the authority as indicated in Schedule 'F' in writing. Non-application by the contractor for extension of time shall not be a bar for giving a fair and reasonable extension of time by the authority as indicated in Schedule 'F' and this shall be binding on the contractor.
CLAUSE 6		
Measurements of Work Done	i)	Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement, the value in accordance with the contract.
	ii)	<p>All measurements of all items having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per the format of the department so that a complete record is obtained of all the items of works performed under the contract.</p> <p>All such measurements and levels recorded by the contractor or his authorized representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorized representative as per interval or program fixed in consultation with Engineer-in-Charge or his authorized representative. After the necessary corrections made by the Engineer-in-Charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the</p>

	<p>Engineer-in Charge for the dated signatures by the Engineer-in- Charge and the contractor or their representatives in token of their acceptance.</p> <p>Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked/test checked from the Engineer-in-Charge and/or his authorized representative. The contractor will, thereafter, incorporate such changes as may be done during these checks/test checks in his draft computerized measurements, and submit to the department a computerized measurement book, duly bound, and with its pages machine numbered. The Engineer-in- Charge and/or his authorized representative would thereafter check this MB and record the necessary certificates for their checks/test checks.</p> <p>The final, fair, computerized measurement book given by the contractor, duly bound, with its pages machine numbered, should be 100% correct, and no cutting or over-writing in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly machine numbered and bound, after getting the earlier MB cancelled by the department. Thereafter, the MB shall be taken in the Bank's records, and allotted a number as per the Register of Computerized MBs. This should be done before the corresponding bill is submitted to the Bank for payment. The contractor shall submit two spare copies of such computerized MB's for the purpose of reference and record by the various officers of the department.</p> <p>The contractor shall also submit to the department separately his computerized Abstract of Cost and the bill based on these measurements, duly bound, and its pages machine numbered</p>
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	along with two spare copies of the bill. Thereafter, this bill will be processed by the Bank and allotted a number as per the computerized record in the same way as done for the measurement book meant for measurements.
iii)	All measurement of all items having financial value shall be entered in Measurement Book so that a complete record is obtained of all works performed under the contract.
iv)	If for any reason, the contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the Employer shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor.
v)	The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels by the Engineer-in-Charge or his representative.
vi)	Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the Section VIII and Section X notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards (IS 1200) or any other relevant code of

		practice and if for any item no such standard is available, then a mutually agreed method shall be followed.
	vii)	The contractor shall give, not less than seven days' notice to the Engineer-in-Charge or his authorized representative in charge of the work, before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing, the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.
	viii)	Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the department to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.
	ix)	It is also a term of this contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.
	CLAUSE 7	
	i)	Interim or running account bills shall be submitted by the

<p>Payment on Interim Certificate to be Regarded as Advances</p>	<p>contractor for the work executed on the basis of such recorded measurements on the format approved by the Employer. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment/ adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in Schedule 'F', in which case the interim bill shall be prepared only after the requisite progress is achieved. Engineer-in-Charge shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. In the event of the failure of the contractor to submit the bills, Engineer-in-Charge shall prepare or cause to be prepared such bills in which event no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in- Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-in-Charge.</p> <p>The Contractor shall be paid by the Employer from time to time, by instalments under Interim Certificates to be issued by the Engineer-in-Charge to the Contractor on account of the works executed as aforesaid in accordance with this contract, subject, however, to a retention of the percentage of such value named in the schedule 'F' as "Retention percentage for Interim Certificates" until the total amount retained shall reach the sum named in the schedule 'F' as "Total Retention Money". The Contractor shall be entitled to the payment of the retention money in accordance with the final certificate to be issued in writing by the Engineer-in-Charge at the expiry of the period referred to as "the Defects Liability Period" in clause 17 or as soon as after the expiration of such period as the works shall have been finally completed and all defects made good</p>
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	<p>according to the true intent and meaning hereof whichever shall last happen, provided always that the issue by the Engineer-in-Charge of any Certificate during the progress of the works or at or after their completion shall not relieve the Contractor from his liability under this contract nor relieve the Contractor of his liability in case of fraud, dishonesty or fraudulent concealment relating to the works or materials or to any matter dealt with in the certificate, and in case of all defect and insufficiencies in the works or materials which a reasonable examination would not have disclosed. No certificate of the Engineer-in-charge shall of itself be conclusive evidence that any works or materials to which it relates are in accordance with the Contract neither will the Contractor have a claim for any amounts which the Engineer-in-charge might have certified in any interim bill and paid by the Employer and which might subsequently be discovered as not payable and in this respect the Employer's decision shall be final and binding.</p>
a)	<p>The contractor, on signing an undertaking on stamp paper in the proforma given at Annex 9, shall be entitled to be paid during the progress of the execution of the work up to 75% of the assessed value of any materials or an amount not exceeding 75% of the material element cost in the tendered rate of the finished item of the work, whichever is lower ,which are in the opinion of the Engineer-in- Charge non-perishable, nonfragile and non-combustible and are in accordance with the contract and which have been brought on the site in connection therewith and are adequately stored and/or protected against damage by weather or other causes but which have not at the time of advance been incorporated in the works. When materials on account of which an advance has been made under this sub-clause are incorporated in the work, the amount of such advance shall be recovered/deducted from the next</p>

	<p>payment made under any of the clause or clauses of this contract.</p> <p>Such secured advance shall also be payable on other items of perishable nature, fragile and combustible with the approval of the Engineer-in-Charge provided the contractor provides a comprehensive insurance cover for the full cost of such materials. The decision of the Engineer- in-Charge shall be final and binding on the contractor in this matter. No secured advance, shall however, be paid on high-risk materials such as ordinary glass, sand, petrol, diesel etc.</p>
	<p>b) 75% of the amount payable to the Contractor on the RA bills will be released as ad-hoc payment within 7 working days from the date of certification by the Engineer-in-charge, pending test checking of work and verification of detailed arithmetical accuracy by Employer.</p>
	<p>c) The Employer shall have power to withhold any certificate if the works or any parts thereof are not being carried out to his satisfaction.</p>
	<p>d) No payment shall be made to the Contractor if the Contractor fails to insure the works and keep them insured till the issue of the Completion Certificate / Defect Liability Period as the case may be.</p>
	<p>e) The amount admissible shall be paid within the specified period of honouring certificates in the schedule 'F' after the day of presentation of the bill by the Contractor to the Engineer-in-Charge together with the account of the dismantled materials, if any and all required details/ documents. In case of delay in payment of Running Account bills after 45 days of submission of bill by the contractor, provided the bill submitted by the contractor found to be in order, a simple interest @ 3% per annum shall be paid to the contractor from the date of expiry of prescribed time limit.</p>

	ii)	All such interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or materials delivered forming part of such payment, may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the contract and specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.
	iii)	Pending consideration of extension of date of completion, interim payments shall continue to be made as herein provided without prejudice to the right of the Employer to take action under the terms of this contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority.
CLAUSE 7A		
Unfixed materials when taken into account to be the property of the Employer	Where in any Certificate (of which the Contractor has received payment), the Engineer-in-Charge has included the value of any unfixed materials intended for and/or placed on or adjacent to the works such materials shall become the property of the Employer and they shall not be removed except for use upon the works, without the written authority of the Engineer-in-Charge. The Contractor shall be liable for any loss of, or damage to, such materials.	
CLAUSE 7B		
No Running Account Bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare		

	Board, whatever applicable are submitted by the contractor to the Engineer-in-Charge.	
	CLAUSE 8	
Completion Certificate	i)	<p>Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice, the Engineer-in-Charge shall inspect the work if the work is found incomplete, the contractor shall be advised suitably .Further, in the completed work, if there is no defect , the Engineer-In-Charge shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the</p>

		contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.
	ii)	The works shall not be considered as completed until the Engineer-in-charge has certified in writing that they have been virtually completed. The Defects Liability Period shall commence from the date of such certificate.
	CLAUSE 8A	
Contractor to Keep Site Clean	The splashes and droppings from white washing, colour washing, painting etc., on walls, floor, windows, etc shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. where the work is done. The cleaning shall be carried out as soon as possible without waiting for the actual completion of all the other items of work in the contract. In case the contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor through any other agency. Before taking such action, the Engineer-in-Charge shall give ten days' notice in writing to the contractor.	
	CLAUSE 8B	
Completion Plans to be Submitted by the Contractor	i)	The contractor shall submit completion plans for Internal, External Civil, Electrical and Mechanical Services within 30 days of completion of work as against service plans issued by the Engineer-in-Charge. OR The contractor shall submit all the data and details as regards the work to enable the Employer to prepare the 'As built drawings' for layouts etc.
	ii)	The contractor shall also submit the operation and maintenance manuals and other technical literature/ warranty certificates provided by OEMs in respect of all the electrical/ electro-mechanical and electronic equipment/ systems etc.

	iii)	In case, the contractor fails to submit the completion plan as aforesaid, the Employer will not process its bills for payment till such time the said details are submitted.
	CLAUSE 9	
Payment of Final Bill	i)	The final bill shall be submitted by the contractor in the same manner as specified in interim bills within 3 months of the date of issue of certificate of virtual completion by the Engineer-in-Charge. No further claims shall be made by the contractor after submission of the final bill. Tenable payments will be made within the period of 6 months of submission, the period being reckoned from the date of receipt of the bill by the Engineer-in- Charge complete with account of materials wherever applicable.
	ii)	In case of delay in payment of final bills after prescribed time limit, a simple interest @ 3% per annum shall be paid to the contractor from the date of expiry of prescribed time limit, provided the final bill submitted by the contractor found to be in order and cleaning as at clause 8A and documents as at clause 8B have been submitted
	CLAUSE 9A	
Payment of Contractor's Bills through electronic means	i)	<p>Payments due to the contractor shall be made to his bank through NEFT. For this purpose, the contractor shall furnish to the Engineer-in-Charge</p> <p>(1) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the bank; to receive payments and all other required particulars in the approved format</p> <p>(2) his own acceptance of the correctness of the amount made out as being due to him by Employer or his signature on the bill or other claim preferred against Employer before settlement by the Engineer-in-Charge of the account or claim by payment to the bank.</p> <p>While the NEFT transaction slip shall constitute a full and sufficient discharge for the payment, the contractor shall whenever</p>

		possible, present his bills duly receipted and discharged through his bank.
	ii)	Nothing herein contained shall operate to create in favour of the bank any rights or equities vis-a- vis the Employer.
	CLAUSE 10	
Materials to be provided by the Contractor	i)	The contractor shall, at his own expense, provide all materials, required for the works.
	ii)	The contractor shall, at his own expense and without delay, supply to the Engineer-in- Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract. The materials shall be selected from the make/brand specified in the list of approved makes of materials at Section VIII and Section X. The contractor shall, if requested by the Engineer-in- Charge furnish proof along with Material Test Certificates (MTC) of manufacturer, to the satisfaction of the Engineer-in-Charge that the materials so comply. The Engineer-in-Charge shall within thirty days of supply of samples or within such further period as he may require intimate to the Contractor in writing whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval, fresh samples complying with the specifications and make/brand in the list of approved make / materials laid down in the contract. In case of non availability of make/brand specified in the list of approved makes of material at Section VIII and Section X and the Contractor submit the documentary evidence for the same to the satisfaction of Engineer-in-Charge, proposed materials shall be tested in accordance with specifications following the Indian Standard Codes of Bureau of Indian Standard and / or applicable code of material testing and specifications, and approval of the

		Engineer-in-Charge in such case shall be issued after receipt of satisfactory test results of materials satisfying the specifications and standards.
	iii)	The Contractor shall at his risk and cost submit the samples of materials to be tested or analysed, if required for approval of material and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.
	iv)	The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The Engineer-in-Charge or his authorized representative shall at all times have access to the works and to all workshops, factories or/ and other places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access for inspections and examination and test of the materials and workmanship. No person not authorized by the employer except the representatives of public authorities shall be allowed on the works at any time.
	v)	The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-in-Charge shall be at liberty to employ at the

		expense of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in-Charge shall also have full powers to require other proper materials to be substituted thereof and in case of default, the Engineer-in-Charge may cause the same to be supplied and all costs which may attend such removal and substitution shall be borne by the Contractor.
	CLAUSE 10A	
Price Adjustment – Payment on account of variation in Material Prices / Wages	(i)	<p>Where scheduled period of completion is more than one year, in order to take in to account the variations in Material prices and wages during the contract period when the work is in progress, including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, adjustments in the costs of materials and labour shall be allowed on the basis of formulae as given below)</p> <p><u>(1) Materials</u></p> $V_M = 70/100 \{0.88 V - (M)\} \times \{(WI - WI_0)/WI_0\}$ <p>Where</p> <p>V_M = Variation in material cost, i.e., increase or decrease in the amount in Rs to be paid or recovered.</p> <p>V = Value of work done excluding advances on materials, if any, during the period under reckoning.</p> <p>M = Cost of materials for which basic rates, if any, are indicated in the tender</p>

		<p>WI = Average of All India Wholesale Price Index for all commodities for the period under reckoning as published in the RBI Bulletin.</p> <p>WI₀ = All India Wholesale Price Index for all commodities during the month of receipt of final Price Bid of the tender as published in the RBI Bulletin</p> <p><u>(2) Labour</u></p> $V_L = 30/100 \{0.88 V - (M)\} \times \{(CI - CI_0)/CI_0\}$ <p>Where</p> <p>V_L = Variation in labour cost, i.e., increase or decrease in the amount in Rs to be paid or recovered.</p> <p>V = As stated in (1) above</p> <p>M = As stated in (1) above</p> <p>CI = Average of Consumer Price Index for industrial workers applicable for Jammu declared by Labour Bureau, Government of India as published in the RBI Bulletin during the period under reckoning.</p> <p>CI₀ = Consumer Price Index for industrial workers applicable for Jammu declared by Labour Bureau, Government of India as published in RBI Bulletin during the month of receipt of final Price Bid of the tender.</p>
	ii)	<p>The base date for working out such price adjustment shall be the last stipulated date of receipt of Final Price bid of the tenders.</p>

	iii)	The cost of work on which price adjustment will be payable shall be reckoned as below:
	a)	Gross value of work done up to last price adjustment: (A)
	b)	Gross value of work done up to the current date: (B)
	c)	Gross value of work done during the period under reckoning (A-B) = I
	d)	Extra items/deviated quantities of items paid as per Clause 12 Based on prevailing market rates during the period under reckoning: (D)
	k)	Then, Cost of work for which price adjustment is applicable: $V = I - (D)$
	iv)	Materials which are covered by the provision of basic prices/rates are excluded from the purview under this adjustment.
	v)	Adjustments based on the above formulae will be made for each bill as and when the indices are published. The Contractors shall submit the bill for price adjustment with detailed calculations. Pending availability of firm figures for the indices, the bills may be paid on the basis of provisional figures, subject to adjustments later on.
	vi)	The downward adjustment on account of labour element will be made only if the minimum wages at Jammu also register corresponding fall compared to the minimum wages at Jammu prevailing in the month of receipt of final price bid of the tenders.
	vii)	The price adjustment clause shall be applicable only for the work executed during the contract period including authorized extension, if any. In case the work is not completed within the contract period including authorized extension and the provision of Compensation for Delay has to be enforced, this adjustment clause will not be applicable for work done during that period. It is also clarified that price adjustment clause will not be applicable to any extra variation items, the rates of which are based on prevailing market rate.

		Contract period shall be reckoned in one stretch without any break from the Commencement Date.
	viii)	In case the bill is submitted to the Employer prior to 15 th of a particular month, index for the previous month will be reckoned for calculating the average indices for arriving at the adjustment. If however, the bill is submitted on or after 15 th , the Indices for that particular month shall be taken into consideration.
	ix)	Price Adjustment bills shall also be treated as bills of the concerned agencies against the Contract and shall attract provisions of Retention Money, Income Tax deductions etc. as stipulated in the contract.
	CLAUSE 10B	
Material Testing lab at site		The contractor shall at his own expense, provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped at least with the testing equipment as specified in Schedule F.
	CLAUSE 11	
Work to be Executed in Accordance with Specifications, Drawings, Orders etc.	i)	The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in any Bureau of Indian Standard or any other, published standard or code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract.
	ii)	In the case of any class of work for which there is no such specifications as referred above, such work shall be carried out in accordance with the Bureau of Indian Standards

		Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturers' specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.
	iii)	The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.
	CLAUSE 11 A	
Action in case Work not done as per Specifications	i)	All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-in-charge, his authorized subordinates in charge of the work and all the superior officers of the Employer or any organization engaged by the Employer for Quality Assurance and of the Chief Technical Examiner's Office, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.
	ii)	If it shall appear to the Engineer-in-charge or his authorized representatives or to the Superior Officers of the employer or

	<p>the officers of the organization engaged by the Employer for Quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskilful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within Defects Liability Period stated in schedule 'F' or, if none stated, then within one year after completion of the work, from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of him failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.</p>
iii)	<p>In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the authority specified in Schedule 'F' may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.</p>
<p>CLAUSE 12</p>	

Deviations/ Variations Extent and Pricing		<p>The Engineer-in-Charge shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.</p> <p>The Engineer-in-Charge shall be the final authority to decide whether any item of work is extra/ deviation/ substitution item.</p>
	12.1	The time for completion of the works shall, in the event of any deviations resulting in additional cost over the Contract price sum being ordered, be extended, if requested by the contractor, as follows
		<p>i) In the proportion in which the additional cost of the altered, additional or substituted work (The difference of Final completed cost of work (including the financial impact of all extra, substituted and deviated items but excluding the financial impact due to operation of price adjustment clause) and the Contract price), bears to the original Contract price plus</p>
		<p>ii) 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.</p>
	12.2	<p>A) Items that are completely new, and are in addition to the items contained in the contract</p>

Deviation – Extra Items and Pricing		<p>Where the extra works are not of similar character and/or executed under similar conditions as aforesaid or where the omissions vary the conditions under which any remaining items of works are carried out or if the amount of any omissions or additions relative to the amount of the whole of the contract works or to any part thereof shall be such that in the opinion of the Engineer-in-charge the net rate or price contained in the Priced Schedule of Quantities or tender or for any item of the works involves loss or expense beyond that reasonably contemplated by the Contractor or is by reason of such omission or addition rendered unreasonable or inapplicable, the Engineer-in-charge shall fix such other rate or price as in the circumstances he shall think reasonable and proper, with the prior approval in writing of the Employer.</p>
		<p>Where extra work cannot be properly measured or valued, the Contractor shall be allowed day work prices as the net rates stated in the tender of the Priced Schedule of Quantities or, if not so stated, then in accordance with the local day work rates and wages for the district, provided that in either case vouchers specifying the daily time (and if required by the Engineer-in-charge, the workman's name) and materials employed be delivered for verification to the Engineer-in-charge or his representative at or before the end of the week following that in which the work has been executed.</p>
		<p>In the case of extra item(s) (items that are completely new, and are in addition to the items contained in the contract), the contractor may within fifteen (15) Calendar days of receipt of order or occurrence of the item(s) claim rates, supported by proper market rate analysis (CPWD method shall be followed as far as possible) supported by invoices, vouchers etc. worked on the "actual cost basis" plus 15%</p>

			towards establishment charges, contractor's overhead and profit and the Engineer-in-charge shall within prescribed time limit of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.
Deviation – Substituted Items and Pricing		B)	Items that are taken up with partial substitution or in lieu of items of work in the contract
			In the case of substituted items (items that are taken up with partial substitution or in lieu of items of work in the contract), the rate for the agreement item (to be substituted) and substituted item shall, wherever possible, be derived out of the rates given in priced schedule of quantities in the manner as mentioned in the following para.
		a)	The net rates or prices in the original tender shall determine the valuation of the extra work where such extra work is of similar character and executed under similar conditions as the work priced therein.
		b)	The net prices of the original tender shall determine the value of the items omitted provided if omissions vary the conditions under which any remaining items of works are carried out the prices for the same shall be valued under sub-clause (A) thereof.
		c)	If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the

			difference between the market rates of substituted item and the agreement item (to be substituted).
		d)	If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).
Deviation – Deviated Quantities and Pricing		C)	In the case of contract items, substituted items, contract cum substituted items which exceed the pre-specified limits over the tender quantity
			In the case of contract items, substituted items, contract cum substituted items, which exceed the pre-specified limits laid down in Schedule 'F', the contractor may within fifteen (15) calendar days of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper rate analysis (CPWD method shall be followed as far as possible) worked on the "actual cost basis" plus 15% towards establishment charges, contractor's overhead and profit for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities, the Engineer-in-Charge shall within prescribed time limit of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

			The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in Schedule F.
			The Engineer-in-Charge shall within prescribed time limit of receipt of the claims supported by analysis, after giving consideration of analysis of rates submitted by the contractor, determine the rates on the basis of the market rates (as per invoice, vouchers from the manufacturers or suppliers submitted by the contractor and duly verified by the Engineer-in-charge or his representative) and the contractor shall be paid in accordance with the rates so determined.
	12.3		The prescribed time limit for finalising rates for Extra Item(s), Substitute Item(s) and Deviated Quantities of contract items is forty five (45) Calendar days.
	12.4		The contractor shall send to the Engineer-in-Charge once every three months, an up to date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right. However, the Employer may authorise consideration of such claims on merits.
	12.5		Any operation incidental to or necessarily has to be in contemplation of Tenderer while filing tender, or necessary for proper execution of the item included in the Schedule of quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the Tenderer or the rate given in the said

		schedule of rates, as the case may be. Nothing extra shall be admissible for such operations.
	CLAUSE 13	
Foreclosure of contract due to Abandonment or Reduction in Scope of Work	If at any time after acceptance of the tender, Employer shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-Charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.	
	The contractor shall be paid at contract rates, full amount for works executed at site and, in addition, a reasonable amount as certified by the Engineer-in-Charge for the items hereunder mentioned which could not be utilized on the work to the full extent in view of the foreclosure;	
	i)	Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site office; storage accommodation and water storage tanks.
	ii)	Employer shall have the option to take over contractor's materials or any part thereof either brought to site or at workshop (factory) or of which the contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work) provided, however Employer shall be bound to take over the materials or such portions thereof as the contractor does not desire to retain. For materials taken over or to be taken over by Employer, cost of such materials as detailed by Engineer-in- Charge shall be paid. The cost shall, however, take into account purchase price, labour in fabrication & installation, cost of transportation and deterioration or damage

	which may have been caused to materials whilst in the custody of the contractor.
iii)	Reasonable compensation for transfer of T & P from site to contractor's permanent stores or to his other works, whichever is less. If T & P are not transported to either of the said places, no cost of transportation shall be payable.
	<p>The contractor shall, if required by the Engineer- in-Charge, furnish to him, books of account, wage books, time sheets and other relevant documents and evidence as may be necessary to enable him to certify the reasonable amount payable under this condition.</p> <p>The reasonable amount of items on (i) and (iii) above shall not be in excess of 2% of the cost of the work remaining incomplete on the date of closure, i.e. total stipulated cost of the work as per accepted tender less the cost of work actually executed under the contract and less the cost of contractor's materials at site taken over by the Government as per item (ii) above. Provided always that against any payments due to the contractor on this account or otherwise, the Engineer-in-Charge shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of any tool, plants and materials and any other sums which at the date of termination were recoverable by the Government from the contractor under the terms of the contract.</p> <p>In the event of action being taken under Clause 13 to reduce the scope of work, the contractor may furnish fresh Performance Guarantee on the same conditions, in the same manner and at the same rate for the balance tendered amount and initially valid up to the extended date of completion or stipulated date of completion if no extension has been granted plus minimum 3 months beyond that. Wherever such a fresh Performance Guarantee is furnished by the contractor the Engineer-in-Charge may return the previous Performance Guarantee.</p>
	CLAUSE 14

Carrying out part work at risk & cost of contractor	If contractor:	
	i)	At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge or
	ii)	Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge or
	iii)	Fails to complete the work(s) or items of work with individual dates of completion, on or before the date(s) so determined and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in-Charge.
	The Engineer- in-Charge without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to Employer, by a notice in writing to take the part work / part incomplete work of any item(s) out of his hands and shall have powers to:	
	a)	Take possession of the site and any materials, implements, stores, etc., thereon; and/or
	b)	Carry out the part work / part incomplete work of any item(s) by any means at the risk and cost of the contractor.
	The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/ part incomplete work of any item(s) taken out of his hands and execute at the risk and cost of the contractor. In addition to it, the liability of contractor on account of loss or damage suffered by Employer because of action under this clause shall not exceed 10% of the Contract price of the work.	
	In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over	

	<p>and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the Employer are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.</p>
	<p>Any excess expenditure incurred or to be incurred by Employer in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by Employer as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to Employer in law or as per agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within thirty (30) Calendar days.</p>
	<p>If the contractor fails to pay the required sum within the aforesaid period of thirty (30) Calendar days, the Engineer-in-Charge shall have the right to sell any or all of the contractor's' unused materials kept at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract.</p>
	<p>In the event of above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.</p>
	<p>CLAUSE 15</p>

Suspension of Work	i)	The contractor shall, on receipt of the order in writing of the Engineer-in-Charge, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-Charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons:
	a)	on account of any default on the part of the contractor or
	b)	for proper execution of the works or part thereof for reasons other than the default of the contractor or
	c)	for safety of the works or part thereof. The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.
	ii)	If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:
	a)	the contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25%, for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part, and
	b)	If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Engineer-in-Charge may consider reasonable in respect of salaries and/or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the

		Engineer-in- Charge within fifteen days of the expiry of the period of 30 days.
	iii)	<p>If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at a time, except when suspension is ordered for reason (a) in sub- para (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within fifteen days from receipt by the Engineer- in-Charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as an omission of such part by Employer or where it affects whole of the works, as an abandonment of the works by Employer, shall within ten days of expiry of such period of 15 days give notice in writing of his intention to the Engineer-in-Charge. In the event of the contractor treating the suspension as an abandonment of the contract by Employer, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer-in-Charge may consider reasonable, in respect of salaries and/or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of 3 months.</p>
Dismantled	CLAUSE 16	
Material Employer's property	The contractor shall treat all materials obtained during dismantling work at site (except material mentioned in Bill of quantity under rebate item and debris) etc. as Employer's property and such materials shall be disposed off as per the specific instructions in this regard or in absence	

	of the same to the best advantage of Employer according to the instructions in writing issued by the Engineer-in-Charge.	
	CLAUSE 17	
Contractor Liable for Damages, defects during defect liability period	i)	<p>If the contractor or his working people shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, or other faults appear in the work within Defects Liability Period stated in schedule 'F' or, if none stated, then within one year after a certificate of virtual completion shall have been given by the Engineer- in-Charge as aforesaid arising out of defect or improper materials or workmanship, the contractor shall upon receipt of a notice in writing on that behalf and within such reasonable times as shall be specified therein, make the same good at his own expense or in case of default the Engineer-in-Charge may employ and pay other persons to amend and make good such defects or other faults and all damages, loss and expenses consequent thereon or incidental thereto shall be made good and borne by the Contractor and such damage, loss, expenses shall be recoverable from him by the Employer or may be deducted by the Employer, upon the Engineer-in-Charge's Certificate in writing, from any money due or may become due to the Contractor, or the Employer may in lieu of such amending and making good by the Contractor deduct from any money due to the Contractor, a sum, to be determined by the Engineer-in-Charge equivalent to the cost of amending such work and in the event of the amount retained as Security Deposit being insufficient, recover the balance from the Contractor, together with any expenses the Employer may have incurred in</p>

		<p>connection therewith. Should any defective work have been done or material supplied by any sub-contractor employed on the works who has been nominated or approved by the Employer, the Contractor shall be liable to make good in the same manner as if such work or material had been done or supplied by the Contractor and been subject to the provisions of this Clause. The Contractor shall remain liable under the provisions of this Clause notwithstanding the signing of any certificate or the passing of any accounts, by the Employer. The security deposit of the contractor shall not be refunded before the expiry of the Defect Liability Period after the issue of the certificate final or otherwise, as provided elsewhere.</p>
	ii)	<p>In case of Maintenance and Operation works of E&M services, the security deposit deducted from contractors shall be refunded within one month from the date of final payment or within one month from the date of completion of the maintenance contract whichever is earlier.</p>
	Clause 18	
Setting out of works	<p>The Contractor shall set out the works and shall be responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions and alignment of all parts thereof. If at any time, any error in this respect shall appear during the progress of the works or within the Defect Liability Period after completion of the works, the Contractor shall, if so required, at his own expense rectify such error to the satisfaction of the Engineer-in-Charge.</p> <p>The checking of any setting-out or of any line or level by the Engineer-in-charge or his representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof and the Contractor shall carefully protect and preserve all benchmarks, sight rails, pegs and other things used in setting out the works.</p>	
	CLAUSE 19	

All relevant Statutory Laws to be complied by the Contractor	i)	The contractor shall comply with provisions of all relevant laws in connection with the work, as may be applicable viz. Contract Labour (R&A) Act, 1970, Contract Labour (Regulation and Abolition) Central Rules, 1971, Minimum Wages (Central) Rules 1950, Child Labour (Prohibition and Regulation) Act 1986, Payment of Wages Act 1936, Minimum Wages Act 1948, ESI Act 1948, EPF Act 1952, Employees Liability Act 1938, Workmen's Compensation Act 1923, Industrial Disputes Act 1947, Maternity Benefits Act 1961, Building and other Construction Workers (Regulation of Employment & Conditions of Service) Act 1996, Building and other Construction Workers Act 1996, or the modifications thereof or any other relevant laws and rules made thereunder from time to time etc. All applicable labour licenses etc. shall be obtained by the Contractor before the commencement of the work and continue to have a valid license until the completion of the work.
	ii)	Any failure to fulfil these requirements shall attract the penal provisions of the concerned Act and Contractor shall be liable to face the consequences thereof in addition to any other penal provisions of this contract. The contractor shall indemnify the Employer for any loss caused due to non-compliance with any of the provisions of laws applicable.
	iii)	The contractor shall indemnify as per the format provided at Annex 7 and keep indemnified the Employer against payments to be made under and for the observance of the laws aforesaid without prejudice to his right to claim indemnity from his sub-contractors.
	iv)	No labour below fourteen years shall be employed at the work.
	v)	The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.
CLAUSE 19A		

		<p>The contractor(s) shall at his/their own cost provide his/their labour with a sufficient number of huts (hereinafter referred to as the camp) of the following specifications on a suitable plot of land to be approved by the Engineer-in-Charge.</p>
	i)	<p>(a) The minimum height of each hut at the eaves level shall be 2.10m (7 ft.) and the floor area to be provided will be at the rate of 2.7 sq.m. (30 sq.ft.) for each member of the worker's family staying with the labourer</p> <p>b) The contractor(s) shall in addition construct suitable cooking places having a minimum area of 1.80m x 1.50m'(6'x5') adjacent to the hut for each family.</p> <p>c) The contractor(s) shall also construct temporary latrines and urinals for the use of the labourers each on the scale of not less than four per each one hundred of the total strength, separate latrines and urinals being provided for women.</p> <p>(d) The contractor(s) shall construct sufficient number of bathing and washing places, one unit for every 25 persons residing in the camp. These bathing and washing places shall be suitably screened.</p>
		<p>a) All the huts shall have walls of sun-dried or burnt-bricks laid in mud mortar or other suitable local materials as may be approved by the Engineer-in-Charge. In case of sun-dried bricks, the walls should be plastered with mud gobri on both sides. The floor may be kutcha but plastered with mud gobri and shall be at least 15 cm"(6") above the surrounding ground. The roofs shall be laid with thatch or any other materials as may be approved by the Engineer-in-Charge and the contractor shall ensure that throughout the period of their occupation, the roofs remain water-tight</p> <p>b) The contractor(s) shall provide each hut with proper ventilation.</p>

	<p>c) All doors, windows, and ventilators shall be provided with suitable leaves for security purposes.</p> <p>(d) There shall be kept an open space of at least 7.2m (8 yards) between the rows of huts which may be reduced to 6m (20 ft.) according to the availability of site with the approval of the Engineer-in-Charge. Back-to-back construction will be allowed.</p>
	<p>iii) Water Supply – The contractor(s) shall provide adequate supply of water for the use of labourers. The provisions shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per day for bathing and washing purposes. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, tanks which may be of metal or masonry, shall be provided. The contractor(s) shall also at his/ their own cost make arrangements for laying pipelines for water supply to his/ their labour camp from the existing mains wherever available, and shall pay all fees and charges therefore.</p>
	<p>iv) The site selected for the camp shall be high ground, removed from jungle.</p>
	<p>v) Toilet facility – Proper and adequate toilet facility shall be provided for the labourers</p>
	<p>vi) Drainage – The contractor(s) shall provide efficient arrangements for draining away sullage water so as to keep the camp neat and tidy.</p>
	<p>vii) The contractor(s) shall make necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers.</p>
	<p>viii) Sanitation – The contractor(s) shall make arrangements for conservancy and sanitation in the labour camps according to the rules of the Local Public Health and Medical Authorities.</p>
	CLAUSE 19 B

	<p>The Engineer-in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractor's employment upon the work who may be incompetent or misconduct himself and the contractor shall forthwith comply with such requirements. In respect of execution works where the labour has an easy access to the individual floors of building, the contractor shall issue identity cards to the labourers, whether temporary or permanent and he shall be responsible for any untoward action on the part of such labour</p>	
	<p>CLAUSE 19 C</p>	
<p>Ensuring Payment and Amenities to Workers if contractor fails</p>	<p>In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and of the Contract Labour (Regulation and Abolition) Central Rules, 1971, Employer is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by. Contractors, Employer will recover from the contractor, the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of the Government under sub-section(2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, Employer shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by to the contractor whether under this contract or otherwise Employer shall not be bound to contest any claim made against it under subsection (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the Employer full security for all costs for which Employer might become liable in contesting such claim.</p>	
	<p>CLAUSE 19D</p>	
	<p>i)</p>	<p>It shall be the responsibility of the contractor to see that the site under execution is not occupied by anybody unauthorizably</p>

		during the work and is handed over to the Engineer-in-Charge with vacant possession of the site with all works completed. If such site though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said site in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay, the provisions of clause 2 shall be applied by the Employer whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.
	ii)	However, the Employer, through a notice, may require the contractor to remove the illegal occupation any time on or before execution and handing over.
	CLAUSE 19 E	
Contribution of EPF and ESI	The ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. The quoted rate shall be inclusive of these amounts. The contractor shall submit the details of registration of labour for EPF and ESI and documents evidencing these payments shall be submitted every month.	
	CLAUSE 20	
Authorities and Notices	i)	The Contractor shall conform to the provisions of any Act of the Legislature relating to the work, and to the regulations and bye-laws of any authority, and of any water, electric supply and other companies and/or authorities with whose systems the structure is proposed to be connected and shall before making any variations from the Drawing or Specifications that may be necessitated by so conforming give to the Employer written notice, specifying the variation proposed to be made and the reason for making it and apply for instructions thereon.
	ii)	The Contractor shall bring to the attention of the Employer all notices required by the said Acts, regulations or bye-laws to be given to any authority and pay to such authority, or to any public office all fees that may be properly chargeable in respect of the works, and lodge the receipts with the Employer.

	CLAUSE 21
Work not to be sublet. Action in case of insolvency	<p>The whole of the works included in the contract shall be executed by the Contractor and the Contract or any part/share thereof or any interest therein shall not be assigned or sublet without the prior written consent of the Employer, and no undertaking shall relieve the Contractor from the full and entire responsibility of the Contract or from active superintendence of the works during their progress.</p> <p>And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employment of the Employer in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the Employer shall have power to adopt the course specified in Clause 3 hereof in the interest of Employer and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.</p>
	CLAUSE 22
Changes in firm's Constitution to be intimated	<p>Where the contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu undivided family business concern, such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 21 hereof and the same action may be taken, and the same consequences shall ensue as provided in the said Clause 21.</p>
	CLAUSE 23

<p>Contractor to Supply Material, Machinery, Equipment, Tools & Plants etc.</p>	<p>The contractor shall arrange at his own expense all materials (including consumables), all tools, plant, machinery and equipment (hereinafter referred to as T&P) required for execution of the work (Indicative list of T&P as specified in Schedule F). In addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffolding, accessories to reach up to working height level and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefor to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his doing, the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expense may be deducted, from any money due to the contractor, under this contract or otherwise and / or from his security deposit or the proceeds of sale thereof, or of a sufficient portion thereof.</p>
	<p>CLAUSE 24</p>
<p>Settlement of Disputes & Arbitration</p>	<p>Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the</p>

	cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:	
	i)	The decision, opinion, direction, certificate of payment issued by the Engineer-in-Charge in respect of all or any of the excepted matters as provided in the contract shall be final, conclusive and binding on the parties hereto and shall be without appeal. Such decision may be in the form of a final certificate or otherwise.
	ii)	All other disputes and differences of any kind whatsoever arising out of or in connection with the contract or the carrying out of the works (whether during the progress of the works or after their completion and whether before or after the determination abandonment or breach of the contract) shall be referred to and settled by the Competent Authority of the Employer as specified in the schedule 'F'. The designated authority shall state its decision in writing within 28 days from the date of receipt of reference from the contractor.
	iii)	<p>But If the Competent Authority (CA) fails to give his decision within the aforesaid period or if either party be dissatisfied on any matter it may, within 28 days after receiving notice of such decision, give a written notice to the other party requiring that the matters in dispute be arbitrated upon. Such written notice shall specify the matters, which are in dispute or difference of which such written notice has been given. If both the parties agree, a single arbitrator would be appointed for the purpose. In case there is no agreement on the appointment of arbitrator, the employer shall prepare a panel of three person's names and forward to the contractor to select one among them as arbitrator.</p> <p>The arbitrator so appointed/selected shall confine himself only to the dispute/difference referred to him while adjudicating and pronouncing his decision.</p>

	<p>The arbitrator shall make his or their award within one year (or such further extended time as may be decided by him or them as the case may be with the consent of the parties) from the date of entering on the reference. In case during the arbitration proceedings the parties mutually settle or compromise their dispute or difference, on the parties filing their joint memorandum of the settlement or compromise, the arbitrator or the arbitrators as the case may be, shall make an award in terms of such settlement or compromise.</p> <p>Upon any such reference, the decision on the cost incidental to the reference and award respectively shall be in the discretion of the arbitrator as the case may be, who may determine the amount thereof or direct the same to be taxed as between the party and party, and shall direct by whom and to whom and in what manner the same shall be borne and paid. This submission shall be deemed to be a submission to arbitration within the meaning of the Indian Arbitration and Conciliation Act, 1996 or any statutory modification thereof. The award of the arbitrator shall be final and binding on the parties. It is agreed that the Contractor shall not delay the carrying out of the works by reason of any such matter, question or dispute being referred to arbitration, but shall proceed with the works with all due diligence and shall until the decision of the arbitrator is given, abide by the decision of the Employer. No award of the arbitrator shall relieve the Contractor of his obligations to adhere strictly to the Employer's instructions with regard to the actual carrying out of the works. The Employer and the Contractor hereby also agree that arbitration under this clause shall be a condition precedent to any right of action under the contract. The place of Arbitration shall be as specified in Schedule 'F'.</p>
	<p>CLAUSE 25</p>

Contractor to indemnify Employer against Patent Rights	The contractor shall fully indemnify and keep indemnified the Employer against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall himself pay any royalties, license fees etc. which may be payable in respect of any article or part thereof included in the contract or damages cost and charges of all and every sort that may be legally incurred in respect thereof. In the event of any claims made under or action brought against Employer in respect of any such matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise therefrom, provided that the contractor shall not be liable to indemnify the Employer if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.	
	CLAUSE 26	
Nominated Sub-Contractors	i)	All Specialists, Merchants, Tradesman and other executing any work of supplying and fixing any goods for which prime cost prices or provisional sums are included in the Schedule of Quantities and/or Specifications who may be nominated or selected by the Engineer-in-charge are hereby declared to be Sub-Contractors employed by the Contractor and are herein referred to as nominated Sub-Contractors.
	ii)	No nominated Sub-Contractor shall be employed on or in connection with the works against whom the Contractor shall make reasonable objection or (save where the Employer and Contractor shall otherwise agree) who will not enter into a Contract provided:
		a) That the nominated Sub-Contractor shall indemnify the Contractor against the same obligation in respect of the Sub-Contract as the Contractor is under in respect of this contract.

		b)	That the nominated Sub-Contractor shall indemnify the Contractor against claims in respect of any negligence by the Sub-Contractor, his servants or agents or any misuse by him or them of any scaffolding or other plant, the property of the Contractor or under any Workmen's Compensation Act in force.
		c)	Payment shall be made to the nominated Sub-Contractor within fourteen days of his receipt of the Engineer-in-charge's Certificate provided that before any certificate is issued, the Contractor shall, upon request, furnish to the Engineer-in-charge proof that all nominated Sub-Contractor's accounts included in previous Certificates have been duly discharged, on the default whereof, the Employer may pay the same upon a Certificate of the Engineer-in-charge and deduct the amount thereof from any sum due to the Contractor. The exercise of this power shall not create brevity of contract as between Employer and Sub-Contractor.
CLAUSE 27			
Withholding and lien in respect of sum due from contractor		i)	Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Employer shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any deposited by the contractor and for the purpose aforesaid, the Employer shall be entitled to withhold the security deposit, if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the Employer shall be entitled to withhold and have a lien to retain to the extent of such claimed amount or amounts referred to above, from any sum or sums found payable or which may at any time thereafter become

		<p>payable to the contractor under the same contract or any other contract elsewhere with the Reserve Bank of India pending finalization of adjudication of any such claim.</p> <p>It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by Employer will be kept withheld or retained as such by the Employer till the claim arising out of or under the contract is determined by the arbitrator(if the contract is governed by the arbitration clause) or by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Employer shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company as the case may be, whether in his individual capacity or otherwise.</p>
	ii)	<p>Employer shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract, etc., to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over-payment and it shall be lawful for Employer to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of</p>

	such under payment shall be duly paid by Employer to the contractor, without any interest thereon whatsoever.
	CLAUSE 27A
Lien in respect of claims in other Contracts	<p>Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Employer against any claim of the Employer in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Employer or Reserve Bank of India elsewhere.</p> <p>It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Employer will be kept withheld or retained as such by the Employer or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause or by the competent court, as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.</p>
	CLAUSE 28
Return of Surplus materials	<p>Notwithstanding anything contained to the contrary in this contract, where any materials for the execution of the contract are procured with the assistance of Employer by purchases made under orders or permits or licenses issued by Government, the contractor shall hold the said materials economically and solely for the purpose of the contract and not dispose them off without the written permission of the Employer and return it to Employer, if required by the Employer, all surplus materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on being paid or credited such price as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however shall not exceed the purchase price thereof inclusive of applicable taxes and</p>

	<p>other such levies paid by Contractor in respect thereof. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to action for contravention of the terms of the license or permit and/or for criminal breach of trust, be liable to Employer for all moneys, advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach.</p>
	<p>CLAUSE 29</p>
Water for work	<p>The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions:</p> <p>(i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.</p> <p>(ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in- Charge, unsatisfactory.</p>
	<p>CLAUSE 29A</p>
Alternate water arrangements	<p>The contractor shall be allowed to construct temporary wells in the site for taking water for construction purposes only after he has got permission of the Engineer-in- Charge in writing. No charges shall be recovered from the contractor on this account, but the contractor shall be required to provide necessary safety arrangements to avoid any accidents or damage to adjacent buildings, roads and service lines. He shall be responsible for any accidents or damage caused due to construction and subsequent maintenance of the wells and shall restore the ground to its original condition after the wells are dismantled on completion of the work.</p>
	<p>CLAUSE 30</p>

Electric power supply for work	The contractor(s) shall make his/their own arrangements for electric power supply from the concerned authorities / generator etc. required for the work and nothing extra will be paid for the same.
	CLAUSE 31
Insurance in respect of damages to Persons and Property	<p>(i) All insurance policies shall be in the joint names of the Employer and the Contractor (the name of the former being placed first in the policy) and shall be submitted to the Employer.</p> <p>ii) All policies shall be taken before commencement of work (within 14 days of award of work) and shall be maintained valid without any gap till completion of work / completion of Defect Liability Period.</p> <p>iii) In case of non-renewal of policies, Employer has every right to stop the work OR Employer will take the policy and deduct such amount from the bills / any dues to the contractor.</p>
	<p>iv) <u>Contractor's All Risk Policy</u>: The Contractor shall be responsible for all injury or damage to persons, animals or things, and for all damage to property which may arise from any factor omission on the part of the Contractor or any Sub-Contractor or any nominated Sub-Contractor or any of their employees. The liability under this clause shall cover also inter-alia any damage to structures, whether immediately adjacent to the works or otherwise, any damage to roads, streets, footpaths, bridges as well as damage caused to the building and other structures and works forming the subject matter of this contract. The contractor shall also be responsible for any damage caused to the buildings and other structures and works forming the subject matter of this contract due to rain, wind, frost or other inclemency of weather. The Contractor shall indemnify and keep indemnified the Employer and hold him harmless in respect of all and any loss and expenses arising from any such injury or damage to persons or property as aforesaid and also against any claim made in</p>

	<p>respect of injury or damage, whether under any statute or otherwise and also in respect of any award or compensation or damage consequent upon such claims. The Contractor shall, at his own expense, effect and maintain till issue of the virtual completion certificate under this contract, with an insurance company approved by the Employer. This policy shall also cover risk due to earthquake.</p> <p>The Contractor shall reinstate all damage of every sort mentioned in this clause so as to do delivery of the whole of the works complete and perfect in every respect and so as to make good or otherwise satisfy all claims for damage to property or third parties.</p>
	<p>v) <u>Workmen Compensation Policy</u>: The Contractor shall also indemnify and keep indemnified the Employer against all claims which may be made against the Employer by any person in respect of anything which may arise in respect of the works or in consequence thereof and shall at his own expense, effect and maintain until the virtual completion of the contract, with an Insurance Company approved by the Employer a policy of Insurance in the joint names of the Employer and the Contractor (name of the former being placed first in the policy) against such risks and deposit such policy or policies before commencement of the works.</p> <p>The minimum limit of the coverage under the policy shall be Rs.5 lakhs per person for any one accident or occurrence and Rs.10 lakhs in respect of damage to property for any one accident or occurrence. The Contractor shall also indemnify the Employer against all claims which may be made upon the Employer, whether under the Workmen's Compensation Act or any other statute in force, during the currency of this contract or at Common Law in respect of any employee of the</p>

	<p>Contractor or Sub-Contractor and shall at his own expense effect and maintain until the Virtual Completion of the Contract with an Insurance Company approved by the Employer a policy of Insurance against such risks and deposit such policy or policies with the Employer from time to time till the end defect liability period.</p> <p>In default of the Contractor insuring as provided above, the Employer may so insure and may deduct the premiums paid from any money due or which may become due to the Contractor.</p>
vi)	<p>Policy covering accidents to staff, Engineers, supervisors and others who are not governed by Workmen's Compensation Act</p>
	<p>vii) The Contractor shall be responsible for any liability which may not be covered by the insurance policies referred to above and also for all other damages to any person, animal or defective carrying out of this contract, whatever, may be the reasons due to which the damage shall have been caused.</p> <p>The Contractor shall also indemnify and keep indemnified the Employer against all and any costs, charges or expenses arising out of any claim or proceedings relating to the works and also in respect of any award of damage or compensation arising therefrom.</p> <p>Without prejudice to the other rights of the Employer against Contractors in respect of such default, the Employer shall be entitled to deduct from any sums payable to the Contractor the amount of any damages, compensation costs, charges and other expenses paid by the Employer and which are payable by the Contractor under this clause.</p>
	<p>The Contractor shall upon settlement by the insurer of any claim made against the insurer pursuant to a policy taken under this clause, proceed with due diligence to rebuild or repair the works destroyed or damaged. In this event all the money received from the insurer in</p>

	<p>respect of such damage shall be paid to the Contractor and the Contractor shall not be entitled to any further payment in respect of the expenditure incurred for rebuilding or repairing of the materials or goods destroyed or damaged.</p> <p>The Contractor, in case of re-building or reinstatement after damage shall be entitled to such extension of time for completion as the Engineer-in-charge may deem fit, but shall, however, not be entitled to reimbursement by the Employer of any shortfall or deficiency in the amount finally paid by the insurer in settlement of any claim arising as set out herein.</p> <p>Without prejudice to his liability under this clause, the Contractor shall also cause all nominated sub-Contractors to effect, for their respective portions of the works similar policies of insurance in accordance with the provisions of this clause and shall produce or cause to produce to the Employer such policies. The Contractor shall not permit a nominated Sub-Contractor to commence work at the site unless said insurance policies are submitted. In the event of failure, of the Sub-Contractor to take out such policy or policies of insurance before commencing the works at the site, the Contractor shall be responsible for any claim or damage attributable to the said Sub-Contractor.</p>
	<p>CLAUSE 32</p>
<p>Employment of Staff and employees</p>	<p>Contractor's Superintendence and Supervision</p> <p>i) The contractor shall provide all necessary superintendence during execution of the work and all along thereafter as may be necessary for proper fulfilment of the obligations under the contract until the expiry of the "Defects Liability Period" stated in schedule F.</p> <p>ii) The contractor shall provide and employ on the site only such supervisor as are skilled and experienced in their respective fields and competent to give proper supervision of the work.</p> <p>The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work.</p>

	<p>iii) The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer- in-Charge and the persons so removed shall be replaced as soon as possible by competent substitutes.</p> <p>iv) The contractor shall arrange for police verification of the staff and labours before commencement of the work at his own cost.</p>
	<p>CLAUSE 33</p>
<p>Levy/Taxes payable by Contractor</p>	<p>The quoted cost at the rate of percentage above/below/at par shall include all taxes including Goods and Service Tax (GST), levies, cess etc. Any such tax, cess etc. shall be payable by the contractor and Employer shall not entertain any claim whatsoever in this respect.</p> <p>Exemption: However, Labour Cess as per the Building and Other Construction Workers (Regulation of Employment and conditions of Service) Central (Amendment) Rules, 2017 has already been paid by the Bank to the concerned authorities. The bidders shall not include the said cess in their quote</p> <p>If pursuant to or under any law, notification or order any royalty, cess or the like becomes payable by the Employer and does not any time become payable by the contractor to the State Government/ Local authorities in respect of any material used by the contractor in the works, then in such a case, it shall be lawful to the Employer and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the contractor.</p>
	<p>CLAUSE 34</p>

Conditions for reimbursement of levy/taxes if levied after receipt of tenders	i)	All tendered rates shall be inclusive of all taxes, cess and levies payable under respective statutes. However, if any further tax or levy or cess is imposed by Statute, after the last stipulated date for the receipt of tender including extensions, if any, and the contractor thereupon necessarily and properly pays such taxes/levies/cess, the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the Employer (whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of the contractor.
	ii)	The contractor shall keep necessary books of accounts and other substantiating documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the Employer and/or the Engineer-in-Charge and shall also furnish such other information/document as the Engineer-in-Charge may require from time to time.
	iii)	The contractor shall, within a period of fifteen (15) Calendar days of the imposition of any such further tax or levy or cess, give a written notice thereof to the Engineer-in-charge that the same is given pursuant to this condition, together with all necessary information relating thereto.
	CLAUSE 35	
Other Persons employed by Employer	The Employer reserves the right to use premises and any portions of the site for the execution of any work not included in this Contract which it may desire to have carried out by other persons and the Contractor shall allow all reasonable facilities for the execution of such work but shall not be required to provide any plant or material for the execution of such work except by special arrangement with the Employer. Such work shall be carried out in such manner as not to impede the progress of the works included in the Contract and the	

	Contractor shall not be responsible for any damage or delay which may happen to or occasioned by such work.
	CLAUSE 36
If relative working with the Employer, then the contractor not allowed to tender	<p>The contractor shall not be permitted to tender for works in the office of the Employer responsible for award and execution of contracts in which his near relative is posted as an officer (in any grade) or assistant (including Junior Engineer). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Officer of the Employer. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of the Employer. If, however, the contractor is registered in any other organization, he shall be debarred from tendering by the Employer for any breach of this condition.</p> <p>NOTE: By the term "near relatives" is meant wife, husband, parents and grandparents, children and grandchildren, brothers and sisters, uncles, aunts and cousins and their corresponding in-laws.</p>
	CLAUSE 37
No Employee of the Employer to work as Contractor within one year of retirement	No Technical or other officer or assistant (including Junior Engineer) employed with the Employer shall work as a contractor or employee of a contractor for a period of one year after his retirement from the service without the previous permission of Employer in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the Employer as aforesaid, before submission of the tender or engagement in the contractor's service, as the case may be.
	CLAUSE 38
Compensation during warlike situations	The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor

	<p>until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation, the contractor shall when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer-in-Charge, such payments being in addition to compensation up to the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Engineer-in-Charge. The contractor shall be paid for the damages/destruction suffered and for restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the contract. The certificate of the Engineer-in-Charge regarding the quality and quantity of materials and the purpose for which they were collected shall be final and binding on all parties to this contract.</p> <p>Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operations (a) unless the contractor had taken all such precautions against air raid as are deemed necessary by the Engineer-in-Charge (b) for any material etc. not on the site of the work or for any tools, plant, machinery, scaffolding, temporary building and other things not intended for the work.</p> <p>In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the Engineer-in-Charge.</p>
	<p>CLAUSE 39</p>

Direction and approval of Engineer-in-charge	All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.
	CLAUSE 40
	All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of Employer without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.
	CLAUSE 41
Non-Disclosure Pact	<p>The contractor shall not disclose directly or indirectly any information, materials and of the Employer's infrastructure/ system/equipment etc. which may come to the possession or knowledge of the contractor during the course of discharging its contractual obligations in connection with the agreement, to any third party and shall at all times hold the same in strictest confidence. The contractor shall treat the details of the contract as private and confidential, except to the extent necessary to carry out the obligations under it or to comply with applicable laws. The contractor shall not publish, permit to be published, or disclose any particulars of the works in any trade or technical paper or elsewhere without the previous written consent of the Employer. The contractor shall indemnify the Employer for any loss suffered by the Employer as a result of disclosure of any confidential information. Failure to observe the above shall be treated as breach of contract on the part of the contractor and the Employer shall be entitled to claim damages and pursue legal remedies.</p> <p>The contractor shall take all appropriate actions with respect to its employees to ensure that the obligations of non-disclosure of confidential information under this agreement are fully satisfied.</p> <p>The contractor's obligations with respect to non-disclosure and confidentiality will survive the expiry or termination of this agreement for whatever reason.</p>

	CLAUSE 42
Sexual Harassment of women Act, 2013	<p>The Contractor / Agency shall be solely responsible for full compliance with the provisions of “the Sexual Harassment of women at workplace (Prevention, Prohibition and Redressal) Act, 2013”. In case of any complaint of sexual harassment against its employee within the premises of the Bank, the complaint will be filed before the Internal Complaints Committee constituted by the Contractor / Agency of the Contractor / Agency shall ensure appropriate action under the said Act in respect to the complaint.*</p> <p>a) Any complaint of sexual harassment from any aggrieved employee of the contractor against any employee of the Bank shall be taken cognizance of by the Regional Complaints Committee constituted by the Bank.</p> <p>b) The contractor shall be responsible for any monetary compensation that may need to be paid in case the incident involves the employees of the contractor, for instance any monetary relief to Bank’s employee, if sexual violence by the employee of the contractor is proved.</p> <p>c) The contractor shall be responsible for educating its employees about prevention of sexual harassment at workplace and related issues.</p> <p>d) The contractor shall provide a complete and updated list of its employees who are deployed within the Bank’s premises.</p>
	CLAUSE 43
Site Office	<p>Separate site office with toilet facility for Engineer-in-Charge and his representatives with requisite number of tables, chairs, cupboards, desktops, printer, air conditioner/s etc. are to be arranged by the contractor at the site for which no separate payment will be made.</p>

Place:

Date:

Signature of Tenderer with seal

SECTION VI

SPECIAL CONDITIONS OF CONTRACT

General	CLAUSE SC 1	
	i)	Special conditions of Contract shall be read in conjunction with the General Conditions of Contract, specifications of work, drawings and any other documents forming part of this contract, wherever the context so requires.
	ii)	Notwithstanding the sub-divisions of the document into separate sections, schedules, annexures etc., every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the contract so far as it may be practicable to do so.
	iii)	Where any portion of the Special Conditions of Contract is repugnant to or at variance with any provisions of the General Conditions of Contract then unless a different intention appears, the provision(s) of the Special Conditions shall be deemed to override the provision(s) of the General conditions of Contract only of the extent that such repugnance or variations cannot and shall be to the extent that such repugnance or variance cannot be reconciled with the General Conditions of Contract.
	iv)	Wherever it is stated anywhere in this tender document that such and such supply is to be effected or such and such work is to be carried out, it shall be understood that the same shall be effected / carried out by the Contractor at his own cost, unless a different intention is specifically stated.
	v)	The items given in Schedule of Quantities shall be read in conjunction with materials and job specifications and relevant drawings.
Responsibilities of contractor	CLAUSE SC 2	
	i)	The CONTRACTOR shall be entirely responsible for executing the work covered under this Tender document in a safe, efficient and expeditious manner as per the time schedule, specifications, drawings and work aids equipment such as transportation equipment, tools and tackles and the necessary supervisory personnel, skilled, semi-skilled and unskilled labour

		shall be provided by the CONTRACTOR to achieve the monthly/weekly targets and the overall time schedule.
	ii)	The CONTRACTOR shall ensure that local labour, unskilled as well as skilled, to the extent possible and available from local resources are preferably employed on the work.
	iii)	All expenses towards mobilization at site and demobilization including bringing in equipment, work force, materials, dismantling the equipment, clearing the site, etc. shall be deemed to be included in the prices quoted and no separate payments on account of such expenses shall be entertained.
	iv)	It shall be entirely the CONTRACTOR's responsibility to provide, operate and maintain all necessary equipment, scaffoldings and safety gadgets, lifting tackles, tools and appliances to perform the work in a safe and efficient manner and complete all the jobs as per time schedules.
	v)	Preparing approaches and working area for the movement materials shall also be the responsibility of the CONTRACTOR. The CONTRACTOR shall acquaint himself with access availability etc. to provide suitable allowances in his quotation.
	vi)	The procurement and supply in sequence and at the appropriate time of all materials and consumables shall be entirely the CONTRACTOR's responsibility and his/her rates for execution of work will be inclusive of supply of all these items.
	vii)	CONTRACTOR shall take all steps to see that normal functioning of Working Office/Public life/ Public traffic is not affected/obstructed while executing the work. Stacking of materials, equipment, tools and vehicles involved in movement of equipment or materials should not make any hindrance for the movement of other vehicles and people.
	viii)	The works to be undertaken by the Contractor shall inter-alia include the following:
	a)	Preparation of detailed SHOP drawings and AS BUILT drawings wherever applicable.

	b)	Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.
	c)	Contractor shall provide all the shop drawings or layout drawings for all the coordinated services before starting any work or placing any order of any of the services etc. These shop drawings/layout drawings shall be got approved from Engineer-in-charge before implementation and this shall be binding on the Contractor. The Contractor shall submit material submittals along with material sample for approval of Engineer-in-Charge prior to delivery of material at site.
	ix)	Wherever the 'basic rate' for the material is specified, the contractor shall furnish all the paid bills for Employer's verification. The purchase rate shall be got approved from the Engineer-in-charge before purchasing. The adjustment in price shall be made only on measured quantity. No overhead and profit shall be considered on the cost difference. The basic prices are ex-godown and are inclusive of all applicable taxes and duties levied by Local authority / Government and excluding transportation to site, loading, unloading, storing and handling etc. The rate quoted for the items shall include transportation to site, loading, unloading, storing and handling etc.
Role of RBI, Jammu	CLAUSE SC 3	The Reserve Bank of India, Jammu (representative of the Employer [Reserve Bank of India, Mumbai]) shall administer and directly arrange for supervision of works, to test and examine any materials to be used or workmanship employed in connection with the works, monitoring of progress, inspection, certification of bills, making payments and implementation of various terms, conditions and stipulations of the contract.
	CLAUSE SC 4	

Architect	Architect engaged by the Bank will provide the design and drawings pertaining to architectural, structural, MEP etc. Also, the work has to be executed as per the said details and the contractor is bound to accept and execute the works suggested during their supervision a site	
Green building requirements	CLAUSE SC 5	
	The Contractor shall adopt the construction practices and materials in line with the requirements for obtaining highest green building rating from Indian Green Building Council (IGBC) / Green Rating for Integrated Habitat Assessment. Minimum requirements are specified at Section VII. The Contractor shall strictly follow the instructions of Engineer-in-charge in this regard.	
	CLAUSE SC 6	
Inspection of Site	The intending Tenderer shall be deemed to have visited the site and examined the Site and its surroundings and familiarized themselves thoroughly with the site conditions as to the nature of the ground and sub-soil and the form and nature of the Site before submitting the tender. Non familiarity with the site conditions will not be considered as reason either for extra claims or for not carrying out the work in strict conformity with the drawings and specifications. For site visit, the intending Tenderer may contact the Employer.	
Services	CLAUSE SC 7	
	The Contractor shall take due and proper care during execution of work to protect Existing water/electric services from damage. In case, during the execution of work, the Contractor notices some services which require re-routing, the same shall be brought to the notice of the Engineer-in-charge. As per the instructions of Engineer-in-charge, further action for rerouting shall be undertaken. If the Contractor is advised by the Engineer-in-charge to carry out the required re-routing, the work shall be treated as Extra item of work and shall be dealt as per the relevant clause of GCC.	
	CLAUSE SC 8	
	i)	The Contractor shall be required to complete the following

Handing over of site		documentation with regard to the work within fourteen days from the date of award of work:
	a)	Signing of the agreement on adequate value of Non-Judicial stamp paper as per the approved format
	b)	Obtaining and submitting all the required Insurance Policies as specified in the relevant clause of General Conditions of Contract and of specified value mentioned in schedule 'F'
	c)	Submission of the specified Bank Guarantees mentioned in Schedule 'F' or submission of documentary evidence of having instructed his Banker to prepare the specified Bank Guarantee
	d)	Obtaining and submitting the original Labour License or submitting the documentary evidence of having applied to the statutory authority in the prescribed form for Obtaining the Labour License if applicable.
	e)	Submitting the details/ documents of the Contractor's site team as specified in relevant clause of General Conditions of Contract and schedule 'F' for obtaining approval of Engineer-in-charge.
	f)	Submitting the detailed work programme as specified in the relevant clause of General Conditions of Contract for approval of the Engineer-in-charge
	ii)	After complying to the above documentation and other statutory requirements required to be complied by the Contractor before start of work, the Contractor shall be handed over the possession of the site. The scheduled date of commencement of work shall be reckoned as mentioned at Schedule F. However, any delay in handing over the possession of site to the Contractor on account of non-submission of the above documents/ details shall not be considered for extension of time.
CLAUSE SC 9		

Drawings	<p>The CONTRACTOR shall keep one copy of all drawings on the works and Employer or his representative shall at all reasonable time have access to the same. Before the issue of the final certificate to the CONTRACTOR he shall forthwith return to the EMPLOYER all drawings and specifications.</p> <p>Drawings accompanying the tender documents are indicative of the scope or work and issued for tendering purpose only.</p>	
Further drawings and Instructions	CLAUSE SC 10	
	<p>The Engineer-in-Charge shall have full power and authority to supply drawings to the Contractor from time to time during the progress of the Works such further drawings for adequate execution and maintenance of the Works and the Contractor shall carry out and be bound by the same.</p>	
Contractor's Barricades	CLAUSE SC 11	
	i)	Contractor shall erect and maintain at his own cost barricades required in connection with his operation to guard or protect the working area including storage, etc.
	ii)	Barricades and hazardous areas adjacent to but not located in normal routes of travel shall be marked with suitable red markers at night without any extra cost.
	iii)	The Contractor shall also comply with the provisions of Environment Protection Act with regard to air, water & noise pollution.
	iv)	The Contractor shall provide suitable construction safety nets, if applicable, to prevent damage to man / material at site without any extra cost
	v)	Sector 9A: Full height barricading and separation of the work site from the existing residential campus shall be ensured. Labourers are not permitted to the existing residential campus without specific approval from the Engineer-in-Charge or his staff. There shall not be any work / disturbance beyond normal working hours to the residential area unless authorised by the

	Employer.
Site Facilities	CLAUSE SC 12
	CONTRACTOR shall arrange for storage space for keeping own tools/tackles and other materials for performance of work under this contract. The safety and security including safety of materials for erection purpose as well as subsequent removal of the same on completion of 'Work' under this contract are the responsibility of the CONTRACTOR.
	Lighting The CONTRACTOR shall ensure that the entire site is provided with adequate lighting at all times when the work is in progress. He shall also make additional arrangements for lighting for carrying out work at night, whenever required. All costs in this connection shall be borne by him.
	Compressed Air The Contractor shall make his own arrangement for Portable compressors, pumps, temporary piping for compressed air, if required, for the work including all necessary accessories, fittings etc. at his own cost for cleaning, flushing etc.
Execution work Equipment	CLAUSE SC 13
	The CONTRACTOR shall without prejudice to his overall responsibility to execute and complete the work as per specifications and time schedule, progressively deploy adequate and appropriate equipment and tools and tackles and augment the same as decided by the Engineer-in-Charge depending on the requirements of the work so as to suit the work schedule. No equipment shall be supplied by the Employer. Contractor shall assess the actual requirement based on the quantum and nature of work and arrange to provide the same to achieve the progress as per the approved work programme.
	CLAUSE SC 14

Plant etc. to be exclusively for use on the works	i)	All plants, tools and equipment and materials provided by the Contractor shall when brought on to the Site be deemed to be exclusively intended for the execution of work in this document and completion of the Works and the Contractor shall not remove the same or any part thereof (save for the purpose of moving it from one part of the Site to another or moving it outside the site for repairs) without the previous consent in writing of the Engineer-in-Charge which shall not be unreasonably withheld.
	ii)	Clearance of Site on Completion: On completion of the Works, the Contractor shall remove from the Site all the said Constructional Plant, tools and equipment remaining thereon and any unused materials
Care of works /plant/equipment	CLAUSE SC 15	
	<p>From the commencement to the completion of the Works/Plant/Equipment, the Contractor shall take full responsibility for the care thereof and in case any damage loss or injury shall happen to the Works/Plant/Equipment or to any part thereof from any cause whatsoever shall at his own cost repair and make good the same so that at completion the Works/Plant/Equipment shall be in good order and condition and in conformity in every respect with the requirements of the contract.</p> <p>Finished Flooring shall be protected by suitable means while carrying out the work either internally or externally and at no extra cost.</p> <p>Temporary used materials (e.g. Cable, pipe, valve etc.) shall not be used for permanent work. All the bought-out items supplied by the Contractor and billed to Employer shall be considered as Employer's Property and due care shall be taken for safety of these by the contractor till handing over of work.</p>	
Quality Assurance and Quality Control	CLAUSE SC 16	
	i)	The reports of the test shall be submitted to the Engineer-in-charge as and when the tests/ quality assurance & control checks are carried out as per the contract. The Engineer-in-charge, after evaluation of the results of tests may decide to

		either reject or accept the respective materials/ works etc. In case of rejection, the Contractor shall have to replace the defective material/ work at the earliest without any additional cost.
	ii)	In case the CONTRACTOR fails to follow the instructions of Engineer-in-charge in this regard, the Engineer-in-charge may suspend the work till such time the quality of the work is ensured. No compensation for delays on account of such suspension of work shall be considered.
Third Party Quality Audit	CLAUSE SC 17	
	(i)	<p>The work shall be executed at the highest level of quality complying with the specifications, method of execution / work, workmanship and quality standards specified in the latest IS Codes (BIS codes). The quality of the project shall be monitored by the Third Party Quality Auditor/s engaged by the Bank in addition to the monitoring by Engineer-in-Charge and his/her team.</p> <p>The Material Testing and Quality Assurance Plan as suggested / approved by third party quality auditor will be binding to the contractor.</p> <p>The contractor shall follow the instructions of the said auditor and execute / rectify the work as per advice of the auditor / ensure compliance to his/her/their observations.</p>
Materials at Basic Prices/ Basic rates	CLAUSE SC 18	
	i)	For carrying out certain items of work, the tender provides for procurement of certain materials at “Basic Prices/ Basic Rates” as specified in the tender document.
	ii)	While quoting the rates, the Tenderer should base their item rates at “the Basic Prices” wherever specified. The said prices are ex-Godown and are inclusive of all applicable taxes and duties levied by Government or any other statutory body

		and excluding transportation to site, loading, unloading, storing and handling etc. The rate quoted for the items shall include transportation to site, loading, unloading, storing and handling etc. (ex-Godown referred here will be dealer's Godown or Rail head within the Municipal or city limits or the city where the work is being done).
	iii)	The contractor shall obtain written approval from the Engineer-in-charge for material and purchase price before procuring any material for which "Basic Price/ Basic Rate" is specified in the tender Document.
	iv)	Basic Price adjustment shall be done on the measured quantities for the finished items of work with specified "Basic Prices/Rates". While carrying out price adjustments, no other components such as wastage, transportation, loading, unloading, handling, insurance, labour, etc. shall be taken into account.
	v)	The contractor shall submit copies of all tax paid vouchers (original tax paid vouchers shall be shown to the Engineer-in-charge for verification as and when required by him) for full quantity for all items to the Engineer-in-charge in support of their claim for adjustment in Basic Rates/Prices. In absence of these documents, his claim for adjustment in Basic rates/Prices shall not be considered.
Documents to be maintained at site	CLAUSE SC 19	
	a)	The Registers/ Documents specified at Schedule 'D' shall be maintained at site by the Contractor at his own cost and updated regularly.
	b)	These documents shall be available for inspection by Employer's representative or Engineer-in-charge or his representative or third party quality auditor during his/her/their site visit at all reasonable times.

	c)	After completion of work, the Contractor shall submit the duly completed registers/ documents along with all the drawings issued to him for construction purpose to the Engineer-in-charge before submission of the Final bill.
Progress Monitoring by the Engineer-in-charge	CLAUSE SC 20	
	i)	The contractor shall submit his program for approval of Engineer-in-charge within 07 days from the date of award of work as specified in the clause 5 of the Clauses of Contract.
	ii)	On the basis of the approved programme, the Engineer-in-charge shall monitor/ review the progress through site meetings on fortnight interval or earlier, as and when required. The meeting should be attended by the contractor himself (in case of proprietorship firm) or authorized partner/ senior official in case of partnership firm/ limited company along with contractor's site in-charge.
	iii)	For this purpose, the contractor shall prepare and submit a progress report indicating following:
	A	Progress for the previous fortnight (duration under review) and the planning for the next fortnight and materials received during the fortnight (duration under review) and expected to be received during next fortnight.
	B	The reasons for major deviations in planned schedule and the actual progress achieved along with any hindrances/ decisions required from the Employer/ Engineer-in-charge.
	C	Statement of deployment of resources (men and machine) and variations, if any, from the planned schedule
	D	List of Variations / extra items if any carried out during the previous month (period under review)
	CLAUSE SC 21	

Measurement, Billing and Terms of payment	i)	<p>The work shall be measured from time to time as provided in the General Conditions of Contract. The units of measurements shall be as defined in the specific item description in the Schedule of quantities. If for any item or part thereof, physical measurement is not practicable, measurements given in the execution drawings shall be adopted.</p> <p>(ii) As and when the Contractor feels that the gross value of work done after adjustment of the value of work already received in any previous bill and adjustment of advances, if any, has crossed the threshold value specified in the Schedule 'F' for Running Account Bill, he may raise a bill and submit to the Engineer-in-charge for payment. The bill shall invariably be accompanied with following documents:</p>
	a)	The signed measurements, as specified in the General Conditions of Contract.
	b)	The progress reports of the concerned period.
	c)	Test certificates/ reports of any material considered for the first time in the Contractor's bill
	d)	Checklist indicating validity of the labour license, all the Insurance Policies, PBGs
	e)	Documents evidencing the price of materials (e.g. Tax paid vouchers etc.) considered in the bill where Basic Rates are mentioned, as applicable.
	f)	Delivery challans of the materials.
	ii)	The Engineer-in-charge reserves the right to refuse to accept the Running Account bill, if any of the document as above is not submitted along with the bill.
	iii)	Once the bill is received along with all the required documents, the Engineer-in-charge shall arrange to process the bill and the payments due to the Contractor shall be released through NEFT within the specified period for honouring the certificates.
	iv)	After completion of work and completing all the contractual responsibility, the measurement sheets shall be signed jointly by

		the Contractor or his authorized representative and Engineer-in-charge or his authorized representatives. The Contractor shall then submit the Final bill to the Engineer-in-charge. The Final Bill shall necessarily be submitted along with the following documents:
	a)	The signed measurements, as specified in the General Conditions of Contract.
	b)	The copy of last progress report, evidencing the completion of work.
	c)	Test certificates/ reports of any material considered for the first time in the Contractor's bill
	f)	Checklist indicating validity of the labour license, all the Insurance Policies, PBGs
	g)	Documents evidencing the price of materials (eg Tax paid vouchers etc.) considered in the bill where Basic Rates are mentioned, as applicable.
	h)	Delivery challans for the materials
	j)	All the required documents of Guarantees/ warranties (e.g. Structural stability, safety, sturdiness and self-supportiveness etc. of system as mentioned in the specifications of respective items)
	k)	"No claim" certificate by the Contractor except as included in the Final bill.
	l)	Completion plans/ drawings/ details as specified in the General Conditions of Contract
	v)	The Engineer-in-charge reserves the right to refuse to accept the Final bill, if any of the document, as above, is not submitted along with the bill.
	vi)	Once the Final bill is received along with all the required documents, the Engineer-in-charge shall arrange to process the bill and the payments due to the Contractor shall be released through NEFT within the specified period for honouring the

		certificates. No revised Final Bill shall be considered by the Employer.
	vii)	All statutory deductions shall be made from the payments due to the Contractor.
	Clause SC 22	
Other Conditions [to be complied with while working at site]	(i)	Contractor and / or any of their representative, labour etc. shall not encroach upon the residential area adjoining the worksite.
	(iii)	Labours shall not be allowed to work between 10.00 PM to 7.00 AM within the site
	(iv)	Contractor shall clear the debris only in gunny bags within the prescribed hours i.e. between 7.00 PM to 10.00 PM. Contractor shall not be allowed to store any debris in the common compound of society or lobby or on the ground floor.
	(v)	The materials shall be allowed to be carried in or out only between 7.00 PM to 10.00 PM. Truck/Tempo shall not be allowed within Society compound.
	(vi)	All COVID related precaution and protocols shall be followed by the Contractor, their all representatives and labours etc.

Signature of Tenderer with seal

Place:

Date:

SECTION VII

SPECIFIC PROVISIONS

1. SPECIAL CONDITIONS FOR CEMENT:

- 1.1. The contractor shall procure 43 grade Ordinary Portland Cement (OPC) conforming to IS: 8112/Portland Pozzolana Cement (PPC) conforming to IS: 1489 (Part-I) as required in the work, from reputed manufacturers of cement, such as ACC, Ultratech, Vikram, Shree Cement, Ambuja, Jaypee Cement, Century Cement, J.K. Cement **or from any other reputed cement Manufacturer having a production capacity not less than one million tonnes per annum as approved by Bank's Engineer in Charge.**

The tenderers may also submit a list of names of cement manufacturers which they propose to use in the work. The tender accepting authority reserves right to accept or reject name(s) of cement manufacturer(s) which the tenderer proposes to use in the work. No change in the tendered rates will be accepted if the tender accepting authority does not accept the list of cement manufacturers, given by the tenderer, fully or partially.

Supply of cement shall be made in 50 kg. bags bearing manufacturer's name and ISI marking. Samples of cement arranged by the contractor shall be taken by the Engineer-in-Charge and got tested in accordance with provisions of the relevant BIS codes. In case the test results indicate that the cement arranged by the contractor does not confirm to the relevant BIS code the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer-in-charge to do so.

- 1.2. The cement shall be brought at site in bulk supply of approximately **50 tonnes** or as decided by the Engineer-in-Charge.
- 1.3. The cement go-down of the capacity to store a minimum of **2000 bags** of cement shall be constructed by the contractor at site of work for which no extra payment shall be made.
- 1.4. Double lock provision shall be made to the door of the cement godown. The keys of one lock shall remain with the Engineer-in-charge or his authorized representative and the key of the other lock shall remain with the contractor. The contractor shall be responsible for the watch and ward and safety of the

cement godown. The contractor shall facilitate the inspection of the cement godown by the Engineer-in-Charge at any time.

- 1.5. The cement shall be got tested by the Engineer-in-Charge and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to test laboratories.

The cost of tests shall be borne by the contractor/ Bank in the manner indicated below:

- a) By the contractor, if the results show that the cement does not conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.
 - b) By the department, if the results show that the cement conforms to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.
- 1.6. The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in clause 42 of CPWD General Condition of Contract (Construction Work) 2020 and shall be governed by conditions laid therein. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at the rate show prescribed shall be made. In case of excess consumption, no adjustment need to be made.
 - 1.7. The cement brought to site and the cement remaining unused after completion of the work shall not be removed from site without the written permission of the Engineer-in-Charge.
 - 1.8. The damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-in-Charge. If he does not do show within three days of receipt of such notice, the Engineer-in-Charge shall get it removed at the cost of the contractor.
 - 1.9. Cement bags shall be stored in separate godowns to be constructed by the contractor at his own cost as per sketch (which is only indicative and actual

size will depend on the site requirements) given in CPWD specifications with weather proof roofs and walls. Each godown shall be provided with a single shutter door with two locks. The key of one lock shall remain with Engineer-in-charge or his authorized representative and that of the other lock with the authorized agent of the contractor at the site of work so that the cement is issued from the godown according to the daily requirements with the knowledge of both parties and proper account for the same is maintained in the standard proforma.

- 1.10. Separate cement registers showing the receipt of the OPC and PPC shall be maintained at site. The contractor shall construct separate godowns for storage of OPC & PPC at site and nothing extra on this account shall be payable.
- 1.11. In order to have an effective control over the issue of cement, the following drill should be observed:
 - (i) The cement godown(s) should be properly and effectively double locked, keys of one of the locks remaining with the Bank and that of the other with the contractor.
 - (ii) The pages of the Cement Register should be as per Appendix-30 of CPWD Works Manual, machine numbered and each page initialed by the Engineer-in-Charge.
 - (iii) Periodical checking of cement godown.: The cement godown and the Cement Register should be checked by the Engineer-in-Charge of the work as per following schedule:
 - a) At least weekly or fortnightly, respectively, in case of works at the headquarters of the Engineer-in-Charge.

2. SPECIAL CONDITIONS FOR STEEL REINFORCEMENT BARS:

- 2.1. The Contractor shall procure IS marked TMT bars of various grades from Primary Steel manufacturer such as **SAIL, Tata Steel Ltd, RINL, Jindal Steel & Power Ltd and JSW Steel Ltd** or any other steel manufacturer or their authorized dealers (as per following selection criteria) having valid BIS license for IS:1786-2008 (Amendment -1 November 2012).

- 2.2. The contractor shall have to obtain and furnish test certificates to the Engineer-in-charge in respect of all supplies of steel brought by him to the site of work.
- 2.3. Samples shall also be taken and got tested by the Engineer-in-Charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to the specifications, the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week time or written orders from the Engineer-in-Charge to do so.
- 2.4. The steel reinforcement bars shall be brought to the site in bulk supply of **10 tonnes** or more as decided by the Engineer-in-charge.
- 2.5. The steel reinforcement shall be stored by the contractor at site of work in such a way as to prevent distortion and corrosion and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.
- 2.6. For checking nominal mass, tensile strength, bend test, re-bend test etc. specimen of sufficient length shall be cut from each size of the bar at random at frequency not less than that specified below:

Size of bar	For consignment below 100 tonnes	For consignment above 100 tonnes
Under 10mm dia. Bars	One sample for each 25 tonnes or part thereof	One sample for each 40 tonnes or part thereof
10mm to 16mm dia bars	One sample for each 35 tonnes or part thereof	One sample for each 45 tonnes or part thereof
Over 16mm dia bars	One sample for each 45 tonnes or part thereof	One sample for each 50 tonnes or part thereof

- 2.7. The contractor shall supply free of charge the steel required for testing including transportation to testing laboratories. The cost of tests shall be borne by the contractor.

- 2.8. The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of steel shall be worked out as procedure prescribed in clause 42 of the contract and shall be governed by conditions laid therein. In case the consumption is less than theoretical consumption including permissible variations recovery at the rate so prescribed shall be made. In case of excess consumption, no adjustment need to be made.
- 2.9. Steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge.
- 2.10. Steel bars brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use.
- 2.11. In case the contractor brings surplus quantity of steel the same after completion of the work will be removed from the site by the contractor at his own cost after approval of the Engineer-in-Charge.
- 2.12. Reinforcement including authorized spacer bars and overlaps shall be measured in length of different diameters, as actually (not more than as specified in the drawing) used in the work, nearest to a centimeter. Wastage and unauthorized overlaps shall not be measured.
- 2.13. The standard sectional weights referred to as in Table 5.4 under para 5.3.4 in CPWD Specifications for works 2019 Vol. 1 will be considered for conversion of length of various sizes of MS bars, Tor steel bars and TMT bars into standard weight.
- 2.14. Records of actual sectional weight shall also be kept dia-wise & lot-wise. The average sectional weight for each diameter shall be arrived at from samples from each lot of steel received at site. The decision of the Engineer-in-Charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute one single lot for the purpose. The weight of steel by conversion of length of various sizes of bars based on the actual weighted average sectional weight shall be termed as derived actual weight.

- 2.15. If the derived weight as in para 2.14 above is lesser than the standard weight as in para 2.13 above, the derived actual weight shall be taken for payment. If the derived actual weight is found more than the standard weight then the standard weight as worked out in para 2.13 above shall be taken for payment. In such case nothing extra shall be paid for the difference between the derived actual weight and the standard weight.
- 2.16. Mixing of different type of steel/different grades of steel shall not be allowed in the same structural members as main reinforcement to satisfy clause 26.1 of IS:456.
- 2.17. Tolerances on Nominal Mass (individual sample) shall be as under:

S. No.	Nominal size mm	Tolerances on the Nominal Mass (in %age)
1	Upto and including 10 mm	-8%
2	Over 10 upto & including 16 mm	-6%
3	Over 16 mm	-4%

3. SPECIAL CONDITIONS FOR PREVENTION OF AIR POLLUTION AS PER DIRECTIVES OF NATIONAL GREEN TRIBUNAL (NGT):

- 3.1. The contractor shall not store/dump construction material or debris on metalled road.
- 3.2. The contractor shall get prior approval from Engineer-in-charge for the area where the construction material or debris can be stored beyond the metalled road. This area shall not cause any obstruction to the free flow of traffic/inconvenience to the pedestrians. It should be ensured by the contractor that no accidents occur on account of such permissible storage.
- 3.3. The contractor shall take appropriate protection measures like raising wind breakers of appropriate height on all sides of the plot/area using CGI sheets or plastic and/or other similar material to ensure that no construction material dust fly outside the plot area.

- 3.4. The contractor shall ensure that all the trucks or vehicles of any kind which are used for construction purpose or are carrying construction material like cement, sand and other allied materials are fully covered. The contractor shall take all necessary precautions that the vehicles are properly cleaned and dust free to ensure that enroute their destination, the dust, sand or any other particles are not released in air / contaminate air.
- 3.5. The contractor shall provide mask to every worker working on the construction site and involved in loading, unloading and carriage of construction material and construction debris to prevent inhalation of dust particles.
- 3.6. The contractor shall provide all medical help, investigation and treatment to the workers involved in the construction of building and carry of construction material and debris relatable to dust emission.
- 3.7. The contractor shall ensure that C&D waste is transported to the C&D waste site only and due record shall be maintained by the contractor.
- 3.8. The contractor shall ensure compulsory use of wet jet in grinding and stone cutting.
- 3.9. The contractor shall comply all the preventive and protective environmental steps as stated in the MoEF guidelines, 2010.
- 3.10. The contractor shall carry out on road inspection for black smoke generating machinery. The contractor shall use cleaner fuel.
- 3.11. The contractor shall ensure that all DG sets comply emission norms notified by MoEF.
- 3.12. The contractor shall use vehicles having pollution under control certificate. The emissions can be reduced by a large extent by reducing the speed of a vehicle to 20 KMPH. Speed bumps shall be used to ensure speed reduction. In cases where speed reduction cannot effectively reduce fugitive dust, the contractor shall divert traffic to nearby paved areas.
- 3.13. The contractor shall ensure that the construction material is covered by tarpaulin. The contractor shall take all other precaution to ensure that no dust particles are permitted to pollute air quality as a result of such storage.

- 3.14. The paving of the path for plying of vehicles carrying construction material is more permanent solution to dust control and suitable for longer duration projects.

4. SPECIAL CONDITIONS FOR GREEN BUILDING PRACTICE:

The building/project is targeted to obtain Green Building Certification and for achieving this the contractor shall strictly adhere to the following conditions as part of his contractual obligations:

4.1. SITE

- 4.1.1. The contractor shall ensure that adequate measures are taken for the prevention of erosion of the top soil during the construction phase. The contractor shall implement the Erosion and Sedimentation Control Plan (ESCP) provided to him by the Engineer in Charge as part of the larger Construction Management Plan (CMP). The contractor shall obtain the Erosion and Sedimentation Control Plan (ESCP) Guidelines from the Engineer in Charge and then prepare working plan for the following month activities as a CAD drawing showing the construction management, staging & ESCP. At no time soil should be allowed to erode away from the site and sediments should be trapped where necessary.
- 4.1.2. The contractor shall ensure that all the top soil excavated during construction works is neatly stacked and is not mixed with other excavated earth. The contractors shall take the clearance of the Engineer in Charge before any excavation. Top soil should be stripped to a depth of 20 cm from the areas to be disturbed, for example proposed area for buildings, roads, paved areas, external services and area required for construction activities etc. It shall be stockpiled to a maximum height of 40 cm in designated areas, covered or stabilized with temporary seeding for erosion prevention and shall be reapplied to site during plantation, landscaping etc. of the proposed vegetation. Top soil shall be separated from subsoil, debris and stones larger than 50 mm diameter. The stored top soil may be used as finished grade for planting areas.
- 4.1.3. The contractor shall carry out the recommendations of the soil test report for improving the soil under the guidance of the landscape consultant who

would also advise on the timing of application of fertilizers and warn about excessive nutrient levels.

- 4.1.4. The contactor shall carry out post-construction placement of topsoil or other suitable plant material over disturbed lands to provide suitable soil medium for vegetative growth. Prior to spreading the topsoil, the sub-grade shall be loosened to a depth of 50mm to permit bonding. Topsoil shall be spread uniformly at a minimum compacted depth of 50mm on grade 1:3 or steeper slopes, a minimum depth of 100mm on shallower slopes. A depth of 300mm is preferred on relatively flatter land.
- 4.1.5. The Contractor should follow the construction plan as proposed by the Architect / Engineer in Charge to minimize the site disturbance such as soil pollution due to spilling. Use staging and spill prevention and control plan to restrict the spilling of the contaminating material on site. Protect top soil from erosion by collection storage and reapplication of top soil, constructing sediment basin, contour trenching, mulching etc.
- 4.1.6. No excavated earth shall be removed from the campus unless suggested otherwise by Engineer in Charge. All subsoil shall be reused in backfilling/landscape, etc as per the instructions of the Engineer in Charge. The surplus excavated earth shall be disposed of by the contractor at his own cost for reuse after approval from E-in-C. A certificate of reuse as required by the Engineer-in-Charge shall be submitted by the contractor.
- 4.1.7. The contractor shall not change the natural gradient of the ground unless specifically instructed by the Engineer in Charge. This shall cover all-natural features like water bodies, drainage gullies, slopes, mounds, depressions, etc. Existing drainage patterns through or into any preservation area shall not be modified unless specifically directed by the Engineer-in-charge.
- 4.1.8. The contractor shall not carry out any work which results in the blockage of natural drainage.
- 4.1.9. The contractor shall ensure that existing grades of soil shall be maintained around existing vegetation and lowering or raising the levels around the vegetation is not allowed unless specifically directed by the Engineer-in-charge

4.1.10. Contractor shall reduce pollution and land development impacts from automobiles use during construction.

4.1.11. Overloading of trucks is unlawful and creates the erosion and sedimentation problems, especially when loose materials like stone dust, excavated earth, sand etc. are moved. Proper covering must take place. No overloading shall be permitted.

4.2. CONSTRUCTION PHASE AND WORKER FACILITIES

4.2.1. The contractor shall specify and limit construction activity in preplanned/ designated areas and shall start construction work after securing the approval for the same from the Engineer in Charge. This shall include areas of construction, storage of materials, and material and personnel movement.

4.3. PRESERVE AND PROTECT LANDSCAPE DURING CONSTRUCTION

4.3.1. The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damage to roots should be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash, oil, paint, and other materials detrimental to plant health. These activities should be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not to be permitted.

4.3.2. The contractor shall take steps to protect trees or saplings identified for preservation within the construction site using tree guards of approved specification.

4.3.3. The contractor shall conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity. Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) approved by Engineer-in-Charge. All the existing trees should be preserved, if not possible than compensate the loss by re-planting trees in the proportion of 1:3.

- 4.3.4. The contractor shall avoid cut and fill in the root zones, through delineating and fencing the drip line (the spread limit of a canopy projected on the ground) of all the trees or group of trees. Separate the zones of movement of heavy equipment, parking, or excessive foot traffic from the fenced plant protection zones.
- 4.3.5. The contractor shall ensure that maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy. The preserved vegetated area shall be inspected by the Landscape Architect / Architect / Engineer-in-charge at regular intervals so that they remain undisturbed. The date of inspection, type of maintenance or restorative action followed shall be recorded in the logbook
- 4.3.6. Contractor shall be required to develop and implement a waste management plan, quantifying material diversion goals. He shall establish goals for diversion from disposal in landfills and incinerators and adopt a construction waste management plan to achieve these goals. A project-wide policy of "Nothing leaves the Site" should be followed. In such a case when strictly followed, care would automatically be taken in ordering and timing of materials such that excess doesn't become "waste". The Contractor's ingenuity is especially called towards meeting this prerequisite/ credit (IGBC Green new buildings v-3). Consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area(s) on the construction site for segregated or commingled collection of recyclable material, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. The diversion may include donation of materials to charitable organizations and salvage of materials on-site.
- 4.3.7. Contractor shall collect all construction waste generated on site. Segregate these wastes based on their utility and examine means of sending such waste to manufacturing units which use them as raw material or other site which require it for specific purpose. Typical construction debris could be broken bricks, steel bars, broken tiles, spilled concrete and mortar etc. The contractor shall maintain record of all construction waste sent for recycling

by means of site challans/receipts with waste quantity mentioned in weight or volume.

4.3.8. The contractor shall provide potable water for all workers. The contractor shall maintain monthly test reports highlighting that water is fit for drinking.

4.3.9. The contractor shall provide the minimum level of sanitation and safety facilities for the workers at their camp/labour site. The contractor shall ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water and latrines and urinals as per applicable standard. Adequate toilet facilities shall be provided for the workman within easy access of their place of work. The total no. to be provided shall not be less than 1 per 30 employees in any one shift. Toilet facilities shall be provided from the start of building operations, connection to a sewer shall be made as soon as practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling objects. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided. Natural or artificial illumination shall be provided.

4.3.10. The contractor shall ensure that air pollution due to dust/generators is kept to a minimum, preventing any adverse effects on the workers and other people in and around the site. The contractor shall ensure proper screening, covering stockpiles, covering brick and loads of dusty materials, wheel-washing facility, gravel pit, and water spraying. Contractor shall ensure the following activities to prevent air pollution during construction:

- Clear vegetation only from areas where work will start right away
- Vegetate / mulch areas where vehicles do not ply.
- Apply gravel / landscaping rock to the areas where mulching / paving is impractical
- Identify roads on-site that would be used for vehicular traffic. Upgrade vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral types that make up the surface & base. Add surface gravel to reduce source of dust emission. Limit of fine particles (smaller than 0.075mm) – 10 to 20%.

- Water spray, through a simple hose for small projects, to keep dust under control. Fine mists should be used to control fine particulate. However, this should be done with care so as not to waste water. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't get plugged. Water spraying shall be done on:
 - Any dusty materials before transferring, loading and unloading
 - Area where demolition work is being carried out
 - Any un-paved main haul road
 - Areas where excavation or earth moving activities are to be carried out
- The contractor shall ensure that the speed of vehicles within the site is limited to 10 km/hr.
- All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust / particulate emissions.
- Spills of dirt or dusty materials will be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained / leaned up immediately before they can infiltrate into the soil / ground or runoff in nearby areas
- Provide barricading of **6 meters** or higher as per direction of Engineer-in-charge, along the site boundary, next to a road, around batching plant or other public area.
- Provide dust screens, sheeting or netting to scaffold along the perimeter of the building
- Cover stockpiles of dusty material with impervious sheeting

- Cover dusty load on vehicles by impervious sheeting before they leave the site
- 4.3.11. Contractor shall be required to provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics, and metals. He shall coordinate the size and functionality of the recycling areas with the anticipated collections services for glass, plastic, office paper, newspaper, cardboard, and organic wastes to maximize the effectiveness of the dedicated areas. Consider employing cardboard balers, aluminum can crushers, recycling chutes, and collection bins at individual workstations to further enhance the recycling program
- 4.3.12. The contractor shall ensure that no construction leachate (e.g. cement slurry etc.), is allowed to percolate into the ground. Adequate precautions are to be taken to safeguard against this including, reduction of wasteful curing processes, collection, basic filtering and reuse. The contractor shall follow requisite measures for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant-laden water directly to the treatment device or facility (municipal sewer line).
- 4.3.13. Staging (dividing a construction area into two or more areas to minimize the area of soil that will be exposed at any given time) should be done to separate undisturbed land from land disturbed by construction activity and material storage.
- 4.3.14. The contractor shall comply with the safety procedures, norms and guidelines (as applicable) as outlined in the document Part 7 Constructional practices and safety, 2005, National Building code of India, Bureau of Indian Standards. A copy of all pertinent regulations and notices concerning accidents, injury and first-aid shall be prominently exhibited at the work site. Depending upon the scope & nature of work, a person qualified in first-aid shall be available at work site to render and direct first-aid to casualties. A telephone may be provided to first-aid assistant with telephone numbers of

the hospitals displayed. Complete reports of all accidents and action taken thereon shall be forwarded to the competent authorities.

4.3.15. The contractor shall ensure the following activities for construction workers safety, among other measures as specified in NBC-2016:

- Guarding all parts of dangerous machinery.
- Precautionary signs for working on machinery
- Maintaining hoists and lifts, lifting machines, chains, ropes, and other lifting tackles in good condition.
- Durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.
- Ensuring that walking surfaces or boards at height are of sound construction and are provided with safety rails or belts.
- Provide protective equipment; helmets etc.
- Provide measures to prevent fires. Fire extinguishers and buckets of sand to be provided in the fire-prone area and elsewhere.
- Provide sufficient and suitable light for working during night time.

4.3.16. The storage of material shall be as per standard good practices as specified in Part 7, Section 3 – Storage, stacking and Handling practices, NBC-2016 and shall be to the satisfaction of the Engineer in Charge to ensure minimum wastage and to prevent any misuse, damage, inconvenience or accident. Watch and ward of the Contractor's materials shall be his own responsibility. There should be a proper planning of the layout for stacking and storage of different materials, components and equipment with proper access and proper maneuverability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components and equipment at different stages of construction shall be considered.

4.3.17. The contractor shall provide for adequate number of garbage bins around the construction site and the workers facilities and will be responsible for the proper utilization of these bins for any solid waste generated during the construction. The contractor shall ensure that the site

and the workers facilities are kept litter free. Separate bins should be provided for plastic, glass, metal, biological and paper waste and labelled in both Hindi and English with suitable symbols.

- 4.3.18. The contractor shall prepare and submit spill prevention and control plans. Before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.
- 4.3.19. Contractor shall collect & submit the relevant material certificates for materials with high recycled (both post-industrial and post-consumer) content, including materials like RMC mix with fly-ash, glass with recycled content, calcium silicate boards etc.
- 4.3.20. Contractor shall collect the relevant material certificates for rapidly renewable materials such as bamboo, wool, cotton insulation, agrifiber, linoleum, wheat board, strawboard and cork etc.
- 4.3.21. Contractor shall adopt an IAQ (Indoor Air Quality) management plan to protect the HVAC system during construction, control pollutant sources, and interrupt pathways for contamination. He shall sequence installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile, and gypsum wallboard. He shall also protect stored on-site or installed absorptive materials from moisture damage.
- 4.3.22. The contractor shall ensure that a flush out of all internal spaces is conducted prior to handover. This shall comprise an opening of all doors and windows for 14 days to vent out any toxic fumes due to paints, varnishes, polishes, etc.
- 4.3.23. Contractor shall make efforts to reduce the quantity of indoor air contaminants that are odorous or potentially irritating harmful to the comfort and well-being of installer and building occupants. Contractor shall ensure that the VOC (Volatile Organic Compounds) content of paints, coatings and primers used must not exceed the VOC content limits mentioned below:

Paints:

Non-flat – 150 g/L

Flat (Mat) – 50 g/L

Anti-corrosive/ anti rust – 250 g/L

Coatings / Clear wood finishes:

Varnish – 350 g/L

Lacquer – 550 g/L

Floor coatings – 100 g/L

Stains – 250 g/L

Sealers:

Waterproofing sealer – 250 g/L

Sanding sealer – 275 g/L

Other sealers – 200 g/L

The VOC (Volatile Organic Compounds) content of adhesives and sealants used must be less than VOC content limits mentioned:

Architectural Applications VOC Limit (g/l less water)

Indoor Carpet adhesives – 50 g/L

Carpet Pad Adhesives – 50 g/L

Wood Flooring Adhesive – 100 g/L

Rubber Floor Adhesives – 60 g/L

Sub Floor Adhesives – 50 g/L

Ceramic Tile Adhesives – 65 g/L

VCT and Asphalt Tile adhesives – 50 g/L

Dry Wall and Panel Adhesives – 50 g/L

Structural Glazing Adhesives – 100 g/L

Multipurpose Construction Adhesives – 70 g/L

Substrate Specific Application VOC Limit (g/l less water)

Metal to Metal – 30 g/L

Plastic Foams – 50 g/L

Porous material (except wood) – 50 g/L

Wood – 30 g/L

Fiber Glass – 80 g/L

4.3.24. Wherever required, Contractor shall meet and carry out documentation of all activities on site, supplementation of information, and submittals in accordance with IGBC LEED India New Construction v3.0 (or latest amendment) or GRIHA program standards and guidelines. Towards meeting the aforementioned building environmental rating standard(s) expert assistance shall be provided to him up on request.

4.4. **WATER USE DURING CONSTRUCTION**

4.4.1. Contractor should spray curing water on concrete structure and shall not allow free flow of water. Concrete structures should be kept covered with thick cloth/gunny bags and water should be sprayed on them. Contractor shall do water ponding on all sunken slabs using cement and sand mortar.

4.4.2. The Contractor shall remove from site all rubbish and debris generated by the Works and keep Works clean and tidy throughout the Contract Period. All the serviceable and non-serviceable (malba) material shall be segregated and stored separately. The malba obtained during construction shall be collected in well-formed heaps at properly selected places, keeping in a view safe condition for workmen in the area. Materials which are likely to cause dust nuisance or undue environmental pollution in any other way, shall be removed from the site at the earliest and till then they shall be suitable covered. Glass & steel should be dumped or buried separately to prevent injury. The work of removal of debris should be carried out during day. In case of poor visibility artificial light may be provided.

4.5. **MATERIALS & FIXTURES FOR THE PROJECT**

4.5.1. The contractor shall endeavor to source most of the materials for construction at this project from a distance of 400 km radius from the project site. Contractor shall collect the relevant material certificates to prove the same.

4.5.2. Any material that is to be sourced from outside the prescribed radius shall be done after securing the necessary approval from the Engineer-in-charge.

4.5.3. Unless otherwise specified, the contractor shall comply following:

- All cement used at site for reinforced concrete, precast members, mortar, plaster, building blocks, etc shall be PPC (Portland Pozzolana Cement). The PPC must meet the requirements of IS 1489: 1991. Replacement of cement with fly ash in PPC (Portland Pozzolana Cement) used in the overall RC for meeting the equivalent strength requirements shall be carried out.
- The contractor has to comply as per MoEF issued notification 8.0.763€ dated 14th Sept.1999 containing directive for greater fly ash utilization, where it stipulates that every construction agency engaged in the construction of buildings within a radius of 50 km radius of a Thermal Power Plant, have to use of 100% flyash based bricks/blocks in their construction. Any brick/block containing more than 25% fly ash is designated as fly ash brick/block. As per IGBC credits, bricks / blocks should contain a percentage of fly ash.
- The contractor shall ensure that all paints, polishes, adhesives and sealants used both internally and externally, on any surface, shall be Low VOC products. The contractor shall get prior approval from the Engineer-in-charge before the application of any such material.
- All plumbing and sanitary fixtures installed shall be as per the direction of the Engineer-in-charge and shall adhere to the minimum LPM (liters per minute) and LPF (liters per flush) mentioned.
- The contractor shall employ 100% zero ODP (ozone depletion potential) insulation; HCFC (hydro-chlorofluorocarbon)/ and CFC (chlorofluorocarbon) free HVAC and refrigeration equipment and/halon-free fire suppression and fire extinguishing systems.

4.6. **RESOURCES CONSUMED DURING CONSTRUCTION**

4.6.1. The contractor shall ensure that the water and electricity is not wasted during construction. The Engineer in Charge can bring to the attention any

such wastage and the contractor will have to ensure that such bad practices are corrected.

- 4.6.2. The contractor shall install necessary meters and measuring devices to record the consumption of water, electricity and diesel on a monthly basis for the entire tenure of the project.
- 4.6.3. The contractor shall ensure that all run-off water from the site, during construction is collected and reused to the maximum.
- 4.6.4. The contractor shall use treated recycled water of appropriate quality standards for construction, if available.
- 4.6.5. No lights shall be turned on during the period between 6:00 AM to 6:00 PM, without the permission of the Engineer-in-charge.
- 4.6.6. The contractor is encouraged to use bio-diesel in place of petroleum diesel for the running of generators during construction

4.7. **CONSTRUCTION WASTE**

- 4.7.1. Contractor shall ensure that wastage of construction material is within 3%.
- 4.7.2. All construction debris generated during construction shall be carefully segregated and stored in a demarcated waste yard. Clear, identifiable areas shall be provided for each waste type. Employ measures to segregate the waste on site into inert, chemical, or hazardous wastes.
- 4.7.3. All construction debris shall be used for road preparation, back filling, etc, as per the instructions of the Engineer in Charge, with necessary activities of sorting, crushing, etc.
- 4.7.4. No construction debris shall be taken away from the site, without the prior approval of the Engineer in Charge.
- 4.7.5. The contractor shall recycle the unused chemical/hazardous wastes such as oil, paint, batteries, and asbestos.
- 4.7.6. If and when construction debris is taken out of the site, after prior permissions from the Engineer in Charge, then the contractor shall ensure the safe disposal of all wastes and will only dispose of any such construction waste in approved dumping sites.

4.7.7. Inert waste to be disposed of at Municipal Corporation/ local bodies landfill sites.

4.8. **DOCUMENTATION**

4.8.1. The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer in Charge on a monthly basis:

- (i) Water consumption in litres
- (ii) Electricity consumption in kwh units
- (iii) Diesel consumption in litres
- (iv) Quantum of waste (volumetric/weight basis) generated at site and the segregated waste types divided into inert, chemical and hazardous wastes.
- (v) Digital photo documentation to demonstrate compliance of safety guidelines as specified here and in the Appendix on Safety Conditions.

4.8.2. The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer in Charge on daily basis:

- (i) Quantities of material brought into the site, including the material issued to the contractor by the Engineer-in-charge.
- (ii) Quantities of construction debris (if at all) taken out of the site
- (iii) Digital photographs of the works at site, the workers facilities, the waste and other material storage yards, pre-fabrication and block making works, etc as guided by the Engineer in Charge.
- (iv) No. of different categories of labours deployed at site for work (shift wise).

4.8.3. The contractor shall submit a document after construction of the buildings, a brief description along with photographic records to show that other areas have not been disturbed during construction. The document should also include brief explanation and photographic records to show erosion and sedimentation control measures adopted. (Document CAD drawing showing site plan details of existing vegetation, existing buildings, existing

slopes and site drainage pattern, staging and spill prevention measures, erosion and sedimentation control measures and measures adopted for top soil preservation during construction.

- 4.8.4. The contractor is required to submit following documents for IGBC submission to achieve desired rating in due time.

Submi- ssion No	Project Stage
1	Excavation Work Completed
2	Above Ground Structure 50% Completed
3	Structure Work 90% completed
4	Masonry Work 90% completed
5	Roof Insulation 100% completed
6	Interior Finishing 90% Completed (Flooring, False ceiling, Wall Tiles, Wall Panelling, paint, polish etc)
7	Low Side HVAC 90% completed
8	High Side HVAC 100% completed
9	External Glazing 100% Completed
10	Electrical Works 90% completed (Installation of Interior & exterior lighting, transformers, LT panels, energy meters etc)
11	STP Installation & commissioning completed
12	Renewable Energy Systems Installation completed (Solar PV Panels, Solar Hot Water etc)
13	Outdoor Paving completed 100% (Open Parking, Footpath, Internal Roads etc)
14	Landscape Plantation 100% Completed (Trees, Plants, Grass, Ground Covers, Shrubs etc)

15	Project completion & All Electrical, Mechanical & Plumbing equipment commissioning	
S.N.	Documents List	Submission
1	<p>Site Management Plan highlighting following strategies</p> <p>Excavation area for building foundations.</p> <ol style="list-style-type: none"> i. Extent of construction activity area on site ii. Area of stacked Top soil for preservation & its quantity in cubic meter iii. Labour hutment & no. of workers (men/women) iv. Drinking water near construction area and labour hutment v. Toilets for gents and ladies near construction area and labour hutment vi. Creche facility for labour children vii. Site perimeter fencing viii. Storm water drainage within site ix. Storm water collection & sedimentation pit x. Vehicle wheel wash pit xi. First aid facility xii. Location of DG sets xiii. Location of all existing trees preserved at site xiv. Batching Plant location xv. Cement Store location xvi. Raw material storage like steel, aggregates, sand, stone dust, chemicals, bricks, concrete blocks, AAC Blocks, stone, tiles, 	1,2,3,4,6,13,15

	<p>paint drums, false ceiling, etc.</p> <p>xvii. Segregated waste collection areas for steel scrap, empty cement bags, empty chemical drums, broken bricks, scrap wood etc.</p>	
2	Photographs of the above site management strategies	1,2,3,4,6,13,15
3	Photographs of construction waste materials segregated & collected at site	1,2,3,4,6,13,15
4	Purchase invoices of cement, Bricks, AAC blocks, Fly-ash bricks, concrete blocks etc	2,3,4,15
5	Purchase invoices of all interior finishing materials like flooring stone/tiles, false ceiling, wall paneling, Paints, polishes, wall tiles etc	6,15
6	Purchase invoices of flush doors, fire rated doors, window frames & window glass	6,15
7	Purchase invoices & technical cutsheet of roof insulation, Duct & Pipe insulation	5,7,8,15
8	Cement test report highlighting fly ash content	2,3,4,6,15
9	Test reports of drinking water at site	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15
10	Air quality test report for site	1,2,3,4,6,9,13,14,15
11	Manufacturer certificate of fly-ash content in flash bricks, AAC blocks, concrete blocks etc	2,3,4,15
12	Purchase invoices & technical cutsheet of Glass used in project windows / exteriors	9
13	Site challans highlighting quantity of all sold scrap from	2,3,4,5,6, 7,9,10,11,13,15

	site like steel, waste wood, plastic drums, empty cement bags, broken glass, aluminium etc.	
14	Photographs of construction waste materials reused within site like broken bricks, broken tiles, stone cutting, concrete debris etc.	2,3,4,5,6, 7,9,10,11,13,15
15	Purchase invoices & technical cutsheet of Renewable Energy Systems	12
16	Photographs of Renewable Energy Systems installed in the project	12
17	Test report of STP treated water	11
18	Digital copies of Mechanical, Electrical & Plumbing equipment commissioning reports, Operation & Maintenance Manuals & Annual Maintenance Contracts	15
19	Purchase invoices of landscape trees, plans, shrubs & ground covers	14
20	Photographs of Landscape trees, plants, shrubs & ground covers	14

4.8.5. The contractor shall submit to the Engineer in Charge after construction of the buildings, a detailed as built quantification of the following:

- (i) Total materials used,
- (ii) Total top soil stacked and total reused
- (iii) Total earth excavated
- (iv) Total waste generated,
- (v) Total waste reused,
- (vi) Total water used,
- (vii) Total electricity consumed

(viii) Total diesel consumed.

- 4.8.6. The contractor shall submit to the Engineer in Charge, before the start of construction, a site plan along with a narrative to demarcate areas on site from which top soil has to be gathered, designate area where it will be stored, measures adopted for top soil preservation and indicate areas where it will be reapplied after construction is complete.
- 4.8.7. The contractor shall submit to the Engineer-in-charge, a detailed narrative (not more than 250 words) on provision for safe drinking water and sanitation facility for construction workers and site personnel.
- 4.8.8. Provide supporting document from the manufacturer of the cement specifying the flyash content in PPC used in reinforced concrete.
- 4.8.9. The contractor shall submit the following information to the Engineer-in-charge at the end of construction, for all material brought to site for construction purposes, including manufacturer's certifications, verifying information, and test data, where Specifications sections require data relating to environmental issues including but not limited to:
- (i) Source of products: Supplier details and location of the supplier.
 - (ii) Project Recyclability: Submit information to assist Owner and Contractor in recycling materials involved in shipping, handling, and delivery, and for temporary materials necessary for installation of products.
 - (iii) Recycled Content: Submit information regarding product post-industrial recycled and post-consumer recycled content, Use the Recycled Content Certification Form, to be provided by the Commissioning Authority appointed for the Project.
 - (iv) Product Recyclability: Submit information regarding product and products component's recyclability including potential sources accepting recyclable materials where ever applicable.
 - (v) Provide final certification of well-managed forest of origin to provide final documentation of certified sustainably harvested status:

Acceptable wood, certified sustainably harvested, certifications shall include:

- Wood suppliers' certificate issued by one of the Forest Stewardship Council-accredited certifying agencies;
 - Suppliers' invoice detailing the quantities of certified wood products for project;
 - Letter from one of a certifying agency corroborating that the products on the wood supplier's invoice originate from certified well-managed forests.
- (vi) Clean tech: Provide pollution clearance certificates from all manufacturers of materials
- (vii) Indoor Air quality and Environmental Issues: Submit emission test data, sourced from the manufacturers, produced by acceptable testing laboratory listed in Quality Assurance Article for materials as required in each specific Specification section.
- Certifications from manufacturers of Low VOC paints, adhesives, sealant and polishes used at this particular project site.
 - Certification from manufacturers of composite wood products/agrofibre products on the absence of added urea formaldehyde resin in the products supplied to them to this particular site.
 - Submit environmental and pollution clearance certificates for all diesel generators installed as part of this project.
- (viii) Provide total support to Engineer-in-charge and Green Building Consultants appointed by the Engineer-in-charge in completing all Green Building Rating related formalities, including signing of forms, providing signed letters in the contractor's letterhead whenever required.

4.9. EQUIPMENT

- 4.9.1. To ensure energy efficiency during and post construction all pumps, motors and engines used during construction or installed, shall be subject to approval of the Engineer-in-charge.
- 4.9.2. All lighting installed by the contractor around the site and at the labour quarters during construction shall be CFL bulbs of the appropriate illumination levels. This condition is a must, unless specifically prescribed.
- 4.9.3. The contractor is expected to go through all other conditions of the LEED & GRIHA rating stipulations. Failure to adhere to any of the above-mentioned items, without approval of the Engineer-in-charge, shall be deemed as a violation of contract and the contractor shall be held liable for penalty as per terms of the agreement.
- 4.9.4. In case any penalty is imposed by any Hon'ble Court, NGT or any other authority due to non-compliance of any statutory order, or law or guidelines or pollution control or environmental norms, the same will be borne by the contractor.

4.10. SUBMISSION OF POLLUTION CONTROL PLAN

- 4.10.1. The contractor shall submit the detailed action plan for control of pollution and for adherence to all the environmental guidelines/Laws/statutes/Court Orders/NGT orders/orders of pollution control authorities through the entire period of construction at site. The detailed action plan shall be submitted to the Engineer-in-Charge **within 15 days of the stipulated date of start** of work and shall be got approved from the Engineer-in-charge.
- 4.10.2. The contractor shall arrange for control measures of all dust/noise/emission from the construction activities at site of work and shall install screens/curtains/ covers/dust trappers etc. as per guidelines/orders of the NGT/Court of law/ statutory authorities etc. No hindrance shall be allowed, arising out of any stay/stopping of work from any court/statutory authority/NGT/Govt. Authorities as a consequence of the contractor not adhering to any pollution control guideline/law/order of the state bodies

during the construction period. Nothing shall be paid to the contractor on account of expenses for any dust/pollution/emission control measures at the site of work or any delay in work due to any orders passed by any court/statutory authority/Govt. Authorities during the period of construction.

4.10.3. Compensation of Rs. 5,000/- per day will be levied and recovered from the dues of the contractor for each day of delay beyond 15 days for non-submission of pollution control plan.

4.10.4. The contractor is strongly advised to study all dust/Noise/emission/pollution control norms/laws/Court Orders before bidding for the work and quote his rates accordingly for any liability which may arise on this account during the period of construction.

5.0. OTHER SITE-SPECIFIC PROVISIONS

5.1. Undergrounding Water Tank:

Construction and commissioning of proposed underground water tank before decommissioning of existing underground water tank (approximate capacity 75000 litre). Decommissioning should be done as per advice of the Bank and no extra payment to contractor shall be made in this regard other than quantity specific rates / amounts as per schedule of quantities read with quoted rates.

SECTION VIII

**TECHNICAL SPECIFICATIONS (INCLUDING
APPROVED MAKE OF MATERIALS AND BASIC
PRICES): MAJOR COMPONENT**

PREAMBLE:

A) This section contains the list of latest edition of relevant Standards & Specifications to be complied with, by the contractor for Design and Execution of this project/work. The list of Standards & Specifications provided hereunder is not exhaustive and any other Standard & Specification which are not mentioned in this section are also applicable if required for the completion of work as per the Scope of Work, Technical Specifications, & Drawings.

B) The work in general shall be carried out as per the latest CPWD specifications with up to date correction slips, unless otherwise specified in the nomenclature of the individual item or as specifications shall be carried out as per approved specifications. In case any item is not covered in any of these documents, the same shall be carried out as per the latest BIS codes in practice or as per approval of Engineer in Charge. Where any portion of special conditions of contract is repugnant to or at variance with any provision of the with Instruction to Tender and General Conditions of contract and/or the other documents forming part of the contract then unless a different intention appears the provisions of the general conditions of Contract shall the other documents forming part of the contract only to the extent such repugnant/variations in the special conditions of contract as are not possible of being reconciled with the provision with Instruction to Tender of General Conditions of Contract and/or the other forming part of the contract.

C) The work in general shall be carried out as per the latest CPWD specifications 2019 Vol. 1&2.

D) The Electrical works shall be carried out as per CPWD Specifications for Electrical works (Part-I) Internal, 2013 (Part-II) External, 2013 with up to date corrections slips, General specifications for Electrical works Part-VII (DG Sets), 2013 General Specifications for Electrical works Part-IV (Substation), 2013; General specifications for Electrical works – Part-V (Wet Riser & Sprinkler Systems) 2020 and General specifications for Electrical works (Lifts & Escalators) Part-III, 2003.

E) For items not covered under any of the specifications mentioned in tender documents, the works shall be carried out as per BIS code/manufactures

specifications/ General Engineering practice and/or as per direction of Engineer-in-Charge.

F) For Non DSR Items, Technical specifications specified in tender documents may be followed.

II) FOR STRUCTURAL WORKS

DESIGN CODES, STANDARDS AND REFERENCE DOCUMENTS

S. No.	CODE*	NAME
1	IS: 1893 – 2002	Criteria for Earthquake resistant design of Structures
2	IS: 13920	Ductile detailing of Reinforced Concrete Structures subjected to Seismic forces.
3	IS: 4326 – 1993	Earthquake resistant Design and construction of Buildings
4	IS: 875 – 1987 (Part I to III & Part V)	Code and Practice for Design Loads (Other than earthquake) for Building and Structures like Dead, Imposed, Wind and other Loads
5	IS: 456 – 2000	Plain and Reinforced Concrete (Code of practice)
6	SP: 16	Design aids for Reinforced Concrete Structure.
7	SP: 34	Handbook on Concrete Reinforcement and Detailing
8	IS: 3370 Part I, Part II and Part IV	Code of practice for Concrete structures for the storage of liquids.
9	IS: 1786	Specification for High Strength Deformed Steel bars and wires for concrete reinforcement
10	IS: 1904	Code and Practice for design and Construction of Foundations in Soils

11	IS: 2950	Code and Practice for Design and Construction of Raft Foundations
12	IS: 800-1980	Code of Practice for general Construction in Steel.
13	IS: 1343-1980	Code of Practice for Pre-stressed Concrete.
14	BS 8081:2015 & BSEN-1537-2013 & IS 10270-1982 & IS 14268 class11/ASTM-416	Code of Diaphragm.
15	BS 8110: 1997 class-2 for gravity load. BS 8110: 1997 class-3 for gravity load and lateral load	Code of Composite structure slab

*above mentioned IS codes shall be read with upto date amendment and correction slips

PARTICULAR SPECIFICATIONS

1.0 EARTH WORK

- 1.1 The work shall be done in accordance with CPWD Specifications – 2019 – Vol.I& Vol. II and National Building Code 2016 with upto date correction slips.
- 1.2 Excavation shall be undertaken to the width of the Basement / Retaining wall footing including necessary margins for construction operation as per drawing or directed otherwise. Where the nature of soil or the depth of the trench and season of the year, do not permit vertical sides, the contractor at his own expense shall put up the necessary shoring, strutting and planking or cut slopes with or without steps, to a safer angle

or both with due regard to the safety of personnel and works and to the satisfaction of the Engineer, Measurement of plan area of excavation for payment shall be permitted only. Nothing extra shall be paid for making steps and slopes etc. as required.

- 1.3 The contractor shall make at his own cost all necessary arrangements for maintaining water level, in the area where works are under execution low enough so as not to cause any harm to the works or problems in carrying out with the execution and the rates for all items of work shall be considered as inclusive of pumping out or bailing out water, if required, for which no extra payment shall be made. This will include water coming from any source, such as rains, accumulated rain water, floods, leakages from sewer and water mains, subsoil water table being high or due to any other cause whatsoever. The contractor shall make necessary provision of pumping, dredging, and bailing out water coming from all above sources and excavation and other works shall be kept free of water by providing suitable system approved by the Engineer-in-charge.
- 1.4 Sub-soil water table at work site is not encountered up to 3.0m depth below general ground level. The water level may vary due to rainy season or due to dewatering etc. in order to avoid possibility of basement floor of building being getting uplifted/damaged due to water pressure, the contractor shall make arrangement for lowering the ground water table below the proposed foundation level as approved by Engineer-in-charge. Sub soil water table shall be maintained at least 50 cm below the P.C.C. level during laying of P.C.C., water proofing treatment, laying of basement raft and beams including filling of earth/sand under the basement floor. The water table shall not be allowed to rise above base of raft level until completion of outer retaining walls including water proofing of vertical surface of walls and back filling along the walls up to ground level and until the structure attains such height to counter balance the uplift pressure. However, the contractor should inspect the site and make his own assessment about sub-soil water level likely to be encountered at the time of execution and quote his rates accordingly. Rate of all items are inclusive of pumping out or bailing out water, if

required. Nothing extra on this account whatsoever shall be paid to him unless otherwise specified. The sequence of construction shall be got approved by the Engineer-in-charge.

- 1.5 All the major excavation shall be carried out by mechanical excavator. No extra payment shall be made for that.
- 1.6 Any trenching and digging for laying sewer lines/water lines/cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been arranged and closing of the trench(s) thereafter shall be ensured within the least possible time.
- 1.7 The rates are inclusive for all depths & nothing extra shall be paid for additional lift etc.

2.0 CONCRETE WORK

- 2.1 The work shall be done in accordance with CPWD Specifications – 2019 – Vol.I& Vol. II with upto date correction slips.
- 2.2 If the quantity of cement actually used in the work is found to be more than the theoretical quantity of cement including authorized variation, nothing extra shall be payable to the contractor on this account. In the event of it being discovered that after the completion of the work, the quantity of cement used is less than the quantity ascertained as herein before provided (allowing variation on the minus side as stipulated in clause 42) the cost of quantity of cement so less used shall be recovered from the contractor at the rate as specified in schedule 'F'. Decision of the Engineer-in-Charge in regard to the quantity of cement which should have been actually used as per the schedule and recovery at the rate specified shall be final and binding on the contractor.
- 2.3 For non-scheduled items, the decision of the Engineer-in-Charge regarding theoretical quantity of the cement which should have been actually used shall be final and binding on the contractor.

3.0. RCC/CC WORK (DESIGN MIX CONCRETE)

- 3.1 The Design Mix Concrete will be designated based on the principles given in BIS codes IS:456, IS:10262 & SP:23. The condition and specifications stated herein shall have precedence overall conditions and specifications stated in relevant BIS codes/CPWD specifications. The concrete mix shall be designed for specified target mean compressive strength in order to ensure that the work test results do not fall below the acceptance criteria specified for the concrete mix. The Contractor shall design mixes for each class of concrete indicating that the concrete ingredients and proportions will result in concrete mix meeting requirements specified. The mix shall be designed with quantities of admixture / plasticizer proposed to achieve required workability & strength. The specifications mentioned here in below shall be followed for Design Mix Concrete.
- 3.2 The sources of coarse aggregate, fine aggregate & water to be used in concrete work shall be identified by the contractor & he will satisfy himself regarding their conforming to the relevant specification & their availability before getting the same approved by the Engineer-in-Charge.
- 3.3 Coarse Aggregate: As per CPWD Specifications – 2019 – Vol.I& Vol. II with up to date correction slips.
- 3.4 Fine Aggregate: As per CPWD Specifications – 2019 – Vol.I& Vol. II with upto date correction slips.
- 3.5 Water: It shall confirm to requirements laid down in IS:456-2000 / CPWD Specifications – 2019 – Vol.I& Vol. II with upto date correction slips.
- 3.6 Cement: PPC shall be used for design mix concrete and shall conform to IS-1489 (part-I). However, if higher grade of cement is used by the contractor nothing extra shall be paid on this account.
- 3.7 Cement: PPC shall be used for design mix concrete and shall conform to IS-1489 (part-I). However, if higher grade of cement is used by the contractor nothing extra shall be paid on this account.

3.8 Admixtures / Plasticizers: - The admixture shall conform to IS:9103, wherein required, the admixture of approved quality and approved make only shall be used to attain the required workability. Nothing extra shall be paid for use of admixtures.

3.9 Grade of Concrete: The compressive strength of various grades of concrete shall be given as below:

Reinforced Concrete

Grade Designation	Compressive Strength on 15 cm Cubes at 7 Days (N/mm ²)	Specified Characteristic Compressive Strength At 28 Days At (N/mm ²)	Maximum Water Cement Ratio
M-20	As Per Design	20	0.55
M-25	As Per Design	25	0.50
M-30	As Per Design	30	0.45
M-35	As Per Design	35	0.45
M-40	As Per Design	40	0.40

Water cement ratio and slump shall be as per IS:456-2000.

NOTE:

- (i) In the designation of a Concrete mix letter M refers to the mix and the number of the specified characteristic compressive strength of 15 cm cube at 28 days expressed in N/mm².
- (ii) It is specifically highlighted that in addition to the above requirements, the **maximum cement content for any grade shall be limited to 380 kg /cum.**
- (iii) The maximum cement content for design mix concrete shall be maintained as per the quantity mentioned above. In case where the quantity of cement

required as per Design Mix is lower than the quantity specified in the respective item in the “schedule of quantity”, necessary deduction for less quantity of cement used shall be made from the contractor.

3.10 The contractor shall engage one of the IIT/NIT/Reputed Govt. Engineering Institutions/Approved Laboratories as directed by the Engineer-in-charge at his own expenses for designing the concrete mix in accordance with relevant IS Codes and to conduct laboratory test to ensure the target strength and workability criteria for a given grade of concrete.

3.11 The contractor shall submit the report on design mix from any of above approved laboratories for approval of Engineer-in-Charge within 30 days from the date of issue of letter of acceptance of the tender. No concreting shall be done until the design mix is approved. In case of white Portland cement and the likely use of admixtures in concrete with ordinary Portland/white Portland cement, the contractor shall design and test the concrete mix by using trial mixes with white cement and / or admixtures also, for which nothing extra shall be payable.

3.12 In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised laboratory mix design report conducted at laboratory established at site shall be submitted by the contractor as per the direction of the Engineer-in-Charge.

3.13 Trial Batches:

3.13.1 The designed mix proportion shall be checked for target mean compressive strength by means of trial batches.

3.13.2 The quantities of materials for each trial mix shall be sufficient for at least six specimens (cubes) and the concrete required for carrying out workability tests.

3.13.3 The workability of trial mix No. 1 shall be measured and mix shall be carefully observed for freedom from segregation, bleeding and its finishing characteristics. The water content, if required, shall

be adjusted corresponding to the required changes in the workability.

3.13.4 With the modified water content, the mix proportions shall be recalculated by keeping with water cement ratio unchanged. The mix proportions, as modified, shall form the Trial Mix No. 2 and tested for the specified strength and workability.

3.13.5 In addition, trial mix No. 3 and 4 shall be designed by keeping water contents same as that determined for trial mix 2 but varying the water cement ratio + 10 percent of the specified value and tested for their design characteristics.

3.14 All cost of mix designing and testing connected therewith including charges payable to the laboratory shall be borne by the Contractor including redesigning of the concrete mix wherever required and directed by Engineer-in-Charge.

3.15 APPROVAL OF DESIGN MIX:

The mix design for a specified grade of concrete shall be done for a target mean compressive strength

$$T_{ck} = F_{ck} + 1.65s$$

Where, F_{ck} = Characteristic compressive strength at 28 days.

S = Standard deviation which depends on degree of quality control.

The degree of quality control for this work is "good" for which the standard deviation (s) obtained for different grades of concrete shall be as follows:

GRADE OF CONCRETE	STANDARD DEVIATION(S)
M-15	3.5
M-20	4.0
M-25	4.0
M-30	5.0

M-35	5.0
M-40	5.0

Minimum three sets of separate preliminary test shall be carried out for each trial batch of concrete mix. Each test shall comprise six specimens and only one test set of six specimens shall be made on any particular day. Out of the six specimens of each set, three shall be tested at seven days and remaining three at 28 days. The preliminary tests at seven days are intended only to indicate the strength to be attained at 28 days. While the design mix shall be approved only on the basis of test strength of 28 days. The design mix shall be considered satisfactory and approval if at least three preliminary tests- sets individually satisfy the following strength and workability criteria:

- (a) The average strength of each test sets is not less than the specified target mean compressive strength (T_{ck}).
- (b) The strength of any specimen cube is not less than $0.85 T_{ck}$.
- (c) The concrete mix is required degree of workability and acceptance concrete finish.

3.16 All cost of mix designing and testing connected therewith including charges payable to the laboratory shall be borne by the Contractor.

3.17 WORK STRENGTH TEST:

TEST SPECIMEN:

Work strength test shall be conducted in accordance with IS:516 on random sampling. Each test shall be conducted on six specimens, three of which shall be tested at 7 days and remaining three at 28 days.

TEST RESULTS OF SAMPLES:

The test results of the sample shall be the average of the strength of three specimens. The individual variation shall not be more than + 15% percent of the average. If variation is more, the test results shall be treated as invalid. 90% of the total tests shall be done at the laboratory established at site by the contractor and remaining 10% in

the laboratory of IIT/NIT or in any other laboratory as directed by the Engineer-in-Charge.

LOT SIZE:

The minimum frequency of sampling of concrete of each grade shall be in accordance with CPWD specification 2019 and following:

QUANTITY OF CONCRETE IN THE WORK (CUBIC METRE PER DAY).	NUMBER OF SAMPLES
1-5	1
6-15	2
16-30	3
31-50	4
51 & above	4 Plus one additional sample for each additional 50 cubic meters of part thereof

NOTE: - At least one sample shall be taken from each shift.

3.18 STANDARD OF ACCEPTANCE:

- (i) In case the test results of all the samples are above the characteristic compressive strength, the concrete shall be accepted.
- (ii) In case the test result of one or more samples fails to meet the requirement (i) above, it shall be accepted if both the following conditions are met:
 - a. Any individual test result is not less than $(F_{ck} - 4) \text{ N/mm}^2$.
 - b. The mean of test results from any group of four consecutive samples is more than $(F_{ck} + 4) \text{ N/mm}^2$.
- (iii) Concrete of each grade shall be assessed separately.
- (iv) Concrete is liable to be rejected, if it is porous or honeycombed, its placing has been interrupted without providing a proper construction joint, the

reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met.

3.19 The contractor has to arrange at site sufficient centering and shuttering for before two months from stipulated date of start of work. Only MS centering / shuttering and scaffolding material unless & otherwise specified shall be used for all R.C.C. work to give an even finish of concrete surface. However, marine-ply shuttering in exceptional cases as per site requirement may be used on specific request from contractor as approved by the Engineer-in-Charge.

3.20 Nothing extra shall be paid for the centering and shuttering, circular in shape whenever the form work is having a mean radius exceeding 6m in plan.

3.21 In order to keep the floor finish as per architectural drawings and to provide required thickness of the flooring as per specifications, the level of top surface of RCC shall be accordingly adjusted at the time of its centering, shuttering and casting for which nothing extra shall be paid to the Contractor.

3.22 As per general engineering practice, level of floors in toilet / bath, balconies, shall be kept 25 mm as required lower than general floors shuttering should be adjusted accordingly, and slabs should be laid with slope towards the drainage point. Nothing extra is payable on this account.

3.23 PRODUCTION OF CONCRETE

All concrete shall be produced at site through fully computerized weigh-batching plant of suitable capacity (**not less than 18 cum/hr.**) conforming to IS:4925 with the arrangements for automatic dispensing of admixture and having facility of giving print out indicating weight / details of all ingredient of concrete in each lot/ batch and variations from the approved design mix if any. Fully automatic batching and mixing plant having capacity not less than 18 cum/ hour shall be installed at the arranged site by the contractor. The batching and mixing plants shall be dedicated plants for this project. Contractor shall make his own arrangements for the necessary infrastructure

for installation of batching plant and other machineries. However, if due to any reason, contractor wishes to supplement the concrete from Ready Mix Concrete (RMC) supplier, he is permitted to procure the same from the source approved by the Engineer-in-charge at his own cost. In such a situation nothing extra shall be paid to the contractor. All technical requirements such as cement type and minimum cement quantity, w/c ratio, slump, admixture etc. shall be conveyed to RMC supplier by the contractor and contractor shall be wholly responsible for ensuring the property of concrete as required at site, nothing extra shall be paid to the contractor.

The contractor may take some time to install his own batching plants at the arranged site and till the batching plants are installed, the contractor is permitted to procure concrete from approved Ready-Mix Concrete (RMC) supplier for a period of 3 months from date of start of work or the period as agreed by Engineer-in-Charge. Similarly, when the work is nearing completion and daily requirement of concrete is very less, if agreed by the Engineer-in-Charge, the contractor may be permitted to procure the concrete from approved Ready-Mix Concrete (RMC) supplier and nothing extra shall be paid to the contractor on this account.

3.24 LAND FOR TEMPORARY USE

The land for labour camps & concrete Batching Plant shall be arranged by the contractor. The lease/rent charges shall be borne by the contractor. The Engineer-in-Charge shall extend necessary help and issue necessary recommendations etc. to the concerned clients / department for temporary allotment of land during construction period if land is available with them. In such cases, the contractor shall vacate the land after completion of work in same condition as was at the time of allotment.

3.25 BATCHING PLANT

The batching and mixing plant shall be fully automatic of suitable capacity not less than 18cum/hour. Automatic batcher shall be charged by devices which when actuated by a single starter switch will automatically start the weighing operation of each material and stop automatically when the designated weight of each material is fed in the mixer. The batching plant shall have automatic arrangement for dispensing the admixture and shall be capable of discharging water in morethan one stage. A batching plant essentially shall consist of the following components:

- Separate storage bins for different sizes of aggregates, silo for cement and fly ash; water storage tank.
- Batching equipment
- Mixers
- Control Panels
- Mechanical material feeding and elevating arrangements

The compartments of storage bins for aggregates shall be approximately of equal size. The cement compartment shall be centrally located in the batching plant. It shall be water tight and provided with necessary air vent, aeration fittings for proper flow of cement & emergency cut off gate. The aggregate and sand shall be charged by power operated centrally revolving chute. The entire plant from mixer floor upward shall be enclosed and insulated. The batch bins shall be constructed so as to be self-cleansing during draw-down. The batch bins shall in general conform to the requirements of IS:4925.

The batching equipment shall be capable of determining and controlling the prescribed amounts of various constituent materials for concrete accurately i.e. water, cement, sand, individual size of coarse aggregates etc. The accuracy of measuring devices shall fall within the following limits.

Measurement of Cement: + 2% of the quantity of cement in each batch

Measurement of Water: + 3% of the quantity of water in each batch

Measurement of Aggregate: + 3% of the quantity of aggregate in each batch

Measurement of Admixture: + 3% of the quantity of admixture in each batch

The batching and mixing plant shall have the provision of adjusting the plus / minus quantity of various ingredients in the next batch so that there is no variation in quantity of ingredients from design mix in a lot consisting of 5 to 6 batches.

The mixer in the batching plant shall be so arranged that mixing action in the mixer can be observed from the operator's station. The mixer shall be equipped with a mechanically or electrically operated timing, signaling and metering device which will

indicate and assure completion of the required mixing period. The mixer shall have all other components as specified in IS:4925.

3.26 TRANSPORTATION, PLACING AND COMPACTION OF CONCRETE

Mixed concrete from the RMC / Batching plant shall be transported to the point of placement by transit mixers and placed in position through concrete pumps and/or steel closed bottom buckets capable of carrying minimum 0.6 cum concrete. In case the concrete is proposed to be transported by transit mixer, the mixing speed shall not be less than 4 rev/min. of the drum nor greater than a speed resulting in a peripheral velocity of the drum 70 m/minutes at its largest diameter. The agitating speed of the agitator shall be not less than 2 rev/min nor more than 6 rev/min of the drum. The number of revolution of the mixing drum or blades at mixing speed shall be between 70 to 100 revolutions for a uniform mix, after all ingredients, have been charged into the drum. Unless tempering water is added, all rotation after 100 revolutions shall be at agitating speed of 2 to 6 rev/min and the number of such rotations shall not exceed 250. The general construction of transit mixer and other requirement shall conform to IS:5892.

In case concrete is to be transported by pumping, the conduit shall be primed by pumping a batch of mortar through the line to lubricate it. Once the pumping is started, it shall not be interrupted (if at all possible) as concrete standing idle in the line is liable to cause a plug. The operator shall ensure that some concrete is always there in the pump receiving hopper during operation. The lines shall always be maintained clean and shall be free of dents at all stages. Special precaution shall be taken that surrounding temperature during concreting shall not exceed 30 degrees centigrade.

Except where otherwise agreed to by the Engineer-in-Charge, concrete shall be deposited in horizontal layers to a compacted depth of not more than 450 mm. Unless agreed to by the Engineer- in-Charge, concrete shall not be dropped into place from a height exceeding 1.5m. In order to avoid such situations chutes, tremie pipe or closed bottom buckets shall be used. These shall be kept clean and used in such a way as to avoid segregation. Slope of the chute shall be so adjusted that concrete flows without the use of excessive quantity of water. The delivery end of chute shall be as close as possible to the point of deposit. The chute shall be thoroughly flushed with water before and after each working period and the water used for this purpose shall

be discharged outside the formwork. The concrete shall be compacted by using immersion type vibrators. When the concrete is being continuously deposited to a uniform depth along a member, vibrator shall not be operated within one meter of free end of the advancing concrete. Every effort shall be made to keep the surface of the previously placed layer of concrete alive so that the succeeding layer can be amalgamated with it by the vibration process. In case the concrete in underlying layer has hardened to such an extent that it cannot be penetrated by the vibrator but is still fresh (that is, just after initial set), un-imposed bond shall be achieved between the top and underlying layer by first scarifying the lower layer before the new concrete is placed by systematically and thoroughly vibrating the new concrete. The points of insertion of vibrator in the concrete shall be so spaced that the range of action overlap to some extent and the freshly filled concrete is sufficiently consolidated at all locations. The spacing between the dipping positions of vibrator shall be maintained uniformly throughout the surface of concrete so that concrete is uniformly vibrated. The vibrating head shall be regularly and uniformly inserted in the concrete so that it penetrates of its own accord and shall be withdrawn slowly whilst running so as to allow redistribution of concrete in its way and allow the concrete to flow back into the hole behind the vibrator. The vibrator head shall be kept in one position till the concrete within its influence is completely consolidated. Vibration shall be continued until the coarse aggregate particle have blended into the surface but have not disappeared. The contractor shall keep at least one additional vibrator in serviceable condition to be used in the event of breakdowns and maintenance problems.

The vibrator head shall not be brought more than 200 mm near to the formwork as this may cause formation of water stagnations. The formwork shall be strong and great care shall be exercised in its assembly. It shall be designed to take up increased pressure of concrete and pressure variations caused in the neighborhood of vibrating head, which may result in excessive local stress on the formwork. The joints of the formwork shall be made and maintained tight and close enough to prevent the squeezing out slurry or sucking in of air during vibration. The formwork to receive concrete shall be cleaned and made free from standing water, dust, etc. The contractor shall keep provision for screed and shutter vibrators at site.

No concrete shall be placed in any part of the structure until the approval of Engineer-in-Charge has been obtained. If concreting is not started within 24 hours of the

approval being given, it shall have to be obtained again from the Engineer-in-Charge. Concreting shall be done continuously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept, clean, thoroughly wetted and covered with a 13 mm thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself. The 13 mm layer of mortar shall be freshly mixed and placed immediately before placing of new concrete.

Where concrete is not fully hardened, all latency shall be removed by scrubbing the wet surface with wire or bristle brushes. Care shall be taken to avoid dislodgement of particles of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed and then coated with neat cement grout. Particular attention shall be given to corners and close spots.

In case of rejection of concrete on account of unacceptable compressive strength, governed by para "Standard of Acceptance" as above, the work for which samples have failed shall be redone at the cost of contractor. However, the Engineer-in-Charge may order for additional tests (like cutting cores, ultrasonic pulse velocity test, load test on structure on part of structure, etc) to be carried out at the cost of contractor to ascertain if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The Contractor shall take remedial measures necessary to retain the structure as approved by the Engineer-in-Charge without any extra cost. However, for payment, the basis of rate payable to contractor shall be governed by the 28 days cube test results and reduced rates shall be regulated in accordance with para 3.24.2.

4.0 SHUTTERING / FORM WORK

- 4.1 The work shall be done in accordance with CPWD Specifications – 2019 – Vol. I & Vol. II with upto date correction slips.
- 4.2 Steel shuttering as approved by the Engineer-in-Charge shall be used by the contractor. Minimum size of shuttering plates shall be 600mm x 900mm except for the case when closing pieces required to complete the

shuttering panels. Dented, broken, cracked, twisted or rusted shuttering plates shall not be allowed to be used on the work.

- 4.3 The shuttering plates shall be cleaned properly with electrically driven sanders to remove any cement slurry or cement mortar or rust. Proper shuttering oil or debonding compound shall be applied on the surface of the shutter plates in the requisite quantity before assembly of steel reinforcement.
- 4.4 The joint filler shall be resilient closed cell expanded polyethene and non-tainting as manufactured by Supreme Industries Ltd.
- 4.5 Providing joint filler of required thickness in position to substrate using either double sided foam adhesive tape or neoprene synthetic rubber adhesive. When forming expansion joint with the Board in in-situ concrete, joint sealing slots can be readily formed in the following manner-
- a) Before installing, simply cut off a strip of the required depth. Then install the filler flush with the finished surface.
 - b) Prior to sealing, the top strip can then be pulled easily from the joint to provide an uncontaminated sealing slot ready for preparation and sealing.

5.0 REINFORCEMENT

- 5.1 The reinforcement shall be done as per CPWD Specifications – 2019 – Vol. I & Vol. II with upto date correction slips.
- 5.2 The item of reinforcement of RCC work includes all operations including straightening, cutting, bending, welding, binding with annealed steel or welding and placing in position at all the floors with all leads and lift complete as per CPWD Specification – 2019 – Vol. I & Vol. II with upto date correction slips.
- 5.3 To avoid displacement of bars in any direction and to ensure proper cover, only factory made round type/rectangular cover blocks shall be used by the contractor. Nothing extra

6.0 BRICK WORK

6.1 Unless otherwise specified FPS Bricks shall be used in all items of brick work up to plinth level. The classification of bricks brought by the contractor shall strictly conform to CPWD Specifications – 2019 Vol-1 & II with upto date correction slips or as specified. The work shall also include for leaving chases / notches for dowels / cramps for all kinds of cladding to come over brick work.

6.2 Autoclaved aerated cement blocks

6.2.1 Material

Autoclaved aerated cement blocks masonry with 115 / 230 mm thick AAC blocks in super structure above plinth level up to floor V level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar. The rate includes providing and placing in position 2 Nos 6 mm dia M.S. bars at every third course of masonry work, raking out joints, curing, double legged scaffolding, etc complete and as directed by Engineer in Charge. (The payment of RCC band and reinforcement shall be made for separately).

6.2.2 Measurement

Length, breadth & height shall be measured correct to a cm & cubical area shall be calculated up to two decimal place.

6.2.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above

7.0 STONE / MARBLE / GRANITE WORK (OTHER THAN MASONARY)

7.1 The execution of stones work shall be in general as per CPWD Specifications – 2019 – Vol. I & Vol. II with upto date correction slips.

7.2 All holes, rebates, recesses etc. for providing fixing and inserts shall be predrilled and precut and worked using precision machine tools. Nothing extra on this account shall be payable.

7.3 SAMPLES FOR STONE WORK: Samples of each item of stone work either individually or in combination shall be prepared for approval of Engineer-in-Charge before commencement of work.

7.4 Sequence of execution for cladding work shall be suggested by the contractor for approval of Engineer-in-Charge.

8.0 SCAFFOLDING

8.1 Double steel scaffolding having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed.

9.0 WOODWORK

9.1 The wood work in general shall be carried out as per CPWD Specifications – 2019 Vol.I& II with upto date correction slips.

9.2 The samples of species of timber to be used shall be got approved and deposited by the contractor with the EE before commencement of the work. The contractor shall produce cash vouchers and certificates from kiln seasoning or/and chemical treatment plants about the timber section to be used on the work having been kiln seasoned or/and chemically treated by them.

9.3 Factory made shutter as specified shall be obtained from factories approved by the Engineer in charge. The contractor shall inform well in advance to the Engineer-in-charge the names and address of the factory from where the contractor intends to get the shutters manufactured. The contractor will place order for manufacture of shutters only after written approval of the Engineer-in-charge in this regard is given. The contractor is bound to abide by the decision of the Engineer-in-charge and recommend a name of another factory from the approved list in case the factory already proposed by the contractor is not found competent to manufacture quality shutters. Shutters will however be accepted only if this meet the specified tests. The contractor will also arrange stage wise inspection of the shutters at factory to the Engineer-in-charge or his authorized representative. Contractor will have no claim if the shutters

brought at site are rejected by Engineer-in-charge in part or in full lot due to bad workmanship / quality even after inspection of factory. Such shutters will not be measured and paid and the contractor shall remove the same from the site of work within 7 days after the written instruction in this regard are issued by Engineer in Charge or his authorized representative.

9.4 All fittings and fixtures shall be got approved from the Engineer-in Charge before procurement well in advance and the approved samples shall be kept at site till completion of the work.

9.5 Glazing for toilets shall be of translucent type.

9.6 The shape and size of beading shall be as per drawings. The joints of beading shall be mitred.

10.0 STEEL WORK

10.1 Work shall be carried out as per CPWD Specifications – 2019 – Vol.I& Vol. II with upto date correction slips.

10.2 The rate of T- angle iron frame shall include the following.

- (a) M.S. sill/tie of 10mm dia bar welded to T-iron frames to keep the frames vertical in correct position. The sill / tie shall be embedded in floor concrete. No tie is necessary for window frames.
- (b) Each T – iron frame for doors shall have 4 Nos. M.S. lugs 15x3mm, 10 cm long welded to each vertical member of the frame.
- (c) M.S. flat 6 x 25mm, 100mm long having threaded holes (No. of flats shall correspond to the no. of butt hinges to be fixed to door / window shutters) shall be welded at appropriate places at the back of the T-iron frames for fixing the required butt hinges to the frame with machine screws.

10.3 All welded structural steel work shall be tested for quality of weld as laid down in IS:822-1970 before actual erection if required.

11.0 FLOORING

- 11.1 All work in general shall be carried out as per CPWD Specifications- 2019 – Vol.I& Vol. II with upto date correction slips.
- 11.2 Whenever flooring is to be done in patterns tiles/ stone, the contractor shall get samples of each pattern laid and approved by the Engineer-in-Charge before final laying of such flooring for which nothing extra shall be paid.
- 11.3 Different stones/ tiles used in pattern flooring as per the approved architectural drawings and nothing extra for laying pattern flooring shall be paid. No additional wastage if any shall be accounted for any extra payment.
- 11.4 The proper gradient shall be given to flooring for toilets, verandah, kitchen, court yard, etc. as per the directions of Engineer-in-Charge. For this there may be extra thickness of dry mortar below the tiles/stone slabs. These gradients should be insured in the shuttering itself. Nothing extra shall be paid for this as this is included in the tendered cost.
- 11.5 The rate of items of flooring is inclusive of providing sunken flooring in bathrooms, kitchen, balcony etc. and nothing extra on this account is admissible. The samples of flooring, dado & skirting as per approved pattern shall be prepared & got approved from the Engineer-in-charge before execution of work.
- 11.6 Ceramic Tiles/Vitrified Tiles Work/ Granite stone flooring
- 11.6.1 Work shall be carried out as per CPWD Specifications- 2019 Vol I & II with up to date correction slips and as per manufactures specifications.
- 11.6.2 Rates shall be inclusive of all operations including labour, material, T&P, scaffolding etc. complete. Nothing extra shall be payable on any account.
- 11.6.3 One-piece Granite stone for treads / risers in staircase shall be used and nothing extra shall be paid on this account.

11.7 GRANITE STONE IN RISERS OF STEPS, SKIRTING AND DADO

11.7.1 Granite Stone Slabs

The slabs shall be of selected quality, hard, sound, dense and homogeneous in texture free from cracks, decay, weathering and flaws. They shall be hand or machine cut to the requisite thickness. They shall be of the colour indicated in the drawings or as instructed by the Engineer-in-Charge. The slabs shall have the top (exposed) face polished before being brought to site, unless otherwise specified. The slabs shall conform to the size required. Before starting the work the contractor shall get the samples of slabs approved by the Engineer-in-Charge.

11.7.2 Dressing

Every slab shall be cut to the required size and shape and fine chisel dressed on the sides to the full depth so that a straight edge laid along the side of the stone shall be in full contact with it. The sides (edges) shall be table rubbed with coarse sand or machine rubbed before paving. All angles and edges of the slabs shall be true, square and free from chippings and the surface shall be true and plane. The thickness of the slab after it is dressed shall be 18mm as specified in the description of the item. Tolerance of ± 2 mm shall be allowed for the thickness. In respect of length and breadth of slabs Tolerance of ± 5 mm for hand cut slabs and ± 2 mm for machine cut slabs shall be allowed except that the thickness of the slabs shall be 18 mm or as specified in the description of the item. The slabs may be of uniform size if required.

11.7.3 Preparation of Surface

The joints shall be raked out to a depth of at least 15 mm in masonry walls. In case of concrete walls, the surface shall be hacked and roughened with wire brushes. The surface shall be cleaned thoroughly, washed with water and kept wet before skirting is commenced. Where necessary, the wall surface shall be cut uniformly to the requisite depth so that the skirting face shall have the projection from the finished face of wall as shown in drawings or as required by the Engineer-in-Charge. In no case the skirting should project by more than thickness of stone.

11.7.4 Laying

The risers of steps and skirting shall be in grey or white cement admixed with or without pigment to match the shade of the stone, as specified in the description of the item,

with the line of the slab at such a distance from the wall that the average width of the gap shall be 12 mm and at no place the width shall be less than 10 mm, if necessary, the slabs shall be held in position by temporary M.S. hooks fixed into the wall at suitable intervals. The skirting or riser face shall be checked for plane and plumb and corrected. The joints shall thus be left to harden then the rear of the skirting or riser slab shall be packed with cement mortar 1:3 (1 cement : 3 coarse sand) or other mix as specified in the description of the item. The fixing hooks shall be removed after the mortar filling the gap has acquired sufficient strength. The joints shall be as fine as possible but not more than 1 mm. The top line of skirting and risers shall be truly horizontal and joints truly vertical, except where otherwise indicated. The risers and skirting slab shall be matched as shown in drawings or as instructed by the Engineer-in-Charge except that the joints of the slabs shall be set in grey cement mixed with pigment to match the shade of the slabs.

11.7.5 Curing, Polishing and Finishing

The day after the tiles are laid all joints shall be cleaned of the grey cement grout with a wire brush or trowel to a depth of 5 mm and all dust and loose mortar removed and cleaned. Joints shall then be grouted with grey or white cement mixed with or without pigment to match the shape of the topping of the wearing layer of the tiles. The same cement slurry shall be applied to the entire surface of the tiles in a thin coat with a view to protect the surface from abrasive damage and fill the pin holes that may exist on the surface.

The floor shall then be kept wet for a minimum period of 7 days. The surface shall thereafter be grounded evenly with machine fitted with coarse grade grit block (No. 60). Water shall be used profusely during grinding. After grinding the surface shall be thoroughly washed to remove all grinding mud, cleaned and mopped. It shall then be covered with a thin coat of grey or white cement, mixed with or without pigment to match the color of the topping of the wearing surface in order to fill any pin hole that appear. The surface shall be again cured. The second grinding shall then be carried out with machine fitted with fine grade grit block (No. 120). The final grinding with machine fitted with the finest grade grit blocks (No. 320) shall be carried out the day after the second grinding described in the preceding para or before handing over the floor as ordered by the Engineer-in-Charge. For small areas or where circumstances

so require, hand grinding/polishing with hand grinder may be permitted in lieu of machine polishing after laying. For hand polishing the following carborundum stones, shall be used:

1st grinding — coarse grade stone (No. 60)

Second grinding — medium grade (No. 80)

Final grinding — fine grade (No. 120)

In all other respects, the process shall be similar as for machine polishing. After the final polish, oxalic acid shall be dusted over the surface at the rate of 33 gm per squaremeter sprinkled with water and rubbed hard with a 'namdah' block (pad of woolen rags). The following day the floor shall be wiped with a moist rag and dried with a soft cloth and finished clean. If any tile is disturbed or damaged, it shall be refitted or replaced, properly jointed and polished. The finished floor shall not sound hollow when tapped with a wooden mallet.

11.7.6 Measurements

Length shall be measured along the finished face of riser, skirting or dado correct to a cm. Height shall be measured from the finished level of tread of floor to the top (the underside of tread in the case of steps). This shall be measured correct to a mm in the case of risers of steps and skirting and correct to a cm in the case of dado. The area shall be calculated in square meter correct to two places of decimal. Lining of pillars etc. shall also be measured under this item.

12. WATER PROOFING TREATMENT

12.1 Work shall be executed as per CPWD Specifications, 2019 Vol I & II with upto date correction slips.

12.2 The contractor shall associate himself with the specialized firm, to be approved by the Engineer-in-charge in writing, for water proofing treatment for basement/lower ground floor, underground tank and on roofs.

12.3 The brick bats shall be from over burnt bricks. The water proofing compound used in integral water proofing treatment shall satisfy all the performance requirements indicated in IS:2645 and shall be got tested before its use. The

compound shall be used @ 2% by weight of cement used or as recommended by the manufacturer.

- 12.4 Total quantity of the water proofing compound required shall be arranged only after obtaining the prior approved of the Engineer-in-Charge in writing. Materials shall be kept under double lock and key and proper account of the water proofing compound used in the work shall be maintained. It shall be ensured that the consumption of the compound is as per specified requirements.
- 12.5 The finished surface after water proofing treatment for roof slab shall have smooth slope with minimum gradient of 1 in 80.
- 12.6 Before commencement of treatment on roof surface, it shall be ensured that the outlet drain pipes/ spouts have been fixed and the spout opening have been eased and rounded off properly for easy flow of water.
- 12.7 The surface where the water proofing is to be done shall be thoroughly cleaned with wire brushes. All loose scales mortar splashes etc. shall be removed and dusted off. The surface shall be treated with neat cement slurry admixed with proprietary water proof compound to penetrate into crevices and fill up all the pores in the surface.
- 12.8 This cement slurry shall be applied at the junction of parapet and terrace slab including the vertical face of the parapet.
- 12.9 After the slurry coat is laid, layer of over burnt brick bats shall be laid in cement mortar of mix as specified by specialist firm but not leaner than 1:5 (1 cement : 5 coarse sand) admixed with proprietary water proofing compound to required gradient and joints filled to half the depth. The bricks bat layer shall be rounded at the junction with the parapet and tapered towards top for a height of 300mm. Curing of this layer shall be done for 2 days.
- 12.10 After curing the surfaces shall be applied with a coat of cement slurry admixed with proprietary water proofing compound.
- 12.11 Joint of bricks bat layer shall be filled fully with cement mortar of mix as specified by the specialist firm but not leaner than 1:5 (1 cement : 5 coarse sand) admixed with proprietary water proofing compound and finally top finished with average

20 mm thick layers of cement mortar 1:4 (1 cement : 4 coarse sand) and finished smooth with cement slurry mixed with proprietary water proofing compound. The finished surface shall have marking of 300x300 mm false squares to give the appearance of tiles.

12.12 Curing of water proofing treatment shall be done for a minimum period of two weeks by flooding the water by making compartments etc.

12.13 **MESUREMENTS:** The measurements shall be taken for plan area of terrace only. Length and breadth shall be measured correct to one centimeter and area shall be worked out to nearest 0.01 sqm. No deduction in measurements shall be made for either opening or recesses for chimneys, stacks, roof lights and the like of areas up to 0.10 sqm nor anything extra shall be paid for forming such openings. For similar areas exceeding 0.10 sqm, deductions will be made in measurements for full openings and nothing extra shall be paid for making such opening.

12.14 **Rates:** The rate shall include the cost of all labour and materials involved in all the operations described above.

12.15 GUARANTEE:

The water proofing work shall carry Ten Years guarantee to be reckoned from the date of completion of the entire work under the contract against faulty workmanship, finishing, unsound materials, efficiency of water proofing treatment and other related problems.

Ten Years Guarantee bond in prescribed Performa attached herewith as **Annexure-I** shall be submitted by the contractor which shall also be signed by both the specialized agency and the contractor to meet their liability / liabilities under the guarantee bond. However, the sole responsibility about efficiency of water proofing treatment shall rest with the main contractor.

Five percent of the cost of water proofing work shall be retained as security deposit. This five percent amount shall be transferred to RBI immediately after completion of work. And the amount so transferred would be released by RBI after ten years from the date of completion of the entire work under the contract, if the performance of the work done is found satisfactory. If any defect is noticed during the

guarantee period, it shall be rectified by the contractor within seven days of receipt of intimation of defects in the work. If the defects pointed out are not attended to within the specified period, the same will be got done from another agency at the risk and cost of contractor.

However, the security deposit deducted may be released in full against bank guarantee of equivalent amount in favor of RBI.

The Security deposit against this item of work shall be in addition to the security deposit mentioned elsewhere in contract form.

13 FINISHING:

13.1 The work shall be carried out as per CPWD Specifications- 2019 Vol.-I & Vol. II with upto date correction slips.

13.2 All painting material shall be brought to the site of work in the original sealed containers. The material brought to the site of work shall be sufficient for at least 30 days of work. The material shall be kept under the joint custody of contractor and representative of the Engineer-in-Charge. The empty contains shall not be removed from the site till the completion of the work without permission of the Engineer-in-Charge.

14. SPECIFICATIONS FOR ALUMINIUM DOOR, WINDOW, VENTILATOR WORKS:

14.1 Extent and Intent:

14.1.1 The work shall be carried out through an approved specialized agency, who shall furnish all materials, labour, accessories, equipment, tool and plant and incidentals required for providing and installing aluminum doors, windows, claddings, louvers and other items as called for on the drawings. The specialized agency for the Aluminum work shall be got approved from the Engineer-in-charge, well before actual commencement of the item of work. Necessary performance certificates in respect of agencies proposed to be engaged shall be submitted within 30 days from the date of issue of acceptance letter to substantiate technical capability and experience of the agency for prior approval of the Engineer-in-charge.

14.1.2 The drawings and specifications cover the major requirement only. The supplying of additional fastenings, accessory features and other items not mentioned specifically herein, but which are necessary to make a complete installation shall be a part of this contract.

14.2 General:

14.2.1 Work shall be carried out as per CPWD Specifications- 2019 Vol. I & Vol. II with upto date correction slips.

14.2.2 Aluminum doors, windows etc. shall be of sizes, section details as shown on the drawings. The details shown on the drawings indicate generally the sizes of the components parts and general standards. These may be varied slightly to suit the standard adopted by the manufacturer. Before proceeding with any manufacturing, the contractor shall prepare and submit complete manufacturing and installation drawings for approval of the Engineer-in-Charge and no work shall be performed until the approval of these drawings is obtained.

14.3 Shop Drawings:

The contractor shall submit the shop drawings of doors, windows, louvers, cladding and other aluminum work, based on architectural drawings, to the Engineer-in-Charge for his approval. The drawings shall show full size sections of doors, windows etc. thickness of metal (i.e. wall thickness), details of construction, sub frame/ rough ground profile, anchoring details, hardware as well as connection of windows, doors and other metal work to adjacent work. Samples of all joints and methods of fastening and joining shall be submitted to the Engineer-in-Charge for approval well in advance of commencing the work.

14.4 Samples:

Samples of doors, windows, louvers etc. shall be fabricated, assembled and submitted to the Engineer-in-Charge for his approval. They shall be of sizes types etc. as decided by Engineer-in-Charge. All samples shall be provided at the cost of the contractor.

14.5 Sections:

Minimum doors and windows shall be fabricated from extruded section of profile as detailed on drawings. The sections shall be extruded by the manufacturers approved

by the Engineer-in-charge. The aluminum extruded sections shall conform to relevant IS designation with chemical composition and technical properties as per IS:733 and IS:1285. The permissible dimensional tolerance of the extruded sections shall be such as not to impair the proper and smooth function/ operation and appearance of doors and windows.

14.6 Fabrication:

Doors, windows, etc. shall be fabricated to sizes as shown at factory and shall be of section, sizes combinations and details as shown in the Architectural Drawings. All doors, windows etc. shall have mechanical joints. All members shall be accurately machined and fitted to form hairline joints prior to assembly. The joint and accessories such as cleats, brackets, etc. shall be of such materials as not to cause any bimetallic action. The fabrication of doors, windows, etc. shall be done in suitable sections to facilitate easy transportation, handling and installation. Adequate provision shall be made in the door and window members for anchoring to support and fixing of hardware and other fixtures as approved by the Engineer-in-Charge.

14.7 Anodizing:

Wherever specified, Aluminum sections shall be anodized as per IS:7088 and to required color as specified in the item as per IS:1868 grading, after cutting the members to requisite sizes. Anodizing shall be to the specified grade with minimum average thickness of 15 microns when measured as per IS:6012. The anodic coating shall be properly sealed by steams or by boiling in deionized water or cold sealing process as per IS:1868 / IS:6057. Polythene tape protection shall be applied on the anodized sections before they are brought to site. All care shall be taken to ensure surface protection during transportation, storage at site and installation. The tape protection shall be removed on installation. The sample will be tested in the approved laboratory and cost of samples, cost of testing shall be borne by the contractor.

14.8 Powder Coating:

All aluminum sections shall be powder coated 50 microns to required color as specified in the item and as per direction of Engineer-in-Charge. Polythene tape protection shall be applied on the powder coated section before they are brought to site. All care shall be taken to ensure surface protection during transportation, storage at site and

installation. The tape protection shall be removed on installation. The samples will be tested in the approved laboratory and cost of samples, cost of testing, shall be borne by the contractor.

14.9 Protection of Finish:

All aluminum members shall be wrapped with approved self-adhesive non- staining masking tapes.

14.10 Handling and stacking:

14.10.1 Fabricated materials shall be stacking in an approved manner to protect the material against any damage during transportation. The loading and unloading shall be carried out with utmost care, on receipt of materials at site, they shall be carefully examined to detect any damaged pieces. Arrangements shall be made for expeditious replacement of damaged piece/ parts. Materials found to be acceptable on inspections shall be repacked in crates and stored safely.

14.10.2 In the case of Composite windows and doors, the different units are to be assembled first. The assembled Composite units should be checked for line, level and plumb before final fixing is done. Units may be serial numbered and identified as how to be assembled in their final location of situation so warrants.

14.10.3 Where aluminum comes into contact with masonry brickwork, concrete, planter or dissimilar metals, it shall be coated with approved insulation lacquer, paint or plastic tape to ensure that electro- chemical corrosion is avoided. Insulation material shall be trimmed off to a clean flush line on completion.

14.10.4 The contractor shall be responsible for assembling Composite, bedding and filling the groove with backup roads polysulphide sealant inside and outside, placing the doors, windows etc. in their respective opening. After the doors/ windows have been fixed in their correct assigned position, the open hollow sections abutting masonry concrete shall be fitted with approved polysulphide sealant densely packed and neatly finished.

14.10.5 The contractor shall be responsible for doors, windows, etc. being set straight plumb, level and for their satisfactory operation after fixing is complete.

14.11 Installation

14.11.1 Just prior to installation the doors, windows etc. shall be uncrated and stacked on edge on level bearers and supported evenly. The frame shall be fixed into position true to line and level using adequate number of expansion machine bolts, anchor fasteners of approved size and manufacturer and in an approved manner. The holes in concrete/ masonry members for housing anchor bolts shall be drilled with an electric drill.

14.11.2 The doors, windows assembled as shown on drawings shall be placed in correct final position in this opening and marks made on concrete members at jambs, sills and heads against the holes provided in frames for anchoring. The frame shall then be removed from the opening and laid aside. Neat hole with parallel sides of appropriate size shall then be drilled in the concrete members with an electric drill at the marking to house the expansion bolts. The expansion bolts shall then be inserted in the holes, struck with a light hammer till the nuts is forced into the anchor shell. The frame shall then be placed in final position in the opening and anchored to the support through cadmium plated machine screws of required size threaded to expansion bolts. The frame shall be set in the opening by using wooden wedges at supported and bar plumbed in position. The wedges shall invariably be placed at meeting points of glazing bars and frames.

14.12 Neoprene Gaskets:

The contractor shall provide and install Neoprene gaskets of approved size and profile at all locations as shown and as called for to render the doors, windows etc. absolutely airtight and weather tight. The contractors shall produce samples of the gaskets for approval and procure after approval only.

14.13 Fittings:

14.14 Hinges, stays, handles, tower bolts, locks and other fittings shall be of excellent quality and manufacturers shall be approved by the Engineer-in-Charge.

14.15 Manufacturer's Attendance:

The manufacturer immediately prior to the commencement of glazing shall adjust and set all windows and doors and accept responsibility for the satisfactory working of the opening frames.

14.16 Mastic Cement:

The gaps between frames and supports and also any gaps in the windows section shall be raked out as directed and filled with mastic cement of approved colour and make to ensure complete water tightness. The mastic cement shall be of such colour and Composition that it would not stain the masonry/ concrete work, shall receive paint without bleeding, will not sag and shall not set hard or dry out under any conditions of weather. The samples of mastic cement to be used for this purpose shall be got approved by the Engineer-in-Charge before its actual use.

14.17 Sealant:

- 14.17.1 Use modified silicone for joint subject to movement and in glazing.
- 14.17.2 Surfaces to receive sealant shall be properly prepared, cleaned, primed and excess sealant removed from finished surfaces.
- 14.17.3 Sealed joints shall be neatly tooled and surfaces smoothed.
- 14.17.4 Follow the instruction of the sealant manufacturers.
- 14.17.5 Color of the sealant shall be approved by the Engineer-in-Charge.

14.18 Glazing:

- 14.18.1 Glazing shall generally be accomplished from the inside of building.
- 14.18.2 The glazing system shall be designed to this end use a continuous EPDM compression gasket on both sides (Present Gasket on one side of glazing pocket and roll in gasket on another side). A continuous wet seal shall be employed to ensure a complete water tightness.
- 14.18.3 Maintain a minimum glazing bite, edge clearance and surface clearance depending on the glass as recommended by the glass manufacturer.

14.19 Sealant and Gasket Application:

- 14.19.1 Sealant and gasket shall be provided wherever shown in the drawings or required for a permanently weather tight installation. The sealing mechanism is necessary but is not indicated, it shall be of type recommended by the sub-contractor and approved by the Engineer-in-Charge.
- 14.19.2 All adjoining surfaces shall be protected to receive sealant against staining by masking and/ or other methods.
- 14.19.3 Joints and joint surfaces shall be clean, dry, and free of any material that may have an adverse effect on the bonding and/ or seal of the sealant and gasket materials.
- 14.19.4 Apply sealant and gasket under the conditions recommended by the manufacturer(s). Prime all surface to receive sealant and gasket unless recommended otherwise, use no sealant that has started to set in its container or a sealant that has exceeded the self-life published by the manufacturer.
- 14.19.5 Fill all joints continuously and completely with sealant, forming a neat, uniform, concave bead. Finish the material flush with adjoining surfaces unless shown on the drawings. All sealant surfaces shall be tooled smooth.
- 14.19.6 Tensile or shear stress in structural silicone sealant joint shall not exceed 1.4 kg/ sqm.

14.20 Protection & Cleaning: The contractor shall adequately protect all components and accessories from damage during shipments, storage at job site, erection and after completion of the work. At such time as may be directed, the sub-contractor shall remove all protective tapes or coating, thoroughly clean all anodized aluminum and glass surfaces with suitable cleaning agent, make final adjustments to all ventilators, etc. and hardware leaving all in first class working order.

14.21 Details of Tests

- 14.21.1 The various tests on aluminum sections shall be conducted in accordance with the relevant IS codes.
- 14.21.2 The minimum number of tests for powder coating and corrosion resistance shall be as given below:

S. No.	Details	No. of Tests
1	Doors, Windows & Ventilators	5% of Nos. manufactured.

14.21.3 The samples of major member of each unit of doors/ windows shall be selected at random by Engineer-in-Charge as such that all the aluminum section be got tested.

14.21.4 The cost of samples, carriage or the samples and testing charges, if any, shall be borne by the contractor.

14.22 Acceptance Criteria:

The Aluminum sections shall conform to the provisions of the relevant items. For payment purpose only, actual weight of sections shall be taken into account. However, if the sectional weight of any Aluminum section is higher than the permissible variation then the weight payable shall be restricted to the weight of the section including permissible variation.

14.23 Measurement:

Payment by weight shall be made for Aluminum sections including beading only and all fixing angles cleats fittings and fixtures such as handles and hinges etc., shall not be included in the weight to be paid.

14.24 Rates:

The rates of the items shall include the cost of all materials, labors and inputs required

15 STRUCTURAL GLAZING

15.1 General:

The work shall be carried out through an approved specialized agency, who shall furnish all materials, labor, accessories, equipment, tool and plant and incidentals required for providing and installing Structural Glazing work. The specialized agency shall be got approved from the Engineer-in-charge, well before actual commencement of the item of work. Necessary performance certificates in respect of agencies proposed to be engaged shall be submitted within 30 days from the date of issue of

acceptance letter to substantiate technical capability and experience of the agency for prior approval of the Engineer-in-charge.

The Contract Documents define only the design intent and general performance requirements. The Contractor is entrusted with total responsibility for design, structural calculations, shop drawings, fabrications, installation, warranties, certifications and related documentation.

The Contractor shall be entirely responsible for the design, fabrication and erection of the systems, and all work shall be performed entirely by his own forces.

Design approved metal framing members to accommodate expansion and contraction of components without buckling, creating stress on glass, structural components and fasteners, joint seals or other damaging effects.

The Contractor shall provide to sealant manufacturer samples of all relevant substrates, including finished aluminum, coated glass, gaskets, setting blocks and brackets.

Sealant manufacturer shall perform tests to verify adhesion, staining and chemical compatibility. The Contractor shall use sealants and substrates only in combinations for which favorable adhesion and compatibility results have been obtained.

Aluminum surfaces in contact with mortar, concrete, plaster, masonry, wet application of the fire proofing and absorptive materials shall be coated with an anti-galvanic, moisture barrier material.

15.2 Conceptual design:

- Component and hardware description.
- Design, fabrication & execution methodologies.
- Detailed bar chart & showing all activities from macro to micro details.
- Structural design and engineering fabrication, supply and erection of the Structural/ Structural Glazing wall system including but not limited to the following:
 - Extrusion aluminum framing members.

- All interior trim covers and closures.
- All anchor clips, fasteners, and brackets.
- Glazing, including materials, gaskets, sealants, spacers and related work.
- A continuous gutter system at each floor of the unitized Structural Glazing wall.
- Field water tests.

15.3 Samples:

Sample of one typical panel shall be fabricated, assembled and installed for approval. It shall be of type as per approved drawings. All samples shall be provided at no cost to the Project In-charge.

15.4 Design Considerations:

The Contractor should possess adequate engineering background and facilities inclusive of trained system personnel from their parent company and should be able to prove their design and engineering capabilities to meet structural design parameters. The Contractor should carry adequate Professional Indemnity Insurance supporting a design warranty to the benefit of the Project In-charge. Copies of the same to be forwarded to the Project In-charge within 2 weeks of signing the Agreement.

The Contractor shall submit structural calculations for the system and it shall be stamped and signed by a qualified structural engineer, including mock-up complying with current design rules of the relevant aluminum code include analysis for wind, dead loads, deflections and if appropriate seismic loads on framing members and anchors. All Structural Glazing shall have mechanical joints shall be designed IS 875.

The design shall also ensure that the maximum deflection of any member shall not exceed $1/175$ of the span between supports or 20mm, whichever is less for vertical elements & $1/250$ of the span between supports for horizontal elements. Air leakage through windows should not exceed 0.60 Cu.ft/Sq.ft. Minimum design pressures both inward, outward and acting perpendicular to glass (including return surfaces) shall be

per the requirements the Indian Wind Loading Code IS 875 Part 3 and earthquake regulations.

The framing members should be designed such that deflection perpendicular to the wall plane of any unsupported span shall not exceed $1/175$ or 20mm whichever is the least, under the required design load both positive and negative. Also, no failure of structural silicone Jolts, damage to joinery, components, or permanent set in the framing members in excess of 0.2 percent of the span shall occur under 1.5 times the design load. Deflection in the wall plane of any glazed horizontal span should not exceed $\frac{1}{2}$ the glass edge clearance dimension below.

The Contractor shall also submit the calculations for the structural silicone joint, size as required.

15.5 Water Tightness:

A complete drainage system must be incorporated into the Structural Glazing wall frame. Water leakage and condensation shall be drained or discharged to exterior face of the wall and all internal spaces shall be vented by acceptable means to ensure air-pressure equalization when possible.

Drainage system shall be sealed off per floor height to prevent infiltrated water from leaking to lower floors.

Movement of water behind and on exposed surfaces must be controlled to ensure that water is not retained and that elements will not be damaged or corroded by water and to minimize the potential for algae and fungus growth as a result of standing or trapped water.

15.6 Shop Drawings:

The Contractor shall prepare detailed shop drawings incorporating all allowances for construction and fabrication tolerances.

The Contractor shall submit detailed shop drawings for the Structural wall system, aluminum composite panel cladding works to the Project In-charge for review.

The Architect's review will be conformance to the design concept and for the general arrangement only. And such review shall not relieve the Contractor of any responsibilities as stated herein or any other applicable items herein specified.

The Shop drawings shall show joinery techniques, provisions for horizontal and vertical expansion, glass and metal thickness, framing and anchor member profiles, identification all materials including metal alloys, glass types, fasteners and glazing materials, all shop and field sealants by product name. This shall also show relative layout of all adjacent walls, beams, columns and slabs with all dimensions to each other and grid lines/ dimension position of glass edge relative to metal daylight, anchorage details to the building structure and coping details at the parapet are also to be submitted. The drawing shall also indicate all gaskets, weather strips and Aluminium extrusions.

Shop Drawings shall be signed and sealed by a Qualified Structural Engineer with specific experience in Structural Glazing Wall construction and design.

15.7 Samples:

The Contractor shall submit samples for review three (3) sets of labelled samples of each required type and color of metal finish, on 300mm long sections of aluminum extrusion shapes. Samples must show extremes of color texture variation. Samples will be reviewed by Project In-charge for color and texture only. Compliance with other requirements is the responsibility of the Contractor. Color and texture range of production material shall match approved samples.

Project In-charge reserves the right to require samples which will show the fabrication techniques and workmanship of the component parts, and the design of accessories and other exposed auxiliary items, before fabrication of this work proceeds.

The Contractor shall also submit samples for review three (3) sets of labelled samples of sealant backers, anchor components, anchor assemblies and epoxies.

15.8 Aluminum:

Extruded aluminum sections should conform to BIS designation HE9WP/HV9WP, the chemical composition requirements of IS:733, and technical properties as laid down in IS:1285. Standard commercial tolerances shall apply to finished, fabricated and assembled materials.

The sections of mullions and transoms shall be designed to withstand deflection and wind pressure as described in specifications and shall be rigid enough to support and retain the glass and other construction variation as indicated.

Reinforcing member, where used, shall be completely enclosed and if fabricated from steel shall be galvanized and protected with two coats of zinc chromate where welded shall be treated in the same way.

The frames shall be formed by integrated PVDF 3 coats (40 – 45 microns) as per AAMA 2605 specification aluminum section with provision to receive fixed glass spandrel and other construction variation as indicated.

Sections of the frame shall be cut and profiled for assembly in the best workmanlike manner and finished in a neat and weatherproof construction with proper tempering of aluminum sections.

All dimensions of the Structural Glazing wall shall conform to the overall sizes shown on the drawings. They shall be fabricated to proven and tested detail designs. All parts shall be supplied ready for fixing and complete with all necessary fittings. The exact dimensions for frame work shall be physically checked at site before starting fabrication.

All joints shall be mechanical, jointed with aluminum angles with stainless steel screws.

15.9 Silicone Sealant:

The Contractor shall send a sample of PVDF 3 coats (40 – 45 microns) as per AAMA2605 specification aluminum section & selected glass to the silicon sealant manufacturer and get his approval. A copy of that certificate to be submitted to Project-In-charge. The cost of samples, carriage of the samples and testing charges, if any shall be borne by the Contractor.

The Contractor shall submit, for record only, glass manufacturer's written statement that any insulated glass, reflective glass and spandrel glass is supported by structural silicone is suitable for such application.

The colour/ shade of sealant shall be decided by the Engineer-in-charge and the Contractor to get approval before procurement.

15.10 Glass Specification:

Providing and fixing aluminum semi unitized vertical Structural glazing system with single glass vision panel and spandrel panel of approved make having main frame of verticals and horizontals made out of specially designed extruded aluminum sections to withstand wind pressure of 175 kg/sqm at a height of 40m and fabricated, fixed at all levels, elevation and heights to the Masonry / RC walls with necessary clamps, brackets and anchor fasteners. All clamps and brackets shall be Mild Steel Hot dip galvanized minimum 80 microns thick and shall conform to IS: 4759-1996. The extruded aluminum section shall be anodized in approved color with an anodic coating of minimum 20 microns. Extruded section shall be of 6063 T5 or T6 alloy conforming to ASTM B 221. Any other fastening straps, nuts, bolts, rivets, washers, Fire stops at all floor levels etc. shall be in stainless steel SS 304 grade. All tapes shall be of approved make. The system shall be designed to withstand a wind pressure of 200 kg/Sqm and shall be fixed to the masonry/RC walls with necessary clamps, brackets and anchor fasteners, clamps and brackets shall be Hot dip galvanized minimum 80 microns thick all complete as per manufacturer's manual and specifications. The spandrel panel shall have 50mm thick fiber glass insulation of 48 kg/Cum density of approved make conforming to IS-8183 and 1.0 mm thick Twiga black tissue conforming to BS 476 Part 7. This insulation shall be enclosed in a GI tray fabricated out of 1mm thick. GI sheet and fixed to the glazing framework with stainless steel fasteners. The gap between the GI framework and the concrete framework shall be sealed with Aluminum flashing fixed with stainless steel fasteners. All gaps shall be sealed with Silicone sealant of approved brand. Insulation should be provided in between the Structural glazing aluminum frame work (i.e., behind the spandrel glazed panel) and the structure. Providing 6 mm thick toughened fully tempered hard coated glass of blue/green/blue-green or approved color having VLT = 32 to 48 %, External reflectance= 6 to 16%,Internal reflection = 8 to 20%, Solar factor = 0.33 to 0.36, U Factor = 2.8 to 3.6 W/sqm K etc.

15.11 Accessories:

Silicon gaskets, weather stripping, extruded seals and spacers, which do not come into contact with structural silicone sealant shall be of Silicon gasket or approved equivalent. Where in parallel contact with structural silicone sealants, all gaskets,

setting blocks and spacers other than foam glazing tapes shall be of heat cur silicone rubber, chemically compatible with the silicone sealant and suitable for the specific purpose intended. All extruded gaskets, weather stripping and spacers other than foam glazing tapes shall have continuous mechanical engagement to framing members adhesive attachment is not acceptable.

The cladding system shall be constructed with (and shall maintain during its design life) a standard of seal which shall not result in any reduction of sound insulation performance.

Gaskets, weather stripping and seals used to achieve the required weather proofing and/ or air tightness shall be selected to accommodate fully the range of dimensional tolerances associated with fabrication and installation of the cladding system. Gaskets, weather stripping and seals shall be formed from materials capable of retaining their elastic qualities, dimensions and resistance to physical and chemical attack sufficient to maintain the full water tightness, air tightness and acoustic performance for the design life of the Structural wall.

Extruded gaskets, weather stripping, seals and spacers mechanically engaged by flutes or pockets extruded in framing member shall be installed without residual tension or extension. Dry lubricants may be used to reduce drag during installation of synthetic rubber extrusions and to induce compression so as to prevent gradual elastic shrinkage and retraction from their ends. Wet lubricants containing detergent shall not be used for any purpose which may bring the liquid into contact with the coated surfaces of vision and spandrel glass.

15.12 Fabrication & Installation:

Installation shall be in true line vertically and horizontally.

Work shall be done by competent workmen who are thoroughly skilled in their trade. Assemblies shall be neat and free of defects that impair strength, function or appearance. The work shall be accomplished in compliance with the specified criteria without buckling opening or joints. Under stress on fasteners, sealants and gaskets, opening of welds cracking of glass leakage noises and other harmful effects.

As far as practicable fitting and assembly of the work, shall be done in the shop.

All exposed work shall be carefully matched to produce continuity of line and design.

All joints in exposed metal work, unless otherwise shown or specified shall be accurately fitted and rigidly secured with joint sizes conforming to industry standards.

Except where otherwise shown specified or directed the method of assembly and joining shall be as per approved shop drawings. Fabricate and fasten metal work so that the work will not be distorted nor the fasteners overstressed from the expansion and contraction of the metal.

All welding shall be in accordance with the appropriate recommendations of the Indian welding codes and shall be done with electrodes and/ or by methods recommended by the manufacturer of the alloys being welded. All welds behind finished surfaces shall be done as to minimize distortion and/ or discoloration on the finished side. All weld spatter and welding oxides on finished surfaces shall be removed by de-scaling and/ or grinding.

Unless otherwise shown or specified, all weld beads or exposed surfaces shall be ground and finished to match and blend with finish on adjacent parent metal. Grinding and polishing of nonferrous metal shall be done only with clean wheels and compounds free from iron and iron compounds. No soldering and/ or brazing shall be allowed.

The Contractor shall conceal all the fasteners where visible in the finished work.

All aluminum components shall be fabricated before finishing, cutting of components will not be acceptable.

As the building is exposed to varying weather actions, all fasteners shall be stainless steel, self-tapping screws with Aluminum brackets. Steel anchors shall be pre-holed and galvanized. The bolts shall be steel chromium plated along with nuts and covered with butyl sealing compound.

Where aluminum comes into contact with masonry, brickwork, concrete, plaster or dissimilar metals, it shall be coated with an approved insulation lacquer, paint or plastic tape to ensure that electro-chemical corrosion is avoided.

The Contractors shall be responsible for placing in position the Structural Glazing wall frames for the satisfactory performance and should be totally leak proof for a minimum period of ten years Sealant and Gasket Application

Sealant and gasket shall be provided wherever shown in the drawings or required for a permanently weather tight installation. The sealing mechanism for each location and use shall be as indicated on drawings in those locations where a mechanism is necessary but is not indicated. It shall be of type recommended by the Contractor and approved by the Project In-charge.

All adjoining surfaces shall be protected to receive sealants against staining by masking and/ or other methods.

Joints and joint surfaces shall be clean, dry and free of any material that may have an adverse effect on the bonding and/ or seal of the sealant and gasket materials.

Apply sealants and gasket under the conditions recommended by the manufacturer(s) Prime all surface to receive sealants and gasket unless recommended otherwise use no sealant that has started to set in its container or a sealant that has exceeded the self-life published by the manufacturer.

Fill all joints continuously and completely with sealant forming a neat uniform concave bead. Finish the material flush with adjoining surfaces unless otherwise shown on the drawings. All sealant surfaces shall be tooled smooth.

15.13 Certification:

The Contractor shall submit a letter of certification from the sealant manufacturer stating that the sealant has been tested for adhesion and compatibility on production samples of metals, glass, and other glazing components, and that all sealant details and application procedures shown on the reviewed shop Drawings are acceptable for use.

Where the Structural Glazing wall and other cladding impinges on, intercepts, covers, is attached to or supported by the work of other trades, for instance at parapet-level junctions with roof membranes and back-up walls, the Contractor's shop drawing and location drawings shall clearly distinguish elements and components of construction by other.

Anchorage System and Building Frame

Each mullion shall be fixed to the structural slab at each floor level. All steel fasteners shall be galvanized to minimum 80-90 microns coated with zinc chromate primer and supplied by the Contractor.

15.14 Water Tightness:

No gross leakage shall be observed when subject to test for water penetration as described in BS 4315 Part-1.

15.15 GUARANTEE:

Contractor & Specialized agency to offer a warranty on the Fire Doors for a period of Five Years to be reckoned from the date after the expiry of maintenance period prescribed in the contract of the work against faulty workmanship, finishing, unsound materials, structural instability and other related problems.

Five Years Guarantee bond in prescribed Performa attached herewith as **Annexure-II** shall be submitted by the contractor to meet their liability / liabilities under the guarantee bond.

Five percent of the cost of Fire Doors shall also be retained as security deposit and the amount so withheld would be released after Five Years to be reckoned from the date after the expiry of maintenance period prescribed in the contract, if the performance of the work done is found satisfactory. If any defect is noticed during the guarantee period, it shall be rectified by the contractor within seven days of receipt of intimation of defects in the work. If the defects pointed out are not attended to within the specified period, the same will be got done from another agency at the risk and cost of contractor.

However, the security deposit deducted may be released in full against bank guarantee of equivalent amount in favour of Engineer in charge, if so decided by the Engineer in charge.

The Security deposit against this item of work shall be in addition to the security deposit mentioned elsewhere in contract form.

Factory made glazed Steel/Aluminum Doors, Windows & Ventilators shall be manufactured in a workshop approved by the Engineer-in-charge.

16 12MM THICK TOUGHENED GLASS PARTITIONS WITH PATCH FITTING

16.1 SCOPE OF WORK

- i. The contractor shall be responsible for design, fabrication, supply, installation, test and guarantee of all items including taking all measures that may be required to complete the work as per Architectural concept drawings and specifications details.
- ii. The specialist agency engaged to carry out the external glazing installation and supply shall have at least 5 years of relevant experience and have completed external glazing systems of similar nature and equivalent scale of works as shown in the tender documents.
- iii. The specialist contractor shall submit an outline of recent comparable works (illustrated by appropriate drawings, sketches, photographs, brochures) by the firm / it's technical partner to illustrate the competence, experience and suitability of the firm.

16.2 The brief scope of work is:

- i. Design, preparation of shop drawings, calculations, engineering data and test reports.
- ii. Fabrication and installation of Glass Entrances and Glazing with Patch Fittings system.
- iii. All anchors, fixings, attachments, reinforcements, steel reinforcing for mullions and transoms required for a complete installation, except those specifically indicated as being provided by other trades.
- iv. Exposed Architectural mullions and other support members.
- v. Finishes, protection coatings and treatments.
- vi. Sealing with approved sealants within and around the perimeter.

- vii. All thermal insulation, fire safety etc. including supports and/or backing.
- viii. All caulking, sealing, electrometric and metal flashing, and gaskets including sealing at junctions with roof, ground-floor waterproofing and building expansion joints between structures.
- ix. Electrical bonding and earthing of all metal cladding elements.
- x. Provisions to receive electrical outlets and cutouts for conduits and other electrical work.
- xi. Glass and glazing.
- xii. Transportation, storage, handling, protection and cleaning.

16.3 SUBMITTALS

- i. Product Data: Include construction details, material descriptions, dimensions of individual components, profiles and finishes.
- ii. Shop Drawings
- iii. Plans, elevations and sections.
- iv. Details of fittings and glazing.
- v. Hardware quantities, locations and installation requirements.
- vi. Sample for verification, for each type of exposed finish required for
- vii. Metal finish: 150mm long section of patch fittings, rails and other items.
- viii. Glass: 150mm square, showing exposed edge finish.

FABRICATION AND INSTALLATION DETAILS, INCLUDING FOLLOWINGS

16.4 MATERIALS

i. Glass

1. Glass shall be as specified in drawing or BOQ or as per design requirement. It shall be Indian / imported hard coated reflective bronze and heat strengthened glass. It shall be of approved make.

2. In toughening of Glass rolling direction shall be parallel to the width of the glass panel such that waviness if any is parallel to the horizontal and no waviness parallel to the vertical and to ensure that such waviness is of negligible order.

ii. Components

1. Patch fittings: Stainless steel-clad aluminum
2. Floating Transom Bar: Steel clad in metal matching fittings and in sizes recommended by manufacturer for application indicated. Include stainless steel support rods, lateral adjustment and ceiling channel. Support fins to be metal, finished to match transom bar.
3. Rails: Stainless steel clad aluminum.
4. Accessory Fittings: Matching with patch fittings and rails metal and finish for overhead door stop, Centre hosing lock, glass support fin brackets and other as shown in drawing.
5. Anchors and fastenings: Concealed
6. Weather stripping: Sweep type
7. Hardware
8. Hardware should be heavy duty in matching finish
9. Concealed Floor Closer and Top Pivots
 - a. Centre hung; BHMA A156.4, Grade 1; including cases, bottom arm, top walking beam pivots, plates, and accessories required for complete installation.
 - b. Swing : Double acting; Positive dead stop, concealed with hold open angle
 - c. Delayed action closing
 - d. Concealed Overhead Holder: Grade 1, with dead stop setting coordinated with concealed floor closer.
 - e. Push-pull set : Stainless steel finish
10. Lock set of approved make.

iii. FABRICATION

1. Provide holes and cutouts in glass to receive hardware, fittings, rails and accessories before tempering glass. Fully temper glass using horizontal (roller-hearth) process and fabricate so, when installed, roll wave distortion is parallel with bottom edge of door or tile.
2. Factory assembled components and factory installed hardware to greatest extent possible.

iv. EXECUTION

1. Examine areas and condition for compliance with requirements for installation tolerances and other conditions affecting performance of work.
2. Install all glass system and associated components according to manufacturer's written instructions.
3. Set units in level and plumb.
4. Maintain uniform clearances between adjacent components.
5. Lubricate hardware and other moving parts according to manufacturer's written instructions.
6. Set, seal and grout floor closer cases as required suiting hardware and substrate indicated.

v. CLEANING

1. The Contractor shall ensure that all actions are taken during installation to eliminate the effects of corrosive substances on the finishes.
2. The Contractor shall clean both internal and external surfaces to remove corrosive substances, dust or cement / mortar dropping during the installation as may be directed and instructed by the ENGINEER-IN-CHARGE.
3. The internal surfaces of glass and aluminum frame are to be cleaned with compatible cleaning agents prior to the installation of the internal protective sheeting.

4. The Contractor shall provide written verification that cleaning agents are compatible with aluminum, stainless steel, glass coatings, granite, glazing materials and sealants. In no case shall alkaline or abrasive agent be used to clean the surface. Care shall be taken during cleaning to avoid scratching of the surface by grit particles.
5. Prior to snagging inspections the Contractor shall, remove the internal protection sheets and carry out a thorough cleaning of all glass and aluminum.
6. The Contractor shall also make good any physical damage to the structure including scratches, dents, abrasions, pitting, etc. to the satisfaction of the ENGINEER IN CHARGE.
7. Manufacturer's delivery or job markings on glass and adhesive for manufacturer's labels shall be either a neutral or slightly acidic material. In no case shall such material be alkaline; any staining of glass by alkaline material will be cause for rejection of the glass.
8. After the installation of each pane of glass all markings and labels shall be carefully and completely removed from the panes. Thereafter no markings or labels of any sort shall be placed on the glass.
9. Glazed openings shall be identified by suitable warning tapes or flags attached with a non-staining adhesive or other suitable means to the framing of the opening. Tapes or flags shall not be in contact with glass.
10. As soon as it is practically possible after the issuance of the occupation Permit for the Building, the Contractor is to carry out a complete cleaning of the external face.

Measurement

Measurements shall be in Sqm of actual area covered.

Rate

Rate shall include all required labour, material, designing, drawing conveyance, testing at approved laboratory breakage, wastage, supervision, protection till handing over.

17 CHICKEN WIRE MESH ON JOINTS OF RCC & BRICK WORK

17.1 Material

Providing and fixing 24 gauge 8 mm size galvanized chicken wire mesh of approved width at junctions of concrete and brick work and other locations called for including necessary laps and U shape galvanized wire nails complete at all heights and leads and lifts, doing independent double legged scaffolding, etc. complete as directed by Engineer-in-charge.

17.2 Chicken wire Mesh at Junction

All junction of Masonry wall with R.C. structure e.g. column, beam, etc, which are to be plastered, shall be reinforced by fixing strips of approved 22 SWG G.I Chicken wire mesh 250mm wide with an overlapping of 100 mm centrally over the length of junction. G.I. Chicken wire mesh of required width shall also be fixed over chasing for conduits, pipes, etc. on masonry walls before plastering is commenced. The mesh shall be nailed rigidly to the masonry with G.I. nails of suitable type of 226ncompl. 400 mm centers. The finished mesh shall be straight, rigid and laid without sagging. The contractor shall take into account the cost of G.I. chicken wire mesh while coating for plastering work.

Double scaffolding to be used shall be as specified.

The finished plaster surface shall not show any deviation more than 4mm when checked with a straight edge of 2m length placed against the surface.

To overcome the possibility of development of cracks in the plastering work following measures shall be adopted.

Plastering work shall be deferred as much as possible so that fairly complete drying shrinkage in concrete and masonry works takes place.

Where plastering is to be done over junction of two different materials e.g. concrete and masonry, the junction shall be covered by a chicken mesh of 250 mm width with margins on either side and then the plaster shall be applied. Where only one of the materials is plastered over, the plaster at junction shall be stuck to obtain a groove.

18 HARD STONE SOLING

18.1 Material

Hard stone soling of required thickness (or as specified in drawing) in layers not exceeding 20 cm in depth under foundation, flooring, under pavement, under plinth protection, under ramp, consolidating each deposited layer by ramming, watering and rolling with ½ tonne roller or wooden or steel rammers where ever required including preparing of surface etc. complete as per the direction of Engineer-in-charge.

18.2 Measurement

Length, breadth & height shall be measured correct to a cm & cubical area shall be calculated up to two decimal places.

18.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above

19 STAINLESS STEEL SS GRADE 304, CURTAIN ROD

19.1 Material

Stainless steel SS grade 304, curtain rod 25 mm dia 1.20mm thick with two Stainless steel SS grade 304, brackets and one center support brackets fixed with S.S screws and PVC sleeves etc., wherever necessary complete: 25 mm dia.

19.2 Measurement

Shall be measured in meter and no extra payments shall be made for fixing etc.

19.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above

20. CARTAGE OF GOOD EARTH

20.1 Material

Cartage of good earth for raising low site all around with approved soil obtained from outside by truck carriage including loading, unloading and stacking at Site, breaking clods, dressing etc. complete including paying necessary forest royalty, sales tax, land

compensation, municipal gate fees, if any monopoly duty etc. complete as directed and specified.

20.2 Measurement

Length, breadth & height shall be measured correct to a cm & cubical area shall be calculated up to two decimal place.

20.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above

21 GALVANIZED STEEL DECK SHEET ROOFING COVERED WITH CONCRETE

21.1 Materials

Galvanized Steel Deck Sheet

The base metal of plain galvanized sheets and coils shall conform to IS 1079 or IS 513 as the case maybe. However, deck sheet shall conform to IS 277:2003. When it is not possible to test the base metal before galvanizing, the base metal may be tested after stripping off the zinc coating. The grade of coating shall be minimum 275 g/sqm.

Galvalume and pre-painted galvalume sheets are not recommended for use in contact with concrete.

Shear Connectors

Shear connectors (Shear studs) at the interface of the concrete and sheet are provided. These shear connectors are embossment in deck sheets as typical pattern unique to each profile.

To ensure friction at the embossments, there should not be any paint or grease on the sheet surface in contact with concrete nor should any vibrating load be permitted to act on the slab until the concrete has set completely.

The length after weld should extend at least 35mm above the top of the main rib of the deck profile. The distance from the deck rib shall be minimum 25mm.

Single connector to be located at the center of beams except at butt joints where connectors to be staggered.

To avoid damaging to decking, connectors to be located along the predetermined lines marked on it. Minimum Spacing of the connectors shall be 5 times the diameter of shank and maximum shall not be more than 600 or 4 times the depth of slab.

Connectors in pair to have a minimum gap of 4 times the diameter of shank.

Wire Mesh

(i) mm wire mesh laid at 100x100 mm grid is to be provided to control the cracking.

Edge Trim

Galvanized edge trim is provided where requested around perimeter and void edges. This edge trim acts as permanent formwork only to support the wet weight of concrete during construction.

Finish

The roof when completed shall be true to lines, and slopes and shall be leak proof.

21.2 Measurements

The length and breadth shall be measured correct to a cm. Area shall be worked out in sqm correct to two places of decimal.

The area of roof shall be measured on the flat without allowance for laps and corrugations. Roof with curved sheets shall be measured and paid for separately. Measurements shall be taken on the flat and not girthed. No deduction in measurement shall be made for opening upto 0.4 sqm and nothing extra shall be allowed for forming such openings. For any opening exceeding 0.4 sqm in area, deduction in measurements for the full opening shall be made and in such cases the labour involved in making these openings shall be paid for separately. Cutting across corrugation shall be measured on the flat and not girthed. No additions shall be made for laps cut through.

21.3 Rate

The rate shall include the cost of all the materials and labour involved in all the operations

described above including all shear connectors, wire mesh, edge trim, seal, scaffolding, machinery for operations required etc. but excluding the cost of structural steel like beams, columns, joists etc. and concrete of different grade as per design.

22 TEMPORARY SITE BARRICATING 6.0 MT HEIGHT

22.1 Material

Erecting 6.00 metre high temporary barricading at site; each panel of size 3.00mx6.00m made of Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. Covered with precoated 230ncomplete iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm (+ 0.05 %) total coated thickness with zinc coating 120 grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12metre or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling /self tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto any pitch in horizontal/ vertical or curved surfaces, including Earth work in excavation, backfilling, providing & laying of reinforced cement concrete M-25 Grade in foundation also includes Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete.

The panels shall be made so that gap of 300mm above the ground is available making overall height as 6.3m. Suitable arrangement shall be made to fix the barricading to avoid from overturning. The work shall be executed as per detail drawing/direction of Engineer-in-Charge which includes writing and painting, arrangement for traffic diversion such as traffic signals during construction at site for day and night, glow lamps, reflective signs, marking, flags, caution tape as directed by the Engineer-in-Charge.

The barricading provided shall be retained in position at site continuously i/c shifting of barricading from one location to another location as many times as required during

the execution of the entire work till its completion. The barricading shall not be removed without prior approval of Engineer-in-Charge.

23 SPECIALISED ITEMS

23.1 List of Specialized Items has been provided in Annexure-VI of CPWD Works Manual.

23.2 PROCEDURE FOR EXECUTION OF THE SPECIALIZED ITEMS:

Such items should be got executed only through associated agencies specialized in these fields. The contractor shall indicate the name(s) of his associated specialized agencies those fulfilling the eligibility conditions as early as possible and within one month of award of work to Engineer-in-Charge for approval of competent authority.

Specialized Agencies for works shall be approved by the competent authority. The contractors shall quote the rates after careful study of contract conditions, specifications, drawings & schedule of quantities.

It shall be the responsibility of main contractor to sort out any dispute / litigation with the Specialized Agencies without any time & cost overrun to the Department. The main contractor shall be solely responsible for settling any dispute / litigation arising out of his agreement with the Specialized Agencies. The contractor shall ensure that the work shall not suffer on account of litigation/ dispute between him and the specialized agencies / sub-contractor(s). No claim of hindrance in the work shall be entertained from the Contractor on this account. No extension of time shall be granted and no claim what so ever, of any kind, shall be entertained from the Contractor on account of delay attributable to the selection/rejection of the Specialized Agencies.

For specialized items, the main contractor cannot work as a specialized agency unless his name is already included in the list of approved specialized agencies for these items. The contractor shall get these items executed through the specialized agencies as approved by competent authority.

23.3 ELIGIBILITY CONDITIONS FOR APPROVAL OF SPECIALIZED AGENCIES:

The Contractor(s) shall submit his proposal for the approval of the Engineer-in-Charge, the names of specialized agencies of repute along with their technical capability

/experience proposed to be engaged by him. The agency must be currently actively engaged in execution of the said specialized item and must have who have satisfactorily executed similar work during last 5 (Five) years as below:

- (i) Three works each of value not less than 40% of corresponding cost of the specialized item.

Or

- (ii) Two works each of value not less than 50% of corresponding cost of the specialized item.

Or

- (iii) One work of value not less than 80% of corresponding cost of the specialized item

For calculation purpose only, cost of the specialized item as per accepted tendered value of the all the items corresponding to the specialized item under consideration.

24 UPVC Casement/Sliding Window & Door

24.1 Material

uPVC (un-plasticized polyvinyl chloride) is PVC resin blended with acrylic modifier, titanium dioxide and other chemicals. Then it is processed through machine and mould to produce required uPVC multi-chambered profiles.

24.2 The factory made uPVC white color doors and windows shall be comprising of approved uPVC make multi-chambered frames, sash and mullion duly reinforced with appropriate thickness of galvanized iron section of required length, an appropriate dimension of uPVC glazing beads, EPDM gasket according to frame/sash profile and specified hardware and fittings of approved make having dimensions as per nomenclature of items. There are two type of uPVC extruded profile series which are used depending upon the size and design of window/door and wind load consideration and the agency shall also provide wind load calculation sheet duly approved by the Engineer-in-Charge as per IS 875 (Part-3) namely Small Series (small depth dimension) having wall thickness of 1.9 ± 0.2 mm and Big Series (big depth dimension) having wall thickness of 2.3 ± 0.2 mm of

uPVC main profile i.e frame. Depth and width of the profile mentioned in the nomenclature of the item is as following.

- (i) **Depth of a profile (D)**- Dimension which is measured at right angles to the glazing plane, between the front and back face surfaces of a profile.
- (ii) **Width of a profile (W)**-Dimension, measured in the direction of the glazing plane, and perpendicular to the longitudinal axis of the profile.

Note:

- (i) Profile size mentioned in the Delhi Schedule of Rate are in Depth (Base of Frame) x width format (visible elevation)
- (ii) For building it is a must to use big series above 5th floor.
- (iii) All uPVC profiles should be got approved by Engineer-in-charge before fixing at site of work.

Tolerance in profile dimension

For uPVC frame, sash and mullion extruded profile minus 5 % tolerance in dimension. i.e in depth and width of profile shall be accepted. Variation in profile dimension in higher side shall be accepted but no extra payment on this account shall be made.

24.3 Terminology

(a) **Frame**

Non movable or fixed portion of the window/door attached to the wall and to which the sash is assembled.

(b) **Sash**

Movable part in a window/door.

(c) **Glazing Bead**

Profile which holds the glass or any other partition materials.

(d) **Transom (or Mullion)**

Profile used within the frame, vertically or horizontally in a frame and/ or sash.

24.4 Marking

uPVC profiles shall be legibly and visibly marked in an unobtrusive position not visible when the window is closed at least once every one meter along the length of the profile and it should be visible when the window is open as well as shall contain the following minimum information on the main profile such as frame, sash and mullion/transom.

- (i) The name of the trade mark or brand name of the manufacturer.
- (ii) Date of manufacturing and profile code.

24.5 Testing (Criteria for conformity)

The uPVC extruded hollow profiles use in window and doors shall conform to the specification as per EN 12608 and other standards as mentioned below:

Table

S.No.	Name of the test	Test Method	Specified Parameter
i)	Vicat Softening Temperature	EN ISO – 306	Shall not be <75 C
ii)	Charpy Impact Strength	EN ISO – 179-2	Shall not be <20KJ/Sqm.
iii)	Flexural Modulus Elasticity	EN ISO – 178	Shall not be <2200 N/Sqmm.
iv)	Tensile Impact Strength	EN ISO – 8256	Shall not be <600 KJ/Sqm.
v)	Mean Breaking Stress for welded corner a) For the tensile bending test or b) For the compression bending test	EN – 514	Shall not be <25 N/Sqmm. Shall not be <30 N/Sqmm.
vi)	Heat Reversion Test	IS: 4985- 2000	Shall not be > 2.0%
vii)	Surface Spread of flame	BS : 476 – Part 7	Classification 1
viii)	Ignitability Evaluation	BS : 476 – Part 5	'P' Not easily ignitable

ix)	Tensile modulus	ASTM D 638	Shall not be < 35 Mpa
x)	Shear Modulus	ASTM D 732	Shall not be < 220 Mpa
xi)	Tensile Strength	EN ISO 527	Shall not be < 30 Mpa

For the determination of the weld ability of profiles, welded corners shall be tested for tests as mentioned above. The sample subjected to weld test shall not be finished by grooving and knifing etc. except for the outside edge of 90 degree angle, which shall be cleaned to permit the sample to sit fully on to the support.

Minimum percentage of **titanium dioxide** content in uPVC profiles shall not be less than **7.00 percent** and **calcium carbonate** content shall not be more than **10.00 percent**.

The uPVC casement / fixed / sliding windows and doors shall be factory fabricated by the approved manufacturer and installation work shall be carried out by them or their 235n complete vendor duly approved by the Engineer – in -charge.

24.6 Configuration

Indicative size and configuration of window& door (Casement/ sliding) are given in figure 9.29 to 9.38 of CPWD specification 2019 Volume 1. In case a new configuration is to be provided, same shall be specified in the item and figure included in the tender document.

24.7 Fabrication

(ii) According to the drawing, the required dimension and length of uPVC frame, sash and mullion profiles shall be mitred cut and reinforced with galvanized iron section of required length and thickness.

(ii) All frame and sash profiles of door and window shall be fusion welded at all corners. Mullion and Transom profiles shall also be fusion welded as per window / door design so as to prevent any ingress of water or air in the reinforcement chamber.

(iii) Each corner and joints shall be neatly cleaned by removing all excess material. The weld shall be finished by grooving, knifing etc. at exposed welded portion only.

- (iv) The minimum overlap of 6 mm shall be provided on frame and mullion to ensure effective seal between the sash and frame.
- (v) The window / door shall be designed and provided water drainage/ventilation slots in profile of frame, sash, transom or mullion in order to permit the escape of entrapped water, moisture from the system. A minimum of 2 nos slots shall be provided at least at every 500 mm. The drainage shall be so designed as not to puncture the reinforcement chamber and prevent water running through the reinforcement chamber. The holes and slots shall offset between the inner and outer walls so as to prevent any back flow.

24.8 Reinforcement

- i) The reinforcement material should be non-hygroscopic and should have no adverse effect of the performance of the window/door and it shall conform to any grade of IS 1079 or IS 513.
- ii) Mild steel section reinforcement made from Roll forming process and shall be hot dip zinc galvanized in accordance with IS 277 with a minimum coating mass of 120 gm/sqm.
- (iii) The thickness of reinforcement shall be as such that the uPVC window and doors meet the design wind pressure in accordance with IS 875 (Part-3) and design of the reinforcement should be as per uPVC profile manufacturer recommendation and fix to ensure adequate fastener retention.
- (iv) Galvanized mild steel reinforcement section is to be inserted in uPVC frame, sash and mullion profile of required length with in 6 to 15 mm distance from the face of the weld and then shall be screwed at 150mm from the end at every 400 mm (maximum) pitch to uPVC profile so that it does not move or rattle.
- (v) Galvanized mild steel reinforcement section thickness shall be changed according to floor level keeping in consideration of wind load factor and minimum thickness should be as below:
 - (a) From ground floor upto floor 5th level = 1.60 ± 0.2 mm
 - (b) From floor 5th level onwards = 2.20 ± 0.2 mm

24.9 Glazing

- (i) After fusion welding and cleaning of the corner of the sash prescribed glass panes shall be placed after fitting EPDM gasket and uPVC beading of approved quality and make.
- (iv) Window sash shall be made in such a way that glazing or re-glazing is possible at site without the need to remove the outer frame.
- (v) The plastic spacer shall be used to provide to support the glass in sash/frame.
- (iv) The following glass thickness shall be used in uPVC windows and doors but in no case less than 4mm.
 - (a) For single glazing – 4 to 6mm
 - (b) For double glazing – 20 mm or 24mm

Glazing supports shall be provided on frame or sash in order to distribute the load of the glass and to place the glass in the frame or sash. Spacers that would provide supports to the glass in the frame or sash shall be installed after the glazing support are installed. The supports and spacers shall be so placed as not block the drainage holes/slots.

24.10 Glazing gasket & Weather pile strip/ Wool pile

- (vi) Material for glazing gaskets shall be of EPDM (Ethylene propylene diene monomer) and shall be used on both side of glass panes in uPVC sash and glazing bead profiles.
- (ii) Weather pile strip / Wool pile shall be used in uPVC sliding door and window to reduce air filtration and water penetration.

24.11 Window / Door Hardware and Fittings

Materials for all hardware except for fixing shall have at least the equivalent corrosion resistance of EN 1670- 1988 grade 4 (240 hrs) when subjected to natural salt spray testing in accordance with EN ISO 9227. Testing shall be carried out on complete hardware items and also duly approved by the Engineer – in – charge before use at the site of work.

Hardware like hinges, rollers and locking devices which have been life cycle tested in accordance with EN 199 (Windows and Doors – Resistance to repeated opening and closing – Test method) and have achieved at least 10,000 operating cycles (i.e. opening and closing) without deterioration, failure or excessive wear.

These shall be provided as per nomenclature of item of approved make and duly approved by Engineer-in-Charge before fixing at site of work. Hardware / fittings such as handle, roller, touch lock, multipoint locking, 3D hinges, friction hinges etc. shall be directly screwed not pre-drilled or hammered.

24.11.1 For Casement windows

Approved quality stainless steel friction hinges (SS 304 grade) with SS screws shall be provided as per nomenclature of item and length of friction hinges should cover more than 60 percent width of the shutter and two number friction hinges required for each shutter one at top and one at bottom.

24.11.2 For Casement doors

Minimum three numbers of approved quality 3D hinges with necessary SS screws shall be provided in the casement door shutter up to 0.90 meter in width and 2.10 meter in height, for more than 2.10 metre height minimum four numbers 3D hinges to be used.

24.11.3 For Sliding windows/doors

(i) One pair of zinc alloy body with single nylon roller (weight bearing capacity to be 40 kg) upto 1.50m window height dimension and one pair stainless steel (SS 304 grade) body with adjustable double nylon roller (weight bearing capacity to be 120kg) above 1.50 m window height dimension of approved quality to each shutter of window shall be provided.

(ii) One pair of adjustable double nylon roller of approved quality to each shutter of door shall be provided.

(iii) In case of wire mesh, stainless steel fly proof wire mesh shall be provided as per nomenclature of item of approved make and manufactures duly approved by the Engineer-in-charge before fixing at site of work. SS wire mesh must be in the first track of the three track frame from the interior field of vision and that SS wire mesh must be fixed with EPDM gasket in a sash profile as the glass sash profile.

24.12 Tolerance

The tolerance in dimensions of finished window / door in size shall not be more than + 5mm from the approved drawing dimension.

24.13 Installation

(i) There shall be a maximum gap of 3 to 5mm in between uPVC door / window frame and finished opening and the plastic packers shall be provided to maintain the level.

(ii) To maintain the exact dimension of door or window, the opening shall be checked for dimension and orthogonally using a prefabricated template. Any defect shall be made good by the agency at his own cost before fixing of door or window.

(iii) The uPVC frames are to be fixed in prepared opening in the walls. Window / door frame shall be fixed into the aperture by drilling through the outer frame to the existing structure and shall use 100x8mm fasteners of approved make.

(iv) The gap between uPVC window / door and adjacent RCC/Brick/Stone cladding work shall be filled with weatherproof Silicon sealant of approved make to maximum 5mm depth and 5mm in width to allow expansion/contraction of uPVC profiles. Silicon sealant of matching colour of uPVC profile shall be applied over backer rod.

24.14 Precautions taken before installation of uPVC Window & Door

(i) Jambs, sills and soffits of the opening shall be finished with plaster / stone / tiles according to agreement where uPVC window / door to be fixed.

(ii) Aperture shall be smooth in line and level as well as in plumb.

(iii) Flooring (where casement door is to be installed should be complete before installation of door).

(iv) The grill where to be installed in sliding / casement window should be provided after the installation of window.

(a) For sliding window – The grill shall be provided on the outer face of window.

(b) For casement window – The grill shall be provided on the inner face of window.

(v) Installation of uPVC door and window should be done before the last coat of the paint on the wall where window jambs, sills and soffits to be finished by paint. At least one coat of paint should be done before installation begins.

(vi) The colour of the profile shall be same and uniform on any surfaces or part of the surfaces which may be visible after installation of the window/door fabricated from the profile, when viewed by the normal vision.

(vii) The uPVC profiles manufacturer shall provide warranty of 10 years for colour fastness and any manufacturing defects in respect of uPVC profiles as well as water and air tightness in case of casement uPVC door/window unit.

(viii) uPVC door/windows hardware and fittings manufacturer shall provide warranty of 10 years for any manufacturing defects.

24.15 Mode of Measurement

The length and width of the window / door shall be measured from outer to outer face of the uPVC frame correct to a centimeter. Area shall be calculated in square meter nearest to 0.01 square meters.

24.16 Rate

The rate includes the cost of all labor, material and T&P involved in all the operations described above at all heights of the building. The cost of glass panes, wire mesh and silicon sealant shall be paid separately.

25 HARDWARE FITTINGS FOR UPVC DOORS & WINDOWS

25.1 Hardware fittings such as zinc alloyed white powder coated casement handles, touch lock, steel roller, steel crescent lock (white powder coated) for uPVC doors/windows shall be of approved brand/make, size and manufacturer as described in nomenclature of item complete as per direction of Engineer-in-Charge.

25.2 Measurement

uPVC doors & windows hardware fittings shall be measured in numbers.

25.3 Rate

Rate shall include all the material and operation as described in the nomenclature of item.

26 TECHNICAL SPECIFICATIONS FOR SANITARY INSTALLATIONS, WATER SUPPLY AND DRAINAGE

26.1 The scope of work comprises supply, laying, installation, commissioning and testing of water supply, sewerage and drainage works including sanitary fixtures and fittings. These works shall be executed as per the specifications of items attached and CPWD specifications- 2019 Vol. I & II with up-to-date correction slips up to the date of tender submission.

26.2 The work of water supply and sanitary installations shall be got executed by the agency as approved by Engineer-in-Charge.

(vii) The entire plumbing drawing and sanitary installation drawing/ details shall be submitted by the contractor and got approved by the Engineer-in-Charge before the execution.

(viii) The entire responsibility for the quality of work will however rest with the building contractor only.

26.3 The work of water supply, internal sanitary installations and drainage etc. shall be carried out as per the bylaws of the Municipal Corporation or any other local body and the contractor shall produce necessary completion certificates from such authority after completion of work.

26.4 All water tanks, taps, sanitary, water supply and drainage pipes fittings and accessories etc. shall conform to the bylaws and specifications of the Municipal Body/Corporation where CPWD specifications are not available.

26.5 The contractor shall engage licensed plumbers for the work and the materials (fixtures/fittings) tested by the local Municipal Body/Corporation wherever required at his own cost. Nothing extra shall be paid/reimbursed for the same.

26.6 All sanitary wares and fittings shall conform to IS standards and to be procured from approved makes. The contractor shall submit samples of all fittings and fixtures proposed to be used to the Engineer-in-charge for his approval. The approved samples shall remain with the Engineer-in-charge till the completion of the work.

- 26.7** P or S and floor traps (long arm upto 90 cm length or more) in WCs shall be of deep seal type of RIF make or equivalent and shall have a minimum water seal of 75 mm. Floor traps (long arm upto 90 cm length or more) shall have a minimum water seal of 50 mm.
- 26.8** The pig lead to be used in jointing 100 mm, 75mm, 50 mm SCI pipe joints shall not be less than 0.98 kg, 0.88 kg and 0.77 kg per joint respectively. A variation of 5% is allowed on higher side. However, in case of variation on lower side, the quantity of pig lead less used shall be recovered from the contractor at market rate to be determined by the Engineer-in-Charge whose decision in the matter shall be final.
- 26.9** All fixtures and accessories shall be fixed in accordance with a set pattern matching the tiles or interior finish as per architectural requirements. Wherever necessary the fittings centered to dimensions and pattern desired.
- 26.10** The rates shall include the cost of cutting chases, holes in walls, floors, RCC slabs etc. Wherever required and making good the same for which nothing extra shall be paid. The work in general shall be carried out as per CPWD specifications.
- 26.11** Rate includes all materials, labour and all the operations mentioned in the respective items unless and otherwise specifically mentioned.
- 26.12** The SCI pipe wherever necessary shall be fixed to RCC columns, beams etc. with rawl plugs of approved quality and nothing extra shall paid for on this account.
- 26.13** All the works shall be completely concealed either within shafts or chases or in fills and dropped ceilings, unless specifically shown in drawings or required otherwise.
- 26.14** All the works shall be adequate protected against corrosion, so that the whole work is free from damage throughout.
- 26.15** The contractor shall give a performance test of the entire installation(s) as per standing specifications before the work is finally accepted by making his own arrangements for water supply, electricity etc. and nothing extra whatsoever shall be payable for the same.

26.16 The contractor shall give a satisfactory performance test of the entire installation (s) before the work is finally accepted and nothing extra shall be payable to the contractor on this account.

26.17 The contractor shall be responsible for all the protection of sanitary, water supply fittings and fixtures against pilferage and breakage during the period of installation until the completion / handing over of the work.

26.18 Before the work is handed over, the contractor shall clean all fixtures removing all plaster, stickers, rust stains and other foreign matter, leaving every part in acceptable condition and ready for use to the satisfaction of the Engineer-in-charge.

26.19 The contractor shall submit completion plans for water supply internal sanitary installations and building drainage work within thirty days of the date of completion. These plans are to be submitted on drawings prepared preferably through computers (1 original copy + 3 photocopies) on suitable scales to show the general arrangement and desired details.

26.20 INSPECTION AND TESTING

Inspection and testing of water supply sewerage and drainage installations shall be carried out as per National Building Code 2016 with up to date amendments.

NON-SCHEDULE ITEMS

1.0 GRC CLADDING FOR PANELS BRACKETS MOULDING ARCHITRAVE ETC.

1.1 Material

Fixing of Glass Reinforced Concrete (G.R.C) Screens casted with 'Spray Mix' concrete design in approved size, pattern, thickness (40mm thick) and shade. The Screens should be made from '53 grade' White Portland Cement manufactured by 'JK Cement' or 'Birla white', White Quartz fine graded sieved Silica Sand, Alkali Resistant Glass Fiber manufactured by 'NEG Japan, Owen Corning 'Saint Gobain' or equivalent, Super Plasticizers manufactured by 'Karochem' or equivalent, Polymers manufactured by 'Nova Polychem' or equivalent and U.V resistant Synthetic inorganic pigments should be used for pigmentation manufactured by 'Phenochem industries or equivalent. The

Screens casting shall take place with layering methodology using- Direct Power Spray machines. The GRC Screens flexural strength average L.O.P should be above or equivalent to 6 N/mm² & M.O.R should be above or equivalent to 12 N/mm² for tests done on 28 days cured samples. The fixing of Screens should be done using 'Dry fixing' method onto structural support members i.e. R.C.C, Brick work or Red oxide Primer -paint or Epoxy primer -paint treated mild steel. The fixtures, fasteners and self tapping screws to be used for dry fixing should be of HP/KLIMAS. The quantity of fasteners or self tapping screws shall be calculated in accordance to the weight of Screens and actual site fixing conditions. If there will be requirement of Joint filling then elastomeric exterior grade paintable PU Sealant will be used. For final finishing of Screen one weather shield exterior grade water based diluted paint coat will be done if required. Vendor shall submit shop drawings of same, the drawings to be duly approved from Engineer in charge at site..

1.2 Measurement

Length and breadth shall be measured correct to a cm & area shall be calculated up to two decimal place.

1.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above.

2.0 TOILET CUBICALS

2.1 Material

Fixing of Toilet cubicles of width and depth as per specifications/ site drawings. Cubicle height to be 1980 mm made from solid grade compact high pressure laminate as per IS: 2046 manufactured under high specific pressure > 5 Mpa and temperature >120oC with bunch of kraft papers impregnated with thermosetting phenolic resin and decorative papers made of Alpha cellulose fiber impregnated with thermosetting melamine resin which provide superior scratch, abrasion, heat, chemical, impact, graffiti & moisture resistance along with anti-bacterial properties. Panels have a black core that when machined, presents a distinctive black edge. Panel thickness 12 mm. Design no. as specified by Arch. / Engr. In suede finish. Size of panels to be as per drawing. • Rectangular head frame structure made from Stainless steel grade 304.

Surface finish to be brush type. A thin plastic film pasted for surface protection. Size to be 55mmx42mmx1.6mm. Corner joinery section made from Stainless steel grade 304. Surface finish to be brush type. A thin plastic film pasted for surface protection. Size to be 35mmx15mmx0.8mm. Wall joinery section with hamming profile made from Stainless steel grade 304. Surface finish to be brush type. A thin plastic film pasted for surface protection. Size to be 21mmx16mmx0.8 mm. • Adjustable Palm Design Pedestal Footing of base diameter 64 mm made from Stainless steel grade 316 giving a clearance height of 150 mm. Surface finish to be matt type. • Spring loaded Butt Hinges made from Stainless steel grade 304. Surface finish to be matt type. Covers to be lacorcoated. • Conical shape Coat hook with rubber stopper made from Stainless steel grade 304. Surface finish to be matt type. • Round Door knob diameter 30 mm with grooves for better hand grip made from Stainless steel grade 304. Surface finish to be matt type. • Rotating Thumb-turn locking system with privacy indicator made from Stainless steel grade 304. Surface finish to be matt type. • Anti-noise rubber padding of thickness 2 mm and width 10 mm • Stainless steel grade 304 screws. • Anti-rotation Nylon polyamide grade-6 expandable wall plugs.

2.2 Measurement

Shall be measured in pair and no extra payments shall be made for fixing etc.

2.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above.

3.0 GLASS DOOR HARDWARE

3.1 SS 304 TOP & BOTTOM PATCH

3.2 Material

Approved brand and manufacturer SS 304 grade Top & Bottom Patch fixed with SS screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.

3.3 Measurement

Shall be measured in numbers and no extra payments shall be made for fixing etc.

3.4 Rate

Rate includes the cost of materials and labour involved in all the operations described above.

4.0 SS 304 H TYPE 900MM PULL HANDLE WITH 32MM DIA

4.1 Material

Approved brand and manufacturer SS 304 grade H type 900mm Pull Handle with 32mm dia fixed with SS screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.

4.2 Measurement

Shall be measured in pair and no extra payments shall be made for fixing etc.

4.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above

5.0 BRASS PULL HANDLE 300 MM

5.1 Material

Fixing approved make Brass Pull Handle 300 mm size fixed with SS screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.

5.2 Measurement

Shall be measured in pair and no extra payments shall be made for fixing etc.

5.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above

6.0 GLASS LOCK

6.1 Material

SS 304 grade Glass to Glass Lock Round type with SS screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.

6.2 Measurement

Shall be measured in pair and no extra payments shall be made for fixing etc.

6.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above

7.0 BRASS PENTABOLT LOCK

7.1 Material

Fixing approved make Pentabolt lock brass. Complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge

7.2 Measurement

Shall be measured in numbers and no extra payments shall be made for fixing etc.

7.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above.

8.0 BRASS DOOR SAFETY CHAIN

8.1 Material

Fixing approved make Brass Door Safety chain. Complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.

8.2 Measurement

Shall be measured in numbers and no extra payments shall be made for fixing etc.

8.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above.

9.0 MAGIC EYE BIG (BRASS) DOOR VIEWER

9.1 Material

Fixing approved make Magic Eye Big (Brass) Door Viewer. Complete in all

respects as per manufacturers' specifications & as directed by Engineer-in-charge..

9.2 **Measurement**

Shall be measured in numbers and no extra payments shall be made for fixing etc.

9.3 **Rate**

Rate includes the cost of materials and labour involved in all the operations described above.

10.0 WALL MOUNTED DOOR BUFFER

10.1 **Material**

Fixing approved make SS 304 grade wall mounted door buffer fixed with SS screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.

10.2 **Measurement**

Shall be measured in numbers and no extra payments shall be made for fixing etc.

10.3 **Rate**

Rate includes the cost of materials and labour involved in all the operations described above.

11.0 16MM THICK MULTIWALL POLYCARBONATE SHEET

11.1 **Material**

Multilayer standing seam polycarbonate panel system of 16mm thickness (minimum) including all standard fixing accessories on top of the supporting structure (Paid extra in another item) complete & as per the direction of the engineer in charge. The panels should work on angular day lighting concept with translucent and opaque combination of louvers inside, for better thermal insulations and diffusion of light especially with white and clear combination designed for tropical regions & shading throughout the day for better ambient temperature below the roof. Panels shall have minimum seven layers with all fixing accessories to ensure best performance for wind

uplift, vibration, oil canning and visual appearance. The entire panel system shall be with a width from min. 1200 mm. Bigger width and minimal junctions should be preferred for better performance. Panels shall be manufactured with vertical offset standing seam at both sides of the panel. Panels have to be fixed on Purlin with snap on connectors with grip lock double tooth locking mechanism and will be secured on MS structure / purlins (will be paid Separately) with HDSS Fastener and double tooth polycarbonate connector for best stability and having a pull-out load of min. 7000N (7KN) tested as per ISO 6892:1998 and IS 1608: 2005. Panels cell structure be in truss bridge design or commonly called X structure for better strength and stability. Panels must satisfy Dart drop impact test as per IS 14443-97 shall show no sign of breakage on Polycarbonate Panel which have been exposed to UV for a min. of 500 Hours as per ASTM G 155. Panels shall not have Yellowness Index as per ASTM D 1925 of 15 units when tested on a sample exposed to UV for 500 Hours as per ASTM G 155. U value shall not be more than 2.1 W/m²K as per EN ISO 10077-2:2018. Panel shall be with additional End cap/Aluminium U/F profile/ Glazing Bar (all mill finish) for ends as required. Trained and factory authorized labour with supervision to complete the entire panel installation as per drawing & direction of the engineering in charge.

Color: A Combination of Clear/White or any colour in a single panel and as per approved sample.

11.2 Measurement

Length and breadth shall be measured correct to a cm & area shall be calculated correct to two decimal place.

11.3 Rate

The rate include cost of all the operations, labour materials and tests (as applicable) for proper completion of the work except the M.S tubular framework which shall be measured and paid separately (For payment purpose the area of finished polycarbonate sheet fixed in position shall only be measured).

12.0 LAMINATED WOODEN FLOORING

12.1 Material

Fixing 8mm thick wooden laminate flooring Essentials-” having AC4, Grade 4, weight 7.16 kg/m², IC2 impact resistance, grade 4 in resistance in cigarette burn, level 6 in color fastness, Surface soundness >1N/mm. PLANK SIZE:8x194x1292mm. Consisting of a high density fiber board (HDF) core with a design layer on top protected by a high wear and scratch resistant overlay and a melamine backing at the bottom with the quality of Direct Pressure Laminate (DPL) and installed over a high moisture resistant polyethylene sheet and cross-linked polymer based intermediate overlay and installed by a trained applicator. The flooring must include all accessories including under layer of 200-micron pvc sheet and pvc foam layer, completed in all respect with material, labour required for the complete item with all leads, lifts for materials as per approved specifications, removal of debris from the premises etc., all complete as directed by the Engineer in Charge.

12.2 Measurement

Shall be measured in Square Meters of actual area covered.

12.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above

13.0 HETEROGENEOUS VINYL SHEET FLOORING

13.1 Material

Heterogeneous vinyl sheet flooring areas in sheet form. The total thickness would be 4.5mm and thickness of wear layer would be 0.45mm. The product should be multi layered consisting of wear layer with PUR coating, PVC layer, fiber glass layer and foam layer. It shall conform to shock absorption of ≥28% ball bounce of ≥97% , sound insulation of 20-22db, Impact resistance of ≥8N/m as per DIN 18032, abrasion resistance of ≥7mm, indentation resistance of 0.6mm as per EN1016, friction coefficient of 0.6 as per GB/T14833-1993, Rebound coefficient of 0.86 as per GB/T14833-1993.

Rate to exclude skirting, end profile, pvc cove former on edges. Area for skirting shall be measured separately. In all respects as per manufacturer's specifications & as directed by Engineer-in-charge.

13.2 Measurement

Shall be measured in Square Meters of actual area covered.

13.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above

14.0 400 MICRON THICK PVC SHEET

14.1 Material

400 micron thick PVC Sheet on WBM Surface complete as per direction of engineer-in-charge.

14.2 Measurements

Measurements shall be in Sqm of actual area covered.

14.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above.

15.0 SINGLE GLAZING 6MM THICK

15.1 Material

6mm thick toughened glass of approved make with necessary fixing arrangement complete in all respects as per site requirement and as direction of the Engineer-in-charge. (Required properties of toughened glass Solar factor ≤ 0.45 , U-Value \leq (W/sq.m-K) 5.7W /M2K, Visible light transmittance ≥ 0.30)

15.2 Measurements

Measurements shall be in Sq m of actual area covered.

15.3 Rate

Rate includes the cost of materials and labour involved in all the operations described above.

ANNEXURE-I

GUARANTEE TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATERPROOFING WORKS

This agreement made this..... day of Two Thousand between M/s(hereinafter called the GUARANTOR on the one part) and the Reserve Bank of India (hereinafter called the Client on the other part)

WHEREAS THIS agreement is supplementary to a Contract No. dated (Hereinafter called the Contract) and made between the GUARANTOR on the one part and the Bank on the other part whereby the contractor inter alia undertook to render the building and structures in the said contract completely water and leak-proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain water and leak proof, for **Ten Years** from the date of completion of the work under the contract.

NOW THE GUARANTOR hereby guarantee that work executed by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be **Ten years** to be reckoned from the date of completion of the work under the contract.

Provided that the guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose:

- (a) Misuse of roof shall mean any operation which will damage proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof;
- (b) Alteration shall mean construction of an additional storey or a part of the roof or construction adjoining to existing roof whereby proofing treatment is removed in parts;
- (c) The decision of the Engineer-in-Charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect being found render the building water proof to the satisfaction of the

Engineer-in-Charge calling upon him to rectify the defects failing which the work shall be got done by the Bank by some other contractor at the Guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to execute the water proofing or commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Bank, the decision of the Engineer-in-Charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator..... and by for and on behalf of the RESERVE BANK OF INDIA on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of:

- 1.
- 2.

SIGNED FOR AND BEHALF OF THE RESERVE BANK OF INDIA BY in the presence of:

- 1.
- 2.

ANNEXURE-II

GUARANTEE TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF FIRE CHECK DOORS AND STRUCTURAL GLAZING WORKS

This agreement made this..... day of Two Thousand betweenM/s(hereinafter called the GUARANTOR on the one part) and the Reserve Bank of India (hereinafter called the Client on the other part)

WHEREAS THIS agreement is supplementary to a Contract No. dated (Hereinafter called the Contract)and made between the GUARANTOR ON THE ONE PART AND the Reserve Bank of India on the other part whereby the contractor inter alia undertook to render the work in the said contract structurally stable, workmanship, finishing and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable and guaranteed against faulty workmanship, finishing and materials for **five years** to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable and defect free for minimum period of **five years** to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

During this period of guarantee, the guarantor shall make good all defects to the satisfaction of the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Bank by some other contractor at the Guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all the defects, commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost

incurred by the Reserve Bank of India, the decision of the Engineer-in-Charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator and by for and on behalf of the Reserve Bank of India on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of:

- 1.
- 2.

SIGNED FOR AND BEHALF OF THE Reserve Bank of India by in the presence of:

- 1.
- 2.

LIST OF ACCEPTABLE MAKES OF MATERIALS

Acceptable makes of materials to be used in the work are as given in the table below. In case of non-availability of these makes, the Engineer-in-charge may allow use of alternative makes. Only BIS marked materials shall be used in the work. Non-BIS marked materials may be permitted by the Engineer-in-charge only when BIS marked materials are not manufactured.

S. No.	Materials	List of Approved Make
1.	(i) Ordinary Portland Cement/ Portland Pozzolana Cement.	Ultratech (Chitaurgarh), Wonder, Nuvoco Duraguard (Chitaurgarh), J.K. Supper Cement, A.C.C., Ambuja Cement,
	(ii) White Cement	Birla White, J.K. White.
2.	Reinforcement Steel	SAIL, Tata Steel, Rashtriyaspat Nigam Ltd (RINL), JSW Steel Ltd., Jindal Steel & Power Ltd.
3.	Water Proofing compounds, Admixtures, Plasticizer, Super Plasticizer, Curing Compounds	Fosroc, ROFF / Dr. Fixit (Pidilite Industries), CICO, Sika, BASF, Ardex Endura (Bal Endura)
4.	Integral water proofing compound with cement (For Plaster & Mortar)	Fosroc: Conplast 421 Dr. Fixit : LW+ Sika: Sikacin Asian Paints: Smart care Vitalia & equivalent product of BASF, CICO, Ardex, Endura.
5.	Water proofing for bathroom/ toilet/ balcony & other wet areas	Fosroc: Brush Bond Dr. Fixit : Pidifine 2 K Sika: Nito Bond

		Asian Paints: Damp Block 2K & equivalent product of BASF, CICO, Ardex Endura.
6.	Crystalline water proofing compound	Fosroc: Fosroco Crystalline Dr. Fixit: Dr. Fixit Crystalline Sika: Sika Crystalline Asian Paints: Crystalline Quarty & equivalent product of BASF, CICO, Ardex Endura, Pentron.
7.	Grouts, Tile Adhesive	Latecrete, Kerokoal, BASF, Ardex Endura Ferrous Crete.
8.	Structural steel	SAIL, Tata Steel, RashtiryalspatNigan Ltd (RINL) and JSW Steel Ltd. Jindal Steel & Power Ltd.
9.	Polycarbonate Sheet	GE Plastic, LEXAN COVESTRO India Pvt. (Brand name Makrolon), Flux
10	Profile Steel Sheet (Precoated)	Ezydeck of TATA, Lloyd Superdesk, JSW/Jindal
11.	Particle Board	Kitply, Action TESA, Greenlam, Merino, Century
12.	Laminated Particle Board/Laminates	Kitply, Greenlam, Action TESA, Century Ply, Merino
13.	Flush door Shutters	Duro, Kitply Industries (Swastik), Century, Durian, Green Ply, Jain Wood Industries
14.	Fire Rate Doors	Signum fire protection, Shakti Metdoor, NAVAIR, Adhunik Technology, Tata Pravesh, Vishnu, Sukri, Promat International, Kutty

15.	False Ceiling system	Armstrong, Hunter Douglas, USG Boral, Gypsum India Gyproc, Aerolite, Durlum, Interarch.
16.	Plywood/ Veneer	Kitply, Duro, Green Ply, Century, Merino, Durian,, Greenlam
17.	Melamine Polish	Asian Paints Melamine Gold, Wudfin of Pidilite, Timbertone of ICI Dulux.
18.	Floor Spring & Door Closure	Geze, Dorma, Doorset, Godrej
19.	(a) Aluminium section	Hindalco, Jindal, Indian Aluminium Co.
	(b) Anodised Aluminium Hardware (Heavy Duty)	Kilong, Alualpha, Ebco
20.	Clear/ Float/ Frosted/ Refractive/ Coated Glass	Saint Gobain, AIS, Modiguard, Ashai Float.
21.	Stainless Steel Railing, Accessories etc.	JINDAL, Dorma, GEZE, Hardwyn.
22.	S.S. Door & window Fittings	JINDAL, Dorma, Doorset, GEZE, Hettich, ENOX, Godrej
23.	Silicon Based water repellent/ weather sealant	G.E. Plastics, Dow Corning (Wacker), BASF, Pidilite (Dr. Fixit)
24.	Poly-Sulphide Sealant	Fosroc, Pidilite (Dr. Fixit), Sika, BASF
25.	Mosaic Tiles/ Chequered Tiles	Ultra Tiles, NITCO, NTC Tiles
26.	Ceramic Tiles	Kajaria, RAK, Bellissimo, NITCO, H & R Johnson, Somany.
27.	Vitrified Tiles (Antiskid. Matt/ Glazed)	Kajaria, RAK, Bellissimo, NITCO, H & R Johnson, Somany, Marbonite.
28.	Paver Block & Kerb Stone	NTC, NITCO

29.	Dash/Anchoring Fasteners	HILTI, Fischer, Bosch, Wurth
30.	Cement Based wall putty	Birla Wall care, JK white, Berger, Asian Paints
31.	Oil Bound Washable Acrylic Distemper	Asian Paints: Professional Acrylic Distemper Nerolac: Beauty Acrylic Distemper Berger: Bison Acrylic Distemper Dulux: Maxilite
32.	1 st Quality Acrylic Distemper (washable/ Ready mix/Low VOC)	Asian Paints: Tractor Aqua Lock Paint Berger: Commando Or Equivalent paints of Nerolac or Dulux.
33.	Acrylic Emulsion Paints	Asian Paints: Professional Premium Interior Emulsion Paint Nerolac: Beauty Gold Berger: Rangoli Total care Dulux: Super Cover
34.	Plastic Emulsion paint	Asian Paints: Apcolite Heavy Duty Premium Emulsion Paint Nerolac: Impression Berger: Easy Clean Dulux: Super Clean 3 in 1
35.	Premium Acrylic Emulsion Paints (Interior)	Asian Paints: Royale Luxury Emulsion Nerolac: Impression Berger: Silk

		Dulux: Velvet touch
36.	Textured Exterior Paint	Asian Paints, Nerolac, Berger Paints, Ultratech Paints Luxture.
37.	Acrylic Smooth Exterior Paint	Asian Paints: Apex Professional Exterior Emulsion Nerolac: XL Berger: Weather Coat Dulux: Weather Shield
38.	Premium Acrylic Smooth Exterior Paints with Silicon Additive.	Asian Paints: Apex Ultima Nerolac: XL Total Berger: Weather Coat all guard Dulux: Weather Shield Max
39.	Synthetic Enamel paint	Asian: Apcolite gloss enamel Nerolac: Synthetic Hi gloss Berger: Luxol Hi gloss Dulux: Gloss Synthetic enamel
40.	Cement Primer	Nerolac, Berger, Asian, Dulux
41.	Steel Primer (Red Oxide Zinc Chromate Primer)	Asian, Nerolac, Berger, Dulux
42.	Wood Primer	Asian, Nerolac, Berger, Dulux
43.	Epoxy Paint	Asian, Nerolac, Berger, Akzo Nobel
44.	Fire Paint	Asian Paints, Akzo Nobel, PROMAT, Jotun
45.	G.I./ M.S Pipe	Tata, Jindal (Hisar)

46.	G.I. Fittings	Unik, AVR, Zoloto
47.	HDPE Pipes	Reliance, Jain Pipes, ORIPLAST, Supreme
48.	DI PIPES	Elctrosteel, Jindal, TATA DUCTURA, Kapilangle, Kesoram
49.	DI Fittings	Elctrosteel, Jindal, TATA DUCTURA, Kapilangle, Kesoram
50.	UPVC pipe and fittings	Supreme, Astral, Ashirwad, Finolex
51.	Centrifugally cast (spun) Iron Pipes	NECO, Kapilansh, Electrosteel, SKF
52.	C.I Manhole Covers, Frames & GI Gratings	NECO, Raj Iron Foundary Agra, BIC, SKF, Kapilansh
53.	CI Fittings	NECO, Neel, Kartar, Sarkar
54.	SFRC Manhole Cover & gratings	KK, JAIN, PARGATI
55.	CP Brass Fitting (Superior Range)	Jaquar, Roca, Kohler
56.	CP Brass Fittings (Normal Range)	Hindware, Jaquar (Continental Series), ESSCO, Parryware
57.	Sanitary ware, Fittings & accessories (Superior Range)	Kohler, Roca, Grohe
58.	Sanitary ware, Fittings & accessories (Normal Range)	Hindware, CERA, Parryware, Jaquar
59.	Mirror Glass	Atul, Modi Guard, Golden Fish
60.	CPVC Pipe & Fitting	Supreme, Astral, Ashirwad, Finolex
61.	uPVC Pipe & Fitting	Astral, Supreme, Ashirwad, Finolex

62.	Stainless Steel sink	Neelkanth, Nirali, Jayna
63.	RCC Pipes (NP-2)	Lakshmi, Sood&Sood Jain Pipe Co. (Newai), Mahaveer Enterprises (Newai), work well spun pipes (Pali)
64.	UPVC Doors and windows (Profile makers and their authorized fabricators only)	Fenesta, VEKA, KOMERLING, REHAU, Aluplast, Wintech.
65.	Extruded Polystyrene Insulation Board	Dow Corning, Supreme, Texas, Analco.
66.	Heat Resistant Tiles	Swastik, Thermatek
67.	Gypsum Plaster	Ferrous Crete, Gyproc, Saint Gobain, Ultratech
68.	Floor Hardener	Ironite, Ferrok, Hardonate
69.	Modular Expansion Joint	Herculus, Sanfiled India Ltd. Vexcolt, Devin
70.	Glass Wool	Dow Corning, U.P. Twiga, Isover
71.	UPVC doors and window Hardware's	Rotto, Doorset, Kinlong
72.	AAC Block Adhesive	Ultratech, Ardex Endura, Ferrous Crete.
73.	Aluminium Doors and windows systems	Schueco, Raynaers, Cruze, AGV, IGT, Kalco
74.	Fiberglass reinforced asphalt Roof Shingle	Certain Teed (Saint Gobian), GAF
75.	Corian	Dow Cornice, Du pont
76.	Antistatic false/raised flooring (Frames & tiles)	SNS, ZK, KIBO

77.	Vinyl flooring	Armstrong, wonder floor, LG
78.	Strong room doors/ventilators	Godrej, BMS
79.	GRC Jali & Claddings	Unistone, VARE, Birla GRC
79.	Tang bar	Godrej
80	GI Sheet for Roofing	Jindal, Tata Blue Scope
81	Rigid Polyurethane foam	Pidilite, MBCC, Grace, Mappaie

Note: 1) RBI reserves the right to add or delete any materials and Brands in the list of acceptable materials/brands on the recommendations of Engineer-in-charge.

2) The make of material which are not mentioned shall be got approved from Bank's Engineer-in-Charge before use.

TECHNICAL SPECIFICATION - PLUMBING

1 Technical Specifications-Plumbing

1.1 IS Code for Plumbing Work

IS 651-1965	Specification for salt Glazed stoneware pipes and fittings (First revision).
IS 782-1978	Specification for caulking lead.
IS 1172-1971	Code of basic requirements for water supply, drainage and sanitation (revised).
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 1537-1976	Specification for vertically cast iron pressure pipes for water, gas and sewage.
IS 1536-1976	Specification for centrifugally Cast (Spun) Iron pressure pipes 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 1626-1960	AC building pipes, gutters and fittings (Spigot and socket type).
IS 1726-1960	Code for cast iron manhole frame and cover.
IS 1729-1979	Specification for Sand cast iron Spigot and Ventilating pipes, fittings and accessories.
IS 1742-1960	Code of practice for building drainage.
IS 2064-1962	Code of practice for selection, installation and maintenance of sanitary appliances.
IS 2065-1963	Code of practice for water supply to buildings.
IS 3114-1965	Code of practice for laying of C.I. Pipes.
IS 3589-1981	Specification for electrically welded steel pipes for water, gas and sewage.
IS 3989-1970	Centrifugally cast spun iron and socket soil and ventilating pipe, fittings and accessories.
IS 4111-1967	Code of practice for Ancillary structure in sewerage system.
IS 4127-1967	Code of Practice for laying glazed stone ware pipe.
IS 4515	Specification for unplasticized PVC pipe fittings.

IS 4985-1981	Specification for unplasticized PVC pipes for portable water supplies.
IS 1703-1984	Ball Valves
IS 2548-1970	Toilet Seat Cover
IS 4736-1986	Galvanizing G.I. Pipes
IS 780-1984	Cast iron sluice valves
IS 778-1984	Full way valves
IS 2692-1978	Brass ferrule
IS 458-1971	R.C.C. pipes
National building code for water supply, drainage and sanitation Part IX Plumbing services section 1 & 2.	
The installation shall also be in conformity with the bye-laws and a requirement of the local authority is so far as these become applicable to the installation. Where ever this specification calls for a higher standard of materials and/or workmanship then those required by any of the above regulations and standards, hen this specification shall take precedence over the said regulations and standards. Wherever drawings and specifications require something that may violate the regulations, the regulation shall govern.	

1.2 Sanitary Fixture & Fitting

1.2.1 Scope of Work

Work under this section shall consist of furnishing all labor as necessary and required to completely install all Sanitary Fixtures, Brass and Chromium plated fittings and accessories as required.

Without restricting to the generally of the foregoing the Sanitary Fixtures shall include all Sanitary Fixtures, C.P. fittings and Accessories etc. necessary and required for the Building.

Whether specifically mentioned or not all Fixtures and appliances shall be provided with all fixing devices, nuts, bolts, screws, hangers as required.

Testing of all fixture and fittings as per relevant IS codes.

1.2.2 European Water Closest

General

The item pertains for providing white or colour glazed vitreous chinaware European water closet with seat and cover of size and colour as specified in the schedule including fixing.

Material

European type water closet shall be washing down pattern unless otherwise specified. Water closet shall be vitreous china conforming to IS 2556 (Part-I & II). The closet shall be of one piece construction and shall have minimum two hole of 6.5 mm diameter for fixing closet to floor. Closet shall have an integral flushing rim of self draining type. Each water closet shall have an integral

Trap with either `S` or `P` outlet with and trap shall be uniform and smooth in order to enable an efficient flush. Plastic seat and cover shall be of black colour or as specified, they shall have conformity to IS2548 Part I & II.

Fixing

The water closet pan shall be placed in position. If the pan trap is damaged during handling or fixing, it shall be replaced by the contractor at his own cost. The pan, soil pipe shall be jointed in 1:1 Cement Mortar with hemp yarn caulked. The gap between W.C. and floor shall be finished with white/matching cement and sand as directed. Seat and cover shall be fixed to the Pan by two corrosion resistance hinge with 65 mm shank and threaded to within 25 mm from of flange. Seat shall be fixed in level by providing the washers of rubber with non ferrous or stainless steel washer to bolt.

1.2.3 Indian Water Closest

General

The item pertains for providing white or colour glazed vitreous chinaware Indian 84 water closet of size and colour as specified in the schedule including fixing.

Material

EWC is of white or colour glazed vitreous China conforming IS 2556 Part III. Pan shall have flushing rim and are inlet of self draining type. It shall have weep hole at the following inlet to the Pan. The flushing inlet shall be in front unless

otherwise specified. The inside of the bottom of the pan shall have sufficient slope from the front to the outlet and surface shall be uniform and smooth to enable easy and quick disposal while flushing. The exterior surface of the outlet below the flange shall be an unglazed surface which shall have groove at right angle to the axis of the outlet. In all the cases pan shall have be provided with 100 mm Glazed Vitreous China `P` or `S` trap with 50 mm water seal and 40 mm size vent harm

Fixing

The water closet pan shall be placed in position. The EWC shall be supported on brick masonry in CM 1:4 or as directed by the Engineer-in-charge. The pan shall be fixed slightly lower than the floor level. If the pan or trap is damaged during handling of fixing, it shall be replaced by the contractor at his own cost. The pan, trap and C.I. pipe shall be jointed in 1:1 Cement Mortar with hemp yarn caulked. The gap between W.C. and floor shall be finished with white/matching cement as directed.

1.2.4 Lavatory Basin

General

The item pertains for providing colour or white glazed vitreous chinaware wash basin with or without pedestal of size and colour as specified in the schedule including fixing.

Material

Wash basins shall be of vitreous china conforming to IS : 2556(Part-IV) of flat back or angle back as specified shall be of one piece construction including combined over flow, basin shall be provided with single or double tap holes of size 28 mm square or 30 mm rounded. Each basin shall have circular waste hole, or 5 sq.cm slot type over flow. Pedestals for wash basin shall be exactly same glazing that of basin. Pedestal shall be capable of supporting the basin and completely recessed at the back to accommodate supply and waste pipes and fittings. The basin shall be supported on pan of C.I Cantilever brackets conforming to IS 775. Use of MS angle or Tee Section as bracket is not permitted.

Fixing

The wash basin shall be fixed in position. Basin shall be supported on a pair of C.I brackets which is embedded in cement concrete (1:2:4) block 100 x 75 x 150 mm. Oval shape or round shape wash basins are required to be fixed in RCC platform with stone tapping either fully sunk in stone top or flush with stone topping. The wall plaster on seat shall be cut to rest over the top edge of the basin so as not to leave any gap for water seepage through between wall plaster & skirting of basin. The gap between basin and wall shall be finished with white matching cement.

1.2.5 Urinal**General**

The item pertains for providing colour or white glazed vitreous chinaware urinal in single or range (1, 2 & 3) and size as specified in the schedule with necessary fittings and appliances including fixing.

Material

Bowl Type with Flushing Rim: Urinal basin shall be flat back or corner wall type lipped in front. The vitreous china conforming to IS 2556 (Part VI). Urinal shall have an integral flushing rim and inlet or supply horn for connecting flush pipe. Flushing rim and inlet shall be of the self draining type. At bottom of basin and outlet horn for connecting outlet shall be provided. The inside surface of the urinal shall be uniform and smooth throughout to ensure efficient flushing.

Bowl Type Flat Back without Flushing Rim: They shall be of vitreous china conforming to IS: 2556 (Part-VI) constructed in one piece with providing slot or alternative fixing arrangement at flat back and where the integral flushing rim is not provided, they shall be provided with ridges inside the bowl to divert towards the front line of the urinal.

Stall Urinals: The stall urinal and its screen shall be glazed fire clay conforming IS: 771(Part-III, Sec-2). The inside surface of stall and screen shall be regular and smooth throughout to ensure efficient flushing.

CP Brass Flush Pipe: The flushing arrangement to urinals for single or in range shall be of CP brass with CP brass spreader of 15 mm dia conforming to IS: 407. The capacity of flush pipe for urinal in a range shall be as follows:

Nos. of urinals in range	Capacity of flush tank	Size of C.P. brass Flush pipe	
		Main	Distribution
One	5 litres	15mm	15mm
Two	10 litres	20 mm	15 mm
Three	10 litres	25 mm	15 mm

Fixing

Bowl Type Flat Back without Flushing Rim: Urinal shall be fixed in position by using rawl plug, wooden plug, C.P screws etc. It shall be fixed at height of 65 cm from the standing level to the top of the lip of urinal or as directed by the Engineer-in-charge. Each urinal shall be connected with 32 mm size waste pipe which shall discharge into channel or a floor trap

Stall Urinals: The stall urinal shall be flush with the finished floor level. The stall urinal shall be laid over a fine sand cushion on average 25 mm thickness. The gap between wall surface, finished floor level and urinals shall not be more than 3mm and filled with water proofing plastic compound.

CP Brass Flush Pipe: The flushing arrangement to urinal in single or range shall be of CP brass from 25 mm dia to 15 mm dia and CP brass spreader of 15 mm size to each urinal including the cost of CP brass elbows, tees, coupling, crosses, clamps, clips, union CP brass check nut and screws etc. CP brass

G.I. Pipes: Waste pipes may be exposed on wall or concealed in chase as directed by the Engineer-in-Charge. Specifications for waste pipes shall be same as given in Sub Section.

1.2.6 Flushing Cistern

General

The item pertains to provide white or colour glazed chinaware / PVC flushing cistern with all inside syphonic fitting including fixing.

Material

The flushing cistern shall be automatic or manually of rates high level or low level as specified for water closets and urinals. Cisterns shall be of cast iron,

vitreous china, enamelled pressed steel conforming to IS 774 for Flushing Type and IS 2326 for Automatic flushing cistern and Plastic (IS 7231). Cistern shall be mosquito proof. All working parts shall be designed to operate smoothly and efficiently. the cistern shall have removable covers which shall fit closely on it and be screwed against top displacement where operating mechanism is attached to the cover. This may be made in two section, but the section supporting the mechanism shall be securely fitted or screwed to the body. The outlet fitting of the cistern shall be securely connected to the cistern. The nominal internal diameter of the cistern outlet shall not be less than 32 mm and 38 mm for high level and low level respectively. Length of outlet cistern shall be 37 +/- 2 mm. Ball valve shall be screwed type 15 mm in diameter and shall conform of IS 1703. The flat shall be made of polyethylene as specified in IS 9762. A high level cistern is intended to operate with minimum height of 125 cm and a low level cistern with maximum height of 30 cm between the top of the pan and under side of the cistern. A G.I chain strong enough to sustain a sudden applied pull of 10 kg or a dead load of 50 kg without any apparent or permanent deformation of the chain rings shall be attached to the ring or hook of the level manually operated high level C.I cistern. In case of low level cistern handle shall be of CP brass. In case of Plastic cistern, operation of cistern shall be through Push Button at the top for dual system and beyond plastic handle. The discharge rate of the cistern as per IS 774 shall be 10 +/- .5 litres 6 second and 5 +/- .5 litres in 3 second for cistern capacity 10 ltrs. and 5 ltrs. respectively. Flush pipe shall be of class `B` G.I pipe of 32 +/- mm diameter for high level. Polyethylene flush pipe shall be low density confirming to IS 3076 or high density confirming to IS 4984 or UPVC pipe confirming to IS 4965 of 40 mm outer diameter. Over flow pipe shall not be less than +/- 5mm `B` diameter. It shall be of G.I valve with mosquito proof jalli of 1.25 mm dia.

Fixing

The chinaware flushing cistern shall be placed over a pair of C.I. brackets. C.P. brass flush pipe shall be fixed to cistern and W.C. pan using check nut, spun yarn, cement mortar etc. The cast iron flushing cistern shall be placed over a pair of C.I. or G.I. or PVC flush pipe of specified diameter shall be fixed to cistern and W.C. pan by using check nut, white zinc, spun yarn, cement mortar etc. The

PVC flushing cistern shall be placed or fixed as recommended by the manufacturer, PVC flush pipe of specified diameter shall be fixed to cistern and W.C. pan by using check nut, white zinc, spun yarn, cement

1.2.7 Stainless Steel Sinks

General

Item includes providing the stainless steel sink with or without drain board of size as specified in the schedule including fixing.

Material

The sink shall be manufactured from stainless steel of Salem or equivalent steel conforming to IS: 13983. Stainless steel sink shall be of one piece construction moulded out of 19 SWG (1mm) stainless steel sheet of grade AISI 304 (18/8) with stainless steel choke – stop strainer (waste coupling) check nuts conforming to IS 13983.

Fixing

The sink shall be fixed in position. The sink shall be placed over the brackets or on the platform. Gap between sink and platform / wall shall be finished.

1.2.8 Glazed Fire-Clay / Vitreous China Sink

General

Item includes providing white or colour glazed -fire clay sink for kitchen or vitreous china sink for lab as specified in the schedule of quantities including fixing.

Material

Laboratory sink shall be of vitreous china confirming to IS 2556 (PART-V) and kitchen sink shall be of glazed fire-clay conforming to IS 771 (Part-II) and shall have combined over flow of the weir type and invert shall be 30 mm below the top edge. These shall be of one piece construction and floor of sink shall gently slope towards the outlet. The outlet of sink should be suitable for waste fitting having flanges 88 mm diameter and waste hole of 65 mm diameter. the waster hole shall be either rebated or beveled having the depth of 10 mm. C.I brackets for supporting sink shall confirm to IS: 775.

Fixing

The sink shall be supported on C.I cantilever brackets, embedded in cement concrete 1:2:4 block of size 100 x 75 x 150 mm. Bracket shall be fixed in the position before dado work is done. The height of front edge of sink from floor level shall be 80 cm or as directed by the Engineer-in-charge. The gap between floor/wall and sink shall finish with white cement.

1.2.9 Half Round Channel**General**

The item pertains for providing colour or white glazed vitreous chinaware half round channel of size and colour as specified in the schedule including laying and fixing.

Material

The half round channel shall be of white or colour glazed vitreous chinaware of size as mentioned in the schedule with or without dead end and shall conform to IS 2556 part VII.

Fixing

The channel shall be laid to the correct alignment to required slope. It shall be fixed on 80 mm thick bed of 1:2:4 cement concrete. The channel shall be used in standard length. Pieces are not allowed except where it is necessary to make up exact length.

1.2.10 Glass Mirror**General**

The item providing beveled or plain edges mirror with or without frame of size as mentioned in the schedule including fixing.

Material

The mirror shall be of superior sheet glass with edges rounded off or beveled, size 600 x 450 mm unless specified in the schedule. It shall be free from flaws, specks or bubbles and thickness plated and should not be less than 5.0 mm. The back of mirror shall be uniformly silver plated and should be free from

silvering defects. Silvering shall now have a protective uniform covering of red lid paint, where bevelled edge mirror are not available. Fancy looking mirrors with PVC beading/border or aluminium beading on stainless steel beading/border based on manufacturer's specification, provided nothing extra shall be paid on this account. The backing of mirror shall be provided with 6mm thick marine plywood or environmentally friendly material other than asbestos cement sheet.

Fixing

Mirror shall be fixed in position with 6mm thick marine ply wood backing. It shall be fixed by means of 4 nos. of CP brass screws & caps over rubber washers and rawl plug or as per the manufacturer's specification unless specified otherwise the longer side shall be fixed horizontally.

1.2.11 Shower Rose & CP Fittings

General

The item pertains to provide chromium plated brass shower rose of specified diameter with accessories including fixing.

Material

The shower rose & CP fittings shall be CP brass of approved and heavy quality. Its accessories shall conform to IS 1239 Part II.

Fixing

Shower rose & CP Fittings shall be fixed to be water supply pipe line with necessary G.I fittings etc. as required by the Engineer-in-charge. Jointing shall be done with the zinc, spun yarn etc. A few turns of fine hemp yarn dipped in linseed oil shall be taken over the threaded ends to obtain complete water tightness. Leaky joint shall be remade to make it leak proof at his risk & cost.

1.2.12 Accessories

Accessories shall be of any of the following types:

- Towel rails
 - Towel rail shall be C.P brass of size 610mm long and 20mm dia, and fixing with C.P brass brackets fixed to wooden cleats with C.P. brass screws.

- Towel rings
Towel rail shall be C.P brass of size 150mm dia, and fixing with C.P brass brackets fixed to wooden cleats with C.P. brass screws.
- Toilet paper holder
Toilet paper holder shall be of Satin finish stainless steel AISI 316 grade wall mounted type fixed to wooden cleats with C.P. brass screws.
- Hand Dryer
Hand dryer shall be of best quality, to be operated with 230 volts, single phase, with fully hygienic condition, with all accessories and fixing in the wall or as directed by Engineer-in-Charge.
- Coat hooks
Coat hooks shall be of satin finish stainless steel AISI 316 grade wall mounted coat hooks fixed to wooden cleats with C.P. brass screws or as directed by Engineer-in-Charge.
- Soap dispensers
Soap dispensers shall be of satin finish stainless steel AISI 316 grade wall mounted liquid soap dispenser with indicator having bottom trough of soap fixed to wooden cleats with C.P. brass screws or as directed by Engineer-in-Charge.
- Soap dispensers
Soap dispensers shall be of satin finish stainless steel AISI 316 grade wall mounted liquid soap dispenser with indicator having bottom trough of soap fixed to wooden cleats with C.P. brass screws or as directed by Engineer-in-Charge.

Accessories shall be fixed with stainless steel half round head screws and cup washers in wall with rawl plugs or nylon sleeves and shall include cutting and making good.

Porcelain accessories shall be fixed in walls and set in cement mortar 1:2 (1 cement: 2 coarse sand) and fixed in relation to the tiling work. The flange of the recessed fixture shall cover the recess in the wall fully.

Contractor shall install all Chromium Plated and porcelain accessories.

All C.P. Accessories shall be fixed with C.P. brass half round head screws and cup washers in wall with rawl plugs or nylon sleeves and shall include cutting and making good as required or directed by Engineer-in-Charge.

Porcelain accessories shall be fixed in walls and set in cement mortar 1:2 (1 cement: 2 coarse sand) and fixed in relation to the tiling work.

1.2.13 Urinal Partitions

Urinal partitions shall be white glazed vitreous china or 25mm/40 mm thick marble of size of 690x325mm.

Porcelain partitions shall be fixed at proper heights with C.P. brass bolts, anchor fasteners and M.S. clips as recommended by the manufacturer and directed by Engineer-in-Charge.

1.2.14 Testing and Acceptance

Testing is done as per BS-5572

1.2.15 Internal Drainage Soil, Waste & Vent Pipes

1.2.16 Scope of Work

Work under this section shall consist of furnishing all labor, materials, equipments and appliances necessary and required to completely install all soil, waste, vent and rainwater pipes.

Without restricting to the generally of the foregoing, the soil, waste, vent and rainwater pipes system shall include the followings:-

- Vertical and horizontal Soil, Waste and Vent Pipes, Rainwater Pipes and Fittings, Joints Clamps and connections to Fixtures.
- Connection of pipes to Gully Traps & Manholes etc.
- Floor and urinal traps, cleanout plugs, inlet fittings and rainwater heads as specified.
- Waste pipes connections from all Fixtures e.g. wash basins, sinks, urinals and kitchen equipment..
- Testing of all pipes.

1.2.17 General Requirements

All materials shall be new of the best quality conforming to specifications and subject to the approval of Engineer-in-Charge.

Soil, waste and vent pipes in shafts, ducts and in concealed areas i.e. (false ceiling) shall consist of Hubless centrifugally cast (Span) iron pipes epoxy coated in sides and outside as per IS code 15905. & fittings (for Soil, waste, anti-siphon age pipes)

Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanlike manner.

Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages etc.

Pipes shall be securely fixed to walls and ceilings by suitable clamps at intervals specified. Pipes shall as far as possible be kept 50mm clear of wall.

Access doors for fittings and cleanouts shall be so located that they are easily accessible for repair and maintenance.

Every waste pipes shall discharge above the grating of properly trapped gully. Contractor will ensure that this requirement is adequately met with. Wherever floor traps are provided it shall be ensured that at-least one washbasin/washing trough is connected to such floor traps to avoid drying of water seal in the trap.

All traps on branch soil and waste pipes shall also be ventilated at a point not less than 75mm or more than 300mm from their highest part and on the side nearest to the soil pipe or waste pipe.

All works shall be executed as directed by Engineer-in-Charge.

1.2.18 Soil, Waste & Vent Pipes

- a) The Soil & Waste pipe system above ground has been planned as a "two pipe system" as defined in IS: 5329, having separate pipes for waste from kitchen sinks, showers, washbasins, AHU's condensate drains and floor drains . Waste stacks have been provided with a "P" trap at basement ceiling.

- b) All waste water from AHU's, A.C. plant and pump rooms, floor channels in basements will be provided with a deep seal trap before connecting to the main drain or vertical stack.
- c) Vertical soil & waste stacks shall be connected to a common horizontal drain pipe at basement ceiling or to an external manhole directly wherever feasible.
- d) All soil and waste from areas below general ground level (Basements) will be collected in sumps and pumped into sewer lines.
- e) Anti-siphonage pipe (ASP) shall be provided for soil fittings on vertical stacks. It may also be provided for waste lines.
- f) Vent pipes shall be provided at all sewer lines at the starting manholes.

1.2.19 Rainwater Pipes

- a) All terraces shall be drained by providing down-takes rainwater pipes.
- b) A separate piped drainage system for slopping roof with leaders shall be provided.
- c) Rainwater pipes are separate and independent connected to the external storm water drainage system.
- d) Rainwater in enclosed courtyards shall be collected in catch-basins and connected to storm water drains.
- e) Any dry weather flow from waste appliances, AHU's pump rooms, shall be connected to the sewerage system only.

1.2.20 Balcony / Planter drainage

Open balconies, terraces, planters and formal landscape areas will be drained by a separate pipe connected to external storm water drainage system.

1.2.21 C.I pipe for Soil & Waste

Soil, waste, vent and anti-siphonage pipes, fittings and accessories shall be cast iron pipes. All pipes shall be straight and smooth and their inside free from irregular bore, blow holes, cracks and other manufacturing defects. Pipes shall be centrifugally cast (spun) iron hub less soil pipes conforming to IS: 15905-2011.

1.2.22 Standard weight, dimensions and pig lead required for joints

For pipes conforming to IS: 15905-2011 (centrifugally spun soil hub less pipes).

Nominal Size	Diameter	Pipe Thickness Nominal	Pipe Thickness Minimum	Fittings Thickness Nominal	Fittings Thickness Minimum
In	mm	mm	mm	mm	mm
2	50	3.5	3.0	4.2	3.0
3	75	3.5	3.0	4.2	3.0
4	100	3.5	3.0	4.2	3.0
5.	150	4.0	3.5	5.3	3.5

1.2.23 Tolerance

Acceptable tolerance for pipes to IS: 15905-2011 shall be as follows:

Nominal Size	Diameter	External Diameter DE	Tolerance on External diameter DE
In	Mm	mm	mm
2	50	58	+2 -1
3	75	83	+2 -1
4	100	110	+2 -2
5.	150	160	+2 -2

1.2.24 Fittings

Fittings shall conform to the same Indian Standard as for pipes. Contractor shall use pipes and fittings of matching specifications.

Fittings shall be of the required degree of curvature with or without access door or as directed.

Access door shall be made up with 3mm thick insertion rubber washer and white lead. The bolts shall be lubricated with grease or white lead for easy removal later. The fixing shall be air and water tight. Fitting shall be SS 304/316 coupling as per manufacture with EPDM gaskets.

1.2.25 Fixing

All vertical pipes shall be fixed by MS clamps truly vertical. Branch pipes shall be connected to the stack at the same angle as that of the fittings. No collars shall be used on vertical stacks. Each stack shall be terminated at top with a cowl (terminal guard).

Horizontal pipes running along ceiling shall be fixed on structural adjustable clamps of special design or as directed. Horizontal pipes shall be laid to uniform slope and the clamps adjusted to the proper levels so that the pipes fully rest on them.

Contractor shall provide all sleeves, openings, hangers, inserts during the construction. He shall provide all necessary information to the building Contractor for making such provisions in the structure as necessary. All damages shall be made good by the Contractor at his own cost to restore the surfaces.

1.2.26 Clamps

Holder bat clamps shall be of standard design fabricated from MS flats 40x3mm thick and 12mm dia MS rod and 6mm nuts and bolts; painted with two coats of black bitumen paint before fixing. The clamps shall be fixed in cement concrete 1:2:4 mix (1 cement : 2 sand : 4 stone aggregate 20mm nominal size) blocks 100x100x100mm deep.

Where holder bat clamps are to be fixed in RCC column or slotted angles, walls or beam they shall be fixed with 40x3mm flat iron "U" type clamps with anchor fasteners of approved design.

Structural clamps shall be fabricated from MS structural members e.g. rods, angles, channels, flats or as directed. Contractor shall provide all nuts, bolts, welding material and paint the clamps with one coat of red oxide and two or more coats of black enamel paint to give an even shade.

Wherever MS clamps are required to be anchored directly to brick walls, concrete slabs, beams or columns, nothing extra shall be payable for clamping arrangement, RCC block and making good with cement concrete 1:2:4 mix (1 cement : 2 sand : 4 stone aggregate 20mm nominal size) as directed by the Architect/Consultants.

1.2.27 uPVC pipes for rain water system

Pipes

- All pipes shall be straight and smooth and inside free from cracks and other manufacturing defects. Pipes shall be conforming to I.S. 13592 (Type-A) for rain water.
- Pipes shall be joined by approved type of socket and 'O' rubber ring (conforms to I.S. 5382) joints with rubber lubricant.

Fittings

- Fittings shall conform to the Indian Standard recommended for the pipes. Pipes and fittings must be of matching I.S. Specification. Interchange of pipes of one standard with fittings on the other standard will not be permitted.
- Fittings shall be of the required degree of curvature with or without access door.
- Connection from a vertical stack or position to a horizontal line shall be made only by a “Y” junction.

Fixing

- All vertical pipes shall be fixed truly vertical to walls with approved type of uPVC saddle clamp. Branch pipes shall be connected to the stack at the same angle as that of the fittings. No collars shall be used on vertical stacks. Each stack shall be terminated at top with a cowl (terminal guard). However shaft where more vertical pipes run, the pipes may be fixed to the slotted angle/channel supports fixed to walls at intervals specified here under:-
- Horizontal pipes running along ceiling shall be fixed on **galvanized structural adjustable clamps** (Clevis clamps) of special design or as directed. Horizontal pipes shall be laid to uniform slope and the clamps adjusted to the proper levels so that the pipes fully rest on them.
- Contractor shall provide all sleeves, openings, hangers, inserts during the construction. He shall provide all necessary information to the Engineer-in-charge for making such provisions in the

Structure as necessary. All damages shall be made good to restore the surfaces at no extra cost.

Clamps

- Holder bat clamps shall be of standard design and fabricated from **galvanized M.S. standard flats** 40x3 mm thick and 12 mm dia M.S. Rod and 6 mm nuts and bolts. Holder bat clamps shall be fixed in cement concrete 1:2:4 mix blocks 10x10x10 cms deep.
- Where holder bat clamps are to be fixed in RCC column or slotted angles, walls or beam they shall be fixed with **galvanized** 40x3 mm flat iron "U" type clamps with anchor fasteners of approved design or 6 mm nuts and bolts.
- Structural clamps shall be fabricated by electro-welding from M.S. structural members e.g. rods, angles, channels flats. Contractor shall provide all nuts & bolts, welding material. All fabricated clamps, nuts, bolts and washers shall be not dipped galvanized.
- Galvanized slotted angle/channel supports on walls shall be provided wherever shown on drawings. Angles/channels shall be of sizes as required. Angles/channels shall be fixed to brick walls with bolts embedded in cement concrete blocks and to RCC walls with suitable anchor fasteners. The spacing of support bolts horizontally shall not exceed 1 m.
- Wherever M.S. clamps are required to be anchored directly to brick walls, concrete slabs, beams or columns, nothing extra shall be payable for clamping arrangement and making good with cement concrete 1:2:4 mix (1 cement :2 coarse sand :4 mm stone aggregate 20 mm nominal size) as directed by the Engineer-in-Charge.
- For sleeves, anchor fasteners and clamp spacing chart shall be as follows:

Clamp and Pipe Support Spacing

S.No.	Type of Pipes & Position	<----- Commercial Pipe Dia.(Spacing in m) ----->						
		15/20	20/25	32/40	50	75/80	100/110	150/160
1	Vertical Pipes							
1.1	GI /MS Pipes	2.4	2.4	3		3.6	4.5	5.4
1.2	uPVC Pipes Soil & Waste CI Pipes	x	x	<----- 1 m ----->				
1.3	uPVC /cPVC Pipes IS 4985 for Water Supply	x	x	x		<-----1 m----->		
	IS 13585 for SWR	x	x	0.5		0.7	0.9	0.9
2	Horizontal Pipes							
2.1	GI /MS Pipes	<-----2.0 m----->		2.4 m	3	3.6	4	4.5
2.2	uPVC pipes Soil & Waste Pipes			<----- 1.0 m ----->				
	IS Water Supply Pipes uPVC IS 4985					<-----1 m----->		
2.3	Fittings	All traps and tees and fittings runing below ceiling shall be supported on both sides						

1.2.28 Traps

Floor traps

Floor traps shall be siphon type full bore P or S type cast iron having a minimum 50 mm deep seal. The trap and main waste pipes in toilets having 150 mm sinking shall run below slab and shall be supported from the ceiling below. The trap and waste pipes in sunken area (where required) shall be set in cement concrete blocks firmly supported on the structural floor. The blocks shall be in 1 : 2 : 4 mix (1 cement :2 coarse sand :4 stone aggregate 20 mm nominal size) and extended to 40 mm below finished floor level. Contractor shall provide all necessary shuttering and centering for the blocks. Size of the block shall be 30x30 cms of the required depth.

Urinal traps

Urinal traps/horn shall be cast iron P or S traps with or without vent shall be fixed as specified for floor traps.

Floor trap inlet

Bath room traps and connections shall ensure free and silent flow of discharging water. Where specified, Contractor shall provide a special type inlet

fitting fabricated from CI pipe without, with one, two or three inlet sockets fixed on side to connect the waste pipe. Joint between waste and hopper inlet socket of the trap shall be joined with solvent cement recommended by the manufacturer. Inlet shall be connected to a CI. P or S trap. Floor trap inlet hoppers and the traps if set in cement concrete blocks as specified in para above without extra charge. CI multi-inlet trap can be used where ever possible to be decided by the Engineer-in-Charge.

Trap & Seals

All traps shall be self cleaning design and the seal depth shall be as specified below wherever the traps are not integral with the appliances:

Appliance or ware	Material	Trap Type	Seal depth(mm)
Lavatory /wash basin	C.P. cast brass	32 mm dia Bottle	75 mm
Sink	C.P. cast brass	40 mm dia Bottle	75 mm
Kitchen floor drain of fabricated drain boxes	C.I.	75/100 mm dia 'P' or 'S'	50 mm
Urinals	C.I.	100 mm dia 'P' or 'S'	50 mm
AHU's	C.I.	75 mm dia 'P' or 'S'	50 mm

Floor Gratings

Floor and urinal traps shall be provided with 100-150mm square or round C.P./ Stainless steel grating, with rim of approved design and shape. Minimum thickness shall be 4 mm.

1.2.29 Cleanout Plugs (On Soil Pipes)

Brass Clean out pipe for Soil, Waste or Rainwater pipes laid under floors shall be provided near pipe junctions bends, tees, "Ys" and on straight runs at such intervals as required as per site conditions. Cleanout pipe shall terminate flush with the floor levels.

Cleanout on Drainage Pipes

Cleanout pipe shall be provided on starting point of each drain and in between at locations indicated on plans or directed by the Engineer-in-Charge Cleanout pipe shall be of size matching the full bore of the pipe but not exceeding 150 mm.

Cleanouts at ceiling level pipe shall be provided with a bend terminating at floor level above. The cap of the cleanout pipe shall have a cap flush with floor.

1.2.30 Waste pipe from appliances

General

- a) Waste pipe from appliances e.g. wash basins, sinks and urinals shall be of GI pipes 32, 40, 50 mm conforming to IS:1239.
- b) All pipes shall be fixed in gradient towards the outfalls of drains. Pipes inside a toilet room shall be in chase or as directed. Where required pipes may be run at ceiling level in suitable gradient and supported on galvanized structural clamps. Spacing for clamps for such pipes shall be as per the pipe spacing chart given in section 1.

Encasing Pipe in Cement Concrete

C.I (Cast iron) soil and waste pipes and drainage under floor in sunken slabs and in wall chases (when cut specially for the pipe) shall be encased in cement concrete 1:2:4 mix (1 cement :2 coarse sand : 4 stone aggregate 12 mm size) 75 mm in bed and all-round. When pipes are running well above the structural slab, the encased pipes shall be supported with suitable cement concrete pillars of required height at intervals of one meter.

Testing

Testing procedure specified below apply to all soil, waste and vent pipes above ground including pipes laid along basement ceiling.

Entire drainage system shall be tested for water tightness during and after completion of the installation. No portion of the system shall remain untested. Contractor must have adequate number of expandable rubber/bellow plugs, manometers, smoke testing machines, pipe and fitting work test benches and any other equipment necessary and required to conduct the tests. All testing

equipment/motors etc. shall be certified for its calibration by an approved laboratory.

All materials obtained and used on site must have manufacturer's Hydraulic Test Certificate for each batch of materials used on the site.

Testing Soil, Waste and Rainwater Pipes

Apart from factory test all pipes and fittings shall be hydraulically tested for a head of 3 m preferably on a specially set up work bench. After applying pressure, strike the pipe with a wooden pallet and inspect for blow holes and cracks. Pressure may be applied for about 2 minutes. Reject and remove all defective pipes.

After installation all connections from fixtures, vertical stacks and horizontal drains including pipes along ceiling shall be tested to a hydraulic pressure not exceeding 3 m. Such tests shall be conducted for each floor separately by suitable plugs.

After the installation is fully complete, it should be tested by flushing the toilets, running at least 20% of all taps simultaneously and ensuring that the entire system is self draining, has no leakages, blockages etc. Rectify and replace where required.

Contractor shall maintain a test register identifying date and time of each area. All tests shall be conducted in presence of Engineer-in-Charge and signed by both.

1.3 Excavation for Pipeline

1.3.1 Excavation

The excavation for pipe works shall be open cutting unless the permission of the Engineer-in-Charge for the ground to be tunneled is obtained in writing. Where sewers have to be constructed along narrow passages, the Engineer-in-Charge may order the excavation to be made partly in tunnel and in such cases the excavated soil shall be brought back later on for refilling the trenches or tunnel.

1.3.2 Opening out Trenches

In excavation the trenches, etc. the solid road metal ling, pavement, curbing etc. and turf is to be placed on one side and preserved for reinstatement when the trenches or other excavation shall be filled up. Before any road metal is replaced, it shall be carefully shifted. The surface of all trenches and holes shall be restored and maintained to the satisfaction of the Engineer-in-Charge and of the Owners of the roads or other property traversed and the Contractor shall not cut out or break down any live fence or trees in the line of the proposed works but shall tunnel under them, unless the Engineer-in-Charge shall order to the contrary.

The Contractor shall grub up and clear the surface over the trenches and other excavations of all trees, stumps roots and all other encumbrances affecting execution of the work and shall remove them from the site to the approval of the Engineer-in-Charge.

1.3.3 Obstruction of Roads

The Contractor shall not occupy or obstruct by his operation more than one half of the width of any road or street and sufficient space shall then be left for public and private transit, he shall remove the materials excavated and bring them back again when the trench is required to be refilled. The Contractor shall obtain the consent of the Engineer-in-Charge in writing before closing any road to vehicular traffic and the foot walks must be clear at all times.

1.3.4 Removal of Filth

All night soil, filth or any other offensive matter met with during the execution of the works, immediately after it is taken out of any trench, sewer or cess pool, shall not be deposited on to the surface of any street or where it is likely to be a nuisance or passed into any sewer or drain but shall be at once put into the carts and removed to a suitable place to be provided by the Contractor.

1.3.5 Excavation to be taken to Proper Depths

The trenches shall be excavated to such a depth that the pipes shall rest on concrete or on firm bedding as described in the several clauses relating to these so that the inverts may be at the levels given in the sections. In bad ground, the Engineer-in-Charge may order the Contractor to excavate to a greater depth

than required and to fill up the excavation to the level of the sewers with concrete, broken stone, gravel or other materials. For such extra excavation and concrete, broken stone, gravel or other materials, the Contractor shall be paid extra at rates laid down for such works in the schedule, if the extra work was ordered by the Engineer-in-Charge in writing, but if the Contractor should excavate the trench to a greater depth than is required without a specific order to that effect in writing of the Engineer-in-Charge the extra depth shall have to be filled up with concrete 1:5:10 mix (1 cement: 5 fine sand: 10 stone aggregate 40mm nominal size) at the Contractor's own costs and charges to the requirements and satisfactions of the Engineer-in-Charge.

1.3.6 Refilling

After the pipes or other work has been laid and proved to be water tight, the trench or other excavations shall be refilled. Utmost care shall be taken in doing this, so that no damage shall be caused to the sewer and other permanent work. The filling in the haunches and upto 75 cms above the crown of the sewer shall consist of the finest selected materials placed carefully in 15 cms layers and flooded and consolidated. After this has been laid, the trench and other excavation shall be refilled carefully in 15 cms layers with materials taken from the excavation, each layer being watered to assist in the consolidation unless the Engineer-in-Charge shall otherwise direct.

1.3.7 Contractor to Restore Settlement and Damages

The Contractor shall, at his own costs and charges, make good promptly during the whole period the works are in hand, any settlement that may occur in the surfaces of roads, beams, footpaths, gardens, open spaces etc. Whether public or private caused by his trenches or by his other excavations and he shall be liable for any accidents caused thereby. He shall also, at his own expenses and charges, repair and make good and damage done to buildings and other property. If in the opinion of the Engineer-in-Charge he fails to make good such works with all practicable dispatch, the Engineer-in-Charge shall be at liberty to get the work done by the Contractor or deducted from any money that may be or become due to him or recovered from him in any other manner according to the law of the land.

1.3.8 Disposal of Surplus Soil

The Contractor shall at his own costs and charges provide places for disposal of all surplus materials not required to be used on the works. As each trench is refilled the surplus soil shall be immediately removed, the surface properly restored and roadways and sides left clear.

1.3.9 Timbering of Sewer and Trenches

The Contractor shall at all times support efficiently and effectively the sides of the sewer trenches and other excavations by suitable timbering, piling and sheeting and they shall be close, timbered in loose or sandy strata and below the surface of the sub soil water level.

All timbering, sheeting and piling with their waling and supports shall be of adequate dimensions and strength and fully braced and strutted so that no risk of collapse or subsidence of the walls of the trench shall take place.

The Contractor shall be held responsible and will be accountable for the sufficiency of all timbering, branches, sheeting and piling used as also for all damage to persons and property resulting from improper quality, strength, placing, maintaining or removing of the same.

1.3.10 Shoring of Buildings

The Contractor shall shore up all buildings, walls and other structures, the stability of which is liable to be endangered by the execution of the work and shall be fully responsible for all damages to persons or property resulting from any accident.

1.3.11 Removal of Water from Sewer, Trench etc.

The Contractor shall at all times during the progress of the work keep the trenches and excavations free from water which shall be disposed off by him in a manner as will neither cause injury to the public health nor to the public or private property nor to the work completed or in progress nor to the surface of any roads or streets, nor cause any interference with the use of the same by the public.

1.3.12 Width and Depth of Trench

The Engineer-in-Charge shall have power by giving an order in writing to the Contractor to increase the maximum width in respect of which payment will be allowed for excavation in trenches for various classes of sewer, manholes, and other works in certain lengths to be specifically laid down by him, where on account of bad ground or other unusual conditions, he considers that such increased widths are necessary in view of the site conditions.

1.4 Water Supply System (Cold & Hot)

1.4.1 Scope of Work

Work under this section consists of furnishing all labor, materials equipment and appliances necessary and required to completely install the water supply system as required & specified hereinafter.

Without restricting to the generality of the foregoing, the water supply system shall include the following:-

- a) Municipal water connection including water meter up to U.G. water tanks.
 - b) Piping from tube well to raw water tank
 - c) Over Head Tank filling mains from hydro pneumatic system.
 - d) Distribution system from overhead tank to toilets and other wet area in the building except upper three floors.
 - e) Distribution mains from hydro pneumatic system to all fixtures and appliances for upper three floors to all buildings.
 - f) Excavation and refilling of pipes trenches.
 - g) Control valves, masonry chambers and other appurtenances.
- All water lines to different parts of building and making connection from source etc.
 - Pipe protection and painting.
 - Providing Hot water supply and return lines and insulation of hot water pipe lines.
 - Control valves, masonry chambers and other appurtenances.
 - Connections to all toilets kitchen equipments, tanks and appliances.
 - Excavation and refilling of pipe trenches, wherever necessary.
 - Trenches for taking pipe lines for these services if required.

1.4.2 General Requirements

All materials shall be new of the best quality conforming to specifications. All works executed shall be to the satisfaction of the Engineer-in-Charge.

Pipes and Fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanlike manner.

Short or Long bends shall be used on all main pipe lines as far as possible. Use of Elbows shall be restricted for short connections.

As far as possible all Bends shall be formed by means of a hydraulic pipe bending machine for pipes up to 65mm dia.

Pipes shall be fixed in a manner so as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages etc.

Pipes shall be securely fixed to walls and ceilings by suitable clamps at intervals specified.

As far as possible, all piping inside the buildings shall run either concealed or embedded. Outside the buildings the piping shall be installed at-least 60cms below finished grade. All galvanized steel piping embedded either in trenches or in concrete and masonry work shall be tightly wrapped 1mm thick fiberglass tissue laid in bitumen.

Valves and other appurtenances shall be so located as to provide easy accessibility for operations, maintenance and repairs.

Water Supply System

Contractor should study the site plan and water supply system diagram for an overview of the system.

Source

- a) Water supply will be acquired from Municipal water mains through a service connection
- b) Additional water supply will be obtained from captive tube-wells within the site. The rising mains will be connected to the main fire static tank and then overflow into the main domestic water tank.

Water supply piping for garden hydrant and sprinkler and irrigation system will be separate and independently connected to a different pumping system.

1.4.3 G.I. Pipes & Fittings

All pipes inside the building and pipes running in Shaft & terrace level shall be galvanized steel tubes conforming to IS: 1239-1979 of class specified. When class is not specified they shall be medium class.

Fittings shall be malleable iron galvanized fittings, of approved make. All fittings shall have manufacturer's trade mark stamped on it. Fittings for G.I. pipes shall include Couplings, Bends, Tees, Reducers, Nipples, Unions and Bushes. Fittings shall be of IS:1879 - (part I to X) 1975.

Pipes and fittings shall be jointed with threaded fittings. Care shall be taken to remove burr from the end of the pipe after cutting by a round file. All pipes shall be fixed in accordance with layout and alignment. Care shall be taken to avoid air pockets. G.I. pipes inside toilets shall be fixed in wall chases well above the floor. No pipes shall be run inside a sunken floor as far as possible. Pipes may be run under the ceiling or floors or as directed.

1.4.4 Clamps

Pipes in shafts and other locations shall be supported by galvanized clamps of design approved by Engineer-in-Charge Pipe in wall chases shall be anchored by iron hooks. Pipes at ceiling level shall be supported on structural clamps fabricated from galvanized structural as described in the sub section. Pipes in typical shafts shall be supported on Slotted Angles/Channels as specified elsewhere.

Pipe hangers shall be provided at the following maximum spacing:

S. No.	Pipe Dia (mm)	Hanger Rod Dia (mm)	Spacing between Supports (Mtr)
1	Upto 25	6	2
2	32 to 50	10	2
3	65 to 100	12	2.4

4	125 to 150	16	3.6
5	200 to 300	19	5.3

1.4.5 Unions

Contractor shall provide adequate number of unions on all pipes to enable dismantling later. Unions shall be provided near each Gunmetal Valve, Stop Cocks, or Check Valves and on straight runs as necessary at appropriate locations as required and/or directed by Engineer-in-Charge.

1.4.6 Flanges

Flanged connections shall be provided on pipes where required, all equipment connections as necessary and required or as directed by Engineer-in-Charge Connections shall be made by the correct number and size of the bolts and made with 3 mm thick insertion rubber washer. Where hot water or steam connections are made insertion gasket shall be of suitable high temperature grade and quality approved by Engineer-in-Charge Bolt hole dia for flanges shall conform to match the specification for C.I. Sluice Valve to I.S. 780.

1.4.7 Trenches

The galvanized iron pipes and fittings shall be laid in trenches. The width and depth of the trenches for the different diameters of the pipes shall be as follows:

Dia of Pipe	Width of Trench	Depth of Trench
15mm to 50mm	30 cms	60 cms
65mm to 100mm	45 cms	75 cms

At joints the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications for earth work in trenches. When excavation is done in rock, it shall be cut deep enough to permit the pipes to be laid on a cushion of sand minimum 7.5 cm deep.

1.4.8 Painting

All pipes above ground shall be painted with one coat of Red Lead and two coats of Synthetic Enamel paint of approved shade and quality. Pipes shall be painted to standard colour code specified by Engineer-in-Charge.

All pipes in chases and below floor shall be provided with Anti-corrosive treatment.

1.4.9 Pipe protection

Wherever required all pipes below ground shall be protected against corrosion by wrapping 100mm wide and 4mm thick layer of PYPKOTE/MAKPOLYKOTE over the pipe.

1.4.10 Sand Filling

All G. I. pipes in trenches shall be protected with fine sand 150 mm all around before filling in the trenches.

1.4.11 Gunmetal Valves

Valves 65mm dia and below shall be heavy Gunmetal Full way Valves or Globe Valves or Ball valves conforming to IS: 778-1971 of 20 Kg/cm² class. Valves shall be tested at manufacturer's works and the same stamped on it. All Valves shall be approved by the Engineer-in-Charge before they are allowed to be used on work.

1.4.12 Sluice Valves

All valves 80mm dia and above shall be C.I. Double Flanged Sluice Valves. Sluice valves shall be Cast Iron double flanged, with rising spindle. Each sluice valve shall be provided with wheel for valves in exposed positions and Cap Top for underground valves. Contractor shall provide suitable operating keys for Sluice Valves with Cap Tops.

Sluice valves shall be of best quality conforming to IS: 780-1969 of class specified.

- Joints for double flanged sluice valves shall be made with suitable tail/socket pieces on the pipeline and flanges joints made with 3 mm thick insertion rubber gasket with appropriate number of bolts, nuts and washers.
- Sluice valves shall be installed at all branches.

1.4.13 Scour Valves

Scour valves shall be C.I. sluice valves as specified above. They shall be installed at the lowest level or tail end of the system or as directed by Engineer-in-Charge.

1.4.14 Air Release Valves

- Air release valves shall be single acting type air valves with Gunmetal body and bronze/gunmetal internal parts and plastic float.
- Each air release valve shall be provided with a cast iron isolating sluice valve of specification given above.

1.4.15 Insulation

For Chased Internal Pipes

Hot water pipes fixed in chase shall be thermal insulation over hot water pipes with 9mm thick nitrile or approved equivalent thermal insulation tubing, a elastomeric flexible material having hermetic blister closed cell structure of expanded synthetic rubber having a thermal conductivity not exceeding 0.040w/m^{°k} @ 40deg C over pipes.

For Exposed Piping

Exposed hot water line laid in trenches, exposed in shafts, on terrace and along ceiling level shall be thermal insulation over hot water pipes with 9mm thick nitrile/ polyolefin or approved equivalent thermal insulation tubing, a elastomeric flexible material having hermetic blister closed cell structure of expanded synthetic rubber having a thermal conductivity not exceeding 0.040w/m^{°k} @ 40 deg C over pipes. With Aluminum Cladding/ protective coating of resin hardener paint with fiber cloth (FRP)

S.No	Pipe Size (MM)	Thickness of Nitrile Rubber Insulation (MM)
1	15 to 25	9
2	32 to 80	13
3	100 & above	19

1.4.16 Anchor Block

Suitable anchor blocks shall be provided at all bends and tees to encounter the excessive thrust developed due to water hammer.

1.4.17 PE-AL-PE Pipes

All pipes inside the buildings and where specified, outside the building shall be Polyethelene-Aluminium- Polyethelene (PE-AL-PE) Composite Pressure Pipes conforming to IS - 15450, U.V. stabilized with carbon black having thermal stability for hot & cold water supply, capable to withstand temperature up to 80°C, including all special fittings of composite material (engineering plastic blend and brass inserts wherever required) e.g. elbows, tees, reducers, couplers & connectors etc., with clamps at 1.00 metre spacing. Testing of joints complete as per direction of the engineer in charge.

Cutting

Pipes shall be cut either with a wheel type plastic pipe cutting or hacksaw blade and care shall be taken to make a square cut which provides optimal bonding area within a joint.

Deburring / Beveling

Burrs and fittings should be removed from the outside and inside of pipe with a pocket knife or file otherwise burrs and fittings may prevent proper contact between pipe and fitting during assembly.

Fitting Preparation

A clean dry rag/cloth should be used to wipe dirt and moisture on the fitting sockets and tubing end. The tubing should make contact with the socket wall 1/3 or 2/3 of the way into the fitting socket.

Jointing

While jointing PE-AL-PE pipes, following steps are required to be taken to ensure a leak proof and strong pipe joint.

- (a) Cut the pipe square by cutter to the required and proper length.
- (b) Select the fitting to be used and dismantle its nuts and split rings

- (c) Place the nut and split ring over the pipe. Ensure that 'O' rings are in proper position of insert.
- (d) Prepare the end of pipe to be jointed for roundness and chamfer by using beveling tool. Push the pipe over the insert and inside the support groove fully.
- (e) Push the split ring and nut towards connector till split ring touches the support groove.
- (f) Tighten the nut over connector with spanner

If the joints are required to be dismantled for any reason, the 'O' ring and split ring should be inspected before reassembling the joint for any damage. If any ring is found damaged, the same should be replaced. All other components can be reused. The joint sealing with fittings is done by silicone rubber ring. No thread sealing is involved. Tightening of the nuts is required only for compressing the split ring over the pipe, hence excessive tightening of the nuts is to be avoided. In case threading is required for fixing valves and fixtures, then select the fittings already having male or female thread as per the requirement

Assembly

After applying the solvent cement on both pipe and fitting socket, pipes should be inserting into the fitting socket within 30 seconds, and rotating the pipe $\frac{1}{4}$ to $\frac{1}{2}$ turn while inserting so as to ensure even distribution of solvent cement with the joint. The assembled system should be held for 10 seconds (approx) in order to allow the joint to set up.

An even bead of cement should be evident around the joint and if this bead is not continuous, remake the joint to avoid potential leaks.

Hangers & Supports

For horizontal runs, support should be given at 3 ft (90 cms) intervals for diameter of 1" and below and at 4 ft (1.20 mtr) intervals for larger size.

Hangers should not have throw or sharp edges which come in contact with the tubing and shall be of GI.

Support should be as per the below mentioned table:

S. No	Size of Pipe Inch	210C Ft	490C Ft	710C Ft	820 C Ft
1	1/2"	5.5	4.5	3.0	2.5
2	3/4"	5.5	5.0	3.0	2.5
3	1"	6.0	5.5	3.5	3.0
4	1 1/4"	6.5	6.0	3.5	3.5
5	1 1/2"	7.0	6.0	3.5	3.5
6	2"	7.0	6.5	4.0	3.5

Installation procedure

All parameters pertaining to the installation of PE-AL-PE plumbing system such as cutting, joining, support spacing, expansion loops, insulation, type of support, special connections, etc. shall be as per the manufacturer's specifications.

1.4.18 Valve Chambers

Contractor shall provide suitable brick masonry chambers in cement mortar 1:5 (1 cement: 5 coarse sand) on cement concrete foundations 150 mm thick 1:5:10 mix (1 cement: 5 fine sand: 10 graded stone aggregate 40 mm nominal size) 12 mm thick cement plaster inside and outside finished with a floating coat of neat cement inside with cast iron surface box as approved and in drawings including excavation, back filling complete.

1.4.19 Water Meters

Water meters of approved make and design shall be supplied for installation at locations as per approved drawings. The water meters shall meet with the approval of the local municipal authorities. Suitable valves and chambers to house the meters shall also be provided along-with the meters.

All meters shall conform to Indian Standard IS: 779-1978 (Water meters-domestic type) and IS: 2373-1981 (water meters-bulk type). Where called for water meters shall be located in masonry chambers of appropriated size.

1.4.20 Pipe Hangers Brackets etc

Sturdy hangers, brackets and saddles of approved design shall be installed to support all pipe lengths which are not embedded over their entire run. The hangers and brackets shall be of adjustable heights and primer coated with red-oxide primer clamps. Collars and saddles to hold pipes shall be provided with suitable gaskets. The brackets and hangers shall be of Mild Steel designed to carry the weight of pipes safely and without excessive deflections.

All pipes and fittings shall be supported near every joint and half-way through every pipe length unless otherwise specified. Where called for, pipe hangers shall also be supplied with proper sound and vibration dampening devices to minimize noise and vibration transmission.

1.4.21 Testing

All pipes, fittings and valves shall be tested by hydrostatic pressure of min. 1.5 times, the working pressure and subject to minimum of 7 kg/cm² in any case and with the consent of Engineer-in-Charge.

Pressure shall be maintained for a period of at least TWELVE hours without appreciable drop in the pressure after fixing at site. (+10 %). A test register shall be maintained and all entries shall be signed and dated by Contractor(s) and Engineer.

In addition to the sectional testing carried out during the construction, Contractor shall test the entire installation after connections to the overhead tanks or pumping system or mains. He shall rectify all leakages, and shall replace all defective materials in the system. Any damage done due to carelessness, open or burst pipes or failure of fittings, to the building, furniture and Fixtures shall be made good during the defects liability period without any extra cost.

After completion of the water supply system, Plumbing Contractor shall test each valve by closing and opening it a number of times to observe if it is working

efficiently. Valves which do not effectively operate shall be replaced by new ones at no extra cost and the same shall be tested as above.

1.4.22 Connections to Water Tanks

The contractor shall provide all inlets, outlets, washouts, vents, ball cocks, overflow, control valves and all such other piping connections including level indicator to water storage tanks as called for.

Suitable float controls of an approved make, securely fixed to the tank independent of the inlet pipe and set in a position so that water inlet into the tank is cut off when filled up to the water line. The water level in the tanks shall be adjusted to 25mm below the lip of the overflow pipe. Full way gate/ball valves of approved make shall be provided as near the tank as practicable on every outlet pipe from the storage tank except the overflow pipe.

The overflow pipe shall be so placed as to allow the discharge of water being readily seen. The overflow pipe shall be of size indicated. A stop valve shall also be provided on the inlet water connection to the tank. The outlet pipes shall be fixed approximately 75mm above the bottom of the tank towards which the floor of the tank is sloping to enable the tank to be emptied for cleaning. The ball valves shall conform to Indian Standard IS:1703-1968

1.4.23 Connections to Mechanical Equipment Supplied by Other Agencies

All inlets, outlets, valves, piping and other incidental work connected with installation of all mechanical equipment supplied by other agencies shall be carried out by the Plumbing contractor in accordance with the approved drawings, requirements for proper performance of equipment, manufacturer's instructions and the directions of the Engineer-in-Charge. The equipment to be supplied by other agencies consists mainly of Kitchen, Laundry, Air-conditioning, Water Treatment and other similar equipment. The connections to the various equipment shall be effected through proper unions and isolating valves. The work of effecting connections shall be executed in consultation with and according to the requirements of equipment suppliers, under the directions of the Engineer-in-Charge. The various aspects of connection work shall be executed in a manner similar to the work of respective trades mentioned elsewhere in these specifications.

1.4.24 Disinfection

After completion of the work Contractor shall flush clean the entire system with the city's filtered water after connection has been made.

After the first flushing, commercial bleaching powder is to be added to achieve a dosage of 2 to 3 mg/l of water in the system added and flushed. This operation should be performed twice to ensure that the system is fully disinfected and usable. The Commissioning would not be considered complete without performing the Disinfection.

1.4.25 Pre Commissioning

Ensure that all pipes are free from debris and obstructions.

Check all valves and fire hydrant for effective opening and closing action. Defects should be rectified or valves replaced.

Ensure that all Connections to Branches has been made.

Ensure that mains have been connected to the respective pumps, underground and Overhead tanks.

Water supply should be available at main Underground tank.

All main line Valves should be closed.

1.4.26 Commissioning

Fill Underground tank with water. Add 1kg fresh bleaching powder after making a solution to be added near inlet.

Start Water Supply Pump and allow water to fill main Underground tank. Water will first fill the fire tank and then overflow to the Raw Water tanks.

After filling Overhead Reservoir drain the same to its one forth capacity through tank scour valve. (This is to ensure removal of all mud, debris etc. from the tank).

Fill Overhead tank to full.

Release water in the main lines by opening Valves in each circuit. Drain out water in the system through scour valves or fire hydrant in lower regions. Ensure clean water is now coming out of the system.

Open valves for individual clusters. Observe for leakages or malfunctions, check pressure & flow at end of line by opening Hydrants etc. Remove and rectify defects noticed.

Check all outlet points for proper operation by opening each valve and allowing water to flow for a few minutes. Also check for effective closure of valve.

The entire water supply system should be disinfected with bleaching powder and system flush cleaned.

Send four samples of water drawn from four extreme locations for testing for bacteriological test in sterilized bottles obtained from the concerned laboratory. (Laboratory personal may collect the samples themselves).

1.4.27 Responsibility

Responsibility for various activities in pre-commissioning and commissioning procedures will rest with the Contractor.

1.5 Tube Well

1.5.1 General Conditions

All work shall be done in a systematic manner in accordance with a programmer prepared in consultation with the Engineer-in-Charge.

Expected quantity of water required is in the order of 10,000 LPH on 10-12 hours continuous pumping, but lower flow will be acceptable if the strata yield is such.

1.5.2 Water Supply & Power

Contractor shall make his own arrangement for water at site required for his work. He may obtain the water by boring a trial bore or by obtaining in water tankers at his own cost.

Contractor shall also make his own arrangements for power required for his work.

1.5.3 Site Clearance

The Contractor shall clear the site for any trees, growth, grass and rubbish to enable him to execute the work properly at his own cost.

On successful completion of the work the Contractor shall clear up the site of all his surplus material equipment and accessories and hand over the same to the Engineer-in-Charge.

1.5.4 Type of Well

a) Tube well shall be bored by a reverse circulation rotary rig with 600 mm dia (24") blind and slotted pipe. Annular space between pipe and bore shall be gravel packed.

1.5.5 Boring

Boring shall be 400-450 mm dia to an approximate depth of 100-120 m. The depth may be increased or decreased as per actual site conditions. The depth at which the tube well boring is to be terminated shall be as agreed upon by the Engineer-in-Charge. Sub-soil water shall not be tapped.

1.5.6 Well and Housing Pipes

Pipes shall be uPVC pressure pipe with couplings.

1.5.7 Slotted Pipes

Slotted pipes shall be 200 mm dia, with slots. Slot size shall be as per soil conditions and shall be approved by the Engineer-in-Charge. No variation in rate shall be permissible due to size and dimension of slots.

1.5.8 Special Fittings

Provide all special fittings e.g. blank pipes, socket rings, bail plug, centering guides, pipe slips and top cap suitable for housing pipe.

1.5.9 Verticality

Well assembly shall be truly vertical as per latest Indian Standard and verticality certificate shall be furnished by the Contractor.

1.5.10 Gravel Packing

Space between boring and well assembly shall be packed with washed pea gravel 3 to 6 mm size.

1.5.11 Development

The well shall be developed by an air compressor of 450 cfm capacity and pressure of 10.5 kg/cm² for a period of at least twenty hours. This period may however be extended in case the development is not satisfactory.

1.5.12 Water Tests

The Contractor shall get the water tested for its quality from approved Water Testing laboratory given Annexure I. Tests shall be for drinking water quality as per IS: 10500 for Physical, Chemical & bacteriological parameters. (Tests shall be performed after development of the well and clear water is available in the discharge).

1.5.13 Sanitary Sealing

The annular space between the bore and its housing pipe shall be grouted with cement concrete 1:2:4 to a depth of 5 m below the ground level. Four 50 mm dia gravel feeding shall be provided with caps at top. Pipes shall be G.I. to I.S. 1239, medium class.

1.5.14 Bore Log

A bore log in a standard format form shall be maintained at the site and shall give the following information:

- a) Description and depth of strata
- b) Spring level below ground.
- c) Aquifer opposite which slotted pipes have been placed.
- d) Rate of progress of drilling
- e) Full particulars of final test
- f) Four copies of strata sheets yield and water quality tests shall be handed over on completion of the well.
- g) Suggested depth for the tube well submersible pump.

1.6 Garden Hydrant System

1.6.1 Scope of Work

The scope of this section comprise of the supply, installation testing and commissioning of piping network for garden hydrant & irrigation system.

Work under this section consists of furnishing all labor, materials equipment and appliances necessary and required to completely install the garden irrigation system as required by the approved drawings, specified hereinafter and given in the approved drawing.

Without restricting to the generality of the foregoing, the garden hydrant system shall include the following: -

- All irrigation lines to different parts of site and making connection from source i.e. from STP etc.
- Pipe protection.
- Control valves, masonry chambers and other appurtenances.
- Connections to all hydrant point.
- Excavation and refilling of pipe trenches, wherever necessary.
- Trenches for taking pipe lines for these services if required.

1.6.2 General Requirements

All materials shall be new of the best quality conforming to specifications. All works executed shall be to the satisfaction of the Engineer-in-Charge.

Pipes and Fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanlike manner.

Pipes shall be fixed in a manner so as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages etc.

As far as possible shall be installed at-least 60cms below finished grade.

Valves and other appurtenances shall be so located as to provide easy accessibility for operations, maintenance and repairs.

1.6.3 HDPE Pipes & Fittings

All pipes used in Garden hydrant System shall be HDPE (High density Polyethylene pipe and conforming to I.S. 4984 of class III (6 kg/cmsq)

Fittings shall be HDPE fittings, of approved make.

Pipes and fittings shall be jointed with butt welding joint.

1.6.4 Flanges

Flanged connections shall be provided on pipes wherever required or as directed by Engineer-in-Charge. Connections shall be made by the correct number and size of the bolts and made with 3 mm thick insertion rubber washer.

1.6.5 Trenches

The HDPE pipes and fittings shall be laid in trenches. The width and depth of the trenches for the different diameters of the pipes shall be as follows:

Dia of Pipe	Width of Trench	Depth of Trench
15mm to 50mm	30 cms	60 cms
65mm to 100mm	45 cms	75 cms

At joints the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications for earth work in trenches.

When excavation is done in rock, it shall be cut deep enough to permit the pipes to be laid on a cushion of sand minimum 7.5 cm deep.

1.6.6 Pipe Protection

Where specified in the approved drawing all pipes below ground shall be in trenches and protected with fine sand 150 mm all around before filling in the trenches.

1.7 Sewerage / Drainage System

1.7.1 Scope of Work

Work under this section shall consist of furnishing all Labor, Materials, Equipments and Appliances necessary and required to completely finish Sewerage/Drainage system as specified hereinafter or given in the approved drawing.

Without restricting to the generality of the foregoing, the sewerage system shall include:

- Internal/External sewer line.
- Excavations including refilling etc.
- Construction of Collection Chambers, Manholes and Drop Connections.

- Construction of Grease Trap etc.
- Connection to S.T.P and Disposal of treated effluent.
- Storm Water Drainage and Disposal.
- Construction of Desalting chamber & Rain water Harvesting tank
- Testing of pipe lines

1.7.2 General Requirements

All materials shall be new of the best quality conforming to specifications and subject to the approval of the Engineer-in-Charge.

Drainage lines shall be laid to the required gradients and profiles.

All piping shall be installed at depth greater than 80cms below finished ground level.

The piping system shall be vented suitably at the starting point of all branch drains, main drains, and the highest/lowest point of drain and at intervals as shown. All venting arrangement shall be un-obstructive and concealed.

All drainage work shall be done in accordance with the local Municipal by-laws.

Wherever the sewerage pipes run above water supply lines, same shall be completely encased in cement concrete 1:2:4 all round with the prior approval of the Engineer-in-Charge.

Location of all manholes, catch basins etc., shall be got confirmed by the Contractor from the Engineer-in-Charge before the actual execution of work at site.

All works shall be executed as directed by Engineer-in-Charge.

1.7.3 Alignment and Grade

The sewer pipes shall be laid to alignment and gradient shown on the approved drawings but subject to such modifications as shall be ordered by the Engineer-in-Charge from time to time to meet the requirements of the works. No deviations from the lines, depths of cutting or gradients of sewers shown on the

plans and sections shall be permitted except by the express direction in writing of the Engineer-in-Charge.

1.7.4 DWC (Double Wall Corrugated) HDPE Pipes

Double Wall Corrugated (DWC) HDPE pipes shall be used for external underground sewerage and storm water pipes.

Nominal Diameter: Double corrugated pipes are in diameters ranging from 150 mm to 450 mm. Nominal diameter coincides with the internal diameter.

Larger diameters can be manufactured at side by means of special equipment

Nominal Pressure Classes: Nominal pressure classes is 1 bar Specific Pipe Stiffness Classes

Pipes are also classified according to specific pipe stiffness Specific pipe stiffness classes are SN 4 AND SN 8.

Intermediate or higher specific pipe stiffness classes are available on request or Depending on the design conditions

Pipes made from plastics have advantages compared to pipes made from other materials such as aluminium, concrete, cast iron, copper and steel. Due to their low weight, their resistance to corrosive effects and chemicals as well as simple handling increases their importance in all application areas.

The maximum permissible slope to the various diameters of pipes shall be as follows:

100mm pipe	.....	1 in 40 to 1:50
150mm pipe	.....	1 in 60 to 1:100
200mm pipe	.....	1 in 80 1: 120 to 1: 200
250mm pipe	.....	1 in 90 1: 120 to 1: 250

Where necessary, pipe shall be laid on a bed of plain cement concrete 1:3:6 and minimum 150 mm thick, and shall be projected by providing hunching up to half the diameter of the pipes. The width of the concrete bed for various diameters shall be as follows:

100mm dia pipe	.....	380mm wide
150mm dia pipe	.....	450mm wide
200mm dia pipe	.....	600mm wide
250mm dia pipe	.....	700mm wide

Where the pipes are laid on a soft soil, with the maximum water table level, lying at the invert level of the pipe, the pipe shall be bedded in concrete.

1.7.5 Laying of Pipes

Pipes are liable to be damaged in transit and notwithstanding tests that may have been made before dispatch each pipe shall be examined carefully on arrival at site. Each pipe shall be rung with a wooden hammer or mallet and those that do not ring true and clear shall be rejected. Sound pipes shall be carefully stacked to prevent damage. All defective pipes should be segregated, marked in a conspicuous manner and their use in the works prevented.

The pipes shall be laid with sockets leading uphill and should rest on solid and even foundations for the full length of the barrel. Socket holes shall be formed in the foundation sufficiently deep to allow the pipe jointer room to work right round the pipe and as short as practicable to admit the socket and allow the joint to be made.

Where pipes are not bedded on concrete the trench bottom shall be left slightly high and carefully bottomed up as pipe laying proceeds so that the pipe barrels rest on firm ground. If excavation has been carried too low it shall be made up with cement concrete 1:5:10 mix at the Contractor's cost and charges.

If the bottom of the trench consists of rock or very hard ground that cannot be easily excavated to a smooth surface, the pipes shall be laid on cement concrete bed of 1:5:10 mix to ensure even bearing.

- **Gully Traps**

Gully traps shall be of the same quality as described for stoneware pipes in Clause 5.

Gully traps shall be fixed in cement concrete 1:5:10 mix (1 cement: 5 coarse sand: 10 stone aggregate 40mm nominal size) and a brick masonry chamber 30x30 cms inside in cement mortar 1:3 with 10 x 10 cms grating inside and 30x30 cms C.I. sealed cover and frame weighting not less than 7.2 kg to be constructed as per standard approved drawing. Where necessary, sealed cover shall be replaced with C.I. grating of the same size.

- Grease Trap

Grease Trap shall be provided on Kitchen waste lines before discharging the waste into the main sewer line. Grease Trap shall be built in brick masonry and shall be similar in construction to manholes. The grease trap shall be constructed to size as shown at the location on approved drawings. The grease trap shall be provided with drop inlet, drop outlet, galvanized wrought iron sediment pan and a baffle wall. Grease trap shall be provided with 2 Nos, double seal manhole cover and frame which shall be identified with lettering "Grease trap" as per the drawing.

- Testing of Grease Trap

All rights of the sewer and drain shall be carefully tested for water tightness by mains of water pressure maintained for not less than 30 minutes. Testing shall be carried out for manhole to manhole. All pipes shall be subject to a test pressure of 1.5 meter head of Water. The test pressure will however, not exceed 6mtr head at any point. The pipes shall be plugged preferably with standard design plugs or with rubber plugs on both sides, the upper end shall, however, be connected to a pipe for filling with water and getting the required head poured at one time.

1.7.6 Reinforced Cement Concrete Pipes

All underground storm water drainage pipes and sewer lines where specified (other than those specified cast iron) shall be centrifugally spun RCC pipes of specified class. Pipes shall be true and straight with uniform bore. Throughout cracked, warped pipes shall not be used on the work. All pipes shall be tested by the manufacturer and the Contractor shall produce, when directed a certificate to that effect from the manufacturer.

1.7.7 Laying

R.C.C. spun pipes shall be laid on cement concrete bed or cradles as specified and shown on the detailed approved drawings the cradles may be precast and sufficiently cured to prevent cracks and breakage in handling. The invert of the cradles shall be left 12mm below the invert level of the pipe properly placed on the soil to prevent any disturbance. The pipe shall then be placed on the bed concrete or cradles and set for the line and gradient by means of sight rails and bonding rods etc. cradles or concrete bed may be omitted, if directed by the Engineer-in-Charge

1.7.8 Encasing (all pipes have to be encased)

The sewer pipes shall be completely encased or surrounded with concrete where

- The maximum water table level is likely to rise above the top of the barrel.
- The top (overt) of pipe is less than 200 cms under the road surface.

1.7.9 Jointing

After setting out the pipes the collars shall be centered over the joint and filled in with tarred gaskin, so that sufficient space is left on either side of the collar to receive the mortar. The space shall then be filled with cement mortar 1:2 (1 cement: 2 fine sand) and caulked by means of proper tools all joints shall be finished at an angle of 45 degree to the longitudinal axis of the pipe on both side of the collars neatly semi flexible type collar joint.

1.7.10 Curing

The joint shall be cured for at least 7 days. Refilling at joints will be permitted only on satisfactory completion of curing period.

1.7.11 Cement Concrete and Masonry Works for Manholes and Chambers etc.

Water

Water used for all the construction purposes shall be clear and free from Oil, Acid, Alkali, Organic and other harmful matters, which shall deteriorate the strength and/or durability of the structure. In general, the water suitable for drinking purposes shall be considered well enough for construction purpose.

Aggregate for Concrete

The aggregate for concrete shall be in accordance with I S: 383 and I S: 515 in general, these shall be free from all impurities that may cause corrosion of the reinforcement. Before actual use these shall be washed in water, if required as per the direction of Engineer-in-Charge. The size of the coarse aggregate shall be done as per I S: 383.

Sand

Sand for various constructional purposes shall comply in all respects with I S: 650 and I S: 2116. It shall be clean, coarse hard and strong, sharp, durable, uncoated, free from any mixture of clay, dust, vegetable matters, mica, iron impurities soft or flaky and elongated particles, alkali, organic matters, salt, loam and other impurities which may be considered by the Engineer-in-Charge as harmful for the construction.

Cement

The cement used for all the constructional purposes shall be ordinary Portland cement or rapid hardening Portland cement conforming to I S: 269.

Mild Steel Reinforcement

The mild steel for the reinforcement bars shall be in the form of round bars conforming to all requirements of I S: 432 (Grade I).

Bricks

Bricks shall have uniform color, thoroughly burnt but not over burnt, shall have plan rectangular faces with parallel sides and sharp right angled edges. They should give ringing sound when struck. Brick shall not absorb more than 20% to 22% of water, when immersed in water for 24 hours. Bricks to be used shall be approved by the Engineer-in-Charge.

Other Materials

Other materials not fully specified in these specifications and which may be required in the work shall conform to the I S code. All such materials shall be approved by the Engineer-in-Charge before use.

1.7.12 Cement Concrete (Plain or Reinforced)

Cement concrete pipes bedding, cradles, foundations and RCC slabs for all works shall be mixed by a Mechanical Mixer where quantities of the concrete

poured at one time permit. Hand mixing on properly constructed platforms may be allowed for small quantities by the Engineer-in-Charge. Rate for cement concrete shall be inclusive of all shuttering and centering at all depth and heights.

All concrete work shall be cured for a period of at least 7 days. Such work shall be kept moist by means of gunny bass at all times. All pipe trenches and foundations shall be kept dry during the curing period.

1.7.13 Masonry Work

Masonry work for manholes, chambers, brick masonry pipe trench and such other works as required shall be constructed from 1st class bricks or 2nd class as specified in the approved drawing in cement mortar 1:5 mix (1 cement: 5 coarse sand). All joints shall be properly raked to receive plaster.

1.7.14 Cement Concrete for Pipe Support

Wherever specified or shown on the approved drawings, all pipes shall be supported in concrete bed all round or in haunches. The thickness and mix of the concrete shall be given in the approved drawing. Type of the bedding is as described as follows:

Unless otherwise directed by the Engineer-in-Charge cement concrete for bed, all round or in haunches shall be laid as follows:-

Description	Upto 3 M depth
Pipes in open ground (No sub soil water)	All round (1:4:8)
Pipes (all) in sub soil water condition	All round (1:4:8)
Pipes under the building or at road crossing or under public places	All round (1:3:6)

(1=1 cement, 3-5=coarse sand, 6-10 stone aggregate 40mm nominal size)

R.C.C. pipes or C.I. pipes ,may be supported on brick masonry or precast R.C.C or Cast insitu cradles. Cradles shall be as shown on the approved shop drawings.

Pipes in loose soil or above ground shall be supported on brick or RCC anchor blocks as shown on the approved shop drawings.

1.7.15 Manholes and Chambers

All manholes, chambers and other such works as specified shall be constructed in brick masonry in cement mortar 1:5 (1 cement: 5 coarse sand) or as specified in the approved shop drawing.

All Manholes, Chambers, etc., shall be supported on base of cement concrete of such thickness and mix or shown on the approved shop drawings.

Where not specified, Manholes will be constructed as follows:-

(All dimensions internal clear in cms)

Size of Manhole Type	90x80 Rect.	120x90 Rect.	910 dia Circular	1220 dia Circular	1520 dia Circular
Maximum depth	100	245	170	230	Any depth beyond 230
Average thickness of R.C.C slab	15	15	--	--	--
Size of cover and frame (Internal dia)	61x45.5	50 dia	56 dia	56 dia	56 dia
Weight of cover and frame	38 Kg.	116 Kg.	116 Kg.	116 Kg.	116 Kg.
Type of Cover & Frame	SFRC	SFRC	SFRC	SFRC	SFRC

All manholes shall be provided with cement concrete benching in 1:2:4 mix (1 cement: 2 coarse sand: 4 stone aggregate 20mm nominal size). The benching shall have a slope of 10cm towards the channel. The depth of the channel shall be full diameter of the pipe. Benching shall be finished with a floating coat of neat cement.

All manholes shall be plastered with 12/15mm thick cement mortar 1:3 (1 cement: 3 coarse sand) and finished with a floating coat of neat cement inside. Manhole shall be plastered outside as above but with rough plaster.

All manholes with depths greater than 1 M. shall be provided with plastic encapsulated 20mm square or 25mm round rods foot rungs set in cement concrete blocks 25 x 10 x 10cms in 1:2:4 mix 30cms vertically and staggered. Foot rests shall be coated with coal tar before embedding.

All manholes shall be provided with cast iron covers and frames and embedded in reinforced cement concrete slab or SFRC precast concrete covers as per instructions of the Engineer-in-Charge. Weight of cover, frame and thickness of slab as given above.

All Rainwater Collection Chamber shall be of the size 50x45x60cm (internal) with horizontal C.I. grating or SFRC precast Gully Grating as per instructions of Engineer-in-Charge. The grating along with frame shall be of size 500x450mm grating having total Wt. of app. 38 Kg and of approved design and quality as per instruction of Engineer-in-Charge. The remaining details of construction shall be same as stated above for the construction of the Manholes etc.

1.7.16 Making Connections

Contractor shall connect the new sewer line to the existing manhole by cutting the walls, benching and restoring them to the original condition. A new channel shall be cut in the benching of the existing manhole for the new connection. Contractor shall remove all sewage and water if encountered in making the connection without additional cost.

1.7.17 Commissioning

After successful testing of the different sewerage and drainage pipes in parts, the Contractor shall provide all facilities including necessary piping's, labors, tools and equipments etc. for carrying out testing and commissioning of the entire external sewerage and drainage system complete as per requirement in the presence of Client representative/Consultant, wherever and as may be required. Generally, the following test/inspection has to be carried out:-

- For any Leakages/seepages in the external sewerage and drainage pipes.

- For checking the functioning of the entire external sewerage and drainage system including rainwater harvesting system and to ensure that the wastewater is continuously flowing towards outfall without any intermediate stagnation.
- For the functioning of the valves and accessories etc. by putting ON/OFF the controlling valves of the various diversions in the sewerage and drainage and rainwater harvesting system.

1.7.18 Desalting Chamber & Rainwater Harvesting Tank

All Rainwater Collection Chamber shall be of the size 200x100x60cm (internal) complete as per approved shop drawing or as instructions of Engineer-in-Charge.

Rainwater harvesting pit is constructed preferably 5 to 10m from the permanent structure. The bore will be excavated manually or drilled by reverse direct rotary method up to the water level or as per instruction of Engineer-in-Charge.

The dia of Rainwater harvesting pit shall be 4500mm. Pit shall be filled with boulders, gravel and coarse sand.

Bore shall be 400mm dia and pipe shall be 200 mm uPVC (10 Kg/cm²) pipe. The pipe placed in the center of the shaft touching the lowest portion of the pit. The overflow pipe from the desalting chamber is directly connected to the rain water harvesting pit so that the rain water freely enters the pit for recharging. In addition to the inlet pipe from desalting chamber an overflow pipe at the ground level so that any excess water that enters the pit is automatically drained away without damaging the pit.

1.8 Handing Over Procedure

1.8.1 Documents Submission

The Contractor shall before finally handing over the completed work in his scope to the Owner, submit the documents as per the Contract and as directed by the Engineer-in-Charge. Given below the checklist for the reference of the Engineer-in-Charge.

Packages/	Sanitary Fixtures	Soil, waste & vent pipes	Water supply system	Sewerage/ drainage system	Water tanks
Final cleaning					
List of inventory					
Training Conducted on					
Operation Manual					
Maint. Manual					
As built P&I Diag/ SLD					
Defects Liability Period/ Warranty					
Commissioning report					
Test reports/ Certificates					
List of essential spares					
Address/ Contact nos. of Vendors					
Remarks					

1.9 Sewage Treatment Plant (STP)

1.9.1 Scope

Detailed engineering design of all plan areas, section, Civil, Structural, mechanical, electrical and piping systems according to the current and

applicable BIS codes as applicable. The proposed plans of the STP shall be subject to the approval of the Architect / Consultant.

Design, manufacture, assembly, installation, testing and commissioning of the main treatment units in RCC tanks , mechanical equipment for the packaged type Sewage Treatment Plant (STP) of capacity and design parameters & specifications broadly comprising of : -

- Diffused aeration system comprising of non-metallic piping submerged diffusers to be provided in the RCC equalization tank, main aeration unit, settling tank and sludge holding tank.
- Twin lobe air blowers with belt drive, electrical motors, piping headers, piping connections to all units.
- Pumping sets from equalization tank to STP, effluent, post filtration and final effluent disposal pumps as per design requirements.
- Final effluent pressure filters, softener pumps for final disposal /reuse.
- Motor control centers, cabling from MCC to all units, all instrumentation, and measuring devices and earthing of equipment. All electrical works to be carried out guidelines as per detailed annexure enclosed.
- Instrumentation and chemical test kit as specified.
- SBR Decanter
- UV
- UF for flushing

Drain channel, sump with a drainage submersible pump (1 working + 1 standby) with pipe work, valves and discharge pipe up to nearest external manhole in plant room shall be provided by others.

Provide PH Meter, Electronic magnetic flow meter in inlet & outlet of filtration system

1.9.2 The Work Includes

- Civil, Mechanical & Electrical works
- Piping as specified.
- Testing, commissioning and operation of plant with water and under load conditions.

Construction of all architectural, civil and structural works related to the construction of the building, its internal lighting, sludge disposal system.

Incoming power connection, electrification of pump house.

Incoming sewer / rising main connection to the plant.

Connection from final effluent tank / pump to point of use for reuse or for disposal in accordance with approval of the State Board for Prevention and Control of Pollution.

1.9.3 Contractor's Experience

Contractor quoting for the work shall be an experienced specialize contractor engaged in the design, manufacture and execution of STP of similar types and must have completed at least 5 plants of similar or larger size in the last 5 years.

Each offer must accompany a list of plants planned, constructed, executed and are in operation for at least 12 months given: -

- Owner's name, address, telephones and faxes nos.
- Architects/Consultants name, Address, Telephone & fax nos.
- Type of load (Domestic and Industrial)
- Average daily flow, BOD and other information of plant.

1.9.4 Shop Drawings

The contractor shall submit shop drawings as follows:

- On award of the work, he shall submit GA drawing, PIB diagrams, plant layout with basic dimensions, flow diagram with levels of elements.
- Fabrication and equipment layout piping, valves and all other information required for installation.
- Electrical layouts, detail of all MCC, cable sizing and system diagrams and ear thing system.
- Piping layout with pipe dia. slopes, fixing arrangements.
- Three copies of the shop drawings shall be submitted for initial scrutiny. On approval of the same contractor shall submit six copies of the same

incorporating corrections etc. Two sets will be stamped "GOOD FOR CONSTRUCTION" by the Consultant and returned to the contractor.

1.9.5 Other Submittals

Contractor shall furnish four sets of folders giving:

- Catalogues and technical information sheets of equipment to be installed.
- Performance curves, foundation details and fixing arrangements.

Contractors' proposal for testing procedures for individual equipment and for overall testing of the plant.

Submittals shall be separate for:

- Mechanical and Piping works
- Electrical Works

All shop drawings and submittals mentioned above shall be approved by Architect and two sets duly stamped shall be returned to the contractor for execution of the works.

1.9.6 Execution of Work

All work shall be executed only in accordance with the approved shop drawings and other submittals. Contractor shall ensure that all inserts, support plates, puddle flanges and other items required to be incorporated during execution shall be placed in position as per his own requirements during execution of the works.

All special tools and tackle required for erection and assembly of the equipment covered by the contract shall be obtained by the contractor himself. All other materials such as foundation bolt nuts, etc. required for the installation of the plant and equipment shall be supplied by the contractor and are part of the contract.

1.9.7 Testing & Handing Over

The contractor shall carryout tests on different equipment as required in the presence of the Consultant or his representative in order to enable him to

determine whether the plant, equipment and installation comply with the specifications, local codes and in accordance with the letter and intents of the specifications.

The installation shall be handed over to the Engineer-in-Charge only on successful completion, operational tests and acceptance of the effluent quality by the municipal / pollution control and statutory authorities.

1.9.8 Statutory Permissions

Contractor shall submit a write-up of process of the plant, drawings, design parameters flow and PIB diagrams as necessary and required for submission to the State pollution control authority.

Contractor shall furnish at his own cost, analysis of influent at source (for evaluation) as well as that of influent at the holding tank of the STP and the effluents from the STP for submitting to State Pollution Control Board and any other statutory authority whose approval is required.

Contractor shall perform all testing and operation of the plant in presence of the Pollution Control Board if so stipulated by them.

Contractor to obtain all statutory approval as required for PCB or any other approval. Only official fee will be reimbursed to contractor by the Owner.

1.9.9 Completion Documents

On successful completion of the entire work, the contractor shall submit 4 sets of following documents to Architect. A brief write-up of process, day to day operating and maintenance instructions.

List of approved chemicals and procedure for storage and safety norms.

Completion drawing and data, catalogues, performance charts, technical data sheets and equipments installed.

Manufacturer's maintenance and operating instructions for mechanical and electrical equipment.

Laminated and framed "As Built" drawings with plans, section, process flow diagrams, pipe runs, levels and final disposal point schedule of equipment installed with all their model Nos. plate data and date of installation.

Test readings of Influent & Effluent parameters taken at final handing over time NOC (No Objection Certificate) from State Pollution Control Board and any other statutory authority whose approval is required.

1.9.10 Performance Guarantee

Equipment supplied and installed shall be guaranteed to yield the specified effluent standards which must meet and accepted with the requirements of Pollution Control Board.

The guarantee implicitly includes replacement of the entire plant on failure to meet desired effluent parameters, replacement of individual equipment or repairs as warranted. Decision on each and every aspect on this matter shall rest with the Consultant and shall be final and binding on the contractor.

1.9.11 Defects Liability

All equipment and the entire installation shall be guaranteed against defective materials and workmanship for a period of 12 months reckoned after taking over of system by Owner along with the documentation. During the defects liability period, the contractor shall replace defective parts and components free of cost. Rectification or repair may be permitted in case the defect is of minor nature.

1.9.12 Deviations from Tender Specifications

Tendered may indicate their comments only as deviations from the conditions stipulated herein. Wholesale submission of their own conditions and/or printed conditions in disregard of the conditions stipulated herein shall not be binding on this Tender.

No corrections, erasure etc. of this document shall be accepted.

1.9.13 Sewage Characteristics

Design Parameters

- Project : Housing
- Usage : Resident persons
- Location : Under ground
- Level : Ground

Design Consideration

- STP Capacity (Max). : As per DBR
- Area Available : As per functional requirement
- Operation : Domestic Sewage (round the clock)
- Influent
 - pH : 7.5 to 8.5
 - BOD 5 days @ 200C. : upto 250-350 mg/l
 - Suspended solids (SS) : upto 250-400 mg/l
 - Oil & grease : 50 mg/l
 - COD : upto 450-600 mg/l
- Treated Effluent
 - pH : 6 - 7
 - BOD 5 days @ 200C. : less than 10 mg/l
 - Suspended solids (SS) : less than 10 mg/l
 - Oil & grease : NIL
 - COD : less than 50 mg/l

1.9.14 Salient Features

The plant should be suitable for low/peak flow in line with medical waste usage.

The plant should not create any noise, with no nuisance on fly or mosquito and no foul odors.

The plant should work without the use of in-organic chemical additives

The plant should be provided with tertiary treatment in form of dual media/activated carbon filter /UV system to provide zero bacteriological standards for reuse on:

- Irrigation system
- Flushing water

Electrical Items:

The electrical work covered in this contract includes:

A) 1 No. LT Panel for STP comprising:

- Cubical type -Non compartmentalized.
- Floor / wall mounted
- Incoming power control switches SFU.
- VAF Meter, phase indicating lamps,
- Individual MCB and starters.
- 2 Nos. automatic level switch/ controller for actuating raw effluent and treated effluent pumps.
- Auto / manual selector switch.

B) Armored cabling from our panel to motor starters and earth pits.

C) Energy Meter – 1 No.

D) Switch board shall be metal clad, totally enclosed.

Panel shall be designed for semi-auto operation of STP. (i.e. LLC based operation for raw and filter). Pressure gauges shall be provided on delivery main for pumps, blowers and vessels.

Instrumentation:

Rota meter : Rota meter on air line.

Pressure Gauge : Pressure gauge will be provided on & Delivery main for pumps & blowers

Level Switch :Level switch for on & off pump.

1.10 Reverse Osmosis System (Portable RO)

1.10.1 Scope of Work

Work under this contract shall consist of furnishing all labor, materials, equipment and appliances necessary and required to supply, install, commission and operate a Portable RO plant cap. as per BOQ complete with all pre and post water treatment equipment, piping and pumps.

1.10.2 Portable RO Inlet Water quality

Design and system manufacturing /assembling is entirely based on the following feed water analysis, assumed for design purpose.

Parameter	Raw water
Colour	Absent

Total Suspended Solids	≤ 2 mg/l
Turbidity	≤ 2 NTU
pH	6-8
Total hardness	≤ 500 mg/l
Alkalinity	≤ 47 mg/l
Fluoride	≤ 1 mg/l
Silica	≤ 10 mg/l
Iron & Heavy Metals	≤ 1 mg/l
Total Dissolved Solids	≤ 1000 mg/l

1.10.3 Treated Water Qualities

Processed water (at the plant outlet) will match with Indian Standard Code.

LIST OF APPROVED MAKES - PLUMBING

1 Plumbing System:

1.	VITREOUS SANITARYWARE	CHINA	HINDWARE / PARYWARE / JAQUAR /AQUAVIVA
2.	WC PAN CONNECTOR		SUPREME/PRINCE/MC ALPINE
3.	BATH FITTINGS		JAQUAR/ROCA/AQUPLUS/GROHE
4.	STAINLESS STEEL SINK		PARYWARE/NILKANTH
5.	AUTO URINAL FLUSH SYSTEM		EURONICS/CMR/ROCA
6.	HAND DRIER		EURONICS/CMR/KOPAL
7.	CISTERN		HINDWARE / PARRYWARE
8.	CP BRASS FITTINGS		JAQUAR/ AQUPLUS/GROHE
9.	GEYSER		RACOLD/BAJAJ/HAVELLS
10.	FLOOR DRAIN FIXTURE RAINWATER OUTLETS		VIEGA/GMGR/GEBRIT
11.	CP GRATING FOR FLOOR TRAP		VIEGA/GMGR/NEER

12.	CAST IRON PIPES & FITTINGS MANHOLE COVER & FRAME	
13.	A. AS PER IS:15905 (PIPES & FITTINGS) OF CAST IRON PIPES & FITTINGS	NECO/KESORAM/SKF
14.	B. AS PER IS:1729 (PIPES & FITTINGS) CAST IRON PIPES & FITTINGS	NECO/BIC/RAJ IRON FOUNDARY AGRA
15.	C. AS PER IS: 1536 (PIPES & FITTINGS) (CI CLASS LA PIPES)	NECO/ IISCO/KESORAM CALCUTTA
16.	D. DI MANHOLE COVERS & FRAMES	KARTAR VALVES & FITTINGS/ NECO/BIC
17.	CILA FITTINGS	KARTAR VALVES & FITTINGS/ NECO/BIC
18.	SUSPENDED MANHOLE & GULLY TRAP	PATEL PATTERN OR EQUIVALENT
19.	DRIP SEAL	ACQUA BOND/BINOD CEMENT COMPANEY/MEGGASEAL
20.	GI / MS PIPE (IS: 1239 and IS : 3589)	TATA STEEL/JINDAL(HISAR)/SAIL
21.	GI PIPE FITTINGS	NVR/MAC/ZOLOTO M/UNIK
22.	GI PIPE SEALENT	HENKEL- LOCTITE 55
23.	PIPE CLAMP & SUPPORT	CHILLY EURO CLAMP/KANWAL
24.	D.I PIPES	ELECTRO STEEL/JINDAL/LANCOKALAHASTHI
25.	UPVC PIPE	SUPREME/AKG/ASTRAL/FINOLEX
26.	CPVC PIPES	AJAY/ASHIRWAD/AKG/ASTRAL/SUPREME
27.	RCC PIPE	KK/PRAGATI/LOCAL ISI APPROVED
28.	STONEWARE PIPE, GULLEY TRAP	ANAND/RAJURA/PERFECT POTTERIES
29.	GM /FORGED BRASS BALL VALVES	DANFOS/KITZ/ UTAM/SANT
30.	SLUICE VALVE	AUDCO/LEADER/ ZOLOTO/CASTLE VALVE/SANT
31.	BUTTERFLY VALVE	AUDCO/LEADER/ ZOLOTO/CASTLE VALVE/SANT
32.	CHECK VALVE-WAFER TYPE	AUDCO/LEADER/ ZOLOTO/SANT

33.	CHECK VALVE-DUAL PLATE	AUDCO/LEADER/ SANT
34.	CHECK VALVE-FORGED SCREWED	AUDCO/LEADER/ ZOLOTO//SANT
35.	PRESSURE REDUCING VALVE	AUDCO/LEADER/ ZOLOTO//SANT
36.	SOLENOID VALVE	DANFOS/ HONEYWELL
37.	THERMOSTATIC VALVE	OVENTROP
38.	AIR RELEASE VALVE	ADVANCE/ ZOLOTO/AIP/LEADER
39.	BALL FLOAT VALVE	ZOLOTO/ VTM/ UTAM
40.	NRV-BALL TYPE-SEWAGE APPLICATION	DANFOS/SILVERSPARK/NORMEX/UTAM
41.	Y STRAINER CI	AUDCO/KITZ/VTM
42.	HYDROPNEUMATIC SYSTEM	GRUNDFOS/XYLEM/WILLO-MATHER & PLATT
43.	STORM WATER DRAINAGE & SEWAGE SUMP PUMPS	GRUNDFOS/XYLEM/WILLO-MATHER & PLATT
44.	TRANSFER PUMPS	GRUNDFOS/XYLEM/WILLO-MATHER & PLATT
45.	SELF PRIMING PUMP	JOHNSON/KIRLOSKAR
46.	MECHANICAL SEAL	BURGMANN/SEALOL
47.	COUPLINGS	LOVE JOY
48.	ANTYVIBRATION MOUNTING & FLEXIBLE CONNECTION	DUNLOP/KANWAL INDUSTRIES/RESISTOFLEX
49.	PRESSURE GAUGE	H GURU/FIEBIG/EMERALD
50.	WATER METER (MECHANICAL TYPE)	KRANTI/ACTARIS/KENT/CAPSTAN
51.	ELECTRONIC FLOW METER	KROHNE/ROCKWIN
52.	LEVEL CONTROLLER & INDICATOR WATER	ELEGGENT CONTROLL/TECHNIKA/TECHTROL
53.	PAINTS	ASIAN PAINTS/BERGER
54.	MH/WATER TANK PLASTIC STEP	KGM/PATEL/PRANALI INDUSTRIES
55.	INSULATION FOR HOT WATER PIPE	ARMACELL-ARMAFLEX/K-FLEX/THERMAFLEX
56.	THREE WAY MOTORISED VALVE	DANFOSS/HONEYWELL/SIEMENS/AIP

57.	GREASE TRAP	ACO/WADE
58.	WELDING RODS	ADOR/ESSAB
59.	FASTENER	FISHER/HILTI
60.	FIRE SEALANT	BIRLA 3M/HILTI
61.	MANHOLE(PREFABRICATED)	OK PLAT/CRESCENT FOUNDARY
62.	TEMPERATURE SENSOR/GAUGE	FORBES MARSHALL/WIKA
63.	DOSING PUMPS	LMI/PULSER FEEDER/TOSCHON
64.	FLANGES	CLASS 150 TABLE H
65.	U.V STERLIZER	ALFA/EUREKA
66.	FLOW CONTROL DEVICES	AQUAPLUS/JAQUAR/RST
67.	SOLAR PANNEL	EPL INDIA/GREEN TEK/ RACOLD/INSHA SOLAR HONEYWEL/BLUEBIRD
68.	SS PIPE	JINDAL/VIEGA/ALFA PRESS
69.	PE-AL-PE	KITEK/EQUIVALENT
Electrical Accessories		
46.	MOTOR CONTROL CENTER	TRICOLITE ELECTRICAL/ADLEC CONTROL SYSTEM/SK POWER SOLUTION
47.	VARIABLE SPEED DRIVES	DANFOS/ABB/SIEMENS
48.	MOULDED CASE CIRCUIT BREAKER(MCB)	L&T/SCHNEIDER ELECTRIC/SIEMENS
49.	STARTER CONTACTOR	LARSEN & TURBO
50.	MINIATURE CIRCUIT BREAKER(MCB)	HAGER/ SCHNEIDER ELECTRIC/SIEMENS
51.	OVERLOAD RELAYS WITH BUILT IN SINGLE PHASE PREVENTER	L&T/SCHNEIDER ELECTRIC/SIEMENS
52.	CURRENT TRANSFORMER	GILBERT & MAXWELL/PRAGATI/AUTOMATIC ELECTRIC
53.	ROTARY SWITCH	L&T/SCHNEIDER ELECTRIC/SIEMENS
54.	TIMER DELAY RELAY	L&T/SCHNEIDER ELECTRIC/SIEMENS
55.	TIMER	ASIA BROWN/L&T/ SIEMENS/GE POWER

56.	SELECTOR SWITCH, TOGGLE SWITCH	L&T/KAYCEE
57.	CHANGE OVER SWITCH	L&T/HPL-SOCOMEK
58.	ELECTRONIC DIGITAL METER	L&T/SCHNEIDER ELECTRIC/SIEMENS
59.	INDICATING LAMPS LED TYPE, PUSH BUTTON	L & T / SCHNEIDER ELECTRIC/SIEMENS
60.	PVC INSULATED ALUMINIUM/COPPER CONDUCTOR, AURMERED MV CABLE(1100 V GRADE)	FINOLEX/POLYCAB/HAVELLS
61.	METALIC CONDUIT	BEC/AKG
62.	PVC CONDUIT & ACCESSARIS	BEC/AKG/POLYCAB
63.	SANDWITCHED CONSTRUCTION BUS DUCTS	CONTROL & SWITCHGEAR-HENIKWON/SCHNEIDER ELECTRIC
64.	CABLE TRAY (FACTORY FABRICATED)	SLLOTCO/NEEEDO/MEM
65.	LT JOINTING KIT/TERMINATION	BIRLA-3M/RAYCHEM
66.	BIMETTALIC CABLE LUGS	COMET/DOWELLS(BILLER INDIA)
67.	PROTECTION RELAY	
68.	A. NUMERIC TYPE	ABB/AREVA/L&T/ SIEMENS/WOODWORD
69.	B.ELECTROMAGNETIC TYPE	ABB/AREVA/L&T

2 STP System

1.	AIR BLOWER	EVEREST/USHA/AIRVAC
2.	SS PIPE	JINDAL/VIEGA/ALFA PRESS
3.	COARSE BUBBLE MEMBRANE DIFFUSER	MM AQUA/AIRFIN
4.	FILTER PRESS	PHARMATECH/NM PATEL/AURO
5.	SCREW SLLURY PUMPS	UT/ROTO/TECHNOFLOW
6.	SUBMERSIBLE MIXTURE	AQA ITELY/ABS
7.	UV SYSTEM	ALFA/EUREKA
8.	GI / MS PIPE (IS : 1239 and IS : 3589)	TATA STEEL/JINDAL
9.	GI PIPE FITTINGS	ZOLOTO M/UNIK
10.	GI PIPE SEALENT	HENKEL- LOCTITE 55

11.	PIPE CLAMP & SUPPORT	CHILLY EURO CLAMP/KANWAL
12.	UPVC PIPE	SUPREME/PRINCE/ASTRAL
13.	CPVC PIPES	AJAY/ASHIRWAD/ASTRAL/SUPREME
14.	GI / MS PIPE (IS : 1239 and IS : 3589)	TATA STEEL/JINDAL HISSAR
15.	GI PIPE FITTINGS	ZOLOTO M/UNIK
16.	BUTTERFLY VALVE	AUDCO/LEADER/ ZOLOTO/CASTLE VALVE
17.	CHECK VALVE-WAFER TYPE	AUDCO/LEADER/ ZOLOTO//SANT
18.	CHECK VALVE-DUAL PLATE	AUDCO/LEADER/ ZOLOTO//SANT
19.	CHECK VALVE-FORGED SCREWED	AUDCO/LEADER/ ZOLOTO//SANT
20.	PRESSURE REDUCING VALVE	HONEYWELL/ WATTS/ /SANT
21.	SOLENOID VALVE	DANFOS/ HONEYWELL
22.	DOSING PUMPS	LMI/PULSER FEEDER/TOSCHON
23.	DRAINAGE & SEWAGE SUMP PUMPS	GRUNDFOS/XYLEM/WILLO-MATHER & PLATT
24.	TRANSFER PUMPS	GRUNDFOS/XYLEM/WILLO-MATHER & PLATT
25.	SELF PRIMING PUMP	JOHNSON/KIRLOSKAR
26.	MECHANICAL SEAL	BURGMANN/SEALOL
27.	COUPLINGS	LOVE JOY
28.	ANTYVIBRATION MOUNTING & FLEXIBLE CONNECTION	DUNLOP/KANWAL INDUSTRIES/RESISTOFLEX
29.	PRESSURE GAUGE	H GURU/FIEBIG/EMERALD
30.	WATER METER (MECHANICAL TYPE)	KRANTI/ACTARIS/KENT/CAPSTAN
31.	STP VENDOR	BS ENVIRO / IONEXCHANGE BRISANZIA/THERMAX

TECHNICAL SPECIFICATIONS- FIRE FIGHTING

IS Code 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 up to 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 firefighting (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 firefighting (third revision)
IS 902-1992	Suction hose coupling for firefighting 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 firefighting 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 up to and including 1100 volts (third revision)
IS 1554-1988 Part II	PVC insulated (heavy duty) electric cables (working voltage from 3.3 KV up to and including 11 KV (second revision)
IS 1648-1961	Code of practice for fire safety of buildings (General) Firefighting 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

NOTE: All capacity given in above is only for guidelines.

1 Technical Specification

Work under this sub-head consists of furnishing all Labour, Materials, equipment and accessories necessary and required to completely install the Fire Fighting equipment etc., specified hereinafter and given in the

Without restricting to the generality of the foregoing the work of Fire Fighting System shall include the followings:

- Providing M.S. black steel (Class C) pressure pipe line main including Valves, Fire Hydrants, Excavation for Pipe, Laying of pipe, Painting of pipe and Making Connection to supply system.
- Black Steel Pipe, Mains Laterals, Branches, Valves, Hangers and Appurtenances.
- Hose Reels, Rubberized fabric lined hose pipes, Hose cabinets and Landing Valves.
- Portable Fire Extinguishers
- Fire Fighting Pumps, diesel operated pumps, panels and all connected accessories including suction & delivery pipes.
- Testing Commissioning and giving live demonstrations to the various Inspection Authorities and Obtain their "No Objection Certificate" (NOC) for occupation of the building.
- **General Requirements**
All materials shall be of the best quality conforming to the Specifications and subject to the approval of the Engineer-in-Charge.

Pipes and Fittings shall be fixed truly Vertical, Horizontal or in slopes as required in a neat workman like manner.

Pipes shall be fixed in a manner so as to provide easy accessibility for repair and maintenance and shall not cause any obstruction in shaft, passage etc.

Pipes shall be securely fixed to walls and ceiling by suitable clamps at intervals specified. Only approved type of anchor fasteners shall be used for RCC ceilings.

Valves and other appurtenance shall be so located that they are easily accessible for operation, repairs and maintenance.

- **Pipes**
All pipes within and outside the building in exposed locations and shafts including connections buried under floor shall be M.S. Pipes as follows:

- Pipes 150 mm dia and below IS: 1239 (Class C) Heavy Class
- Pipe 200 mm dia and above IS 3589 of thickness specified.

- **Pipe Fittings**

Pipes and fittings means tees, elbows, couplings, flanges, reducers etc. And all such connecting devices that are needed to complete the piping work in its totality.

Fabricated fittings shall not be permitted for pipe diameters 50 mm and below.

When used, they shall be fabricated, welded and inspected in workshops under supervision of Engineer-in-Charge whose welding procedures have been approved by the TAC as per TAC rule 4102 for sprinkler system and applicable to hydrant and sprinkler system. For "T" connections, pipes shall be drilled and reamed. Cutting by gas or electrical welding will not be accepted.

- **Jointing**
Screwed (50 mm dia pipes and below)

Joint for black steel pipes and fittings shall be metal-to-metal thread joints. A small amount of red lead may be used for lubrication and rust prevention. Joints shall not be welded or caulked. (With screwed MS forged fittings)

Welding (65 mm dia and above)

Joints between MS pipes and fittings shall be made with the pipes and fittings having "V" groove and welded with electrical resistance welding in an approved manner. Buried pipes will be subject to X Ray test from an approved agency as per the TAC norms at the cost of contractor. (With welded M.S. fittings heavy class with V-Groove). The welding machine shall be 3 Phase rectifier of required current and capacity. The vendor for welding will be approved by Engineer-in-Charge.

Flanges

Flanged joints shall be provided on:

- Straight runs not exceeding 30 m on pipelines 80 mm dia and above.
- Both ends of any fabricated fittings e.g. bend tees etc. of 65 mm dia or larger diameter.
- For jointing all types of valves, appurtenances, pumps, connections with other type of pipes, to water tanks and other places necessary and required as good for engineering practice.

- Flanges shall be as per IS 6392-1971, Table 17/18 with appropriate number of G.I. nuts and bolts, half threaded of with 3 mm insertion neoprene gasket complete.

Unions

Provide Approved type of dismountable unions on pipes lines 65 mm and below in similar places as specified for flanges shall be provided.

- **Pipe Protection**

All pipes above ground and in exposed locations shall be painted with one coat of Red Oxide Primer and two or more coats of Synthetic Enamel Paint of approved shade.

All black steel pipes under floors or below ground shall be provided with protection against corrosion by application of 100mm wide and 4mm thick layer of PYPKOTE/ MAKPOLYKOTE over the pipe, as per manufacturers specifications.

- **Pipe Supports**

All pipes shall be adequately supported from ceiling or walls from existing/new inserts by Structural clamps fabricated from M.S. Structural e.g. Rods, Channels, Angles and Flats as per details given in approved shop drawings and specifications. All clamps shall be painted with one coat of red lead and two coats of black Enamel paint.

Where inserts are not provided, the Contractor shall provide anchor fasteners. Anchor fastener shall be fixed to walls and ceilings by drilling holes with Electrical drill in an approved manner as recommended by the manufacturer of the fasteners.

- **Testing**

All pipes in the system shall be tested to a hydraulic pressure of 1.5 times of the working pressure or minimum of 15 kg/cm² without drop in the pressure for at least 2 hours. Rectify all leakages, make adjustment and retest as required.

- **Anchor Block**

Contractor shall provide suitable cement concrete, anchor blocks of ample dimensions at all bends, tee connection and other places required and necessary for overcoming pressure thrusts in pipes. Anchor blocks shall be of cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 stone aggregate 20 mm nominal size).

- **Valves, Gauge and Orifice Plates**

Sluice Valves above 65 mm shall be of Cast Iron body and Bronze/Gunmetal seat. They shall conform to type PN 1.6 of IS:780-1980, valves up to 65mm shall be of Gunmetal Full way Valve with wheel tested to 20 kg/cm² class-II as per I.S: 778-1971. Valve wheels shall be of right hand type and have an arrow

head engraved or cast thereon showing the direction for turning open and closing. Non-return valves shall be of Cast Iron body and Bronze/Gunmetal seat. They shall conform to class of IS: 5312 and have flanged ends. They shall be swing check type in horizontal runs and lift check type in vertical runs of piping. They shall not be spring-loaded type.

- **Internal Hydrants**

The Internal Hydrant outlet shall comprise “Single Headed Single Outlet Gunmetal Landing Valve” conforming to type ‘A’ of IS: 5290-1977. Separate valve on the head shall form part of the landing valve construction.

A cap with chain is provided on one head of the outlet. The hydrant will have an instantaneous pattern female coupling for connecting to Hose Pipe.

The Landing Valve shall be fitted to a Tee connection on the wet riser at the landing.

- **First-Aid Hose Reel Equipment**

First aid hose reel equipment shall comprise reel, hose guide fixing bracket hose tubing globe valve, stopcock and nozzle. This shall conform to IS:884 - 1969. The hose tubing shall conform to IS:1532-1969.

The hose tubing shall be 20 mm dia and 36.5m long. The GM nozzle 5mm and globe valve shall be of 20 mm size.

The fixing bracket shall be of swinging type. Operating instructions shall be engraved on the assembly. This heavy duty mild steel and cast iron brackets shall be conforming to IS: 884 - 1969. The first-aid hose reel shall be connected directly to the MS pipe riser taken independently from ring.

- **Hose Pipes**

Two numbers Hose Pipes shall be rubber lined woven jacketed and 63mm in dia. 15m long. They shall conform to type A (Reinforced rubber lined) of IS:636 - 1979. The hose shall be sufficiently flexible and capable of being rolled.

Each run of hose shall be complete with necessary coupling at the ends to match with the landing valve or with another run of hose pipe or with branch pipe. The couplings shall be of instantaneous spring lock type. This shall be conforming to IS: 903.

- **Branch Pipes**

Branch pipe shall be of Gunmetal 63 mm dia and be complete with male instantaneous spring lock type coupling for connection to the hose pipe. The branch pipe shall be externally threaded to receive the nozzle.

- **Nozzle**

The nozzle shall be of Gunmetal 20 mm in (internal) diameter. The screw threads at the inlet connection shall match with the threading on the branch pipe. The inlet end shall have a hexagonal head to facilitate screwing of the nozzle on to the branch pipe with nozzle spanner.

End Couplings, Branch pipe, and Nozzles shall conform to IS:903 - 1985.

Two C.P hoses of 15m length with couplings shall be provided with each External (Yard) Hydrant. Two RRL hoses of 15m length, as specified, with couplings shall be provided with each Internal Hydrant. One nozzle and one branch pipe with coupling shall be provided with each Yard Hydrant and Internal Hydrant.

- **Hose Cabinet**

The internal hose cabinet shall accommodate the Hose pipes, branch pipe, Nozzle First aid Hose Reel and Hydrant Outlets and shall be fabricated from 2 mm thick or 14 mm gauge MS/aluminum sheet. The overall size shall be minimum requirement 2100x900x800 mm, or as specified in the Architectural details. This shall have lockable centre opening glazed doors as per the requirement and as per Architectural details. Where the niche for wet riser is provided with shutters, separate hose cabinet as above may be dispensed with.

The hose cabinet shall be painted red and stove enameled and words FIRE written in front glazed portion.

- **Fire Brigade Inlet Connections**

Fire Brigade Inlet connection shall be provided for down comer system as specified, for the following purposes:

- Fire brigade inlet connection to the down comer system. Each connection shall be provided with similar dia of Sluice valve and Non return valve. The locations of this Fire brigade connection shall be suitably decided with the approval of Consultant/Landscape Architect and with a view that these are easily accessible to the fire brigade, without any possible Hindrance.

- **Hydraulic Siren**

A siren shall be provided in the system, to indicate the flow of water in the wet riser system. Alternative arrangements may also be adopted. This shall be turbine type.

- **Valve Chambers**

Contractor shall provide suitable Brick Masonry Chamber in cement mortar 1:5 (1 cement: 5 coarse sand) on cement concrete foundations 150 mm thick in 1:5:10 mix (1 cement: 5 fine sand: 10 graded stone aggregate 40 mm nominal size) 15 mm thick plaster inside and outside finished with a floating coat of neat cement inside with cast iron surface box approved by fire brigade including excavation, back filling complete.

Valve chambers shall be of following size:

- For depths 100 cm and beyond 90x90x100 cm
- **Portable Fire Extinguisher**
Portable fire extinguishers shall be provided as per the approved shop drawing and shall conform to IS:15683.
 - Two 9 lit. water CO2 type for every 600 m² area with minimum of 1 extinguishers per floor as per I.S: 15683
 - Dry Chemical powder type of 6 Kg. Capacity as per (IS:15683)
 - CO2 type of 4.5 kg capacity as per (IS:15683)
- **Shop Drawings & Specifications**
The Contractor shall submit to the Consultant two copies of Shop Drawings for Fire Fighting works as an Advance Copy to the Engineer-in-Charge for approval before start of work. Subsequent to the approval of the shop drawings, the Contractor shall submit six copies of Shop Drawings for execution to the Engineer-in-Charge. Also the Contractor shall submit four copies of the Technical Specifications and Catalogues.

Shop drawings shall be submitted for the following conditions:

- Structural supports/hanging/laying and jointing details for all types of pipes as required.
- Fire Fighting layout plans as required and for any changes in the layout of Fire Fighting/Architectural drawings.

The Contractor can only commence the work after the approval of above documents by Consultant.

- **Water Supply / Fire Fighting Pumps & Equipments and Water Treatment Units etc.**
- **Pumps and Water Treatment Equipment**
Work under this sub-head consists of furnishing all labor, materials, equipment and accessories necessary and required to completely install pumping system for various water supply services and water treatment as per approved shop drawings, specified hereinafter.

Without restricting to the generality of the foregoing, the work of pumps and water treatment equipment shall include the followings:

- Raw water pumps.
- Hydro pumps for Domestic & Flushing water.
- Garden Hydrant Pumps.
- Treated water supply pumps to STP (Emergency supply)

- Sump pumps for disposal of sewage and drainage.
 - Water treatment unit consisting of filter, softener and chlorination etc.
 - Fire pumps.
 - Motor control panels, power and control cabling and allied electrical works.
 - Pipes, valves, accessories, hangers, supports, delivery and suction feeders and connection to proposed pipe work.
- **Water Supply Pumps (Raw Water / Garden Hydrant)**
Water supply pumps shall be suitable for clean water. Pumps shall be multistage, monoblock vertical centrifugal pumps with stainless steel body and stainless steel impeller, stainless steel shaft and coupled to a TEFC electric motor by means of a flexible coupling. Each pump should operate a curve 10m below specified head.

Pump and motor shall be mounted on a common M.S. structural base plate or as required as per site conditions.

Each pump shall be provided with a totally enclosed fan cooled induction motor.

Each pumping set shall be provided with a 150mm dia or of suitable size gunmetal "Burden" type pressure gauge with gunmetal isolation cock and connecting piping.

Provide vibration-eliminating pads appropriate for each pump.

Provide rate of flow measuring meter with bypass arrangement with every set of pumps.

All water supply pumps shall be provided with mechanical seals.

Detail of Pumps as below.

- | | | |
|--|---|-----------------|
| a) Filter feed pumps | – | Cap. as per DBR |
| b) Garden Hydrant pumps | – | Cap. as per DBR |
| c) Treated water transfer pumps to STP | – | Cap. as per DBR |
- (Emergency supply)

- **Hydro Pneumatic System (Domestic & Flushing Water Supply Pumps)**
Domestic water supply pumps shall be packaged type skid mounted hydro pneumatic system with fixed speed system. Complete system to be mounted on a common base frame.

Pumps shall be multistage, monoblock vertical centrifugal pumps with stainless steel body and stainless steel impeller, stainless steel shaft and coupled to a

TEFC electric motor by means of a flexible coupling. Each pump should operate a curve 10m below specified head.

Pressure vessel of non corrosive FRP composite construction lined with NSF and/or FDA listed material, like high density polyethylene with fully replaceable polyurethane. Air cell burst pressure of minimum of 5 times the vessel operating pressure and cycle tested for 2,50,000 cycles. No. and capacity of Pressure Vessel As per manufacturer recommendation.

Pump and motor shall be mounted on a common M.S. structural base plate or as required as per site conditions.

Each pump shall be provided with a totally enclosed fan cooled induction motor.

Each pumping set shall be provided with a 150mm dia or of suitable size gunmetal "Burden" type pressure gauge with gunmetal isolation cock and connecting piping.

Provide vibration-eliminating pads appropriate for each pump.

Provide rate of flow measuring meter with bypass arrangement with every set of pumps.

All water supply pumps shall be provided with mechanical seals.

Pumps shall have Control Panel with programmable logic controller (PLC) for cyclic operation of pumps. Pump working sequence should change after every operation. Contractor overload relays and MCBs should conform to IEC 898 – 1995/ specifications. Blinking indications for pumps start, trip, low level trip, and health supply should be provided in the panel along with the ammeter & voltmeter. Control panel should also consist of cooling fan.

- | | | |
|-------------------------------|---|------------|
| a) Hydro Pumps (for Domestic) | – | As per DBR |
| b) Hydro Pumps (for Flushing) | – | As per DBR |

Sump Pump

Sump pumps shall be submersible type for lifting domestic sewage or muddy water/drainage. Pump with impeller of approved material shall be mounted on waterproof motor. The impeller shall be suitable for handling solids upto 46-100mm dia.

The pump shall automatically operate with high water level and stop at low water level in the sump by means of "Electronic Level Controller", of the approved make.

The sump pumps shall be complete in all respect and shall be installed as per manufacturer's requirement as shown in the approved shop drawing. All accessories shall be In-Built as per manufacturer's specification.

Sump pumps are compact monoblock dry motor submersible pumps for suitable rating, with non-clog free flow open impeller, minimum solid handling capacity up to 100mm for sewer & 40 for storm water . Suitable for operation on 415 volts + 5% -15%, 50 C/s A.C 3 phase supply, speed 960/1440R&M including oil chamber, guide wire for lifting & lowering of pump, M.S. galvanized lifting chain, duck foot bend.

The above pump sets must be supplied complete with following accessories :

- Complete piping 100mm dia common delivery upto 1.5m as shown in the approved drawing. (The pipe should be preferably heavy duty GI)
- Necessary valve i.e Butterfly valve on delivery/suction side and Non return valves are on delivery side.
- Necessary cable from pumps set to control panel.
- Electrical switch panel having all necessary accessories & safety devices of standard specifications. (Panels with sump pumps near each sump as per site conditions)
- Automatic built-up water level controller with necessary length of cable upto control panel.

- **Sewage Pumps (Minimum req.)**

Motor rating - 5.0KW

Discharge - Min. 20 Cu.m/hr.

Total head - 14 m

(Complete set as above including valves and delivery pipes and panels and with 2 nos. pumps)

- **Drainage Pumps (Minimum req.)**

Motor rating - 1.1KW

Discharge - Min. 15 Cu.m/hr.

Total head - 14 m

(Complete set as above including valves and delivery pipes and panels and with 3 nos. pumps)

- **Fire Fighting Pumps**
Electrical Operated terrace fire Pumps

Pumping sets shall be single stage horizontal centrifugal single outlet with cast iron body and dynamically balanced bronze impellers. Connecting shaft shall be of stainless steel with bronze sleeve and grease-lubricated bearings.

Pumps shall be connected to the drive by means of spacer type love-joy coupling which shall be individually balanced dynamically and statically.

The coupling joining the prime mover with the pump shall be provided with a sheet metal guard.

Pumps shall be provided with approved type of mechanical seals.

Pumps shall be capable of delivering not less than 150% of the rated discharge at a head of not less than 65% of the rated head. The shut-off head shall not exceed 120% of the rated head.

The System shall meet the requirements of the National building Code 2016 (NBC).

Necessary 'Y' strainer on the suction side and pressure gauge with GM cocks on the delivery side including bypass arrangement (with 50 valve and up to 5M G.I. Medium pipes) for periodical testing of the working of the pumping set shall be provided.

Pump shall be mounted on common base frame fabricated from MS channel as per manufacturer's specification.

Suitable RCC Pump-foundations as per manufacturer's design and 4 nos. Dunlop (cushy foot) heavy duty Antivibration mounting pads shall be provided.

Motors for Electric Driven Pumps

Electrically driven pumps shall be provided with totally enclosed fan cooled induction motors.

Motors for fire protection pumps shall be at least equivalent to the horse power required to drive the pump at 150% of its rated discharge and shall be designed for continuous full load duty and shall be design proven in similar service.

Motors for fire pumps shall meet all requirements and specifications of the tariff advisory committee.

Motors shall be suitable for 415 volts, 3 Phase, 50 cycles A.C supply and shall be designed for 33°C ambient temperature. Motors shall conform to I.S: 325.

Motors shall be designed for two start system.

Motors shall be capable of handling the required starting torque of the pumps.

Contractor shall provide heating arrangements for the main fire pump motor to ensure that motor windings shall remain dry.

- **Cables**

Contractor shall provide all power control cables from the motor control center to various motors, level controllers and other control devices.

Cables shall conform to I.S: 1554 and carry ISI mark.

Wiring cables shall conform to I.S 694.

All power and wiring cables shall be aluminum conductor PVC insulated armored and PVC sheathed of 1100 volts grade.

All control cables shall be copper conductor PVC insulated armored and PVC sheathed 1100 Volt grade.

All cables shall have stranded conductors. The cables shall be in drums as far as possible and bear manufacturer's name.

All cable joints shall be made in approved manner as per standard practice.

- **Cable Trays**

Contractor shall provide M.S slotted cable trays at locations as per regulation.

Cable trays shall be supported from the bottom of the slab at intervals of 60cms at both ends by anchor fasteners.

- **Earthing**

There shall be an independent earthing station. The earthing shall consist of an earth tape connected to an independent plate made of copper or G.I. having a conductivity of not less than 100% international standard. All electrical apparatus, cable boxes and sheath/armor clamps shall be connected to the main bar by means of branch earth connections of appropriate size. All joints in the main bar and between main bar and branch bars shall have the lapping surface properly tinned to prevent oxidation. The joints shall be riveted and sweated.

Earth plates shall be buried in a pit of 1.20x1.20M at minimum depth of 3M below ground. The connections between main bar shall be made by means of three 10mm brass studs and fixed at 100mm centers. The pit shall be filled with coke breeze, rock salt and loose soil. A G.I. pipe of 20mm dia with perforations on the periphery shall be placed vertically over the plate to reach ground level for watering.

A brick masonry manhole 30x30x30cm size shall be provided to surround the pipe for inspection. A bolted removable link connecting main bar outside the pit portion leading to the plates shall be accommodated in this manhole for testing.

- **Control Panels / Starters**

Switch board cubicles of approved type shall be fabricated from 16-gauge M.S. sheet with dust and vermin proof construction. It shall be painted with powder-coated finish of approved make and shade. It shall be fitted with suitable etched plastic identification plates for each motor. The cubicle shall comprise of the followings:-

- Incoming main isolation MCCB of required capacity.
- Fully Aluminum taped Bus Bar of required capacity.
- Isolation MCCB one for each motor.
- Fully automatic as specified D.O.L/Star Delta starters suitable for motor H.P. with push buttons one for each motor and on/off indicating neon lamps. (DOL up to 7.5 HP and Star Delta from more than 7.5 H.P)
- Single phase preventer of appropriate rating for each motor.
- Panel type ampere meters one for each motor with selector switch.
- Panel type voltmeter on incoming main with rotary selector switch to read voltage between phase to neutral and phase-to-phase.
- Neon phase indicating lamps for incoming main and on/off indicating lamps for each motor.
- Rotary switch for manual or auto operation for each pump (manual/auto off).
- Fully taped separate aluminum bus bars of required capacity and with required outlets.
- Space for liquid level controllers as specified + 1 extra space.
- The panel shall be pre-wired with color-coded wiring. All interconnecting wiring from incoming main to switch gear, meters and accessories within the switchboard panel.
- Provision of main incoming cables from the top of the panel.

All switch gears and accessories shall be of approved make such as “Siemens, Larsen & Toubro” or equivalent.

Switchboard cubicles shall be floor or wall mounted type as recommended by manufacturers. All floor-mounted switchboards shall rest on minimum 225mm high platform. The contractor shall provide the shop drawings for base and panels.

- **Vibration Eliminators**

Provide on all suction and delivery lines double flanged reinforced neoprene flexible pipe connectors. Connectors should be suitable for a working pressure of each pump. Length of the connector shall be as per manufacturer's details.

- **Water Filter**

Water filter shall be of dual filter media pressure filter downward or upward flow type suitable for a rate of filtration.

Filter shall be vertical type of required diameter. The shell shall be fabricated from M.S. plate suitable to withstand a working pressure as given below. The

minimum thickness of shell will be 8mm and dished ends shall be 10mm. The filter shall have at least one pressure tight manhole cover.

Filter shall be provided with screwed or flanged connections for inlet, outlet, individual drain connections and all other connections necessary and required. Filter shall be painted inside with two or more coats of non-toxic corrosion resistant paint, one coat of red oxide primer outside with two or more coats of synthetic enamel paint of approved shade.

Filter Capacity Shall be as functional requirement.

- **Under Drain System**

Filter shall be provided with an efficient under drain system comprising of collecting pipes, gunmetal/polypropylene nozzles of manufacturer's design. The entire under drain system be provided on M.S. plate or cement concrete supports.

- **Face Piping**

Filter shall be provided with interconnecting face piping comprising of inlet, outlet, and backwash pipe complete with pipes, valves and accessories, as per requirement. Piping shall be G.I./M.S. piping, medium duty, as per I.S: 1239 and valves shall be cast iron double flanged sluice valves on SOUNDERS pattern with C.I. body and Neoprene rubber diaphragm (Suggested make LABLINE, NKI or equivalent).

- **Accessories**

Each filter shall be provided with following accessories:-

- Air release valve with connecting piping.
- 150mm dia dial burden type gunmetal pressure gauges with gunmetal isolation cock and connecting piping on inlet and outlet.
- Sampling cocks on raw water inlet and filtered water outlet.
- Individual drain connection with gunmetal full way valve.
- Connection with valve for air scouring.

- **Water Softener**

Softener shall be designed to give zero commercial hardness. Softener shall be with cation exchange resins.

Softener vessel shall be of mild steel plate with dished ends and self supporting arrangement. Vessel shall be suitable for a working pressure. The shell shall have a minimum thickness of 8mm and dished ends 10mm. The vessel shall be painted internally with non-toxic bitumen paint and externally with one coat of red oxide and two or more coats of synthetic paint to give an even shade.

The vessel shall have an internal collecting and distribution system of manufacturer's design.

The softener shall have a set of interconnecting face piping consisting of inlet, outlet and brine injection system with valves and accessories complete as per requirement. Piping shall be M.S. medium duty, as per I.S: 1239 and valves shall be cast iron double flanged sluice valves on SOUNDERS pattern, with C.I. body and Neoprene rubber diaphragm (suggested make LABLINE, NKI or equivalent).

One set of hydraulic injector with control valve, brine delivery pipes with adjustable indicator.

One cylindrical salt saturator and measuring tank of M.S. rubber lined having a capacity of a minimum of two regenerations for.

One orifice board for indicating wash and rinse rate to be fitted in drain sump.

One charge of supporting gravel, sand and "cation" resin in requisite quantity. Resin shall be Indian 220 or approved equivalent make.

One water testing kit with instructions for testing water samples.

Softener Capacity are as per functional requirement.

- **Piping**

Pipes for suction and delivery shall be galvanized/M.S tube (heavy duty) conforming to I.S:1239 up to 150mm dia and as per I.S:3589 for dia 200mm and above. The M.S flanges shall confirm to I.S:6392-1971.

Gate valve and check valve above 65mm dia shall be C.I. double flanged conforming to I.S:780 manufactured by the reputed manufacturers or C.I. double flanged butterfly valves.

Full way and check valves 65mm dia and below shall be gunmetal tested to 20Kg/cm² pressure certified and conforming to I.S:778.

Suction strainer or foot valves shall be C.I., conforming to I.S:4038 - 1979.

- **Joints**

All pipes and fittings shall be provided with flanged joints, with flanges either screwed or welded complete and jointed with 1.5mm thick gasket complete with nuts, bolts and washers etc.

- **Testing**

All G.I pipes (except fire pipe) shall be tested hydrostatically for a period of 30 minutes to a pressure of 7 Kg/cm² without drop in pressure and all G.I pipes for fire shall be tested hydrostatically for a period of 30 minutes to a pressure of 10 Kg/cm² without drop in pressure.

- **Guarantee**

The contractor shall submit a warranty for all equipment, materials and accessories supplied by him against manufacturing defects, malfunctioning or under capacity functioning.

The form of warranty shall be as approved by the Engineer-in-Charge.

The warranty shall be valid for a period of one year from the date of commissioning and handing over.

The warranty shall expressly include replacement of all defective or under capacity equipment, Engineer-in-Charge may allow repair of certain equipment if the same is found to meet the requirement for efficient functioning of the system.

The warranty shall include replacement of any equipment found to have capacity lesser than the rated capacity as accepted in the contract. The replacement equipment shall be approved by the Engineer-in-Charge.

- **Water Quality**

- **Important Instruction for Quality of Water**

The successful contractor will have to carry out a test of raw water from all the sources of water for the building at their own cost from a reputed lab as approved by the Engineer-in-Charge / Consultant. On the basis of these results the contractor has to submit his shop drawings, design calculations and specifications accordingly.

Please note that it is ultimately the responsibility of the contractor to provide treated water for different use in the building as per International Standard as given in the attached guidelines.

- **Required Quality of Treated Water**

Sl. No.	Characteristics	Acceptable as per Indian Standard of P.H.E.
1	Turbidity (Units on J.T.U scale)	2.5
2	Colour (Units on Platinum Cobalt scale)	5.0
3	Taste and Odour	Unobjectionable
4	pH	7.0 to 8.5
5	Total dissolved solids (mg/l)	500

Sl. No.	Characteristics	Acceptable as per Indian Standard of P.H.E.
6	Total hardness (mg/l) (as CaCO ₃)	200
7	Chlorides (as Cl) (mg/l)	200
8	Sulphates (as SO ₄)	200
9	Fluorides (as F) (mg/l)	1.0
10	Nitrates (as NO ₃) (mg/l)	45
11	Calcium (as Ca) (mg/l)	75
12	Magnesium (as Mg) (mg/l)	> 30
13	Iron (as Fe) (mg/l)	0.1
14	Manganese (as Mn) (mg/l)	0.05
15	Copper (as Cu) (mg/l)	0.05
16	Zinc (as Zn) (mg/l)	5.0
17	Phenolic compounds (as Phenol) (mg/l)	0.001
18	Anionic detergents (mg/l) (as MBAS)	0.2
19	Mineral Oil (mg/l)	0.01
20	Arsenic (as As) (mg/l)	0.05
21	Cadmium (as Cd) (mg/l)	0.01
22	Chromium (as hexavalent Cr) (mg/l)	0.05
23	Cyanides (as CN) (mg/l)	0.05
24	Lead (as Pb) (mg/l)	0.1
25	Selenium (as Se) (mg/l)	0.01
26	Mercury (total as Hg) (mg/l)	0.001
27	Polynuclear Aromatic Hydrocarbons (PAH)	0.2 ug/l
28	Gross Alpha activity	3p Ci/l
29	Gross Beta activity Pci = pico curie	30p Ci/l

Sl. No.	Characteristics	Acceptable as per Indian Standard of P.H.E.
30	Bacteriological Quality of piped water supplies	
31	Treated water entering the distribution system	
31.1	Faecal coliforms number/100 ml	0
31.2	Coliform organisms number/ 100 ml	0

LIST OF APPROVED MAKES - FIRE FIGHTING

1.	C.I. MANHOLES FRAME & COVER	NECO/BIC/SKF
2.	BUTTERFLY VALVE	AUDCO/ CRANE/KITZ/ ZOLOTO/ /SANT
3.	GATE VALVE	AUDCO/ CRANE/KITZ/ ZOLOTO/ /SANT
4.	NON RETURN VALVE	AUDCO/ CRANE/KITZ/ ZOLOTO/ /SANT
5.	BALL VALVE	UTAM/ ZOLOTO/ DANFOSS/ VTM
6.	M.S. FORGED FITTINGS	V.S/JOHNSON
7.	DASH FASTENERS	HILTI/ FISHER
8.	AUTOMATIC AIR VENT	CIM/AIP/ZOLOTO
9.	PIPE HANGERS/CLAMPS/SUPPORT	EURO CLAMP/ CHILLY/GRIPPLE
10.	PAINT	SHALIMAR/ BERGER/ NEROLAC
11.	FIRE HOSE	CEASE FIER/ OMEX/UTAM/MINIMAX
12.	FIRE HYDRANT VALVE	CEASE FIER/ OMEX / UTAM//MINIMAX
13.	FIRST AID HOSE REEL DRUM & TUBING	CEASE FIER/ / OMEX / UTAM//MINIMAX
14.	BRANCH PIPE	CEASE FIER/ / OMEX / UTAM//MINIMAX
15.	DOUBLE/SINGLE HEADED LANDING VALVES	CEASE FIER/ / OMEX / UTAM//MINIMAX
16.	FIRE MAN AXE	CEASE FIER/ OMEX / UTAM//MINIMAX
17.	FIRE BRIGADE INLET CONNECTION	CEASE FIER/ / OMEX UTAM//MINIMAX

18.	FIRE /SPRINKLER MAIN PUMP/JOCKEY PUMPS	KIRLOSKAR/WILLO-MATHER & PLATT/ KSB
19.	DIESEL ENGINE	CUMMINES/GREAVES/ KIRLOSKAR
20.	MOTOR	ABB/KIRLOSKAR/ CROMPTON/ CUMMINS
21.	BATTERY	AMCO/EXIDE/ AMRON
22.	BATTERY CHARGER	BCH/HBL/KINETIC
23.	MS PIPE	TATA STEEL/JINDAL HISSAR
24.	SPRINKLER HEAD	TYCO/VIKING/NEWAGE/EVERSAFE
25.	ALARM CONTROL VALVE	TYCO/VIKING/SAFEX/EVERSAFE
26.	FLOW SWITCH	SYSTEM SENSOR/HONEYWELL/POTTER
27.	WELDING ROD	ESAB/ ADOR/ SUPERON OERLIKON
28.	PRESSURE SWITCH	SYSTEM SENSOR/HONEYWELL/POTTER
29.	CONTROLS	HONEYWELL/ SIEMENS/ DANFOSS
30.	VIBRATION ELIMINATOR	RESISTOFLEX/ KANWEL
31.	G.I FITTINGS	UNIK/ ZOLOTO
32.	HOOTER	HONEYWELL/ SIEMENS/ DANFOSS
33.	SLUICE VALVE	LEADER/ AUDCO/ ZOLOTO/VTM/ UTAM
34	Y STRAINER	KITZ/ AUDCO/ VTM/UTAM
35.	DELUGE VALVE	VIKING/TYCO/HD
36.	WATER CURTAIN NOZZLE	VIKING/TYCO/HD
37.	FIRE EXTINGUISHERS	NEWAGE/EXFLAME/KANNEX/ MINIMAX
38.	FLEXIBLE DROP CONNECTION	NEWAGE/SEFEX/EVERSAFE
39.	ELECTRICAL PANNEL DECTION & SUPPERSSION SYSTEM	AVEC INDIA/FIRE TERRACE/SVS BUILDWEL/FOAM TECH
40.	PIPE PROTECTION WRAPPING	PIPEKOTE/COATEK
41.	INSPECTOR TEST ASSEMBLY	EVERSAFE/VIKING/VICTAULIC
42.	FIRE BUCKETS	NEWAGE/SEFEX/MINIMAX
43.	FOOT VALVE	KIRLOSKAR/NORMEX/ VTM/ UTAM
44.	MECHANICAL SEAL	BURGMANN/SEALOL

45.	PRESSURE GAUGE	HGURU/EMERALD/FIEBIG
46.	MOTOR CONTROL CENTER	TRICOLITE ELECTRICAL/ADLEC CONTROL SYSTEM/SK POWER SOLUTION
47.	VARIABLE SPEED DRIVES	DANFOS/ABB/SIEMENS
48.	MOULDED CASE CIRCUIT BREAKER(MCB)	L&T/SCHNEIDER ELECTRIC/SIEMENS
49.	STARTER CONTACTOR	LARSEN & TURBO
50.	MINIATURE CIRCUIT BREAKER(MCB)	HAGER/ SCHNEIDER ELECTRIC/SIEMENS
51.	OVERLOAD RELAYS WITH BUILT IN SINGLE PHASE PREVENTER	L&T/SCHNEIDER ELECTRIC/SIEMENS
52.	CURRENT TRANSFORMER	GILBERT MAXWELL/PRAGATI/AUTOMATIC ELECTRIC
53.	ROTARY SWITCH	L&T/SCHNEIDER ELECTRIC/SIEMENS
54.	TIMER DELAY RELAY	L&T/SCHNEIDER ELECTRIC/SIEMENS
55.	TIMER	ASIA BROWN/L&T/ SIEMENS/GE POWER
56.	SELECTOR SWITCH, TOGGLE SWITCH	L&T/KAYCEE
57.	CHANGE OVER SWITCH	L&T/HPL-SOCOMEK
58.	ELECTRONIC DIGITAL METER	L&T/SCHNEIDER ELECTRIC/SIEMENS
59.	INDICATING LAMPS LED TYPE, PUSH BUTTON	L & T / SCHNEIDER ELECTRIC/SIEMENS
60.	PVC INSULATED ALUMINIUM/COPPER CONDUCTOR, AURMERED MV CABLE (1100 V GRADE)	FINOLEX/POLYCAB/HAVELLS
61.	METALIC CONDUIT	BEC/AKG
62.	PVC CONDUIT & ACCESSARIS	BEC/AKG/POLYCAB
63.	SANDWITCHED CONSTRUCTION BUS DUCTS	CONTROL & SWITCHGEAR-HENIKWON SCHNEIDER ELECTRIC
64.	CABLE TRAY (FACTORY FABRICATED)	SLOTCO/NEEEDO/MEM
65.	LT JOINTING KIT/TERMINATION	BIRLA-3M/RAYCHEM
66.	BIMETTALIC CABLE LUGS	COMET/DOWELLS (BILLER INDIA)
67.	PROTECTION RELAY	
68.	A. NUMERIC TYPE	ABB/AREVA/L&T/ SIEMENS/WOODWARD
	B. ELECTROMAGNETIC TYPE	ABB/AREVA/L&T

NOTE: All makes shall conform to specifications of each item as enclosed with the tender documents.

MAJOR COMPONENT: LIST OF ITEMS WITH BASIC RATES/PRICE

S. No.	Tender Item No.	Description	Basic rate (In Rs.) excluding taxes ex Go-down	Unit
Civil				
1	8.3, 8.4	Vitrified tiles (600mm X 600mm)	1000/-	Sqm
2	8.5	Glazed ceramic floor tiles (300 mm X 300 mm)	800/-	Sqm
3	8.6	Glazed ceramic wall tiles (Min thickness 5 mm)	800/-	Sqm
4	5.1,	18 mm thick polished Granite	1800/-	Sqm
5	8.7, 8.9	18 mm thick polished Granite	2000/-	Sqm
6	8.8	18 mm thick flamed Granite	1000/-	Sqm
7	11.9	Heat resistance high SRI Terrace Tiles (300 mm X 300 mm)	409/-	Sqm
8	6.7	SS 304 Curtain rod (25 mm X 1.20 mm)	170/-	Rm
9	6.10	Brass pull handle 300 mm	1880/-	Each
10	6.11	100 mm Mortice latch and lock	400/-	Each
11	6.14	Brass Pentabolt lock	6030/-	Each
12	6.15	Brass Safety Chain	410/-	Each
13	6.16	Brass Magic Eye Door	378/-	Each
14	6.17	Door Buffer	255/-	Each
15	8.13	Heterogeneous Vinyl Flooring 4.5mm Thk.	1900/-	Sqm

Plumbing				
1	1	18 mm thick table rubbed Granite	1800/-	Sqm
2	3.1	White vitreous china Orissa pattern WC pan	1290/-	Each
3	3.1	Flushing Cistern for Orrisa Pan	575/-	Each
4	3.2	Wall mounted water closet	5500/-	Each
5	3.2	Flushing Cistern	1600/-	Each
6	3.3	Vitreous china battery based infrared sensor operated urinal	4500/-	Each
7	3.4	Vitreous China Wash basin	550/-	Each
8	3.4	Basin Mixer	1600/-	Each
9	3.5	Kitchen sink with drain board	3000/-	Each
10	3.6	Health faucet	1250/-	Each
11	3.7	32 mm Bottle trap	620/-	Each
12	3.9(a)	Wall Hung WC with PP soft close seat cover, Hinges Wall with built in Jet	7500/-	Each
	3.9(b)	Concealed Cistern Cistern	3700/-	Each
	3.9(c)	Flush Plate	1050/-	Each
	3.9(d)	Wall hung Wash Basin	2050/-	Each
	3.9 (e)	Spatula Single lever	2850/-	Each
	3.9(f)	Wall mounted Grab bar 600 mm long	3800/-	Each
	3.9(g)	Wall mounted Hinged hand rail 750 x 100mm	7650/-	Each
	3.9(h)	Bottle Trap	620/-	Each

	3.9(i)	Waste Coupling	375/-	Each
	3.9(j)	Stainless soap dish	500/-	Each
	3.9(k)	Tissue paper holder	280/-	Each
13	3.12	600x120x5 mm glass shelf	300/-	Each
14	3.13	C.P. Brass toilet paper holder	280/-	Each
15	3.26	Nickel Chromium Plated liquid soap dispenser	2550/-	Each
16	3.27	Towel ring	725/-	Each
17	3.28	Towel rail	975/-	Each
18	3.29	Soap dish holder	500/-	Each
19	3.30	CP brass Wall mounted Sink mixer	3225/-	Each
20	3.31	CP Brass diverter, overhead shower with arm	7790/-	Each
21	3.32	Double coat hook	650/-	Each
22	3.33	300mm SS Grab Bar	1500/-	Each
23	3.34	2 Way bib cock	1650/-	Each
24	3.40(a)	Storage type water heater (25 litres)	9675/-	Each
25	3.40(b)	Storage type water heater (40 litres)	10200/-	Each
26	3.40(c)	Storage type water heater (06 litres)	5525/-	Each
27	4.16	C.P. brass bib cock	300/-	Each
29	4.17	C.P. brass Long body bib cock	500/-	Each
30	4.32(a)	65 mm Y strainer	6417/-	Each
31	4.32(b)	80 mm Y strainer	7286/-	Each

SECTION IX

SCHEDULE OF QUANTITIES - MAJOR COMPONENT

SCHEDULE / BILL OF QUANTITIES

SUMMARY OF COST: MAJOR WORKS		
A	CIVIL WORK	
Sl.No.	Description	Total Amount (In Rs.)
1	EARTH WORK	9359127.48
2	CONCRETE WORK	15930927.42
3	REINFORCED CEMENT CONCRETE	276925161.00
4	BRICKWORK	40081159.27
5	GRANITE WORK	12968819.76
6	WOOD AND PVC WORK	20210169.75
7	STEEL WORK	19670884.80
8	FLOORING WORK	88204605.44
9	FINISHING WORK	57080454.64
10	ALUMINIUM WORK	30028676.68
11	WATER PROOFING WORK	30007412.57
12	STRUCTURAL GLAZING, CURTAIN GLAZING, ALUMINIUM COMPOSITE PANEL & STONE CLADDING WORK	6712053.28
13	ROAD WORK	11934895.01
14	SIGNAGES	806850.00
15	DISMANTLING	531499.45
	TOTAL (CIVIL WORK)	620452696.55
B	PLUMBING WORK	

Sl.No.	Description	Total Amount (In Rs.)
1	MARBLE & GRANITE WORK	6576.42
2	ROOFING	1347791.2
3	SANITARY INSTALLATIONS	31300514.62
4	WATER SUPPLY	19375780.96
5	DRAINAGE	10881264.19
6	EARTH WORK, CONCRETE WORK & TUBEWELL	3325822.69
7	RAIN WATER HARVESTING	2734149.13
8	SEWAGE TREATMENT PLANT	6112805.05
9	WATER SUPPLY, DRAINAGE PUMPS & WATER TREATMENT EQUIPMENT	5697720.96
TOTAL (PLUMBING WORK)		80782425.21

C FIRE FIGHTING WORK		
Sl.No.	Description	Total Amount (In Rs.)

1	PUMPS	2859513.20
2	CONTROL PANELS	467134.00
3	PIPE & ACCESSORIES	5464519.4
4	FIRE EXTINGUISHER	950114.00
5	LT & HT PANEL, ELECTRICAL ROOM & SERVER ROOM GAS FLOODING SYSTEM	0.00

TOTAL (FIRE FIGHTING WORK)		9741280.60
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TOTAL COST OF MAJOR WORKS		710976402.38
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S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
1	SUB HEAD-I :- EARTH WORK				
1.1	Clearing of wild vegetation growth, unwanted grass, etc removal and disposal of the rubbish to a suitable municipal dumping area approved by local authorities including all lead and lift etc complete all as per direction of Engineer in charge. Note: 1. Payment for clearing will not be made for area covered under excavation of soil i.e. under item no. 1.3. 2. Green building certification requirement shall be ensured.				
	SECTOR - 9	1633.72			
	SECTOR-1A	576.49			
	TOTAL	2210.21	Sqm	7.33	16192.00
	CARRIAGE OF MATERIALS				
1.2	Cartage of good earth for raising low site all around with approved soil obtained from outside by truck carriage including loading,unloading and stacking at Site,breaking clods, dressing etc. complete including paying necessary royalty, sales tax, land compensation, municipal gate fees, if any monopoly duty etc. complete as directed and specified.				
	Carted earth (Upto 20 Km)				
	SECTOR - 9	1372.50			
	SECTOR-1A	102.78			
	TOTAL	1475.28	Cum	560.34	826658.40
1.3	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and stacking of excavated earth within a lead upto 50 m and lift upto 1.5 m at site for using at site, as directed by Engineer-in-charge. Note: The rate including dewatering of rainwater, flooding etc. from the excavated trench. No additional cost will be paid in this regards.				
	All kinds of soil				
	SECTOR - 9	7062.54			
	SECTOR-1A	2043.01	Cum	203.40	1852027.90

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	9105.55			
1.4	Extra for every additional lift of 1.5 m or part thereof in excavation /banking excavated or stacked materials.				
(a)	All kinds of soil (From 1.5 to 3 m depth)				
	SECTOR - 9	548.88			
	SECTOR-1A	180.11			
	TOTAL	728.99	Cum	103.46	75417.66
(b)	All kinds of soil (From 3 to 4.5 m depth)				
	SECTOR - 9	548.88			
	SECTOR-1A	164.06			
	TOTAL	712.94	Cum	206.91	147514.42
(c)	All kinds of soil (From 4.5 to 6 m depth)				
	SECTOR - 9	505.53			
	SECTOR-1A	86.46			
	TOTAL	591.99	Cum	310.37	183732.98
(d)	All kinds of soil (From 6 to 7.5 m depth)				
	SECTOR - 9	83.88			
	SECTOR-1A	17.44			
	TOTAL	101.32	Cum	413.82	41928.24
1.5	Filling of earth (excluding rock) available from item no. 1.2, 1.3, 1.4 above and item no. 14.1. in existing ground, trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m. Note: Rock if any found during excavation to be utilized under road,etc.				
	SECTOR - 9	6890.37			
	SECTOR-1A	1908.59			
	TOTAL	8798.96	Cum	251.41	2212150.93

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
1.6	Supplying chemical emulsion (Chlorpyrifos/ Lindane E.C. 20% with 1% concentration) in sealed containers including delivery as specified. Diluting the chemical emulsion for anti-termite treatment and Treatment of soil under existing floors using chemical emulsion @ one litre per hole, 300 mm apart including drilling 12 mm diameter holes and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor: Note: Measurement for payment shall be made on footprint of the building including projected area of footing				
	SECTOR - 9	4464.76			
	SECTOR-1A	1166.73			
	TOTAL	5631.49	Sqm	467.92	2635107.90
1.6 (a)	Along the external wall below concrete or masonry apron using chemical emulsion @ 2.25 litres per linear metre including drilling and plugging holes etc.:				
	With Chlorpyrifos/ Lindane E.C. 20% with 1% concentration				
	SECTOR - 9	948.69			
	SECTOR-1A	320.52			
	TOTAL	1269.21	Metre	44.25	56166.35
1.7	Supplying and filling in plinth with good quality sand under floors, including watering, ramming, consolidating and dressing complete(rate shall include cartage of sand, etc complete).				
	SECTOR - 9	487.66			
	SECTOR-1A	125.65			
	TOTAL	613.31	Cum	2139.59	1312230.72
	EARTH WORK SUB HEAD TOTAL for sector 9 & sector 1 A				9359127.48
2	SUB HEAD-II :- CONCRETE WORKS				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
2.1	Providing and laying in position ready mixed or site batched design mix cement concrete for plain cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana/Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads, finishing; but excluding the cost of centering and shuttering as per direction of the engineer-in-charge; for the following grades of concrete.				
	Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the minimum specified cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				
	Note: All works upto Plinth Level(under floors, road, foundation and Damp Proof Course of 40mm thickness,etc.)				
	Concrete of M20 grade with minimum cement content of 270 Kg/cum				
	SECTOR - 9	1408.16			
	SECTOR-1A	398.53			
	TOTAL	1806.69	Cum	8303.28	15001450.23
2.1(a)	All works above plinth and upto floor V level				
	Concrete of M20 grade with minimum cement content of 270 kg /cum				
	SECTOR - 9	20.40			
	SECTOR-1A	2.20			
	TOTAL	22.60	Cum	9909.41	223952.55
2.2	Providing & applying a coat of residual petroleum bitumen of grade of VG-10 of approved quality using 1.7kg per square metre on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.				
	SECTOR - 9	197.56			
	SECTOR-1A	105.55	Sqm	112.71	34163.98

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	303.11			
2.3	Providing and laying 50 mm thick cement concrete M-20 (cement content considered @ 270 kg/cum) in Plinth Protection over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing, finishing the top smooth, curing etc.				
	SECTOR - 9	948.69			
	SECTOR-1A	320.52			
	TOTAL	1269.21	Sqm	528.96	671360.66
	CONCRETE WORK SUB HEAD TOTAL for sector 9 and sector 1A				15930927.42
3	SUB HEAD-III :- REINFORCED CEMENT CONCRETE WORK				
	FORM WORK				
3.1	Supplying and fixing, centering and shuttering including strutting, propping etc. and removal of formwork for all heights:				
(a)	For concrete work in Foundations, footings, bases of columns, etc.				
	SECTOR - 9	2282.54			
	SECTOR-1A	822.82			
	TOTAL	3105.36	Sqm	304.87	946732.66
(b)	For concrete work in Walls (any thickness) including attached pilasters, butresses, plinth and string courses etc.				
	SECTOR - 9	3353.17			
	SECTOR-1A	850.27			
	TOTAL	4203.44	Sqm	662.85	2786269.12
(c)	For concrete work in Suspended floors, roofs, landings, balconies and access platform				
	SECTOR - 9	15340.40			
	SECTOR-1A	2507.14			
	TOTAL	17847.54	Sqm	758.88	13544221.47
(d)	For concrete work in Shelves (Cast in situ)				
	SECTOR - 9	489.60			
	SECTOR-1A	52.80			
	TOTAL	542.40	Sqm	758.88	411618.95
(e)	For concrete work in Lintels, beams, plinth beams, girders, bressumers and cantilevers				
			Sqm	602.27	14657407.99

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR - 9	20662.30			
	SECTOR-1A	3674.78			
	TOTAL	24337.08			
(f)	For concrete work in Columns, Pillars, Piers, Abutments, Posts and Struts		Sqm	796.21	16631715.72
	SECTOR - 9	17612.38			
	SECTOR-1A	3276.29			
	TOTAL	20888.67			
(g)	For concrete work in Stairs, (excluding landings) except spiral-staircases		Sqm	651.17	1156332.59
	SECTOR - 9	1619.11			
	SECTOR-1A	156.66			
	TOTAL	1775.77			
(h)	For concrete work in Edges of slabs and breaks in floors and walls. Under 20cms wide		Meter	180.08	1199433.10
	SECTOR - 9	5727.54			
	SECTOR-1A	932.98			
	TOTAL	6660.52			
(i)	For concrete work in Weather shade, chajjas, corbels etc. Including edges.		Sqm	806.80	1268459.81
	SECTOR - 9	1353.97			
	SECTOR-1A	218.24			
	TOTAL	1572.21			
	STEEL REINFORCEMENT				
3.2	Steel reinforcement for R.C.C. work including supplying, straightening, cutting, bending, placing in position and binding with GI double fold binding wires (18 gauge) all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more.		Kg	88.75	41842249.14
	SECTOR - 9	370791.16			
	SECTOR-1A	100652.21			
	TOTAL	471443.37			
3.3	Steel reinforcement for R.C.C. work including supplying, straightening, cutting, bending, placing in position and binding with GI double fold binding wires (18 gauge) all complete above plinth level upto required height/ floor. Thermo-Mechanically Treated bars of grade Fe-500D or more.		Kg	88.75	82545011.62

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR - 9	810859.83			
	SECTOR-1A	119188.13			
	TOTAL	930047.96			
3.4	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana /Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate /retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. NOTE- (1)Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement. (2) Cement content considered in this item is @ 350 kg/cum. Excess/ less cement used as per design mix is payable/ recoverable separately. (3) Fly ash conforming to grade I of IS 3812 (Part-1) only be used as part replacement of OPC as per IS : 456. Uniform blending with cement to be ensured in accordance with clauses 5.2 and 5.2.1 of IS:456 -2000 in the items of BMC and RMC.				
(a)	Concrete of M-30 with minimum cement content of 350kg/cum. All works upto plinth level				
	SECTOR - 9	2746.60			
	SECTOR-1A	728.62			
	TOTAL	3475.22	Cum	8513.36	29585786.78
(b)	Concrete of M-30 with minimum cement content of 350kg/cum. All works above plinth level upto floor V level.				
	SECTOR - 9	6006.37		10119.48	
	SECTOR-1A	871.24	Cum		69597857.48

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	6877.61			
3.5	Extra over and above item no. 3.4b for above floor V level for each four floors or part thereof.				
	SECTOR - 9	1170.05			
	SECTOR-1A	0.00			
	TOTAL	1170.05	Cum	278.14	325438.29
3.6	Add for plaster drip course/ groove in plastered surface or moulding to R.C.C. projections.				
	SECTOR - 9	5727.54			426626.29
	SECTOR-1A	932.98			
	TOTAL	6660.52	Meter	64.05	
	R.C.C.WORK SUB HEAD TOTAL for sector 9 and sector 1A				276925161.00
4	SUB HEAD-IV :- BRICK WORK				
4.1	Providing and doing Brick masonry work with common burnt clay modular bricks of class designation 7.5 in foundation and plinth in: Cement Mortar 1:6 (1 cement : 6 coarse sand).				
	SECTOR - 9	369.87			
	SECTOR-1A	129.46			
	TOTAL	499.33	Cum	5494.45	2743543.97
4.2	Providing and laying autoclaved aerated cement blocks masonry with 115 thick AAC blocks in super structure above plinth level up to floor V level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar. The rate includes providing and placing in position 2 Nos 6 mm dia M.S. bars at every third course of masonry work all complete as per direction of Engineer-in-Charge. Note: The payment of concrete and steel reinforcement for both the RCC bands shall be made seperately in respective items however cost of 2 Nos 6 mm dia M.S. bars at every third course is included in the item.				
	SECTOR - 9	1298.32			
	SECTOR-1A	151.45			
	TOTAL	1449.77	Cum	7808.48	11320494.98

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
4.3	Providing and laying autoclaved aerated cement blocks masonry with 150mm/230mm/300 mm thick AAC blocks in super structure above plinth level up to floor V level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar all complete as per direction of Engineer-in-Charge. Note:The payment of concrete and steel reinforcement for both the RCC bands shall be made seperately in respective items.				
	SECTOR - 9	2975.91			
	SECTOR-1A	760.50			
	TOTAL	3736.41	Cum	6924.21	25871681.88
4.4	Extra over and above item no. 4.3 for AAC block masonry in superstructure above floor V level, for each four floors or part thereof by mechanical means.				
	SECTOR - 9	1034.56			
	SECTOR-1A	0.00			
	TOTAL	1034.56	Cum	140.58	145438.44
	BRICK WORK SUB HEAD TOTAL for sector 9 and sector 1A				40081159.27
5	SUB HEAD-V :- GRANITE WORK				
5.1	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, jambs, soffits, reveals, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.				
	Granite of approved colour, shade and size				
	Basic rate of 18mm thick Granite= Rs. 1800/sqm. Excluding GST				
	SECTOR - 9	2492.91			
	SECTOR-1A	414.49			
	TOTAL	2907.40	Sqm	4381.10	12737599.96

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
5.2	Extra for providing opening of required size & shape for wash basin/kitchen sink in kitchen platform, vanity counter and similar location in Granite stone work, including necessary holes for pillar taps, gas pipe etc. including moulding, rubbing and polishing of cut edges etc. complete.				
	SECTOR - 9	236.00			
	SECTOR-1A	53.00			
	TOTAL	289.00	Each	800.07	231219.80
	GRANITE SUB HEAD TOTAL for sector 9 and sector 1A				12968819.76
6	SUB HEAD-VI :- WOOD AND PVC WORK				
6.1	Providing and fixing wood work in frames of doors, windows, clerestory windows, cupboard/wardrobe and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fastener shall be paid for separately). Note: Rate shall include for making necessary rebate in frames to receive door shutters.				
	Second class teak wood				
	SECTOR - 9	24.18			
	SECTOR-1A	3.90			
	TOTAL	28.08	Cum	130261.18	3657733.95

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
6.2	Polishing in high gloss/matt finish melamine matt clear polish on new wood work in required colour/wooden shade texture with following process in the sequence as detailed. 1st the surface to be polished is to be sanded with sand paper 80no./120no. and then sanding with sand paper of 160x180 nos. Applying two coats of sealer with spray gun which is allowed to dry for 8 to12 hours. on drying of sealer coat wet sanding with emery cloth of finer grading with ample water is done so as to remove excess sealer layer and make the surface further smooth after this wet rubbing the surface is applied with special grade melamine filler so as to fill all the small and big holes/grooves etc. filler coat dries in 4 to 6 hr on which again a light wet rubbing is done and this surface is allowed to dry for 12 hrs.On this 1st coat of melamine polish is applied using malamine and hardening compound in light proportion using melamine thinner.As far as possible this coat shall be done with compressor pressure air gun. This 1st Coat is allowed to dry for 12 Hrs. On drying the final Melamine polish is applied with compressor pressure gun using melamine and hardener is right proportion as per direction of Engineer-in-Charge. Final coat may be in 1 or 2 layer without gap of time.				
	SECTOR - 9	1202.73			
	SECTOR-1A	211.46			
	TOTAL	1414.19	Sqm	1144.98	1619225.63
6.3	Providing and fixing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embedding in cement concrete block 30x10x15cm 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size).				
	SECTOR - 9	4608.00			
	SECTOR-1A	696.00			
	TOTAL	5304.00	Each	192.41	1020524.08
6.4	Providing and fixing 2nd class Teak wood moulded beading 50 mm x 20 mm size to door and window frames with iron screws, plugs and melamine polishing of desired shade on exposed surface and a coat of wood primer on unexposed surface etc. complete :				
			Mete r	236.81	1073971.64

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	2nd class teak wood				
	50 x 20 mm				
	SECTOR - 9	3898.85			
	SECTOR-1A	636.35			
	TOTAL	4535.20			
6.5	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters:				
	35 mm thick flush door shutters including ISI marked Stainless Steel butt hinges(4nos. of hinges in each shutter) with necessary screws				
	SECTOR - 9	1570.97			
	SECTOR-1A	245.36			
	TOTAL	1816.33	Sqm	1995.59	3624654.53
6.6	Extra for providing and fixing 6mm thick 2nd class teak wood lipping on all edges of flush door shutters with required headless nails, adhesive, etc(over all area of door shutter to be measured). Note: Rate shall include melamine polishing of lipping in desired shade.				
	SECTOR - 9	1570.97			
	SECTOR-1A	245.36			
	TOTAL	1816.33	Sqm	99.34	180428.05
6.7	Providing and fixing Stainless steel SS grade 304, heavy quality curtain rod 25 mm dia 1.20mm thick with two Stainless steel SS grade 304, brackets at both ends including additional center support bracket wherever required fixed with S.S screws and PVC sleeves, decorative type SS grade 304 side caps, etc. complete :				
	Basic rate of S.S. Curtain Rod= Rs. 170/- per Rmt. Excluding GST				
	SECTOR - 9	2020.22			
	SECTOR-1A	322.60			
	TOTAL	2342.82	Meter	354.60	830759.75

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
6.8	Providing & Fixing on wooden flush door decorative high pressure laminated sheet of plain / wood grain in gloss / matt/ suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS : 2046 Type S, including cost of adhesive of approved quality.				
	1.0 mm thick.				
	SECTOR - 9	3141.94			
	SECTOR-1A	490.72			
	TOTAL	3632.66	Sqm	756.36	2747598.72
6.9	Providing and fixing wire gauge 35mm thick shutters (Frame of the shutter shall be made of 2nd Class teak wood with top rail and styles 100x35mm and lock and bottom rail 200x35mm) using stainless steel grade 304 wire gauge with wire of dia 0.5 mm and average width of aperture 1.4 mm in both directions for door panels with necessary screws, butt hinges(4nos. of Stainless Steel hinges in each shutter) etc complete :				
	SECTOR - 9	237.72			
	SECTOR-1A	29.43			
	TOTAL	267.15	Sqm	4585.48	1225011.52
	WOODEN FITTINGS				
6.10	Providing and fixing approved make Brass Handle 300 mm size fixed with necessary screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	Basic rate of Brass Handle= Rs. 1880/- each. Excluding GST				
	SECTOR - 9	274.00			
	SECTOR-1A	72.00			
	TOTAL	346.00	Each	2573.09	890288.86
6.11	Providing and fixing approved make bright finished brass 100mm Mortice latch and lock with 6 levers and a pair of lever handles with key cylinder (with keys in triplicate) fixed with necessary screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	Basic rate of Mortice Latch= Rs. 400/- each. Excluding GST				
	SECTOR - 9	759.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	116.00	Each	716.56	626991.75
	TOTAL	875.00			
6.12	Providing and fixing approved make bright finished brass Tower bolt 250x10mm dia fixed with necessary brass screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	SECTOR - 9	548.00			
	SECTOR-1A	160.00			
	TOTAL	708.00	Each	370.61	262389.40
6.13	Providing and fixing approved make bright finished brass Tower bolt 200x10mm dia fixed with necessary brass screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	SECTOR - 9	733.00			
	SECTOR-1A	86.00			
	TOTAL	819.00	Each	297.54	243688.95
6.14	Providing and fixing approved make brass Pentabolt lock with necessary brass screws. Complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	Basic rate of brass Pentabolt Lock= Rs. 6030/- each. Excluding GST				
	SECTOR - 9	102.00			
	SECTOR-1A	13.00			
	TOTAL	115.00	Each	8070.01	928051.69
6.15	Providing and fixing approved make Brass Door Safety chain. Complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	Basic rate of brass Safety Chain= Rs. 410/- each. Excluding GST				
	SECTOR - 9	102.00			
	SECTOR-1A	13.00			
	TOTAL	115.00	Each	625.99	71988.49
6.16	Providing and fixing approved make Brass Magic Eye Door Viewer. Complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Basic rate of brass Magic Eye= Rs. 378/- each. Excluding GST				
	SECTOR - 9	102.00	Each	583.61	67114.58
	SECTOR-1A	13.00			
	TOTAL	115.00			
6.17	Providing and fixing approved make wall mounted door buffer fixed with necessary screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	Basic rate of door buffer= Rs. 255/- each. Excluding GST				
	SECTOR - 9	637.00	Each	420.69	316780.02
	SECTOR-1A	116.00			
	TOTAL	753.00			
6.18	Providing and fixing approved make bright finished brass Door Stopper - door mounted hanging type fixed with necessary brass screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	SECTOR - 9	385.00	Each	108.50	53600.98
	SECTOR-1A	109.00			
	TOTAL	494.00			
6.19	Providing and fixing aluminium extruded section body tubular type universal hydraulic door closer (having brand logo with IS : 3564, embossed on the body), with double speed adjustment with necessary accessories and screws etc. complete..				
	SECTOR - 9	135.00	Each	847.74	152592.66
	SECTOR-1A	45.00			
	TOTAL	180.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
6.20	Toilet Cubical Providing and fixing Toilet Cubicle in required size with 600mm door width made of 12 mm thick solid compact laminated panels, heat, water, chemical, scratch, impact resistant and anti bacterial, finish of the compact laminate should be raw silk which include doors, pilasters and intermediate panels finished with approved texture/shade as per the detail drawing and as per IS 2046 (Indian Standard) and as per fire retardant BS-476/97 standard. This also includes providing and fixing in position necessary hardware made out of Stainless Steel (Grade 316) viz (1) Door Knob, (2) Gravity Hinges, (3) Thumb turn lockset indicators, (4) Coat hooks, (5) U-Channels, (6) SS-Shoe Box Plate, (7) MS-Base Plate, (8) Rubber noise deafening tape, (9) Screws and wall Plugs all as per manufacturer's specifications, site requirements and as per instructions of Engineer-in-Charge.				
	SECTOR - 9	25.66			
	SECTOR-1A	5.25			
	TOTAL	30.91	Sqm	11100.7 1	343123.00
6.21	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & double acting hydraulic floor spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately)				
	SECTOR - 9	4.80			
	SECTOR-1A	24.00			
	TOTAL	28.80	Sqm	4495.29	129464.44
6.22	Providing and fixing approved make SS Top & Bottom Patch with necessary screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge. (a set of one top & bottom patch is considered as one)				
	SECTOR - 9	2.00			
	SECTOR-1A	10.00			
	TOTAL	12.00	Each	5669.11	68029.28

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
6.23	Providing and fixing approved make SS 304 grade H type 900mm Pull Handle with 32mm dia fixed with necessary screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	SECTOR - 9	2.00			
	SECTOR-1A	10.00			
	TOTAL	12.00	Pair	4361.24	52334.85
6.24	Providing and fixing approved make SS Glass to Glass Lock Round type with necessary screws etc. complete in all respects as per manufacturers' specifications & as directed by Engineer-in-charge.				
	SECTOR - 9	1.00			
	SECTOR-1A	5.00			
	TOTAL	6.00	Each	3970.49	23822.96
	WOOD AND PVC WORK SUB HEAD TOTAL for sector 9 and sector 1A				20210169.75
7	SUB HEAD-VII :- STEEL WORK				
7.1	Providing and doing Structural steel work riveted/bolted or welded in built up sections, trusses and framed work, (all as per drawing) including cutting, hoisting, fixing in position, providing and applying 2 coats of 1st quality synthetic enamel paint of approved manufacturer and shade over a priming coat of approved steel primer all complete:				
	SECTOR - 9	55614.43			
	SECTOR-1A	9295.43			
	TOTAL	64909.86	Kg	90.44	5870220.55
7.2	Providing and doing Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position providing and applying 2 coats of 1st quality synthetic enamel paint of approved manufacturer and shade over a priming coat of approved steel primer all complete.				
	In all types of railing, gratings, frames, guard bar, ladder, brackets, gates and similar works all as per drawing, site requirement and as per direction of Bank's Engineer.				
	SECTOR - 9	63742.27	Kg	149.55	11514641.30

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	13253.30			
	TOTAL	76995.57			
7.3	Providing, fabricating, welding and fixing in position 1mm thick M.S. sheet door shutter with all round frame for door shutter of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, M.S. angels 40x40x6 mm for diagonal braces all necessary fittings complete. Rate shall include providing, fixing and welding 2 Nos. MS Aldrop 300x16 mm size and 1 Nos. 300x12 mm tower bolt and providing, fabricating, welding and fixing in position MS frame/Chowkat made 45x45x6mm MS angle on top and both vertical sides including fixing the MS chowkat with 6 nos. MS hold Fast of 45x45x6mm, 300mm long fish tail duly grouted in cement concrete block of 1:2:4 of 150x100mm x wall thickness and providing and applying 2 coats of 1st quality synthetic enamel paint of approved manufacturer over a priming coat of approved steel primer,etc complete.				
	SECTOR - 9	72.33			
	SECTOR-1A	16.52			
	TOTAL	88.85	Sqm	4863.47	432119.66
7.4	Supplying and fixing rolling shutters of approved make and of required size, made of 80x1.25 mm M.S. laths with 1.25 mm thick MS top cover, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of adequate strength conforming to IS: 4454 - part 1 complete all as required and as directed. Rate will include, providing and applying 2 coats of 1st quality synthetic enamel paint of approved manufacturer and shade over a priming coat of approved steel primer all complete:				
	SECTOR - 9	4.80			
	SECTOR-1A	0.00			
	TOTAL	4.80	Sqm	3163.79	15186.20

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
7.5	Providing and fixing required size ball bearing for rolling shutters.				
	SECTOR - 9	2.00			
	SECTOR-1A	0.00			
	TOTAL	2.00	Each	419.96	839.92
7.6	Providing & fixing polycarbonate roof with multilayer standing seam polycarbonate panel system of 16 mm thickness (minimum) including all standard fixing accessories on top of the supporting structure (Paid extra in another item) complete & as per the direction of the engineer in charge. The Panels shall include opaque and translucent combination of louvers integrated in the panel for Angular Daylighting and, for better thermal insulations and diffusion of light especially with combination designed for tropical regions & shading throughout the day for better ambient temperature below the roof. Panels shall be manufactured with vertical standing seam at both sides of the panel. Panels have to be fixed on Purlin with snap on connectors with grip lock double tooth locking mechanism and will be secured on MS structure / purlins (will be paid Separately) with HDSS Fastener and double tooth polycarbonate connector for best stability and having a pull-out load of min. 7000N (7KN) tested as per ISO 6892:1998 and IS 1608: 2005. Panels shall have minimum seven layers with all fixing accessories to ensure best performance for wind uplift, vibration, oil canning and visual appearance. performance Panels cell structure be in truss bridge design or commonly called X structure for better strength and stability.The entire panel system shall be with a width from min.				
			Sqm	5099.55	1053974.87

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	1200 mm. Bigger width and minimal junctions should be preferred for better Panels must satisfy Dart drop impact test as per IS 14443-97 shall show no sign of breakage on Polycarbonate Panel which have been exposed to UV for a min. of 500 Hours as per ASTM G 155. Panels shall not have Yellowness Index as per ASTM D 1925 of 15 units when tested on a sample exposed to UV for 500 Hours as per ASTM G 155. U value shall not be more than 2.1 W/m ² K as per EN ISO 10077-2:2018. Panel shall be with additional End cap/Aluminium U/F profile/ Glazing Bar (all mill finish) for ends as required. Trained and factory authorized labour with supervision to complete the entire panel installation as per drawing & direction of the engineering in charge. Color: A Combination of Clear/White Louvers or any colour in a single panel and as per approved.				
	SECTOR - 9	81.59			
	SECTOR-1A	125.09			
	TOTAL	206.68			
7.7	Providing and fixing G.I. chain link fabric fencing of required width in mesh size 25x25 mm made of G.I. wire of dia 3 mm including strengthening with 2 mm dia wire or nuts, bolts and washers as required, the fencing shall be supported with 65x65x8mm MS angle at 1.2m C/C embeded in ground in cement concrete 1:2:4 of size 300mmx300mmx600mm deep etc complete as per the direction of Engineer-in-charge				
	SECTOR - 9	48.98			
	SECTOR-1A	51.51			
	TOTAL	100.49	Sqm	1160.18	116586.59
7.8	Providing and fixing roofing as per drawing consisting of 0.8 mm thick galvanized steel deck sheet conforming to IS 277:1992 used as permanent shuttering over which MS wire mesh 3mm laid at 100x100 mm grid including edge trim covered with concrete. This metal deck will be supported on structural steel beam with shear studs. (Structural steel like Beam, column, joists etc. & concrete of different grade as per design will be paid separately).				
			Sqm	1614.10	667315.71

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR - 9	413.43			
	SECTOR-1A	0.00			
	TOTAL	413.43			
	STEEL WORK SUB HEAD TOTAL at sector 9 and sector 1A				19670884.80
8	SUB HEAD VIII :- FLOORING				
8.1	Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) :				
	25mm thick				
	SECTOR - 9	1208.86			
	SECTOR-1A	156.88			
	TOTAL	1365.74	Sqm	1689.53	2307464.17
8.2	Kota stone slabs 20 mm thick and 100mm height in skirting laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.				
	SECTOR - 9	113.15			
	SECTOR-1A	17.37			
	TOTAL	130.52	Sqm	2018.16	263410.83
8.3	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including grouting the joints with white cement and matching pigments etc., complete.				
	Size of Tile 600x600 mm				
	Basic rate of vitrified floor tiles of size 600x600mm= Rs. 1000/- per sqm. Excluding GST				
	SECTOR - 9	7673.84			
	SECTOR-1A	1081.56			
	TOTAL	8755.40	Sqm	1402.48	12279304.04

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
8.4	Providing and laying Vitrified tiles in different sizes (required size of the skirting to be cut from vitrified tiles 600x600mm) (thickness to be specified by manufacturer), with water absorption less than 0.08 % and conforming to I.S. 15622, of approved make, in all colours & shade, in skirting, riser of steps, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including grouting the joint with white cement & matching pigments etc. complete.				
	Size of Tile 600x600 mm				
	Basic rate of vitrified floor tiles of size 600x600mm= Rs. 1000/- per sqm. Excluding GST				
	SECTOR - 9	853.06			
	SECTOR-1A	116.38			
	TOTAL	969.44	Sqm	1999.8	1938686.11
8.5	Providing and laying rectified Glazed Ceramic floor tiles of size 300x300 mm or more (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in all colours laid on 20 mm thick cement mortar 1:4 (1 Cement: 4 Coarse sand), jointing with grey cement slurry @ 3.3kg/ sqm including grouting the joints with white cement and matching pigments etc., complete.				
	Basic rate of Ceramic floor tiles of size 300x300mm= Rs. 800/- per sqm. Excluding GST				
	SECTOR - 9	2836.79			
	SECTOR-1A	465.43			
	TOTAL	3302.22	Sqm	1752.30	5786480.11
8.6	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.				
			Sqm	1876.05	11957023.44

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Basic rate of Ceramic wall tiles of size= Rs. 800/- per sqm. Excluding GST				
	SECTOR - 9	5396.41			
	SECTOR-1A	977.10			
	TOTAL	6373.51			
8.7	Providing and laying Polished Granite stone of approved shade and colour flooring in required design and patterns, in linear as well as curvilinear portions of the building, all complete as per the architectural drawings, with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand), laid and jointed with grey cement slurry and pointing with white cement slurry admixed with pigment of matching shade, including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge.				
	Basic rate of Polished Granite stone 18mm thick= Rs. 2000/- per sqm. Excluding GST				
	SECTOR - 9	3082.07			
	SECTOR-1A	593.00			
	TOTAL	3675.07	Sqm	3869.71	14221462.48
8.8	Providing and laying flamed finish Granite stone of approved shade and colour flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with grey cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing , curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge :				
	Basic rate of Flamed Granite stone 18mm thick= Rs. 1000/- per sqm. Excluding GST				
	SECTOR - 9	139.04			
	SECTOR-1A	6.23			
	TOTAL	145.27	Sqm	2564.00	372472.43

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
8.9	Providing and fixing polished granite stone (polished and machine cut) of approved shade colour and size of thickness 18 mm for wall lining/wall cladding , backing filled with a grout of average 15 mm thick in cement mortar 1:3 (1 cement : 3 coarse sand), including pointing with white cement with an admixture of pigment to match the granite shade. complete all as per direction of Engineer in Charge.				
	Basic rate of Polished Granite stone 18mm thick= Rs. 2000/- per sqm. Excluding GST				
	SECTOR - 9	3370.70			
	SECTOR-1A	234.73			
	TOTAL	3605.43	Sqm	7058.36	25448435.15
8.10	Extra for pre finished nosing to treads of steps of Granite stone.				
	SECTOR - 9	2450.00			
	SECTOR-1A	231.20			
	TOTAL	2681.20	Meter	155.73	417535.23
8.11	Providing and fixing 8mm thick wooden laminate flooring Essentials-" having AC4, Grade 4, weight 7.16 kg/m2, IC2 impact resistance, grade 4 in resistance in cigarette burn, level 6 in color fastness, Surface soundness >1N/mm. PLANK SIZE:8x194x1292mm. Consisting of a high density fibre board (HDF) core with a design layer on top protected by a high wear and scratch resistant overlay and a melamine backing at the bottom with the quality of Direct Pressure Laminate (DPL) and installed over a high moisture resistant polyethylene sheet and cross-linked polymer based intermediate overlay and installed by a trained applicator. The flooring must include all accessories including underlayer of 200-micron pvc sheet and pvc foam layer, completed in all respect with material, labour required for the complete item with all leads, lifts for materials as per approved specifications, removal of debris from the premises etc., all complete as directed by the Engineer in Charge.				
(a)	Flooring				
	SECTOR - 9	60.95			
	SECTOR-1A	12.02			
	TOTAL	72.97	Sqm	2310.03	168562.63

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
(b)	Skirting		Sqm	2310.03	16863.19
	SECTOR - 9	6.10			
	SECTOR-1A	1.20			
	TOTAL	7.30			
(c)	Floor strip on edges		Meter	462.01	1801.82
	SECTOR - 9	2.00			
	SECTOR-1A	1.90			
	TOTAL	3.90			
8.12	Providing and laying C.C. pavement of mix M-30 with ready mixed concrete or batch mixed concrete. The ready mixed concrete shall be laid and finished with screed board vibrator , vacuum dewatering process and finally finished by floating, brooming with wire brush etc. complete as per specifications and directions of Engineer-in-charge. (The panel shuttering work shall be paid for separately).		Cum	8790.77	12606849.42
	(Note:- Cement content considered in this item is @ 350 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately).				
	SECTOR - 9	1030.36			
	SECTOR-1A	403.74			
	TOTAL	1434.10			
	SPORTS VINYL FLOORING				
8.13	Providing and fixing Heterogeneous vinyl sheet flooring areas in sheet form. The total thickness would be 4.5mm and thickness of wear layer would be 0.45mm. The product should be multi layered consisting of wear layer with PUR coating, PVC layer, fiber glass layer and foam layer. It shall conform to shock absorption of ≥28% ball bounce of ≥97% , sound insulation of 20-22db, Impact resistance of ≥8N/m as per DIN 18032, abrasion resistance of ≥7mm, indentation resistance of 0.6mm as per EN1016, friction coefficient of 0.6 as per GB/T14833-1993, Rebound coefficient of 0.86 as per GB/T14833-1993 . Rate shall include skirting, end profile, pvc cove former on edges etc complete in all respects as per manufacturer's specifications & as directed by Engineer-in-charge. Note- Only floor area shall be measured and paid for.		Sqm	2941.52	418254.40

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Basic rate of Heterogeneous vinyl sheet flooring of 4.5mm thickness= Rs. 1900/- per sqm. Excluding GST				
	SECTOR - 9	81.54			
	SECTOR-1A	60.65			
	TOTAL	142.19			
	FLOORING SUB HEAD TOTAL for sector 9 and sector 1A				88204605.44
9	SUB HEAD-IX :- FINISHING WORK				
9.1	12 mm thick cement plaster on the Autoclave Aerated Cement Block masonry/ brick masonry surface/RCC surfaces,etc :				
	1:6 (1 cement : 6 fine sand)				
	SECTOR - 9	42337.93			
	SECTOR-1A	8295.08			
	TOTAL	50633.01	Sqm	279.18	14135723.73
9.2	6 mm cement plaster of mix : 1:3 (1 cement : 3 fine sand) on RCC surfaces i.e ceiling, beam, chajjas, etc.				
	SECTOR - 9	16740.05			
	SECTOR-1A	2368.27			
	TOTAL	19108.32	Sqm	250.52	4787006.77
9.3	18 mm cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement : 5 coarse sand) and a top layer 6 mm thick cement plaster 1:3 (1 cement : 3 coarse sand) finished rough with sponge on the Autoclave Aerated Cement Block masonry/ brick masonry surface, etc .:				
	SECTOR - 9	18864.56			
	SECTOR-1A	2987.20			
	TOTAL	21851.76	Sqm	457.23	9991313.00
9.4	Extra over and above item no. 9.3 for plastering in 2 coats/layer on exterior walls of height more than 10 m from ground level for every additional height of 3 m or part thereof.				
	SECTOR - 9	14888.03			
	SECTOR-1A	1419.19			
	TOTAL	16307.22	Sqm	72.07	1175293.96

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
9.5	Providing and applying white cement based putty of average thickness 1 mm, of approved maker, over the plastered wall surface to prepare the surface even and smooth complete.				
	SECTOR - 9	59007.52			
	SECTOR-1A	8946.06			
	TOTAL	67953.58	Sqm	122.61	8331890.37
9.6	Providing and applying one coat of water thinnable cement primer of approved make on wall, ceiling, beams, columns and other surfaces:				
	Water thinnable cement primer				
	SECTOR - 9	57955.58			
	SECTOR-1A	8654.90			
	TOTAL	66610.48	Sqm	64.00	4263303.86
9.7	Providing and applying two or more coats of approved Premium Acrylic Emulsion paint (of approved make and shade) as per manufacturer's specifications on internal walls, beams, ceiling, columns surfaces etc.				
	SECTOR - 9	57690.22			
	SECTOR-1A	8570.48			
	TOTAL	66260.70	Sqm	136.47	9042697.12
9.8	Providing and applying White washing with lime to give an even shade :				
	New work (three or more coats)				
	SECTOR - 9	350.00			
	SECTOR-1A	334.42			
	TOTAL	684.42	Sqm	32.13	21987.33
9.9	Providing and applying two or more coats of approved Premium Acrylic Smooth exterior paint with Silicone additives (of approved make and shade) over a base coat of Exterior primer of approved manufacture, as per manufacturer's specifications on external walls, chajja, parapets surfaces etc.				
	Note: Only surface area shall be measured for payment, no coefficient shall be considered.				
	SECTOR - 9	18935.01			
	SECTOR-1A	4704.50	Sqm	165.18	3904809.72

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	23639.51			
9.10	Providing & fixing with suitable nails, etc. 250mm wide Chicken wire mesh of approved sample on joints of RCC & Autoclave Aerated Cement blocks/Brick work before plastering complete as required and as directed by Engineer-in-charge.				
	SECTOR - 9	4848.11			
	SECTOR-1A	1401.93			
	TOTAL	6250.04	Sqm	199.15	1244685.47
9.11	Distempering with oil bound washable distemper of approved make and shade to give an even shade :				
	New work (two or more coats) over a coat of approved make water thinnable priming coat with cement primer				
	SECTOR - 9	878.36			
	SECTOR-1A	251.01			
	TOTAL	1129.37	Sqm	160.92	181743.30
	FINISHING WORK SUB HEAD TOTAL for sector 9 and sector 1A				57080454.64
10	SUB HEAD-X :-ALUMINIUM WORK				
10.1	Providing and fixing aluminum work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS : 1285, fixed with rawl plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up of gaps at junctions, at top, bottom and sides with required PVC/neoprene felt etc. Aluminum sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminum snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing and paneling to be paid for separately) :				
	Powder coated aluminum (minimum thickness of powder coating 50 micron)				
	SECTOR - 9	3755.28			
	SECTOR-1A	438.38	Kg	461.64	1935948.62

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	4193.66			
10.2	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of louvres/PVC / neoprene gasket required (Rate shall include all Fittings i.e. hinges, locking arrangement, etc)				
	Powder coated aluminum (minimum thickness of powder coating 50 micron)				
	SECTOR - 9	2425.05			
	SECTOR-1A	248.90			
	TOTAL	2673.95	Kg	559.15	1495144.49
10.3	Providing and fixing 6mm thick toughened glass of approved make with necessary fixing arrangement complete in all respects as per site requirement and as direction of the Engineer-in-charge. (Required properties of toughened glass Solar factor ≤ 0.45 , U-Value $\leq (W/sq.m-K) 5.7W /M2K$, Visible light transmittance ≥ 0.30)				
	SECTOR - 9	1834.70			
	SECTOR-1A	325.48			
	TOTAL	2160.18	Sqm	2205.59	4764474.21
10.4	Filling the gap in between aluminum frame & adjacent RCC/ Brick/ Stone work by providing weather silicon sealant over backer rod of approved quality as per architectural drawings and direction of Engineer-in-charge complete.				
	Upto 5mm depth and 5 mm width				
	SECTOR - 9	5247.02			
	SECTOR-1A	900.76			
	TOTAL	6147.78	Meter	84.40	518857.26

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
10.5	Providing and fixing factory made uPVC white colour casement/casement cum fixed glazed windows/ventilator comprising of uPVC multi-chambered frame, sash and mullion (where ever required) extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, EPDM gasket, stainless steel (SS 304 grade) friction hinges, zinc alloy (white powder coated) casement handles, G.I fasteners 100 x 8 mm size for fixing frame to finished wall, plastic packers, plastic caps and necessary stainless steel screws etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weatherproof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge.(glass panes and silicon sealant shall be paid separately)				
	Note: For uPVC frame, sash and mullion extruded profiles minus 5% tolerance in dimension i.e. in depth & width of profile shall be acceptable. Variation in profile dimension in higher side shall be accepted but no extra payment on this account shall be made.				
(a)	Casement window single panel with S.S. friction hinges (300 x 19 x 1.9 mm), made of (small series) frame 47 x 50 mm & sash 47 x 68 mm both having wall thickness of 1.9 ± 0.2 mm and single glass pane glazing bead of appropriate dimension. (Area of window upto 0.75 sqm.)				
	SECTOR - 9	173.79			
	SECTOR-1A	0.00			
	TOTAL	173.79	Sqm	10339.3 1	1796869.12
(b)	Casement window double panels with S.S. friction hinges (300 x 19 x 1.9 mm) made of (small series) frame 47 x 50 mm, sash 47 x 68 mm & mullion 47 x 68 mm all having wall thickness of 1.9 ± 0.2 mm and single glazing bead of appropriate dimension. (Area of window above 0.75 sqm upto 1.50 sqm).				
			Sqm	9539.05	1926028.78

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR - 9	143.70			
	SECTOR-1A	58.21			
	TOTAL	201.91			
10.6	<p>Providing and fixing factory made uPVC white colour casement/ Casement cum fixed glazed door comprising of uPVC multi-chambered frame, sash and mullion (where ever required) extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, EPDM gasket, zinc alloy (white powder coated) 3D hinges and one handle on each side of panels along with zinc plated mild steel multi point locking having transmission gear, cylinder with keeps and one side key, G.I fasteners 100 x 8 mm size for fixing frame to finished wall and necessary stainless steel screws, etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weatherproof silicon sealent over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. (Single / double glass panes and silicon sealent shall be paid separately).</p> <p>Note: For uPVC frame, sash and mullion extruded profiles minus 5% tolerance in dimension i.e. in depth & width of profile shall be acceptable. Variation in profile dimension in higher side shall be accepted but no extra payment on this account shall be made.</p> <p>Casement door with 3D hinges made of (big series) frame 67 x 64 mm & sash 67 x 110 mm both having wall thickness of 2.3 ± 0.2 mm and single glazing bead / double glazing bead of appropriate dimension. (Area of door upto 2.00 sqm).</p>				
	SECTOR - 9	162.54			
	SECTOR-1A	20.16			
	TOTAL	182.70			
			Sqm	10181.8 5	1860224.54

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
10.7	Providing and fixing factory made uPVC white colour sliding glazed window upto 1.50 m in height dimension comprising of uPVC multi-chambered frame with in-built roller track and sash extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), appropriate dimension of uPVC extruded glazing beads and uPVC extruded interlocks, EPDM gasket, wool pile, zinc alloy (white powder coated) touch locks with hook, zinc alloy body with single nylon rollers (weight bearing capacity to be 40 kg), G.I fasteners 100 x 8 mm size for fixing frame to finished wall and necessary stainless steel screws etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealent over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. (Single / double glass panes, wire mesh and silicon sealent shall be paid separately)				
	Note: For uPVC frame and sash extruded profiles minus 5% tolerance in dimension i.e. in depth & width of profile shall be acceptable. Variation in profile dimension in higher side shall be accepted but no extra payment on this account shall be made.				
(a)	Three track three panels sliding window with fly proof SS wire mesh (Two nos. glazed & one no. wire mesh panels) made of (small series) frame 92 x 44 mm & sash 32 x 60 mm both having wall thickness of 1.9 ± 0.2 mm and single glazing bead of appropriate dimension (Area of window upto 1.75 sqm).				
	SECTOR - 9	152.17			
	SECTOR-1A	39.60			
	TOTAL	191.77	Sqm	9930.00	1904275.52

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
(b)	Three track three panels sliding window with fly proof S.S wire mesh (Two nos. glazed & one no. wire mesh panels) made of (big series) frame 116 x 45 mm & sash 46 x 62 mm both having wall thickness of 2.3 ± 0.2 mm and single glazing bead / double glazing bead of appropriate dimension. (Area of window above 1.75 sqm).				
	SECTOR - 9	396.54			
	SECTOR-1A	98.53			
	TOTAL	495.07	Sqm	9546.17	4726024.36
10.8	Providing and fixing factory made uPVC white colour sliding glazed door comprising of uPVC multi-chambered frame with in-built roller track and sash extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), appropriate dimension uPVC extruded glazing beads, uPVC extruded interlock and uPVC extruded Inline sash adaptor (if required), EPDM gasket, wool pile, zinc alloy (white powder coated) handle with key on one side of extreme panels along with zinc plated mild steel multi point locking having transmission gear with keeps, zinc alloy (white powder coated) crescent lock (if required), stainless steel (SS 304 grade) body with adjustable double nylon rollers (weight bearing capacity to be 120 kg), G.I fasteners 100 x 8 mm size for fixing frame to finished wall and necessary stainless steel screws etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with eather proof silicon sealent over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. (Single / double glass panes, wire mesh and silicon sealent shall be paid separately).				
	Note: For uPVC frame and sash extruded profiles minus 5% tolerance in dimension i.e. in depth & width of profile shall be acceptable. Variation in profile dimension in higher side shall be accepted but no extra payment on this account shall be made.		Sqm	8679.18	8295040.93

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Three track three panels sliding door with fly proof S.S wire mesh (Two nos. glazed & one no. wire mesh panels) made of (big series) frame 116 x 45 mm & sash 46 x 82 mm both having wall thickness of 2.3 ± 0.2 mm and single glazing bead / double glazing bead of appropriate dimension. (Area of door above 2.00 sqm upto 5.00 sqm)				
	SECTOR - 9	821.10			
	SECTOR-1A	134.64			
	TOTAL	955.74			
10.9	Providing and fixing fly proof stainless steel grade 304 wire gauge , to windows and clerestory windows using wire gauge with average width of aperture 1.4 mm in both directions with wire of dia. 0.50 mm including required fixing arrangement, etc. complete.				
	SECTOR - 9	684.92			
	SECTOR-1A	136.40			
	TOTAL	821.32	Sqm	981.09	805788.84
	ALUMINIUM WORK SUB HEAD TOTAL for sector 9 and sector 1A				30028676.68
11	SUB HEAD - XI - WATER PROOFING WORK				
11.1	Providing and laying integral cement based treatment for water proofing on horizontal surface at all depth below ground level for underground structures as directed by Engineer-in- Charge and consisting of : (i) 1st layer of 22 mm to 25 mm thick approved and specified rough stone slab over a 25 mm thick base of cement mortar 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound conforming to IS:2645 in the recommended proportion over the leveling course (leveling course to be paid separately). Joints sealed and grouted with cement slurry mixed with water proofing compound. (ii) 2nd layer of 25 mm thick cement mortar 1:3 (1 cement: 3 coarse sand) mixed with water proofing compound in recommended proportions. (iii) Finishing top with stone aggregate of 10 mm to 12 mm nominal size spreading @ 8 cudm/sqm thoroughly embedded in the 2nd layer.				
			Sqm	1349.32	709864.02

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	For horizontal surface Using rough kota stone.				
	SECTOR - 9	313.31			
	SECTOR-1A	212.78			
	TOTAL	526.09			
11.2	Providing and laying integral cement based treatment for water proofing on the vertical surface by fixing specified stone slab 22 mm to 25mm thick with cement slurry mixed with water proofing compound conforming to IS:2645 in recommended proportions with a gap of 20mm (minimum) between stone slabs and the receiving surfaces and filling the gaps with neat cement slurry mixed with water proofing compound and finishing the exterior of stone slab with cement mortar 1:3 (1 cement : 3 coarse sand) 20mm thick with neat cement punning mixed with water proofing compound in recommended proportion complete at all levels and as directed by Engineer-in-charge :				
	For vertical surface- Using rough Kota stone				
	SECTOR - 9	575.89			
	SECTOR-1A	326.69			
	TOTAL	902.58	Sqm	1762.50	1590794.54
11.3	Providing and placing in position suitable PVC water stops conforming to IS:12200 between two RCC members and fixed to the reinforcement with binding wire before pouring concrete etc complete.				
	Serrated with central bulb (225mm wide,8-11mm thick)				
	SECTOR - 9	97.45			
	SECTOR-1A	50.20			
	TOTAL	147.65	Meter	282.74	41747.15
11.4	Providing and laying water proofing treatment in sunken portion of WCs, bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying :				
	(a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/ sqm. This layer will be allowed to air cure for 4 hours.				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	(b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.				
	c) Providing and applying 20 mm. thick water proofing cement plaster 1:4 (1 cement: 4 coarse sand) mixed with water proofing compound as per manufacturer's specifications to the sunken floor and sides including rounding off junctions / corners with water proofing cement mortar, etc. all complete.				
	The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.				
	SECTOR - 9	5617.75	Sqm	988.56	6057082.98
	SECTOR-1A	509.40			
	TOTAL	6127.15			
11.5	Providing and laying brick bat coba with fly ash bricks in sunken portion of W.C., bathroom & kitchen with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge.				
	SECTOR - 9	577.16			
	SECTOR-1A	69.14			
	TOTAL	646.30	Cum	5498.96	3553974.62
11.6	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations:				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	(a) Applying a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300 mm height including cleaning the surface before treatment.				
	(b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs.				
	(c) After two days of proper curing applying a second coat of cement slurry using 2.75 kg/ sqm of cement admixed with water proofing compound conforming to IS : 2645 and approved by Engineerin-charge.				
	(d) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineerin-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3 mm deep.				
	(e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge :				
	With average thickness of 120 mm and minimum thickness at khurra as 65 mm. Note: A proper slope of not less than 1:100 shall be maintain. For which no extra payment shall be considered.		Sqm	1507.72	6408460.44
	SECTOR - 9	3305.34			
	SECTOR-1A	945.09			
	TOTAL	4250.43			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
11.7	Providing gola 75x75 mm in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10 mm and down gauge), including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design :		Meter	257.60	
	In 75 x75 mm deep chase				
	SECTOR - 9	1379.60			
	SECTOR-1A	420.78			
	TOTAL	1800.38			463774.29
11.8	Providing and laying roof insulation with 40 mm thick impervious sprayed, closed cell free Rigid Polyurethane foam over deck insulation conforming to IS - 12432 Pt. III (density of foam being 40-45 kg/cum), over a coat of polyurethane primer applied @ 6-8 sqm per litre, laying 400 G polythene sheet over PUF spray and providing a wearing course of 40 mm thick cement screed 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 20 mm nominal size) in chequered rough finish, in panels of 2.5 m x 2.5 m and embedding with 24 G wire netting and sealing the joints with polymerized mastic, allcomplete as per direction of Engineer-in-Charge.		Sqm	1350.31	
	SECTOR - 9	3085.48			
	SECTOR-1A	936.13			
	TOTAL	4021.61			
					5430422.21
11.9	Providing and fixing Heat Resistant Terrace Tiles (300 mm x 300 mm x 20 mm) with SRI (solar refractive index) > 78, solar reflection > 0.70 and initial emittance > 0.75 on waterproof and sloped surface of terrace, laid on 20 mm thick cement sand mortar in the ratio of 1:4 (1 cement : 4 coarse sand) and grouting the joints with mix of white cement & marble powder in ratio of 1:1, including rubbing and polishing of the surface upto 3 cuts complete, including providing skirting upto 150 mm height along the parapet walls in the same manner.		Sqm	1430.45	
	Basic Rate of Heat Resistant Terrace Tiles (300 mm x 300 mm x 20 mm) = Rs 409/- per sqm excluding GST				
	SECTOR - 9	3040.00			
	SECTOR-1A	912.18			
	TOTAL	3952.18			5653399.83

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
11.10	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS :1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing complete as per design, as required at site and direction of Engineer in charge.				
	SECTOR - 9	133.00			
	SECTOR-1A	70.00			
	TOTAL	203.00	Each	482.23	97892.49
	WATER PROOFING WORK SUB HEAD TOTAL				30007412.57
12	SUB HEAD-XII :- STRUCTURAL GLAZING, CURTAIN GLAZING, ALUMINIUM COMPOSITE PANEL & STONE CLADDING WORK				
12.1	Providing and supplying aluminium extruded tubular and other aluminium sections as per the architectural drawings and approved shop drawings , the aluminium quality as per grade 6063 T5 or T6 as per BS 1474,including super durable powder coating of 60-80 microns conforming to AAMA 2604 of required colour and shade as approved by the Engineer-in-Charge. (The item includes cost of material such as cleats, sleeves, screws etc. necessary for fabrication of extruded aluminium frame work. Nothing extra shall be paid on this account).The weight of aluminium extruded section shall be taken for purpose of payment.				
	SECTOR - 9	1123.50			
	SECTOR-1A	784.80			
	TOTAL	1908.30	Kg	366.745 5	699860.44

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
12.2	Designing, fabricating, testing, protection, installing and fixing in position semi (grid) unitized system of structural glazing (with open joints) for linear as well as curvilinear portions of the building for all heights and all levels, including:				
	(a) Structural analysis & design and preparation of shop drawings for the specified design loads conforming to IS 875 part III (the system must passed the proof test at 1.5 times design wind pressure without any failure), including functional design of the aluminum sections for fixing glazing panels of various thicknesses, aluminium cleats, sleeves and splice plates etc. gaskets, screws, toggles, nuts, bolts, clamps etc., structural and weather silicone sealants, flashings, fire stop (barrier)-cum-smoke seals, microwave cured EPDM gaskets for water tightness, pressure equalisation & drainage and protection against fire hazard including:				
	(b) Fabricating and supplying serrated M.S. hot dip galvanised / Aluminium alloy of 6005 T5 brackets of required sizes, sections and profiles etc. to accommodate 3 Dimensional movement for achieving perfect verticality and fixing structural glazing system rigidly to the RCC/ masonry/structural steel framework of building structure using stainless steel anchor fasteners/bolts, nylon seperator to prevent bimetallic contacts with nuts and washers etc. of stainless steel grade 316, of the required capacity and in required numbers.				
	(c) Providing and filling, two part pump filled, structural silicone sealant and one part weather silicone sealant compatible with the structural silicone sealant of required bite size in a clean and controlled factory / work shop environment , including double sided spacer tape, setting blocks and backer rod, all of approved grade, make, as per the approved sealant design, within and all around the perimeter for holding glass.				
	(d) Providing and fixing in position flashings of solid aluminium sheet 1 mm thick and of sizes, shapes and profiles, as required as per the site conditions, to seal the gap between the building structure and all its interfaces with curtain glazing to make it watertight.				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	<p>(e) Making provision for drainage of moisture/ water that enters the curtain glazing system to make it watertight, by incorporating principles of pressure equalization, providing suitable gutter profiles at bottom (if required), making necessary holes of required sizes and of required numbers etc. complete. This item includes cost of all inputs of designing, labour for fabricating and installation of aluminium grid, installation of glazed units, T&P, scaffolding and other incidental charges including wastages etc., enabling temporary structures and services, cranes or cradles etc. as described above and as specified. The item includes the cost of getting all the structural and functional design including shop drawings checked by a structural designer, dully approved by Engineer-in-charge. The item also includes the cost of all mock ups at site, cost of all samples of the individual components for testing in an approved laboratory, field tests on the assembled working structural glazing as specified, cleaning and protection till the handing over of the building for occupation. In the end, the Contractor shall provide a water tight structural glazing having all the performance characteristics etc. all complete as required, as per the Architectural drawings, as per item description, as specified, as per the approved shop drawings and as directed by the Engineer- in-Charge.</p>				
	<p>Note:- 1. The cost of providing extruded aluminium frames, shadow boxes, extruded aluminium section capping for fixing in the grooves of the curtain glazing and vermin proof stainless steel wire mesh shall be paid for separately under relevant items under this sub- head. However, for the purpose of payment, only the actual area of structural glazing (including width of grooves) on the external face shall be measured in sqm. up to two decimal places.</p>				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Note:- 2. The following performance test are to be conducted on structural glazing system if area of structural glazing exceeds 2500 Sqm from the certified laboratories accredited by NABL(National Accreditation Board for Testing and Calibration Laboratories), Department of Science & Technologies, India. Cost of testing is payable separately. The NIT approving authority will decide the necessity of testing on the basis of cost of the work, cost of the test and importance of the work. Performance Testing of Structural glazing system Tests to be conducted in the NBL Certified laboratories				
	(1) Performance Laboratory Test for Air Leakage Test (-50pa to - 300pa) & (+50pa to +300pa) as per ASTM E-283-04 testing method for a range of testing limit 1 to 200 mVhr (2) Static Water Penetration Test. (50pa to 1500pa) as per ASTM E- 331-09 testing method for a range up to 2000 ml.				
	(3) Dynamic Water Penetration (50pa to 1500pa) as per AAMA 501.01- 05 testing method for a range upto 2000 ml (4) Structural Performance Deflection and deformation by static air pressure test (1.5 times design wind pressure without any failure) as per ASTM E-330-10 testing method for a range upto 50 mm (5) Seismic Movement Test (upto 30 mm) as per AAMA 501.4-09 testing method for Qualitative test. Tests to be conducted on site. (6) Onsite Test for Water Leakage for a pressure range 50 kpa to 240 kpa (35psi) upto 2000 ml		Sqm	3080.24	587801.53
	SECTOR - 9	112.35			
	SECTOR-1A	78.48			
	TOTAL	190.83			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
12.3	Providing, assembling and supplying vision glass panels (IGUs) comprising of hermetically-sealed 6-12- 6 mm insulated glass (double glazed) vision panel units of size and shape as required and specified, comprising of an outer heat strengthened float glass 6mm thick, of approved colour and shade with reflective soft coating on surface # 2 of approved colour and shade, an inner Heat strengthened clear float glass 6mm thick, spacer tube 12mm wide, dessicants, including primary seal and secondary seal (structural silicone sealant) etc. all complete for the required performances, as per the Architectural drawings, as per the approved shop drawings, as specified and as directed by the Engineer-in-Charge. The IGUs shall be assembled in the factory/ workshop of the glass processor. (Payment for fixing of IGU Panels in the curtain glazing is included in cost of item No.26.2) For payment, only the actual area of glass on face # 1 of the glass panels (excluding the areas of the grooves and weather silicone sealant) provided and fixed in position, shall be measured in sqm.				
	(i) Coloured tinted float glass 6mm thick substrate with reflective soft coating on face # 2, + 12mm Airgap + 6mm Heat Strengthened Glass of approved make having properties as visible Light transmittance (VLT) $\geq 34\%$, Solar Factor/ SHGC ≤ 0.20 and U value ≤ 1.6 W/m ² degree K etc. The properties of performance glass shall be decided by technical sanctioning authority as per the site requirement.				
	SECTOR - 9	115.59			
	SECTOR-1A	78.48			
	TOTAL	194.07	Sqm	3343.73	648916.71
12.4	Extra for openable side / top hung vision glass panels (IGUs) including providing and supplying at site all accessories and hardwares for the openable panels as specified and of the approved make such as heavy duty stainless steel friction hinges, min 4 -point cremone locking sets with stainless steel plates, handles, buffers etc. including necessary stainless steel screws/ fasteners, nuts, bolts, washers etc. all complete as per the Architectural drawings, as per the approved shop drawings, as specified and as directed by the Engineer- in-Charge.		Sqm	3275.96	63586.37

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR - 9	11.56			
	SECTOR-1A	7.85			
	TOTAL	19.41			
12.5	<p>Providing and fixing Glass Reinforced Concrete (G.R.C) Screens casted with 'Spray Mix' concrete design in approved size, pattern, thickness (40mm thick) and shade. The Screens should be made from '53 grade' White Portland Cement manufactured by 'JK Cement' or 'Birla white', White Quartz fine graded sieved Silica Sand, Alkali Resistant Glass Fiber manufactured by 'NEG Japan, Owen Corning 'Saint Gobain' or equivalent, Super Plasticizers manufactured by 'Karochem' or equivalent, Polymers manufactured by 'Nova Polychem' or equivalent and U.V resistant Synthetic inorganic pigments should be used for pigmentation manufactured by 'Phenochem industries or equivalent. The Screens casting shall take place with layering methodology using- Direct Power Spray machines. The GRC Screens flexural strength average L.O.P should be above or equivalent to 6 N/mm² & M.O.R should be above or equivalent to 12 N/mm² for tests done on 28 days cured samples. The fixing of Screens should be done using 'Dry fixing' method onto structural support members i.e. R.C.C, Brick work or Red oxide Primer -paint or Epoxy primer -paint treated mild steel. The fixtures, fasteners and self tapping screws to be used for dry fixing should be of HP/KLIMAS. The quantity of fasteners or self tapping screws shall be calculated in accordance to the weight of Screens and actual site fixing conditions. If there will be requirement of Joint filling then Elastomeric exterior grade paintable PU Sealent will be used. For final finishing of Screen one weather shield exterior grade water based diluted paint coat will be done if required. Vendor shall submit shop drawings of same, the drawings to be duly approved from Engineer in charge at site.</p>				
	SECTOR - 9	771.10			
	SECTOR-1A	129.49			
	TOTAL	900.59	Sqm	5232.00	4711888.23

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	STRUCTURAL GLAZING, CURTAIN GLAZING, ALUMINIUM COMPOSITE PANEL & STONE CLADDING WORK SUB HEAD TOTAL for sector 9 and sector 1A				6712053.28
13.0	SUB HEAD-XIII :- ROAD WORKS :				
13.1	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead upto 50 metres.				
	SECTOR - 9	5186.68			
	SECTOR-1A	1609.20			
	TOTAL	6795.88	Sqm	178.70	1214389.78
13.2	Extra for compaction of earth work in embankment under optimum moisture conditions to give at least 95% of the maximum dry density (proctor density).				
	SECTOR - 9	4927.34			
	SECTOR-1A	1528.74			
	TOTAL	6456.08	Cum	20.34	131345.72
13.3	Providing hard stone soling with stone aggregate of 100mm nominal size mixed with moorum in required thickness (or as specified in drawing) in layers not exceeding 20 cm in depth under road pavement, under foundation, flooring, under plinth protection,, ramp, consolidating each deposited layer by ramming, watering and rolling with ½ tonne roller or wooden or steel rammers where ever required including preparing of surface etc. complete as per the direction of Engineer-in-charge.				
	SECTOR - 9	1192.94			
	SECTOR-1A	370.12			
	TOTAL	1563.06	Cum	2726.06	4261001.60
13.4	Supplying and stacking at site (material to be used in item no. 16.4 below)				
(a)	90 mm to 45 mm size stone aggregate				
	SECTOR - 9	674.27			
	SECTOR-1A	171.08			
	TOTAL	845.35	Cum	1918.22	1621570.66

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
(b)	Moorum		Cum	879.42	285810.53
	SECTOR - 9	259.00			
	SECTOR-1A	66.00			
	TOTAL	325.00			
13.5	Laying spreading and compacting stone aggregate of specified sizes to WBM specifications including spreading in uniform thickness, (Stone and moorum available in item no. 14.4) hand picking, rolling with 3 wheeled road/vibratory roller 8-10 tonne in stages to proper grade and camber, applying and brooming requisite type of screening/binding material to fill up interstics of coarse aggregate watering and compacting to the required density.		Cum	857.14	557373.73
SECTOR - 9	518.67				
SECTOR-1A	131.60				
TOTAL	650.27				
13.6	Providing and laying 400 micron thick PVC Sheet on WBM Surface complete as per direction of engineer-in-charge.		Sqm	63.33	311838.40
	SECTOR - 9	3947.00			
	SECTOR-1A	977.00			
	TOTAL	4924.00			
PAINTING ROAD / RUNWAY MARKING					
13.7	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.		Sqm	196.42	131040.90
	On concrete work				
	SECTOR - 9	503.68			
	SECTOR-1A	163.48			
TOTAL	667.16				
13.8	Providing and laying 60mm thick factory made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with line sand etc. all complete as per the direction of Engineer-in-charge.		Sqm	941.49	483511.60

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR - 9	103.92			
	SECTOR-1A	409.64			
	TOTAL	513.56			
13.9	Providing and laying at or near ground level factory made of approved size and design kerb stone of M-25 grade cement in position to the required line , level and curvature jointed with cement mortar 1:3 (1 cement : 3 coarse sand) including making joints with or without grooves (thickness of joints except sharp curve shall not be more than 5mm) including making drainage opening wherever required complete etc. as per direction of engineer-in-charge (length of finished kerb edging shall be measured for payment).(Precast C.C. kerb stone shall be approved by engineer-in-charge).				
	SECTOR - 9	235.21			
	SECTOR-1A	109.21			
	TOTAL	344.42	Cum	8527.41	2937012.10
	ROAD WORKS SUB HEAD TOTAL for sector 9 and sector 1A				11934895.01
14	SUB HEAD-XIV:- SIGNAGES				
14.1	Supply and fixing of 18 gauge Stainless Steel brass coating plates of grade 304 engraved/ tape with approved matter writing all complete as per sample approved and fixed with two rawls plugs stainless steel srew/ double side tape of 3M make required nos of holes, wherever required complete as per direction of Unit Incharge.				
	SECTOR - 9	10000.00			
	SECTOR-1A	10000.00			
	TOTAL	20000.00	Sq Inch	15.84	316800.00
14.2	Supply and fixing of emergency sign boards size of required size made out of 3 mm thk acrylic sheet/ Sun boards/ ACP sheet Green/ Red Colour Glow Night Tape pasted on sheet with single side writing with fixing on wall, fixed with four rawls plugs stainless steel srew/ double side tape of 3M make required nos of holes, wherever required complete as per direction of Unit Incharge.				
	SECTOR - 9	30000.00	Sq Inch	10.89	490050.00

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	15000.00			
	TOTAL	45000.00			
	SIGNAGES WORKS SUB HEAD TOTAL for sector 9 and sector 1A				806850.00
15	SUB HEAD-XV:- DISMANTLING WORK				
15.1	Demolishing brick work manually/ by mechanical means including reuse the debris under layer in roads, site etc as per direction of Engineer-in-charge. In cement mortar				
	SECTOR - 9	5.93			
	SECTOR-1A	131.61			
	TOTAL	137.54	CUM	1681.46 55	231268.76
15.2	Demolishing R.C.C. work manually/ by mechanical means including reuse the debris under layer in roads, site etc as per direction of Engineer - in- charge.				
	SECTOR - 9	3.47			
	SECTOR-1A	100.10			
	TOTAL	103.57	CUM	2898.82	300230.68
	DISMANTLING WORKS SUB HEAD TOTAL for sector 9 & sector 1A				531499.45
	TOTAL AMOUNT (S.H-1 TO S.H-15) of Civil Works				620452696.57

B PLUMBING WORKS					
S.No	Description	Total Quantity	Unit		Amount On DSR Rate (In Rs.)
1	SUB HEAD-I:- MARBLE & GRANITE WORK				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
1	Providing and fixing stone slab with table rubbed, edges rounded and polished, of size 75x50 cm deep and 1.8 cm thick, fixed in urinal partitions by cutting a chase of appropriate width with chase cutter and embedding the stone in the chase with epoxy grout or with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 6 mm nominal size) as per direction of Engineer-in-charge and finished smooth.				
	Granite Stone of approved shade				
	Basic Rate of 18 mm thick table rubbed granite = Rs 1800/- per sqm excluding GST				
	SECTOR - 9	1.13			
	SECTOR-1A	0.75			
	TOTAL	1.88	Sqm	3507.42	6576.42
	MARBLE & GRANITE WORKS SUB HEAD TOTAL for sector 9 & sector 1A				6576.42
2	SUB HEAD-II:- ROOFING				
2.1	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion, (i) Single socketed pipes.				
2.1 (a)	75 mm diameter		Metr e	210.87	380198.61
	SECTOR - 9	1546.00			
	SECTOR-1A	257.00			
	TOTAL	1803.00			
2.1 (b)	110 mm diameter		Metr e	316.55	351056.72
	SECTOR - 9	928.00			
	SECTOR-1A	181.00			
	TOTAL	1109.00			
2.2	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.				
	Single Push Fit Coupler				
2.2 (a)	75 mm dia		Each	79.00	47559.20
	SECTOR - 9	517.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	85.00			
	TOTAL	602.00			
2.2 (b)	110 mm dia				
	SECTOR - 9	306.00			
	SECTOR-1A	61.00			
	TOTAL	367.00	Each	109.49	40184.30
2.3	Single tee without door				
2.3 (a)	75x75x75 mm				
	SECTOR - 9	304.00			
	SECTOR-1A	40.00			
	TOTAL	344.00	Each	122.96	42297.55
2.3 (b)	110x110x110 mm				
	SECTOR - 9	41.00			
	SECTOR-1A	11.00			
	TOTAL	52.00	Each	188.84	9819.81
2.4	Plain bend 87.5 deg				
2.4 (a)	75 mm dia				
	SECTOR - 9	64.00			
	SECTOR-1A	15.00			
	TOTAL	79.00	Each	90.88	7179.68
2.4 (b)	110 mm dia				
	SECTOR - 9	41.00			
	SECTOR-1A	11.00			
	TOTAL	52.00	Each	130.68	6795.36
2.5	Shoe (Plain)				
2.5 (a)	75 mm dia				
	SECTOR - 9	64.00			
	SECTOR-1A	15.00			
	TOTAL	79.00	Each	80.29	6342.83
2.5 (b)	110 mm dia				
	SECTOR - 9	41.00			
	SECTOR-1A	11.00			
	TOTAL	52.00	Each	114.79	5969.11

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
2.6	Providing and fixing unplasticised -PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50 mm hard wood plugs, screwed with M.S. screws of required length, including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete.				
2.6 (a)	75 mm dia		Each	307.74	277582.83
	SECTOR - 9	773.00			
	SECTOR-1A	129.00			
	TOTAL	902.00			
2.6 (b)	110 mm dia		Each	306.41	170054.78
	SECTOR - 9	464.00			
	SECTOR-1A	91.00			
	TOTAL	555.00			
2.7	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.		Each	47.42	2750.42
	SECTOR - 9	43.00			
	SECTOR-1A	15.00			
	TOTAL	58.00			
ROOFING WORKS SUB HEAD TOTAL for sector 9 & sector 1A					1347791.20
3	SUB HEAD-III:- SANITARY INSTALLATIONS				
3.1	Providing and fixing water closet squatting pan (Indian type W.C. Pan) with 100 mm sand cast Iron P or S trap, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required:				
	White Vitreous china Orissa pattern W.C. pan of size 580x440 mm with integral type foot rests				
	Basic rate of Orrisa Pan= Rs. 1290/- each. Excluding GST Basic rate of flushing cistern- Rs.575/- each. Excluding GST				
	SECTOR - 9	2.00	Each	5723.54	22894.15

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	2.00			
	TOTAL	4.00			
3.2	Providing and fixing white vitreous china extended wall mounting water closet of size 780x370x690 mm of approved shape including providing & fixing white vitreous china cistern with dual flush fitting, of flushing capacity 3 litre/ 6 litre (adjustable to 4 litre/ 8 litres), including seat cover, and cistern fittings, nuts, bolts and gasket etc complete.				
	Basic rate of EWC= Rs.5500/- each. Excluding GST Basic rate of flushing cistern- Rs.1600/- each. Excluding GST				
	SECTOR - 9	226.00			
	SECTOR-1A	42.00		12906.1	
	TOTAL	268.00	Each	8	3458857.45
3.3	Providing and fixing white vitreous china battery based infrared sensor operated urinal of approx. size 610 x 390 x 370 mm having pre & post flushing with water (250 ml & 500 ml consumption), having water inlet from back side, including fixing to wall with suitable brackets all as per manufacturers specification and direction of Engineer-in-charge.				
	Basic rate of Urinal= Rs. 4500/- each. Excluding GST				
	SECTOR - 9	5.00			
	SECTOR-1A	5.00			
	TOTAL	10.00	Each	6934.41	69344.06
3.4	Providing and fixing wash basin with C.I. brackets, 15 mm dia CP Brass single hole basin mixer of approved quality and make, including painting of fittings and brackets, cutting and making good the walls wherever required:-				
	White Vitreous China Wash basin size 550x400 mm with a 15 mm CP Brass single hole basin mixer				
	Basic rate of Wash Basin= Rs. 550/- each. Excluding GST Basic rate of Basin mixer- Rs.1600/- each. Excluding GST				
	SECTOR - 9	228.00	Each	4496.98	1227674.45

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	45.00			
	TOTAL	273.00			
3.5	Providing and fixing Stainless Steel AISI 304 (18/8) kitchen sink of approved make as per IS: 13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required				
	Kitchen sink with drain board				
	510x1040 mm bowl depth 250 mm				
	Basic rate of Kitchen sink with drain board= Rs. 3000/- each. Excluding GST				
	SECTOR - 9	97.00			
	SECTOR-1A	10.00			
	TOTAL	107.00	Each	5948.37	636475.11
3.6	Providing and fixing approved make hand shower (Health faucet) of 1.2mtr long with 8mm dia Easy Flex Tube with wall hook and flow restrictor with flow rate 6 litre per minute at 3 bar in chrome finish and wall hook.				
	Basic rate of health faucet with flexi tube= Rs. 1250/- each. Excluding GST				
	SECTOR - 9	228.00			
	SECTOR-1A	44.00			
	TOTAL	272.00	Each	1686.96	458853.12
3.7	Providing and fixing CP Brass 32mm size Bottle Trap of approved quality & make and as per the direction of Engineer-in-charge.				
	Basic rate of Bottle Trap= Rs. 620/- each. Excluding GST				
	SECTOR - 9	228.00			
	SECTOR-1A	45.00			
	TOTAL	273.00	Each	877.39	239526.79

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
3.8	Providing and fixing glass shower enclosure fitted with fitting of approved make. The track will be fixed between both side on walls and with 2 fixed glass and 1 Door.Fixed glass portion will be fixed with grade connector (SS 304) of approved make and fixed glass top will be fixed with sliding track. 8mm thick clear toughened glass of Saint Gobain or equivalent make will be used for fixed as well as openable shower partition. All joints will be sealed with clear weather silicone. The glass will have Clean Coat .Food Grade seals to be installed.Spring mechanism in hinges to allow easy operating the door.The work shall be executed as per drawing.				
	SECTOR - 9	48.00			
	SECTOR-1A	16.00		41872.0	
	TOTAL	64.00	Each	5	2679811.20
3.9	Providing and fixing Differetally abled toilets including Wash basin, Water closet,Cistern, grab bars & hand rails etc. The rate include cost of all material & labour involved in the item complete and all as per direction of engineer incharge. For physically handicap person consisting of;				
	Wall Hung WC with PP soft close seat cover, HingesWall with built in Jet (Basic rate-Rs.7500/-)				
	Concealed Cistern Cistern-01 no. (Basic rate-Rs.3700/-)				
	Flush Plate -01 no (Basic rate-Rs.1050/-)				
	Wall hung Wash Basin -01 no (Basic rate-Rs.2050/-)				
	Spatula Single lever (basic rate) (Basic rate-Rs.2850/-)				
	Wall mounted Grab bar 600 mm long - 2 nos (Basic rate-Rs.3800/-)				
	Wall mounted Hinged hand rail 750 x 100-01 no (Basic rate-Rs.7650/-)				
	Bottle Trap (Basic rate-Rs.620/-)				
	Waste Coupling (Basic rate-Rs.375/-)				
	Stainless soap dish (Basic rate-Rs.500/-)				
	Tissue paper holder (Basic rate-Rs.280/-)				
	SECTOR - 9	1.00			
	SECTOR-1A	1.00		46900.2	
TOTAL	2.00	Each	6	93800.52	

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
3.10	Providing & fixing heavy quality PVC waste pipe for sink including PVC waste fitting Complete		Each	103.31	11053.80
	Flexible Pipe				
	40mm Dia				
	SECTOR - 9	97.00			
	SECTOR-1A	10.00			
	TOTAL	107.00			
3.11	Providing and fixing approved make, size and quality looking mirror of superior glass complete with 6 mm thick back ply/hard board ground fixed to wooden cleats on walls, allround polished 2nd class teak wood beading of size 40x20mm etc complete.		Sqm	5174.22	853745.51
	SECTOR - 9	120.00			
	SECTOR-1A	45.00			
	TOTAL	165.00			
3.12	Providing and fixing 600x120x5 mm glass shelf with edges round off, supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.		Each	932.73	254634.88
	Basic Rate of Glass shelf = Rs 300/- each excluding GST				
	SECTOR - 9	228.00			
	SECTOR-1A	45.00			
	TOTAL	273.00			
3.13	Providing & fixing toilet paper holder		Each	673.99	180629.86
	C.P. brass				
	Basic rate of toilet paper holder= Rs. 280/- each. Excluding GST				
	SECTOR - 9	226.00			
	SECTOR-1A	42.00			
	TOTAL	268.00			
3.14	Providing and fixing soil waste and vent pipes		Metre	1050.64	4114296.45
3.14 (a)	100 mm dia. Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR - 9	3300.00			
	SECTOR-1A	616.00			
	TOTAL	3916.00			
3.14 (b)	75 mm dia. Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905				
	SECTOR - 9	950.00			
	SECTOR-1A	0.00			
	TOTAL	950.00	Metre	858.87	815930.78
3.15	Providing and fixing M.S. holder-bat clamps of approved design to sand cast iron/ centrifugally cast iron(spun) pipes embedded in and including cement concrete blocks 10x 10 x 10 cm of 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) including cost of cutting holes and making good the walls, etc.				
3.15 (a)	For 100mm dia pipe				
	SECTOR - 9	331.00			
	SECTOR-1A	62.00			
	TOTAL	393.00	Each	305.37	120008.64
3.15 (b)	For 75mm dia pipe				
	SECTOR - 9	475.00			
	SECTOR-1A	0.00			
	TOTAL	475.00	Each	301.41	143167.61
3.16	Providing and fixing bend of required degree with access door insertion rubber washer 3mm thick, bolts and nuts complete				
3.16 (a)	100 mm dia Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
	SECTOR - 9	108.00			
	SECTOR-1A	20.00			
	TOTAL	128.00	Each	545.29	69797.38
3.16 (b)	75 mm dia Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
	SECTOR - 9	38.00			
	SECTOR-1A	0.00			
	TOTAL	38.00	Each	435.60	16552.80

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
3.17	Providing and fixing plain bend of required degree:				
3.17 (a)	100 mm dia		Each	342.59	93184.34
	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
	SECTOR - 9	228.00			
	SECTOR-1A	44.00			
	TOTAL	272.00			
3.17 (b)	75 mm dia		Each	242.25	46028.07
	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
	SECTOR - 9	190.00			
	SECTOR-1A	0.00			
	TOTAL	190.00			
3.18	Providing and fixing double equal plain junction of required degree.		Each	713.49	1426.99
	100 x 100 x 100 x 100mm				
	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905.				
	SECTOR - 9	0.00			
	SECTOR-1A	2.00			
	TOTAL	2.00			
3.19	Providing and fixing single equal plain junction of required degree.				
3.19 (a)	100 x 100 x 100mm		Each	567.77	375860.43
	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
	SECTOR - 9	572.00			
	SECTOR-1A	90.00			
	TOTAL	662.00			
3.19 (b)	75x75x75 mm		Each	315.07	59862.83
	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
	SECTOR - 9	190.00			
	SECTOR-1A	0.00			
	TOTAL	190.00			
3.20	Providing and fixing single unequal plain junction of required degree :		Each	534.70	101592.81
	100x100x75 mm				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
	SECTOR - 9	190.00			
	SECTOR-1A	0.00			
	TOTAL	190.00			
3.21	Providing and fixing terminal guard 100 mm Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
	SECTOR - 9	146.00			
	SECTOR-1A	28.00			
	TOTAL	174.00	Each	395.60	68835.10
3.22	Providing and fixing shielded coupling for Hubless centrifugally cast iron pipe				
	100 mm				
3.22 (a)	SS 304 grade coupling with EPDM rubber gasket				
	SECTOR - 9	6600.00			
	SECTOR-1A	1232.00			
	TOTAL	7832.00	Each	402.24	3150320.18
3.22 (b)	75 mm SS 304 grade coupling with EPDM rubber gasket				
	SECTOR - 9	950.00			
	SECTOR-1A	0.00			
	TOTAL	950.00	Each	361.45	343376.55
3.23	Providing and fixing M.S. stays and clamps for sand cast iron/centrifugally cast (spun) iron pipe of diameter: 100mm				
	SECTOR - 9	146.00			
	SECTOR-1A	28.00			
	TOTAL	174.00	Each	127.36	22161.25
3.24	Providing and fixing trap of self cleansing design with sand cast iron screwed down or hinged grating with or without vent, arm complete, including cost of cutting and making good the walls and floors. 100mm inlet and 100mm outlet				
			Each	753.24	292257.70

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
	SECTOR - 9	328.00			
	SECTOR-1A	60.00			
	TOTAL	388.00			
3.25	Providing and fixing M.S. holder bat clamp of approved design to sand cast iron/ cast iron (spun) pipes comprising of M.S. flat brackets made of 50x5 mm flat of specified shape, projecting 75 mm outside the wall surface and fixed on wall with 4nos, 6mm dia expansion hold fasteners, including drilling necessary holes in brick wall/ CC/RCC surface and the cost of bolts etc. The pipes shall be fixed to the already fixed brackets with the help of 30 mm x1.6 mm galvanised M.S. flats of specified shape and of total length 420 mm and shall be fixed with M.S. nuts, bolts, & washers of size 25x6 mm, one bolts on each side of the pipe.				
3.25 (a)	Total bracket length 580 mm of approved shape and design (for single 100 mm dia pipe)				
	SECTOR - 9	493.00			
	SECTOR-1A	92.00			
	TOTAL	585.00	Each	245.47	143600.24
3.25 (b)	Total bracket length 810 mm of approved shape and design (for two 100 mm dia pipes)				
	SECTOR - 9	416.00			
	SECTOR-1A	78.00			
	TOTAL	494.00	Each	303.83	150092.51
3.25 (c)	Total bracket length 1040 mm of approved shape and design (for three 100 mm dia pipes)				
	SECTOR - 9	416.00			
	SECTOR-1A	78.00			
	TOTAL	494.00	Each	361.99	178824.79
3.26	Providing & fixing Nickel Chromium Plated liquid soap dispenser with metallic bottle of approved brand & make 112 mm distance from wall of standard shape with bracket (Nickel chromium plating should pass Salt Spray Test for 200 hours) of the same materials with snap fittings of approved quality and colour, complete as per direction of Engineer in Charge.				
			Each	3396.69	230974.92

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Basic rate of soap dispenser= Rs. 2550/- each. Excluding GST				
	SECTOR - 9	24.00			
	SECTOR-1A	44.00			
	TOTAL	68.00			
3.27	Providing, Fixing of CP brass Towel Ring with CP brass wall brackets and providing & fixing CP brass screws complete as required.				
	Basic rate of towel ring= Rs. 725/- each. Excluding GST				
	SECTOR - 9	226.00			
	SECTOR-1A	44.00			
	TOTAL	270.00	Each	1017.72	274784.40
3.28	Providing, Fixing of CP brass Towel Rail 600mm long without hanger with 3 hooks and CP brass screws complete as required.				
	Basic rate of towel rail= Rs. 975/- each. Excluding GST				
	SECTOR - 9	220.00			
	SECTOR-1A	31.00			
	TOTAL	251.00	Each	1348.38	338443.38
3.29	Providing & fixing soap dish holder of approved design.				
	Basic rate of soap dish holder= Rs. 500/- each. Excluding GST				
	SECTOR - 9	220.00			
	SECTOR-1A	31.00			
	TOTAL	251.00	Each	681.12	170961.12
3.30	Providing and fixing CP brass single lever low flow wall mounted Sink mixer with 15 mm CP brass single lever swivel spout with waste complete with flow rate 2.5 litre per minute at 3 bar including cutting and making good the walls where required.				
	Basic rate of Sink Mixer= Rs. 3225/- each. Excluding GST				
	SECTOR - 9	97.00			
	SECTOR-1A	10.00			
	TOTAL	107.00	Each	4466.88	477956.16

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
3.31	Providing and fixing of approved make following- a) Concealed type CP Brass diverter(for hot and cold water), overhead shower with arm with rubit cleaning system with flow rate 6 litre per minute at 3 bar complete with all accessories as required and spout with flow rate 3.8 litre per minute at 3 bar, wall flange complete with all accessories as required and making good the walls wherever required.				
	Basic rate of Shower Mixer = Rs. 4725/- each. Excluding GST				
	Basic rate of Shower Arm= Rs. 815/- each. Excluding GST				
	Basic rate of shower head= Rs. 2250/- each. Excluding GST				
	SECTOR - 9	220.00			
	SECTOR-1A	31.00			
	TOTAL	251.00	Each	10513.80	2638963.80
3.32	Providing,Fixing wall mounted of approved make Double Coat hook on door complete.				
	Basic rate of Double coat hook= Rs. 650/- each. Excluding GST				
	SECTOR - 9	228.00			
	SECTOR-1A	44.00			
TOTAL	272.00	Each	917.73	249622.56	
3.33	Providing & fixing wall mounted 300mm Long SS Grab Bar of approved make including cutting & making good the walls.				
	Basic rate of SS Grab Bar= Rs. 1500/- each. Excluding GST				
	SECTOR - 9	100.00			
	SECTOR-1A	14.00			
TOTAL	114.00	Each	2319.57	264430.98	
3.34	Providing and fixing CP brass 2 Way Bib cock with wall flange with flow restrictor with flow rate 2.5 litre per minute at 3 bar.				
	Basic rate of 2 way Bib Cock= Rs. 1650/- each. Excluding GST				
	SECTOR - 9	228.00			
	SECTOR-1A	44.00			
TOTAL	272.00	Each	2212.65	601840.80	

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
3.35	Providing and fixing straight type approved make single body push fit type WC pan connector with factory supplied spring loaded seal guard of approved make with integral single mould sealing fins made of flexible EVA body, including bush/adaptor for use with C.I. Pipe as supplied with the pan connector.				
	SECTOR - 9	228.00			
	SECTOR-1A	44.00			
	TOTAL	272.00	Each	1358.28	369452.16
3.36	Providing & fixing 100mm x 50mm G.I. waste with reducing elbow & nipple cutting chases, the floor / slab, repairs complete as required and connection to GI / CI waste pipe.				
	SECTOR - 9	222.00			
	SECTOR-1A	33.00			
	TOTAL	255.00	Each	944.46	240837.30
3.37	Providing and fixing cast brass Floor cleanout plug with suitable insert keys for opening in brass cap, male threaded joint/reducer with G.I. socket caulked to Pipe/fittings of CI pipe including cost of lead joints etc. complete in all respect.				
	100 mm dia				
	SECTOR - 9	8.00			
	SECTOR-1A	4.00			
	TOTAL	12.00	Each	1301.85	15622.20
3.38	Providing and fixing GI inlet fitting with maximum 3 inlets 32, 40 or 50 mm size fabricated from 100 dia GI pipes and sockets, fixed to C.I. trap with Drip Seal joint and set in cement concrete as per standard drawing complete as directed by Engineer-in-charge.				
	SECTOR - 9	328.00			
	SECTOR-1A	60.00			
	TOTAL	388.00	Each	852.39	330727.32
3.39	Providing and fixing SS Grating of 125 mm dia of approved quality and colour complete as per direction of engineer in charge.				
	Circular Type		Each	312.84	79774.20

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	125 mm nominal dia with 25 mm waste hole				
	SECTOR - 9	222.00			
	SECTOR-1A	33.00			
	TOTAL	255.00			
3.40	Providing, Installing & fixing storage type water heater of approved make (BEE 5 star rated) (vertical/horizontal type) with copper container, glasswool insulation, stove enamelled M.S jacket, thermostatically controlled inner heater with pilot neon lamps, 15mm inlet stop cock valve, on inlet connection, 15mm dia C.P flexible connection pipe in inlet & outlet suitable for working pressure of 8 kg/sqcm complete as required.				
3.40 (a)	Capacity 25 litres (Basic rate = Rs.9675 /- each. Excluding GST)				
	SECTOR - 9	233.00			
	SECTOR-1A	37.00			
	TOTAL	270.00	Each	13479.00	3639330.00
3.40 (b)	Capacity 40 litres (Basic rate = Rs.10200/- each. Excluding GST)				
	SECTOR - 9	2.00			
	SECTOR-1A	0.00			
	TOTAL	2.00	Each	14174.00	28348.00
3.40 (c)	Capacity 06 Litres (Basic rate = Rs.5525/- each. Excluding GST)				
	SECTOR - 9	97.00			
	SECTOR-1A	10.00			
	TOTAL	107.00	Each	7981.00	853967.00
	SANITARY INSTALLATIONS WORKS				
	SUB HEAD TOTAL for sector 9 & sector 1A				31300514.62
4	SUB HEAD-IV:-WATER SUPPLY				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
4.1	Providing and fixing Polyethelene-Aluminium- Polyethelene (PE-AL-PE) Composite Pressure Pipes conforming to IS - 15450, U.V. stabilized with carbon black having thermal stability for hot & cold water supply, capable to withstand temperature up to 80°C, including all special fittings of composite material (engineering plastic blend and brass inserts wherever required) e.g. elbows, tees, reducers, couplers & connectors etc., with clamps at 1.00 metre spacing. This includes the costs of cutting chases and including testing of joints complete as per direction of the engineer in charge.				
	Concealed work , including cutting chases and making good the walls etc.				
4.1 (a)	1216 (16 mm OD) pipe		Metre	508.61	1872202.61
	SECTOR - 9	3366.00			
	SECTOR-1A	315.00			
	TOTAL	3681.00			
4.1 (b)	1620 (20 mm OD) pipe		Metre	531.78	683867.15
	SECTOR - 9	1136.00			
	SECTOR-1A	150.00			
	TOTAL	1286.00			
4.1 (c)	2025 (25 mm OD) pipe		Metre	647.66	19429.74
	SECTOR - 9	15.00			
	SECTOR-1A	15.00			
	TOTAL	30.00			
4.1 (d)	2532 (32 mm OD) pipe		Metre	740.37	14807.43
	SECTOR - 9	10.00			
	SECTOR-1A	10.00			
	TOTAL	20.00			
4.2	Providing and fixing GI pipes complete with GI fittings and clamps, i/c cutting and making good the walls etc.				
	Internal work - Exposed on Wall				
4.2 (a)	15 mm nominal bore		Metre	301.11	157178.64
	SECTOR - 9	430.00			
	SECTOR-1A	92.00			
	TOTAL	522.00			
4.2 (b)	20 mm nominal bore		Metre	369.62	355571.07
	SECTOR - 9	860.00			
	SECTOR-1A	102.00			
	TOTAL	962.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
4.2 (c)	25 mm nominal bore				
	SECTOR - 9	1125.00	Metr e	486.29	657461.38
	SECTOR-1A	227.00			
	TOTAL	1352.00			
4.2 (d)	32 mm nominal bore				
	SECTOR - 9	900.00	Metr e	557.96	623245.79
	SECTOR-1A	217.00			
	TOTAL	1117.00			
4.2 (e)	40 mm nominal bore				
	SECTOR - 9	630.00	Metr e	717.90	525501.70
	SECTOR-1A	102.00			
	TOTAL	732.00			
4.2 (f)	50 mm nominal bore				
	SECTOR - 9	1070.00	Metr e	884.27	1025750.88
	SECTOR-1A	90.00			
	TOTAL	1160.00			
4.3	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc.				
	External Work				
4.3 (a)	25mm nominal bore				
	SECTOR - 9	120.00	Metr e	413.77	70340.99
	SECTOR-1A	50.00			
	TOTAL	170.00			
4.3 (b)	32mm nominal bore				
	SECTOR - 9	120.00	Metr e	453.12	77030.91
	SECTOR-1A	50.00			
	TOTAL	170.00			
4.3 (c)	40mm nominal bore				
	SECTOR - 9	20.00	Metr e	552.77	22110.66
	SECTOR-1A	20.00			
	TOTAL	40.00			
4.3 (d)	50mm nominal bore				
	SECTOR - 9	20.00	Metr e	647.66	12953.16
	SECTOR-1A	0.00			
	TOTAL	20.00			
4.3 (e)	65 mm nominal bore				
	SECTOR - 9	20.00	Metr e		
	SECTOR-1A	0.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	20.00		760.91	15218.28
4.3 (f)	80 mm nominal bore				
	SECTOR - 9	20.00	Metr e	909.91	18198.18
	SECTOR-1A	0.00			
	TOTAL	20.00			
4.4	Making connection of G.I. distribution branch with G.I. main of following sizes by providing and fixing tee, including cutting and threading the pipe etc. complete:				
4.4 (a)	25 to 40 mm nominal bore				
	SECTOR - 9	2.00	Each	749.53	2998.12
	SECTOR-1A	2.00			
	TOTAL	4.00			
4.4 (b)	50 to 80 mm nominal bore				
	SECTOR - 9	2.00	Each	1498.56	5994.25
	SECTOR-1A	2.00			
	TOTAL	4.00			
4.5	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :				
4.5 (a)	20mm nominal bore				
	SECTOR - 9	309.00	Each	457.13	165024.83
	SECTOR-1A	52.00			
	TOTAL	361.00			
4.5 (b)	25mm nominal bore				
	SECTOR - 9	61.00	Each	527.03	44270.23
	SECTOR-1A	23.00			
	TOTAL	84.00			
4.5 (c)	32mm nominal bore				
	SECTOR - 9	72.00	Each	584.00	47888.08
	SECTOR-1A	10.00			
	TOTAL	82.00			
4.5 (d)	40mm nominal bore				
	SECTOR - 9	40.00	Each	700.23	32210.44
	SECTOR-1A	6.00			
	TOTAL	46.00			
4.5 (e)	50mm nominal bore				
	SECTOR - 9	9.00	Each	869.47	10433.61
	SECTOR-1A	3.00			
	TOTAL	12.00			
4.5	65mm nominal bore				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
(f)	SECTOR - 9	9.00	Each	1475.79	16233.72
	SECTOR-1A	2.00			
	TOTAL	11.00			
4.6	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete:				
	20 mm nominal bore				
4.6 (a)	SECTOR - 9	12.00	Each	393.48	7082.56
	SECTOR-1A	6.00			
	TOTAL	18.00			
4.6 (b)	25mm nominal bore		Each	395.16	5532.22
	SECTOR - 9	10.00			
	SECTOR-1A	4.00			
	TOTAL	14.00			
4.7	Providing and fixing unplasticised PVC connection pipe with brass unions :				
	45 cm length				
	45 cm length 15 mm nominal bore				
	SECTOR - 9	1120.00	Each	84.35	109989.79
	SECTOR-1A	184.00			
	TOTAL	1304.00			
4.8	Constructing masonry Chamber 30x30x50 cm inside, in brick work in cement mortar 1:4 (1 cement :4 coarse sand) for stop cock, with C. I. surface box 100x100 x75 mm (inside) with hinged cover fixed in cement concrete slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12mm thick, finished with a floating coat of neat cement complete as per standard design :				
	With common burnt clay F.P.S (non modular) bricks of class designation 7.5				
	SECTOR - 9	10.00	Each	1695.03	23730.40
	SECTOR-1A	4.00			
	TOTAL	14.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
4.9	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design :				
	With common burnt clay F.P.S (non modular) bricks of class designation 7.5				
	SECTOR - 9	2.00	Each	10001.48	40005.90
	SECTOR-1A	2.00			
TOTAL	4.00				
4.10	Constructing masonry Chamber 90x90x100 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100 mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design :				
	With common burnt clay F.P.S (non modular) bricks of class designation 7.5				
	SECTOR - 9	2.00	Each	17402.12	69608.48
	SECTOR-1A	2.00			
TOTAL	4.00				
4.11	Painting G.I. pipes and fittings with synthetic enamel paint (approved shade) with two coats over a ready mixed priming coat, both of approved quality for new work :				
4.11 (a)	15mm diameter pipe	220.00	Metre	16.24	4805.86
	SECTOR - 9	76.00			
	SECTOR-1A	296.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL				
4.11 (b)	20mm diameter pipe				
	SECTOR - 9	440.00	Metr e	19.45	10232.54
	SECTOR-1A	86.00			
	TOTAL	526.00			
4.11 (c)	25mm diameter pipe				
	SECTOR - 9	455.00	Metr e	25.34	14344.70
	SECTOR-1A	111.00			
	TOTAL	566.00			
4.11 (d)	32mm diameter pipe				
	SECTOR - 9	335.00	Metr e	30.39	13251.35
	SECTOR-1A	101.00			
	TOTAL	436.00			
4.11 (e)	40mm diameter pipe				
	SECTOR - 9	315.00	Metr e	35.69	14311.49
	SECTOR-1A	86.00			
	TOTAL	401.00			
4.11 (f)	50mm diameter pipe				
	SECTOR - 9	525.00	Metr e	42.62	25784.80
	SECTOR-1A	80.00			
	TOTAL	605.00			
4.12	Painting G.I. pipes and fittings with two coats of anti-corrosive bitumastic paint of approved quality.				
4.12 (a)	25mm diameter pipe				
	SECTOR - 9	120.00	Metr e	15.10	2566.58
	SECTOR-1A	50.00			
	TOTAL	170.00			
4.12 (b)	32mm diameter pipe				
	SECTOR - 9	120.00	Metr e	18.22	3096.72
	SECTOR-1A	50.00			
	TOTAL	170.00			
4.12 (c)	40mm diameter pipe				
	SECTOR - 9	20.00	Metr e	20.74	829.62
	SECTOR-1A	20.00			
	TOTAL	40.00			
4.12 (d)	50mm diameter pipe				
	SECTOR - 9	20.00	Metr e	25.00	499.95
	SECTOR-1A	0.00			
	TOTAL	20.00			
4.12	65mm diameter pipe				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
(e)	SECTOR - 9	20.00	Metr e	30.99	619.74
	SECTOR-1A	0.00			
	TOTAL	20.00			
4.12 (f)	80mm diameter pipe		Metr e	36.04	720.72
	SECTOR - 9	20.00			
	SECTOR-1A	0.00			
	TOTAL	20.00			
4.13	Providing and filling sand of grading zone V or coarser grade, allround the G.I. pipes in external work: Width of sand filling = 300mm Depth of sand filling Under the pipe = 75mm+ Above the pipe = 150mm+				
4.13 (a)	25mm diameter pipe		Metr e	162.46	19982.46
	SECTOR - 9	90.00			
	SECTOR-1A	33.00			
	TOTAL	123.00			
4.13 (b)	32mm diameter pipe		Metr e	166.67	20499.98
	SECTOR - 9	90.00			
	SECTOR-1A	33.00			
	TOTAL	123.00			
4.13 (c)	40mm diameter pipe		Metr e	168.80	6751.80
	SECTOR - 9	20.00			
	SECTOR-1A	20.00			
	TOTAL	40.00			
4.13 (d)	50 mm diameter pipe		Metr e	175.13	7005.24
	SECTOR - 9	20.00			
	SECTOR-1A	20.00			
	TOTAL	40.00			
4.13 (e)	65 mm diameter pipe		Metr e	276.41	5528.16
	SECTOR - 9	10.00			
	SECTOR-1A	10.00			
	TOTAL	20.00			
4.13 (f)	80 mm diameter pipe		Metr e	284.82	5696.46
	SECTOR - 9	10.00			
	SECTOR-1A	10.00			
	TOTAL	20.00			
4.13 (g)	100 mm diameter pipe		Metr e	301.70	6034.05
	SECTOR - 9	10.00			
	SECTOR-1A	10.00			
	TOTAL	20.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
4.14	Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (New work) :				
	15 mm nominal bore				
4.14 (a)	SECTOR - 9	9.00	Each	259.68	3116.12
	SECTOR-1A	3.00			
	TOTAL	12.00			
	20 mm nominal bore				
4.14 (b)	SECTOR - 9	9.00	Each	286.16	3433.91
	SECTOR-1A	3.00			
	TOTAL	12.00			
	25 mm nominal bore				
4.14 (c)	SECTOR - 9	12.00	Each	365.66	6581.82
	SECTOR-1A	6.00			
	TOTAL	18.00			
	32 mm nominal bore				
4.14 (d)	SECTOR - 9	12.00	Each	405.36	6891.04
	SECTOR-1A	5.00			
	TOTAL	17.00			
	40 mm nominal bore				
4.14 (e)	SECTOR - 9	10.00	Each	517.97	6733.58
	SECTOR-1A	3.00			
	TOTAL	13.00			
	50 mm nominal bore				
4.14 (f)	SECTOR - 9	10.00	Each	699.63	9095.23
	SECTOR-1A	3.00			
	TOTAL	13.00			
	65 mm nominal bore				
4.14 (g)	SECTOR - 9	11.00	Each	984.41	12797.28
	SECTOR-1A	2.00			
	TOTAL	13.00			
	80 mm nominal bore				
4.14 (h)	SECTOR - 9	1.00	Each	1050.64	2101.28
	SECTOR-1A	1.00			
	TOTAL	2.00			
4.15	Providing and placing on terrace (at all floor levels) polyethylene water storage tank , IS : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.				
	SECTOR - 9	42000.00		9.60	773041.50

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	38500.00	Per litre		
	TOTAL	80500.00			
4.16	Providing and fixing C.P. brass bib cock of approved quality conforming to IS:8931 :				
	15mm nominal bore (Basic rate of Bib Cock= Rs. 300/- each. Excluding GST)				
	SECTOR - 9	2.00	Each	429.86	1719.43
	SECTOR-1A	2.00			
TOTAL	4.00				
4.17	Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standards and weighing not less than 690 gms.				
	15mm nominal bore (Basic rate of Long Bib Cock= Rs. 500/- each. Excluding GST)				
	SECTOR - 9	98.00	Each	701.32	79950.02
	SECTOR-1A	16.00			
TOTAL	114.00				
4.18	Providing and fixing C.P. brass angle valve for basin mixture and geyser points of approved quality confirming to IS: 8931.				
	SECTOR - 9	1120.00	Each	495.35	645931.84
	SECTOR-1A	184.00			
TOTAL	1304.00				
4.19	Providing and fixing C.I. double acting air valve of approved quality with bolts, nuts, rubber insertions etc. complete (The tail pieces, tapers etc if required will be paid separately) :				
	50 mm dia				
	SECTOR - 9	22.00	Each	5120.03	163841.04
	SECTOR-1A	10.00			
TOTAL	32.00				
4.20	Providing and fixing enclosed type water meter (bulk type) conforming to IS : 2373 and tested by Municipal Board complete with bolts, nuts, rubber insertions etc. (The tail pieces if required will be paid separately) :				
	100 mm dia nominal bore				
	SECTOR - 9	2.00	Each	4945.94	14837.82
SECTOR-1A	1.00				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	3.00			
4.21	Providing and laying D.I. specials of class K-12 suitable for push-on jointing as per IS : 9523 :				
	Up to 600 mm dia				
	SECTOR - 9	2.00	Quintal	16984.34	42460.85
	SECTOR-1A	0.50			
TOTAL	2.50				
4.22	Providing push-on-joints to Centrifugally (Spun) Cast Iron Pipes or Ductile Iron Pipes including testing of joints and the cost of rubber gasket :				
	100 mm dia pipes				
	SECTOR - 9	67.00	Joint	95.19	8281.40
	SECTOR-1A	20.00			
TOTAL	87.00				
4.23	Providing and laying Double Flanged (Screwed/ Welded) Centrifugally (Spun) Ductile Iron Pipes of Class K - 9 conforming to IS : 8329 :				
	100 mm dia Ductile Iron Double Flanged				
	SECTOR - 9	200.00	Metre	1526.18	396807.84
	SECTOR-1A	60.00			
TOTAL	260.00				
4.24	Cutting holes up to 15x15 cm in R.C.C. floors and roofs for passing drain pipe etc. and repairing the hole after insertion of drain pipe etc. with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including finishing complete so as to make it leak proof.				
	SECTOR - 9	50.00	Each	373.33	25013.04
	SECTOR-1A	17.00			
	TOTAL	67.00			
4.25	Making hole up to 20x20 cm and embedding pipes up to 150 mm diameter in masonry and filling with cement concrete 1:3:6 (1 cement : 3 coarse sand 6 graded stone aggregate 20 mm nominal size) including disposal of malba.				
	SECTOR - 9	50.00	Metre	196.42	11784.96
	SECTOR-1A	10.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	60.00			
4.26	Disinfecting C.I. water mains by flushing with water containing bleaching powder @ 0.5 gms per litre of water and cleaning the same with fresh water, operation to be repeated three times including getting the sample of water from the disinfected main tested in the municipal laboratory.				
	100 mm diameter C.I. pipe				
	SECTOR - 9	2.00	Metr e	1976.54	5929.61
	SECTOR-1A	1.00			
	TOTAL	3.00			
4.27	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc.				
	Internal work - Exposed on Wall				
	65 mm diameter pipe				
4.27 (a)	SECTOR - 9	260.00	Metr e	1020.69	296000.10
	SECTOR-1A	30.00			
	TOTAL	290.00			
	80 mm diameter pipe				
4.27 (b)	SECTOR - 9	0.00	Metr e	1195.92	5979.60
	SECTOR-1A	5.00			
	TOTAL	5.00			
4.28	Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work.				
	65 mm diameter pipe				
4.28 (a)	SECTOR - 9	260.00	Metr e	52.47	15216.30
	SECTOR-1A	30.00			
	TOTAL	290.00			
	80 mm diameter pipe				
4.28 (b)	SECTOR - 9	0.00	Metr e	59.40	297.00
	SECTOR-1A	5.00			
	TOTAL	5.00			
4.29	Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (New work).				
4.29	100 mm nominal bore				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
(a)	SECTOR - 9	2.00	Each	1241.46	2482.92
	SECTOR-1A	0.00			
	TOTAL	2.00			
4.30	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end). 15mm nominal bore				
4.30 (a)	SECTOR - 9	554.00	Each	550.44	353932.92
	SECTOR-1A	89.00			
	TOTAL	643.00			
4.31	Butterfly valve (manual) with C.I body SS disc nitrile sheet & O ring & PN 16 Pressure rating as specified 100 mm nominal bore 80 mm dia.		Each	2984.85	11939.40
	SECTOR - 9	2.00			
	SECTOR-1A	2.00			
	TOTAL	4.00			
4.31	Non - return valve with dual plate of CI Body SS plates vulcanized NBR seal flanged end & PN 16 rating as specified. 65mm dia.		Each	2849.22	5698.44
4.31 (a)	SECTOR - 9	1.00			
	SECTOR-1A	1.00			
	TOTAL	2.00			
4.31 (b)	80 mm dia.		Each	3107.61	6215.22
	SECTOR - 9	1.00			
	SECTOR-1A	1.00			
4.32 (a)	Providing & fixing CI 'Y' Strainer (screwed/ flanged) with stainless steel fine wire mesh perforated sheet basket with necessary flange/ unions nuts, bolts and washers complete as required. 65mm nominal bore- Basic rate of 65mm nominal bore Y Strainer= Rs.6417/- each. Excluding GST		Each	8545.68	188004.96
	SECTOR - 9	19.00			
	SECTOR-1A	3.00			
4.32	TOTAL	22.00			
4.32	80mm nominal bore				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
(b)	Basic rate of 80mm nominal bore Y Strainer= Rs.7286/- each. Excluding GST				
	SECTOR - 9	1.00			
	SECTOR-1A	1.00			
	TOTAL	2.00	Each	9703.98	19407.96
4.33	Providing and fixing M.S fabricated hot dipped galvanized coating puddle flange comprising of 600 mm dia long M.S class 'B' pipe (screwed end up to 50 mm & flange for more than 50 mm dia) with 6 mm thick M.S plates of required size including cutting holes in centre of plate, inserting pipe & making welded (Arc) joint complete. Same shall be installed with TEC welded joint in position with reinforcement bars of RCC tank wall/slab including making cutout in shuttering during concrete casting of tank of following diameter. (Location: Underground / Overhead Tanks.)				
4.33 (a)	25mm dia pipe, 750mm long with size of 250x250x6 mm MS plate				
	SECTOR - 9	18.00			
	SECTOR-1A	8.00			
	TOTAL	26.00	Each	767.25	19948.50
4.33 (b)	32mm dia pipe, 750mm long with size of 250x250x6 mm MS plate				
	SECTOR - 9	12.00			
	SECTOR-1A	2.00			
	TOTAL	14.00	Each	804.87	11268.18
4.33 (c)	40mm dia pipe, 750mm long with size of 300x300x6 mm MS plate				
	SECTOR - 9	4.00			
	SECTOR-1A	4.00			
	TOTAL	8.00	Each	859.32	6874.56
4.33 (d)	50mm dia pipe, 750mm long with size of 350x350x6 mm MS plate				
	SECTOR - 9	34.00			
	SECTOR-1A	4.00			
	TOTAL	38.00	Each	1148.40	43639.20
4.33 (e)	65mm dia pipe, 750mm long with size of 350x350x6 mm MS plate				
	SECTOR - 9	22.00			
	SECTOR-1A	2.00			
	TOTAL	24.00	Each	2111.67	50680.08
4.33 (f)	80mm dia pipe, 600mm long with size of 400x400x6 mm MS plate				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR - 9	34.00			
	SECTOR-1A	4.00			
	TOTAL	38.00	Each	2570.04	97661.52
4.33 (g)	100mm dia pipe, 600mm long with size of 400x400x6 mm MS plate				
	SECTOR - 9	86.00			
	SECTOR-1A	8.00			
	TOTAL	94.00	Each	2958.12	278063.28
4.33 (h)	150mm dia pipe, 600mm long with size of 450x450x6 mm MS plate				
	SECTOR - 9	6.00			
	SECTOR-1A	6.00			
	TOTAL	12.00	Each	3490.74	41888.88
4.33 (i)	200mm dia pipe, 600mm long with 6 mm MS plate of size 600mm dia				
	SECTOR - 9	2.00			
	SECTOR-1A	2.00			
	TOTAL	4.00	Each	4812.39	19249.56
4.34	Providing, laying and joining in position HDPE pipes with slipon flange, High density Poly Ethylene pipe and conforming to I.S. 4984-1995 of required grade / class, 16kg/sq.cm pressure and suitable for the respective working pressures with all fittings and specials, e.g. couplings, tees, bends, reducers, screwed adapters, flanged tail pieces, etc., jointing as per manufacturers recommendations, all complete including trenching, backfilling & pressure testing etc. (For Domestic, Flushing, Soft water riser & Tubewell).				
4.34 (a)	25 mm dia. (OD) (16.0 kgf/sq cm.)				
	SECTOR - 9	225.00			
	SECTOR-1A	160.00			
	TOTAL	385.00	Metre	224.73	86521.05
4.34 (b)	32 mm dia. (OD) (16.0 kgf/sq cm.)				
	SECTOR - 9	215.00			
	SECTOR-1A	60.00			
	TOTAL	275.00	Metre	275.22	75685.50
4.34 (c)	40 mm dia. (OD) (16.0 kgf/sq cm.)				
	SECTOR - 9	45.00			
	SECTOR-1A	70.00			
	TOTAL	115.00	Metre	356.40	40986.00
4.34 (d)	50 mm dia. (OD) (16.0 kgf/sq cm.)				
	SECTOR - 9	50.00		467.28	51400.80

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	60.00	Metre		
	TOTAL	110.00			
4.34 (e)	63 mm dia. (OD) (16.0 kgf/sq cm.)				
	SECTOR - 9	20.00	Metre	678.15	44079.75
	SECTOR-1A	45.00			
	TOTAL	65.00			
4.34 (f)	90 mm dia. (OD) (16.0 kgf/sq cm.)				
	SECTOR - 9	975.00	Metre	1177.11	1206537.75
	SECTOR-1A	50.00			
	TOTAL	1025.00			
4.34 (g)	110 mm dia. (OD) (16.0 kgf/sq cm.)				
	SECTOR - 9	55.00	Metre	1665.18	91584.90
	SECTOR-1A	0.00			
	TOTAL	55.00			
4.35	SOLAR WATER HEATING SYSTEM FOR PREHEATING -500 LPD				
	Supplying, Installing, Testing and Commissioning of 500 LPD Solar Water Heating System capable of generating 500 litres of hot water per day at 40 - 45 deg C as per the following specifications including integration with the Separate Hot Water Mixing Tank.				
	Solar Collector Panels — 5Nos. (Minimum) BIS/ISI marked Flat Plate Solar Collectors Panels with 2 Sq.m. absorbing area for each panel, 0.95 absorptivity factor, 0.1 Emittance Factor, constructed of non corrosive materials and totally sealed outer casing (no ingress of water).				
	Supply, installation, testing & commissioning of SS 304 horizontal / Vertical hot water storage tank with 5 mm thickness (Capacity 500 Lts) suitable for minimum 3.5 Kg /Sq.cm operating pressure. Tank shall be provided with hot water flow meter at inlet (approved by department of weights and measures), inlet / outlet, overflow / drain connection with MH and cover (550 mm ID) Vent, pressure gauge outlet with isolation cock, thermometer. All the valves & accessories shall be suitable for an operating pressure as mentioned above. The tank shall have an provision of electrical booster inside the tank. Tank shall be mounted on 450 mm high steel structural supports with GI access ladder . (Inlet temperature to hot				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	water storage tank 55-60 deg C) with having defrosting provision.				
	Tank shall be insulated with 13 mm thk Nitrile Insulation with Chlorofluorocarbon (CFC Free) as per specification, including 24 gauge aluminium cladding. The flanges shall be of SS 304 with dimensions confirming to ANSI, B 16.5 No. 150. The nozzles shall be SS ERW pipes. (Tank shall be fabricated as per unfired pressure vessel code IS 2825-1969). The tank shall be provided with following:				
	Hot water mixing tank complete with insulation & MS supporting structure with GI access ladder duly paint with red oxide.				
	Solar Water Heating System as Describe Above				
	Basic Rate Solar Water Heating System - 500 LPD = Rs 1,50,000/- per set. Excluding GST				
	SECTOR - 9	28.00			
	SECTOR-1A	4.00			
	TOTAL	32.00	Set	213275.00	6824800.00
4.36	Supplying and fixing in position of approved quality Solenoid Valve with bypass arrangement, isolation cock etc. complete with all required accessories such as level sensor, level indicator, level controller and required cabling for the same.				
4.36 (a)	25 mm dia				
	SECTOR - 9	12.00			
	SECTOR-1A	8.00	Each	4112.46	82249.20

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	20.00			
4.36 (b)	32 mm dia				
	SECTOR - 9	10.00	Each	5255.91	63070.92
	SECTOR-1A	2.00			
	TOTAL	12.00			
4.37	Providing and fixing water meter with direct reading dial in "KL" with all internal parts in gunmetal , strainer, flanged distance piece for easy removal in future, 100 mm dia Bourden type pressure guage and isolation cock including necessary test certificate for the meter. (For water supply metering from source).				
4.37 (a)	25 mm dia		Each	4450.05	89001.00
	SECTOR - 9	12.00			
	SECTOR-1A	8.00			
	TOTAL	20.00			
4.37 (b)	32 mm dia		Each	10886.04	130632.48
	SECTOR - 9	10.00			
	SECTOR-1A	2.00			
	TOTAL	12.00			
	WATER SUPPLY WORKS SUB HEAD TOTAL for sector 9 & sector 1A				19375780.96
5	SUB HEAD : V:- DRAINAGE				
5.1	Providing and laying cement concrete 1:5:10 (1 cement: 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) all-round HDPE pipes/ RCC pipes/S.W. pipes including bed concrete as per standard design:				
5.1 (a)	150 mm diameter HDPE pipe/ RCC pipe / S. W. pipe		Metr e	1084.20	151787.79
	SECTOR - 9	100.00			
	SECTOR-1A	40.00			
	TOTAL	140.00			
5.1 (b)	200 mm diameter HDPE pipe/ RCC pipe / S. W. pipe		Metr e	1263.93	208548.95
	SECTOR - 9	125.00			
	SECTOR-1A	40.00			
	TOTAL	165.00			
5.1 (c)	250 mm diameter HDPE pipe/ RCC pipe / S. W. pipe				
	SECTOR - 9	75.00		1461.59	146158.65

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	25.00	Metre		
	TOTAL	100.00			
5.2	Providing and laying cement concrete 1:5:10 (1 cement: 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) up to haunches of HDPE pipes/ RCC pipes/S.W. pipes including bed concrete as per standard design :				
	150 mm diameter HDPE pipe/ RCC pipe / S. W. pipe				
5.2 (a)	SECTOR - 9	1360.00	Metre	682.85	1140363.68
	SECTOR-1A	310.00			
	TOTAL	1670.00			
5.2 (b)	200 mm diameter HDPE pipe/ RCC pipe / S. W. pipe		Metre	802.69	830786.22
	SECTOR - 9	720.00			
	SECTOR-1A	315.00			
	TOTAL	1035.00			
5.2 (c)	250 mm diameter HDPE pipe/ RCC pipe / S. W. pipe		Metre	934.46	299027.52
	SECTOR - 9	220.00			
	SECTOR-1A	100.00			
	TOTAL	320.00			
5.2 (d)	300 mm diameter HDPE pipe/ RCC pipe / S. W. pipe		Metre	1078.21	280334.34
	SECTOR - 9	210.00			
	SECTOR-1A	50.00			
	TOTAL	260.00			
5.3	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design :				
	180 x 150mm size P-type				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	64.00	Each	2508.66	228288.06
	SECTOR-1A	27.00			
TOTAL	91.00				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
5.4	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :				
	450mm dia RCC pipe				
	SECTOR - 9	50.00	Metre	1466.73	73336.73
	SECTOR-1A	0.00			
TOTAL	50.00				
5.5	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 coarse sand (zone- III) : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand (zone- III) : 8 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design :				
	Inside size 90 x 80 cm and 45 cm deep including CI cover with frame (light duty) 455 x 610mm internal dimensions total weight of cover and frame to be not less than 38 Kg. (weight of cover 23 Kg. and weight of frame 15 Kg.), with FPS bricks with class designation 7.5				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	79.00	Each	11570.23	1284295.42
	SECTOR-1A	32.00			
	TOTAL	111.00			
5.6	Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500 mm internal diameter, total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg) :				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	19.00	Each	24161.84	579884.18
	SECTOR-1A	5.00			
TOTAL	24.00				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
5.7	Extra for depth for manholes:				
	Size 90 x 80 cm				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	21.00	Metre	8046.18	233339.09
	SECTOR-1A	8.00			
TOTAL	29.00				
5.8	Size 120x90 cm				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	2.00	Metre	9646.81	19293.62
	SECTOR-1A	0.00			
TOTAL	2.00				
5.9	Constructing brick masonry circular type manhole 0.91 m internal dia at bottom and 0.56m dia at top in cement mortar 1:4 (1 cement :4 coarse sand), in side cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement, foundation concrete 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size), and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement, all complete as per standard design :				
	0.91 m deep with S.F.R.C. cover and frame (heavy duty, HD-20 grade designation) 560 mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182 kg., fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including centering, shuttering all complete. (Excavation, foot rests and 12mm thick cement plaster at the external surface shall be paid for separately):				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	50.00	Each	11767.59	706055.13
	SECTOR-1A	10.00			
TOTAL	60.00				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
5.10	Extra depth for circular type manhole 0.91m internal dia (at bottom) beyond 0.91 m to 1.67 m				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	20.00	Metre	6916.93	152172.50
	SECTOR-1A	2.00			
TOTAL	22.00				
5.11	Constructing brick masonry circular manhole 1.22m internal dia at bottom and 0.56m dia at top in cement mortar 1:4 (1 cement :4 coarse sand) inside cement plaster 12mm thick with cement mortar 1:3 (1 cement :3 coarse sand) finished with a floating coat of neat cement foundation concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement, all complete as per standard design :				
	1.68 m deep with SFRC Cover and frame (heavy duty HD-20 grade designation) 560mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182kg. fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) including centering, shuttering all complete. (Excavation, foot rests and 12 mm thick cement plaster at the external surface shall be paid for separately) :				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	15.00	Each	22722.43	431726.18
	SECTOR-1A	4.00			
TOTAL	19.00				
5.12	Extra depth for circular type manhole 1.22m internal dia (at bottom) beyond 1.68 m to 2.29 m :				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	5.00	Metre	8977.67	53866.00
	SECTOR-1A	1.00			
TOTAL	6.00				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
5.13	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per design.				
	SECTOR - 9	446.00			
	SECTOR-1A	88.00			
	TOTAL	534.00	Each	482.23	257510.29
5.14	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of required shape and approved quality				
	HD - 20				
	Circular shape 560 mm internal diameter				
	SECTOR - 9	32.00			
	SECTOR-1A	13.00			
TOTAL	45.00	Each	1479.26	66566.61	
5.15	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) cement plastered on both sides with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement and making necessary channels for the drain etc. complete :				
	For pipes 100 to 250 mm diameter				
	SECTOR - 9	2.00			
	SECTOR-1A	2.00			
TOTAL	4.00	Each	676.86	2707.45	
5.15 (b)	For pipes 350 to 450 mm diameter				
	SECTOR - 9	2.00	Each	1123.30	2246.61

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	0.00			
	TOTAL	2.00			
5.16	Constructing brick masonry road gully chamber 50x45x60cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450mm precast RCC horizontal grating with frame complete as per standard design.				
	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
	SECTOR - 9	125.00			
	SECTOR-1A	46.00			
	TOTAL	171.00	Each	5533.56	946237.99
5.17	Providing, laying and joining in position HDPE DWC (Double Wall Corrugated) and conforming to I.S. 16098 of required grade SN-4/SN-8 and suitable for the respective working pressures with all fittings and specials, e.g. couplings, tees, bends, reducers, screwed adapters, flanged tail pieces, etc., jointing as per manufacturers recommendations, all complete including trenching, backfilling & pressure testing etc. (For Sewer & Storm water line).				
5.17 (a)	150 mm dia (SN-4)				
	SECTOR - 9	1360.00			
	SECTOR-1A	310.00			
	TOTAL	1670.00	Metre	621.72	1038272.40
5.17 (b)	200 mm dia (SN-4)				
	SECTOR - 9	720.00			
	SECTOR-1A	315.00			
	TOTAL	1035.00	Metre	774.18	801276.30
5.17 (c)	250 mm dia (SN-4)				
	SECTOR - 9	20.00			
	SECTOR-1A	100.00			
	TOTAL	120.00	Metre	1063.26	127591.20
5.17 (d)	300 mm dia (SN-4)				
	SECTOR - 9	20.00			
	SECTOR-1A	50.00			
	TOTAL	70.00	Metre	1517.67	106236.90
5.17 (e)	250 mm dia (SN-8)				
	SECTOR - 9	200.00			
	SECTOR-1A	0.00			
	TOTAL	200.00	Metre	1352.34	270468.00

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
5.17 (f)	300 mm dia (SN-8)				
	SECTOR - 9	190.00	Metre	1916.64	364161.60
	SECTOR-1A	0.00			
	TOTAL	190.00			
5.18	Providing and fixing F.R.P. Grating drain cover M.S. Angle (35 x35 x 5 mm). (Load Bearing cap. 5 T, suitable for car parking, basement, Pump room, Parking Area).				
5.18 (a)	377mm wide and 30mm thick				
	SECTOR - 9	10.00	Metre	3936.24	78724.80
	SECTOR-1A	10.00			
	TOTAL	20.00			
DRAINAGE WORKS SUB HEAD TOTAL for sector 9 & sector 1A					10881264.19
6	SUB HEAD : VI:- EARTH WORK, CONCRETE WORK & TUBEWELL				
6.1	Excavating trenches of required width for pipe, cables etc including excavation for sockets ,& dressing of sides ,ramming of bottoms ,depth upto 1.5m including getting out the excavated soil,& then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming ,watering, etc and disposing of surplus excavated soil as directed, within lead of 50m.				
	All kinds of soil				
	Pipes, cables etc exceeding 80 mm dia but not exceeding 300 mm dia				
	SECTOR - 9	1725.00	Metre	413.18	946174.19
	SECTOR-1A	565.00			
	TOTAL	2290.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
6.2	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, depth upto 1.5 m, including getting out the excavated materials, returning the soil as required in layers not exceeding 20 cm in depth including consolidating each deposited layers by ramming, watering, etc. and stacking serviceable material for measurements and disposal of unserviceable material for measurement and disposal of unserviceable material as directed within a lead of 50m:				
	Ordinary rock				
	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia				
	SECTOR - 9	775.00	Metre	924.02	914776.34
	SECTOR-1A	215.00			
TOTAL	990.00				
6.3	Earth Work in excavation by mechanical means (Hydraulic / excavator) manual means over area (exceeding 30 cm in depth ,1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50m and lift upto 1.5m, as directed as engineer incharge.				
	Ordinary Rock				
	SECTOR - 9	262.00	Cum	408.82	123054.97
	SECTOR-1A	39.00			
TOTAL	301.00				
6.4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :				
	"1:2:4 (1 cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 20 mm nominal size).				
	SECTOR - 9	4.00	Cum	7291.50	43748.99
	SECTOR-1A	2.00			
TOTAL	6.00				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
6.5	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer –in-charge, upto 90 metre depth below ground level.				
	All types of soil				
	400 mm dia.				
	SECTOR - 9	160.00	Metre	820.56	196934.76
	SECTOR-1A	80.00			
TOTAL	240.00				
6.6	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer –in-charge.				
	200 mm nominal size dia.				
	SECTOR - 9	120.00	Metre	961.59	173085.66
	SECTOR-1A	60.00			
TOTAL	180.00				
6.7	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
	200 mm nominal size dia.				
	SECTOR - 9	40.00	Metre	1088.26	65295.45
	SECTOR-1A	20.00			
TOTAL	60.00				
6.8	Gravel packing in tubewell construction in accordance with IS: 4097, including providing gravel fine/ medium/ coarse, in required grading & sizes as per actual requirement, all complete as per direction of Engineer-in-charge.				
	SECTOR - 9	40.00	Cum	1482.28	88936.65
	SECTOR-1A	20.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	60.00			
6.9	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water samples & getting tested in approved laboratory, i/c disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.				
	SECTOR - 9	48.00			
	SECTOR-1A	24.00			
	TOTAL	72.00	Hour	907.63	65349.50
6.10	Providing and fixing suitable size threaded mild steel cap/shoe or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for borewell of: 200 mm dia				
	SECTOR - 9	2.00			
	SECTOR-1A	1.00			
	TOTAL	3.00	Each	278.14	834.42
6.11	Providing and fixing M.S. clamp of required dia to the top of casing/ housing pipe of tubewell as per IS: 2800 (part I), including necessary bolts & nuts of required size complete. 200 mm clamp.				
	SECTOR - 9	2.00			
	SECTOR-1A	1.00			
	TOTAL	3.00	Each	1808.73	5426.19
6.12	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I). 200 mm dia				
	SECTOR - 9	2.00			
	SECTOR-1A	1.00	Each	305.46	916.39

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	3.00			
6.13	Butterfly valve (manual) with C.I body SS disc nitrile sheet & O ring & PN 16 Pressure rating as specified.				
	80 mm dia.				
	SECTOR - 9	2.00	Each	2984.85	8954.55
	SECTOR-1A	1.00			
TOTAL	3.00				
6.14	Non - return valve with dual plate of CI Body SS plates vulcanized NBR seal flanged end & PN 16 rating as specified.				
	80 mm dia.				
	SECTOR - 9	2.00	Each	3107.61	9322.83
	SECTOR-1A	1.00			
TOTAL	3.00				
6.15	Providing and fixing 80mm dia GI pipes to IS:1239 heavy class with fittings.				
	SECTOR - 9	160.00	Metre	1339.47	321472.80
	SECTOR-1A	80.00			
TOTAL	240.00				
6.16	Supply, Lowering, installation & testing of KSB make submersible pumping set with 10 HP motor 18 stage pump suitable for maximum capacity of 20 m3 hr. at 100 mtr. Head respectively. With Three Phase.				
	SECTOR - 9	2.00	Each	84242.07	252726.21
	SECTOR-1A	1.00			
	TOTAL	3.00			
6.17	Providing & fixing cable Cooper Cable 3x6 sq.mm. From submersible pump to panel board.				
	SECTOR - 9	200.00	Metre	151.47	45441.00
	SECTOR-1A	100.00			
TOTAL	300.00				
6.18	Providing & fixing Panel Board for submersible pump fitted with DOL starter ammeter, voltmeter single phase preventer standard/indo/cop make MCB of off switch push bottom duly wired and made out of 16/18 SWG sheet.				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR – 9	2.00	Each	21063.00	63189.00
	SECTOR-1A	1.00			
	TOTAL	3.00			
	EARTH WORK, CONCRETE WORK & TUBEWELL WORKS SUB HEAD TOTAL for sector 9 & sector 1A				3325822.69
7	SUB HEAD: VII:- RAIN WATER HARVESTING				
7.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth. 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.				
	All kinds of soil				
	SECTOR – 9	300.00	Cum	203.40	122037.30
	SECTOR-1A	300.00			
	TOTAL	600.00			
7.2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.				
	SECTOR - 9	300.00	Cum	251.41	150846.30
	SECTOR-1A	300.00			
	TOTAL	600.00			
7.3	Extra for every additional lift of 1.5 m or part thereof in.				
	All kinds of soil.				
	SECTOR - 9	60.00	Cum	103.46	12414.60
	SECTOR-1A	60.00			
	TOTAL	120.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
7.4	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete.				
	Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				
	All works upto plinth level				
	Concrete of M30 grade with minimum cement content of 350 kg /cum				
	SECTOR - 9	50.00	Cum	8513.36	851335.65
	SECTOR-1A	50.00			
	TOTAL	100.00			
7.5	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves,chajjas, lintels, bands, plain window sills, staircases and spiral stair cases up to floor five level excluding the cost of centering, shuttering, finishing & reinforcement with 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size)				
	SECTOR - 9	30.00	Cum	10612.1 1	636726.42
	SECTOR-1A	30.00			
	TOTAL	60.00			
7.6	Centring and shuttering including stutting, propping etc. and removal of form for:				
	Suspended floors, roofs, landings, balconies and access platform				
	SECTOR - 9	30.00	Sqm	758.88	

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	30.00			
	TOTAL	60.00			45533.07
7.7	Steel reinforcement for R.C.C. work including supplying, straightening, cutting, bending, placing in position and binding with GI binding wires (18 gauge) all complete above plinth level.				
	Thermo-Mechanically Treated bars.				
	SECTOR - 9	120.00			
	SECTOR-1A	120.00			
	TOTAL	240.00	Kg	88.75	21300.84
7.8	Providing and doing Brick masonry work with common burnt clay modular bricks of class designation 7.5 in foundation and plinth in:				
	Cement mortar 1:6 (1 cement : 6 coarse sand)				
	SECTOR - 9	20.00			
	SECTOR-1A	20.00			
	TOTAL	40.00	Cum	6591.67	263666.70
7.9	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS: 10910 on 12mm dia steel bar conforming to IS :1786 having minimum cross section as 23 mm x 25 mm and over all minimum length 263mm and width as 165mm with minimum 112mm space between protruded legs having 2mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and heaving manufactures permanent identification mark to be visible even after fixing " including fixing in manholes with 30x20x15 cm cement concrete block 1:2:4 (1 cement :2 coarse sand :4 graded stone aggregate 20mm nominal size)complete as per design.				
	SECTOR - 9	60.00			
	SECTOR-1A	60.00			
	TOTAL	120.00	Each	482.23	57867.48

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
7.10	Providing and fixing in position precast RCC manhole cover and frame of required shape and approved quality.				
	HD-20 circular shape 560 mm internal diameter.				
	SECTOR - 9	4.00	Each	1479.26	11834.06
	SECTOR-1A	4.00			
TOTAL	8.00				
7.11	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer –in-charge, upto 90m depth below ground level.				
	All types of soil				
	400 mm dia.				
	SECTOR - 9	80.00	Metre	820.56	131289.84
	SECTOR-1A	80.00			
	TOTAL	160.00			
7.12	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer –in-charge.				
	200 mm nominal size dia.				
	SECTOR - 9	60.00	Metre	961.59	115390.44
	SECTOR-1A	60.00			
	TOTAL	120.00			
7.13	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
	200 mm nominal size dia.				
	SECTOR - 9	20.00	Metre	1088.26	43530.30
	SECTOR-1A	20.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	40.00			
7.14	Supplying, filling, spreading & levelling stone boulders of size range 5 cm to 20 cm, in recharge pit, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.				
	SECTOR - 9	20.00	Cum	1289.28	51571.08
	SECTOR-1A	20.00			
	TOTAL	40.00			
7.15	Supplying, filling, spreading & levelling gravels of size range 5 mm to 10 mm, in the recharge pit, over the existing layer of boulders, in required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.				
	SECTOR - 9	30.00	Cum	1295.91	77754.60
	SECTOR-1A	30.00			
	TOTAL	60.00			
7.16	Supplying, filling, spreading & levelling coarse sand of size range 1.5 mm to 2 mm in recharge pit, in required thickness over gravel layer, for all leads & lifts, all complete as per direction of Engineer –in-charge.				
	SECTOR - 9	20.00	Cum	1295.91	51836.40
	SECTOR-1A	20.00			
	TOTAL	40.00			
7.17	Gravel packing in tubewell construction in accordance with IS: 4097, including providing gravel fine/ medium/ coarse, in required grading & sizes as per actual requirement, all complete as per direction of Engineer-in-charge.				
	SECTOR - 9	24.00	Cum	1464.46	70293.96
	SECTOR-1A	24.00			
	TOTAL	48.00			
7.18	Providing and fixing suitable size threaded mild steel cap/shoe or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for borewell of: 200 mm dia				
	SECTOR - 9	8.00	Each	278.14	
	SECTOR-1A	8.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	16.00			4450.25
7.19	Providing and fixing M.S. clamp of required dia to the top of casing/ housing pipe of tubewell as per IS: 2800 (part I), including necessary bolts & nuts of required size complete.				
	200 mm clamp.				
	SECTOR - 9	4.00	Each	1808.73	14469.84
	SECTOR-1A	4.00			
TOTAL	8.00				
	RAIN WATER HARVESTING WORKS SUB HEAD TOTAL for sector 9 & sector 1A				2734149.13
8	SUB HEAD: VIII:-SEWAGE TREATMENT PLANT (STP)				
8.1	Design, Supplying, of Sewage Treatment Plant capacity 120 KLD in Sector 9 & 15 KLD in Sector 1A .(excluding excavation, back filling & disposal of surplus earth /Civil construction work) for the following duty:				
	Nature of effluent - Residential Buildings Sewage from Toilet use , kitchen waste and other areas of office buildings.				
	Incoming parameters:				
	pH - 6 - 8.5				
	BOD5 - upto 250-350 Mg/L				
	S. Solids - 250 - 400 Mg/L				
	COD - upto 450-600 Mg/L				
	Oil & Grease - 50-100 Mg / L				
	Final effluent discharge standard after treatment				
	pH - 6.0 - 8 6-8	After UF			
	BOD5 - Less than 10 Mg/L	After UF <4			
	S. Solids - Less than 30 Mg/L	After UF <2			
	COD - Less than 60 Mg/L	After UF <30			
Oil & Grease - Less than 5 Mg/L	After UF <Nil				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
8.1 (a)	Supply of 2 Nos Manual Stainless Steel Bar Screen with suitable lifting arrangement for required sizes (size 1000 mm wide x 1000 mm high) approx.				
	SECTOR - 9	2.00			
	SECTOR-1A	2.00		16421.1	
	TOTAL	4.00	Nos	3	65684.52
8.1 (b)	Supply, installation, testing & commissioning of electronic type level indicator and controller for automatic operation of the system with high/low level alarm complete with auxiliary NO/NC contacts. Make: Status/Active control				
	SECTOR - 9	1.00			
	SECTOR-1A	1.00		17376.4	
	TOTAL	2.00	Each	8	34752.96
8.2	Supply, installation, testing & commissioning of non clog open impeller type pumps, having CI casing & CI impeller complete with all accessories, motor of required capacity. Delivery header with isolation valve and NRV, lifting arrangement, pressure gauge on delivery line with isolation cock level controller with wiring to control the level of sump automatically. Pump shall have following duty for reference and vendor to confirm on design base.				
8.2 (a)					
8.2 (a) (i)	SECTOR - 9				
	Submersible Sewage Transfer Pumps 2 Nos. (1 Working + 1 Standby)				
	(Solid Handling Cap. 35 mm)				
	Flow rate (each) = 4 M ³ / Hr				
	Head = 10 Mtr				
	Make: Grundfoss/Wilo/KSB/CNP	1.00	Set	125531.00	125531.00
8.2 (a) (ii)	SECTOR-1A				
	Submersible Sewage Transfer Pumps 2 Nos. (1 Working + 1 Standby)				
	(Solid Handling Cap. 35 mm)				
	Flow rate (each) = 1.5 M ³ / Hr				
	Head = 10 Mtr				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Make: Grundfoss/Wilo/KSB/CNP	1.00	Set	89854.0 0	89854.00
8.2 (b)	Supply, installation, testing & commissioning of non clogging submersible type Return Activated Sludge Pumps and Secondary Activated pumps (RAS and SAS Pumps) having CI casing & CI impeller complete with and foundation bolt and lifting arrangement with all accessories, motor of required capacity. pressure gauge on delivery line with isolation cock, level controller to control the level of sump automatically. Pumps shall have following duty: Pumps 2 Nos. (1 Working + 1 Standby)				
	Cost shall be inclusive of PVC flexible Hose pipe (for piping submerged in effluent) with M S epoxy piping (for piping non-submerged in effluent)				
8.2 (b) (i)	SECTOR - 9 (Solid handling cap. 8.5 mm) Flow rate (each) = 4 M ³ / Hr Head = 12 Mtr Make: Grundfos/Wilo/KSB/CNP	1.00	Set	56332.0 0	56332.00
8.2 (b) (ii)	SECTOR-1A (Solid handling cap. 8.5 mm) Flow rate (each) = 1.5 m ³ / hr Head = 12 Mtr Make: Grundfos/Wilo/KSB/CNP	1.00	Set	43814.0 0	43814.00
8.3	Provision of guide ropes to guide submersible pump from upper level to operational level in sump basin with channels / angle section of MSEP shall be made by the STP contractor.				
	Air diffusion system shall include the following:				
8.3 (a)	SECTOR - 9	1.00	Lot	55768. 68	55768.68
8.3 (b)	SECTOR 1A	1.00	Lot	43375.8 6	43375.86

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
8.4	Twin type rotary air blowers 2 Nos. (1 W + 1 S) Capable of delivering 120 cum/hr (each) of free air at 0.6 kg/cm ² driven through "V" belt or directly coupled through flexible coupling to a TEFC motor of suitable HP Suitable for 415 ± 10% volts, 3 phase, 50 cycles a/c supply Make: Everest/Usha/ Airvac/Beta.				
8.4 (a)	SECTOR - 9	2.00	Each	156479.00	312958.00
8.4 (b)	SECTOR 1A	2.00	Each	62592.00	125184.00
8.5	Air piping shall comprise of pipes droppers/ laterals with M S (epoxy coated) Header complete with all fittings such as tees, crosses, plugs, sockets, elbows, reducers, supports & clamps, puddle flanges etc cutting chases & making good in Plant Room. All submerged piping will be SS-304.				
8.5 (a)	SECTOR - 9	1.00	Lot	167307.03	167307.03
8.5 (b)	SECTOR 1A	1.00	Lot	43375.86	43375.86
8.6	Non clog type air dispersion system capable of handling 3-5 cfm of air with oxygen transfer efficiency of 3-4% per/meter water depth. Air dispersion grid shall be assembled in modular form so that they can be replaced / repaired Fine /coarse aeration bubble diffusers as required. Make: Rahau /Jager				
	Air dispersion system shall be provided for Equalisation Tank, Sludge holding Tank and SBR reactor Tanks.				
8.6 (a)	For equalization tank -1 Nos.				
8.6 (a) (i)	SECTOR 9	1.00	Lot	30983.04	30983.04
8.6 (a) (ii)	SECTOR 1A	1.00	Lot	18589.23	18589.23
8.6 (b)	For sludge holding tank - 1 No.				
8.6 (b) (i)	SECTOR - 9	1.00	Lot	30983.04	30983.04

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
8.6 (b) (ii)	SECTOR-1A	1.00	Lot	18589.23	18589.23
8.6 (c)	SBR reactor tank- 1 No.				
8.6 (c) (i)	SECTOR - 9	1.00	Lot	80555.31	80555.31
8.6 (c) (ii)	SECTOR-1A	1.00	Lot	37179.45	37179.45
8.7	Supply of all piping (as described below) and isolation control valves for making the system complete.				
8.7	SS 304 : Submerged air piping Make Jindal Steel Ltd.				
8.7	MS Epoxy : Air piping, Filters & other Eqp. Make: Jindal Hissar/Prakash Surya				
8.7	PVC piping ASTM SCH 40 :Pumped effluent & tank overflow pipe line Make-Supreme/Finolex				
8.7 (a)	SECTOR - 9	1.00	Job	173504.43	173504.43
8.7 (b)	SECTOR 1A	1.00	Job	37179.45	37179.45
8.8	Supplying of Submersible Mixer in Equalization Tank 1 Nos.				
8.8	Capacity : suitable for 120 M ³ /day plant				
8.8	MOC :CI				
8.8	Make: Stormix/CNP				
8.8 (a)	SECTOR - 9	3.00	Each	92948.13	278844.39
8.8 (b)	SECTOR-1A	3.00	Each	43375.86	130127.58
8.9	Supply of motorized Moving Decanter to suit SBR tank with MOC SS-304 with scum guard and connected with ultrasonic level transmitter & ultrasonic level element for automatic control etc. complete as required. Make of Decanter : Premier Tech/C-Tech/BS Enviro				
8.9 (a)	SECTOR - 9	2.00	Each	557691.75	1115383.50

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
8.9 (b)	SECTOR-1A	2.00	Each	247863.33	495726.66
8.12	Supply of multitube type disinfection system comprising of U.V and U.F Reactor in a close circuit chamber with required no of lamps as per detail design on flow conditions with auto dosing controller, display monitor as per manufacturers requirement complete in all respects				
	SECTOR - 9				
8.12 (a)	Flow Rate = 4 M ³ / Hr				
	Make: Alfa & Qua	1.00	Set	111538.35	111538.35
	SECTOR-1A				
8.12 (b)	Flow Rate = 1.5 M ³ / Hr				
	Make: Alfa & Qua	1.00	Set	61966.08	61966.08
8.13	Supply of vertical inline multistage pumping set (Imported) with Stainless steel-304 body, Stainless steel-304 impeller, Stainless steel-304 casing, shaft of Stainless steel-316 and C.I. base & head with mechanical seal, connected to a TEFC induction motor suitable for 415+/-10% volts, 3 phase 50 cycles A.C. supply with 150 mm dia pressure gauge with gunmetal isolation cock, vibration eliminating pads under foundations, 80x40 mm I section base plate bolted to cement concrete foundations complete. Vendor to submit performance curves and technical catalogue of the proposed model for review and information. Make Grundfos/Wilo/KSB				
	Operation of pump shall be based on level controller proposed to be installed in tank as per site location. The contractor to ascertain the Head required for pumps as per site conditions and provide accordingly.				
	SECTOR - 9				
8.13 (a)	Capacity : 4 M ³ / Hr				
	Head : 25-30 M				
	No. of Pumps (1 working + 1 standby)	1.00	Set	162738.00	162738.00

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
8.13(b)	SECTOR-1A				
	Capacity : 1.5 M ³ / Hr				
	Head : 25-30 M				
	No. of Pumps (1 working + 1 standby)	1.00	Set	112665.00	112665.00
8.14	Supply of MSEP vessel filter with all necessary accessories. Filter shall be suitable for minimum working pressure of 5 kg / cm ² and shall include media, standard fittings like pressure gauges, sampling cock, rinse drain, vacuum breaker etc. The MS sheet thickness for shell shall be min. 8 mm and for dishes shall 10 mm. The internal surfaces of tank shall be treated with epoxy coating and external surface with primer and anticorrosive enamel paint (Min. 2 coats). with frontal piping shall be 100 mm dia MSEP along with valves PN 1.0, test cock, air inlet for back washing and pressure gauges at inlet and outlet.				
8.14(a)(i)	SECTOR 9				
	Multigrade Pressure Sand Filter				
	Flow Rate = 4 M ³ / Hr				
	Filtration velocity : 15 Cum/Hr/Sqm				
	Filter HOS : 1200 MM				
	Filter Diameter : 900 MM.	1.00	Each	210683.88	210683.88
8.14(a)(ii)	SECTOR 1A				
	Multigrade Pressure Sand Filter				
	Flow Rate = 1.5 M ³ / Hr				
	Filtration velocity : 12 Cum/Hr/Sqm				
	Filter HOS : 1200 MM				
	Filter Diameter : 450 MM.	1.00	Each	68162.49	68162.49
8.14(b)(i)	SECTOR - 9				
	Activated Carbon Filter				
	Flow Rate = 4 M ³ / Hr				
	Filtration velocity : 15 Cum/Hr/Sqm				
	Filter HOS : 1200 MM				
	Filter Diameter : 900 MM.	1.00	Each	260256.15	260256.15
8.14(b)(ii)	SECTOR 1A				
	Activated Carbon Filter				
	Flow Rate = 1.5 M ³ / Hr				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Filtration velocity : 12 Cum/Hr/Sqm				
	Filter HOS : 1200 MM				
	Filter Diameter : 450 MM.	1.00	Each	80555.31	80555.31
8.15					
	SECTOR 9				
8.15 (a)	Supply of Filter Press of plate as required (size 18"x 18" x 18 nos plate for reference) with screw feed pumps of 4 m3/hr with adequate head (1Working+1Standby) with interconnecting piping and poly dosing system all complete. Make: Pharmatech/Sachin/Universal	1.00	Set	185897.25	185897.25
	SECTOR 1A				
8.15 (b)	Supply of Filter Press of plate as required (size 18"x 18" x 18 nos plate for reference) with screw feed pumps of 1 m3/hr with adequate head (1Working+1Standby) with interconnecting piping and poly dosing system all complete. Make: Pharmatech/Sachin/Universal	1.00	Set	185897.25	185897.25
8.16					
	SECTOR 9				
8.16 (a)	Supply of Magnetic flow meter suitable for 120 KLD Plant with preamplifier and microprocessor including necessary cabling, conduit, etc complete suitable for raw sewage application.				
	Electrical panel With PLC Control	1.00	Each	62592.00	62592.00
	SECTOR 1A				
8.16 (b)	Supply of Magnetic flow meter suitable for 15 KLD Plant with preamplifier and microprocessor including necessary cabling, conduit, etc complete suitable for raw sewage application.				
	Electrical panel With PLC Control	1.00	Each	37555.00	37555.00
8.17	Supply of the PLC based control panel with interlocking arrangement with supply pumps, suction pumps, modulating or shut-off valves including necessary wiring, magnetic switches & sensors complete to make the system functional with following interlocking				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Construction: Compartmentalized Type Skid Mounted, MCC Cum PLC Control panel will be free standing; vertical, fabricated from CRCA steel sheet 14/16 G conforming to degree of protection IP-52 or better. Cable entry will be from bottom. Colour shade - RAL 7032				
	System Voltage: 380 to 410 Volts & 50HZ (415 V \pm 10% , AC, 50 HZ \pm 5% for India). Surge protection to be provided at every applicable point.				
	PLC: The Programmable Logic Controller [PLC] shall consist of a PLC hardware, with 16k (min) program memory shall be protected by a backup battery with further memory protection from an EEPROM.				
	HMI: 5.5 Inch Colour Touch screen HMI, will be mounted on A Man-Machine Interface Terminal (MMI) shall be mounted on the front of the main control panel for control of the activated sludge plant. It will provide a display of the process parameters and equipment status. The display will have an associated keypad. The system will allow operator changes to set points and control of equipment. The terminal shall include an alarm annunciation with a dedicated alarm page and allow acknowledgment of alarms. Make: Siemens / ABB				
8.17 (a)	SECTOR - 9	1.00	Each	187775.00	187775.00
8.17 (b)	SECTOR-1A	1.00	Each	112665.00	112665.00
	Motor Control Centre				
8.18	Design, fabrication, assembling, wiring, supply, installation, testing and commissioning of motor control centre shall be fabricated with reinforcement of suitable size angle iron, channel 'T' sections irons and/or flats wherever necessary. Cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before painting as per specifications with 2 coats of red oxide primer and final approved shade of powder coated paint. 2 Nos. earthing terminals shall be provided for 3 phase, 4 wire, 50 Hz supply system. Lifting hooks shall also be provided in case of large panels.				
	Incoming				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	400 amps TPN MCCB with the following accessories:				
	a. 0-500 volts 96 x 96 mm square electronic voltmeter with selector switch shall be protected by 2 amps TP MCB. 1 Set				
	b. 0-100 amps 96 x 96 mm square electronic ammeter with selector switch and 100./5 amps 10 VA CL:1 CTs. 1 Set				
	c. Phase indicating lamps shall be protected by 2 amp SP MCB 3 Sets				
	Bus Bar				
	300 amps TPN (15 KA) copper bus bar with heat shrinkable insulation sleeves.				
	Required Nos of required capacity TPN MCB for direct on line starter/star delta starters and out going feeders to all the pumps/blowers etc. (including standbys). Each compartment shall contain auto / manual selector switch and indicating lamp with MCB's for 'ON/OFF/TRIP' status of motor				
	Spare MCB's of following capacities: 32 amps TPN MCB's 3 Nos.				
	All MCCBs / MCBs shall be of 15 KA breaking capacity and suitable for motor duty application.				
	All motor starters shall be provided with Automatic level controller				
	DOL starters shall be used for mototrs below 10HP and Star-Delta Starters for other motors				
	Provision shall be made for providing potential free contacts to all pumps starters				
8.18 (a)	SECTOR - 9	1.00	Each	150220.00	150220.00
8.18 (b)	SECTOR-1A	1.00	Each	93887.00	93887.00
8.19	Supply of Cables, Connector, Cable Trays, to make Electrical Installation Complete. Necessary cable alleys, internal / cabling, wiring, cabling from MCC to various pumps / equipment and interlocking, earthing and earthing pits for all equipment.				
8.19 (a)	SECTOR - 9	1.00	Each	156479.001	156479.00
8.19 (b)	SECTOR-1A	1.00	Each	50073.00	50073.00

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
8.20	Installing & fixing cast-iron manhole cover and frame suitable for 600mm dia manhole with lockable and lifting arrangement. The entire item shall be epoxy coated and approved by insecticide department				
	Medium duty double seal of size 560 mm dia and total weight of cover & frame to be not less than 116 KG. (Location : U/G Water Tanks Top)				
8.20 (a)	SECTOR - 9	8.00	Each	5415.30	43322.40
8.20 (b)	SECTOR-1A	6.00	Each	5415.30	32491.80
8.21	Providing and fixing M.S fabricated hot dipped galvanized coating puddle flange comprising of 600 mm dia long M.S class 'B' pipe (screwed end up to 50 mm & flange for more than 50 mm dia) with 6 mm thick M.S plates of required size including cutting holes in centre of plate, inserting pipe & making welded (Arc) joint complete. Same shall be installed with TEC welded joint in position with reinforcement bars of RCC tank wall/slab including making cutout in shuttering during concrete casting of tank of following diameter. (Location: underground)				
8.21 (a)	25 mm dia				
8.21 (a) (i)	SECTOR - 9	6.00	Each	767.25	4603.50
8.21 (a) (ii)	SECTOR-1A	6.00	Each	767.25	4603.50
8.21 (b)	50 mm dia				
8.21 (b) (i)	SECTOR - 9	6.00	Each	1148.40	6890.40
8.21 (b) (ii)	SECTOR-1A	6.00	Each	1148.40	6890.40
8.21 (c)	80 mm dia				
8.21 (c) (i)	SECTOR - 9	2.00	Each	2570.04	5140.08
8.21 (c) (ii)	SECTOR-1A	2.00	Each	2570.04	5140.08

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
8.21 (d)	150mm dia				
8.21 (d) (i)	SECTOR - 9	1.00	Each	3490.74	3490.74
8.21 (d) (ii)	SECTOR-1A	1.00	Each	3490.74	3490.74
8.22	Providing orange colour safety foot rest of minimum 6mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS :1786 having minimum cross section as 23mm x 25mm and over all minimum length 263mm and width as 165mm with minimum 112mm space between protrude legs having 2mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification make to be visible even after fixing, including fixing in manholes with 30x20x15cm cement concrete block 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) complete as per design.				
8.22 (a)	SECTOR - 9	144.00	Each	482.23	69440.98
8.22 (b)	SECTOR-1A	50.00	Each	482.23	24111.45
	STP WORKS SUB HEAD TOTAL for sector 9 & sector 1A				6112805.05
9	SUB HEAD: IX:-WATER SUPPLY,DRAINAGE PUMPS & WATER TREATMENT EQUIPMENT				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
9.1	Supply, installation, testing & commissioning of vertical inline multistage pumping set (Imported) with Stainless steel-304 body, Stainless steel-304 impeller, Stainless steel-304 casing, shaft of Stainless steel-316 and C.I. base & head with mechanical seal, connected to a TEFC induction motor suitable for 415+/-10% volts, 3 phase 50 cycles A.C. supply with 150 mm dia pressure gauge with gunmetal isolation cock, vibration eliminating pads under foundations, 80x40 mm I section base plate bolted to cement concrete foundations complete. Vendor to submit performance curves and technical catalogue of the proposed model for review and information.				
9.1 (a)					
9.1 (a) (i)	SECTOR - 9				
	Filter feed pump at Pump Room				
	Set of Two Pumps (1 Working+ 1 Standby)				
	Capacity 4.0 LPS				
	Head 35 M.				
	HP 4.0 HP Approx.	3.00	Set	157969.00	473907.00
9.1 (a) (ii)	SECTOR 1A				
	Filter feed pump at Pump Room				
	Set of Two Pumps (1 Working+ 1 Standby)				
	Capacity 1.0 LPS				
	Head 35 M.	3.00	Set	113738.00	341214.00
	HP 2.0 HP Approx.				
9.1 (b)	SECTOR - 9				
9.1 (b) (i)	Set of Two Pumps (1 Working+ 1 Standby)				
	Capacity 2.5.0 LPS				
	Head 40 m				
	HP 3 HP Approx..	1.00	Set	132694.00	132694.00
9.1 (b) (ii)	SECTOR-1A				
	Irrigation Pumps at STP Pump Room				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Set of Two Pumps (1 Working+ 1 Standby)				
	Capacity 1.0 LPS				
	Head 40 M.				
	HP 2.0 HP Approx.	1.00	Set	120057.00	120057.00
9.1 (c)	Water Make up Pump to STP				
	Set of Two Pumps (1 Working+ 1 Standby)				
	Capacity 1.0 LPS				
	Head 20 m				
	HP 2 HP Approx..				
9.1 (c) (i)	Sector 9	1.00	Set	107419.00	107419.00
9.1 (c) (ii)	SECTOR-1A	1.00	Set	107419.00	107419.00
9.2	Providing, installing, testing and commissioning of variable speed (VSPS) hydropneumatics system mounted on a common base plate comprising of vertical centrifugal pumping set with S.S body, stainless steel impeller and mechanical seal, shaft directly coupled to a TEFC induction motor suitable for 400/440 volts, 3 phase, 50 cycles AC supply with 150 mm dia pressure gauge with gunmetal isolation cock, vibration eliminating pads under foundation, one No. microprocessor based controller, dedicated variable frequency drive for each pump, one No. remote sensors, pressure transducers, sequence running cotroller, dry running Protection, motor control centre, necessary power and control cabling from MCC to pumps including required rating of MCB, one No. 60 litre capacity M.S diaphragam tank with interchangeable butyl rubber membrane, complete in all respects including stainless steel grade 316 pipe suction and delivery headers and isolation/ control valves(ball valves/butterfly valves/ Nan return valves/ vibration eliminators etc as required) , power box, equipped with fuses/ isolators/circuit breakers as required.				
	The entire Hydropneumatics system shall be factory fitted.				
9.2 (a)					

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
9.2 (a) (i)	SECTOR - 9				
	Hyd. System for Domestic Water Supply Pump				
	Set of Two Pumps (1 Working+ 1 Standby)				
	Capacity 3.5 LPS				
	Head 40 M.				
	HP 4.0 HP Approx.	1.00	Set	470930.00	470930.00
9.2 (a) (ii)	SECTOR 1A				
	Hyd. System for Domestic Water Supply Pump				
	Set of Two Pumps (1 Working+ 1 Standby)				
	Capacity 1.0 LPS				
	Head 40 M.				
	HP 2.0 HP Approx.	1.00	Set	304720.00	304720.00
9.2 (b)	Hyd. System for Flushing Water Supply Pump				
	Set of Two Pumps (1 Working+ 1 Standby)				
	Capacity 1.0 LPS				
	Head 40 M.				
	HP 2.0 HP Approx.				
	SECTOR - 9	1.00	Set	304720.00	609440.00
	SECTOR-1A	1.00			
TOTAL	2.00				
9.3	Supply, installing, testing and commissioning of submersible open impeller non-clog pumps with C.I. body and to TEFC submersible motor for 415 ± 10% volts, 3 phase, 50 cycles A.C. power supply with mechanical seal, pump connector unit with rubber diaphragm and bend, vertical discharge pipe, guide pipe and chain in built level controller, sequence running controller, arrangement for both pumps together in a case of emergency, audible hooter for failure or flooding, dry running Protection complete in all respects., painting, testing and commissioning complete with approved quality and make as required as per instruction of site incharge.				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	(Pumps shall be installed in a set of two pumps One working and One standby)				
9.3 (a)	Pump Room Drainage Pumps				
	(Pumps to be suitable to handle solids upto 12 mm size)				
	Capacity - 4.0 LPS (Each)				
	Head - 20 M				
	H.P. - 2.0 HP Approx.				
	SECTOR - 9	1.00	Set	157969. 00	315938.00
	SECTOR-1A	1.00			
TOTAL	2.00				
9.3 (b)	STP Sewage Sump Pumps				
	(Pumps to be suitable to handle solids upto 40 mm size)				
	Capacity - 4.0 LPS (Each)				
	Head - 20 M				
	H.P. - 3.0 HP Approx.				
	SECTOR - 9	1.00	Set	233795. 00	467590.00
	SECTOR-1A	1.00			
TOTAL	2.00				
9.4	Design, manufacture, supplying, fixing in position, testing and commissioning of the following front operated cubicle type, front access 2mm thick mild steel sheet, free standing, dust and vermin proof, switchboard with IP42 protection with hinged and lockable doors complete with interconnections, tinned copper crimping lugs, bonding to earth and painting, suitable for use at 415 volts, 3 phase 4 wire 50 Hz system and suitable for a fault level of 25 MVA symmetrical at 415 volts.				
	All switchboards shall have provision for entry of cables from the top or bottom as required.				
	All live accessible parts shall be shrouded and all equipment shall be finger touch proof. The busbars insulation shall be with heat shrinkable sleeves. SMC/DMC shrouds and busbar supports shall be used. Padlocking facility shall be provided on all outgoing feeders doors and switch handles shall be lockable in OFF position.				
	Electric Panel For Water Supply Pumps at Water Supply Pump Room				
	INCOMING				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	1 No. 63 amps TPN MCCB with the following accessories:				
	1 No. square flush mounting 0-500 volts scaled voltmeter with three way and OFF switch.				
	Three phase indicating lights.				
	Electrolytic high conductivity three phase and neutral tinned copper bus bar rated at 100 amps having a current density of 1 amp per Sqmm suitable to with stand symmetrical fault level of 25 MVA at 415 volts. The neutral bus bar is to be of 100% capacity.				
	OUTGOING UNITS				
	Two 25 Amp. TP+N M.C.C.B. with rotary handle of breaking capacity 25KA				
	Two 40 Amp. TP+N M.C.C.B. with rotary handle of breaking capacity 25KA				
	4 Nos. fully automatic DOL starters with push buttons and ON/OFF indicating lights and overload relays for 1.5 to 7.5 HP pump .				
	4 Nos. rotary selector switch for selecting mode of operation i.e. auto/manual/off.				
	4 Nos.cyclic relay for automatic duty changeover of pumps.				
	4 No. single phase preventors.				
	4 Nos. square flush mounting 0-30 amps scaled ammeters with three way and OFF selector switch.				
	Space for 3 Nos. Level Controllers.				
	Switchgear shall be suitable for the HP ^s of various motors.				
	2 Nos. 40 Amp. TP+N MCCB Spare.				
	The motor control panel shall be prewired with colour coded wires with identification labels complete in all respects as required.				
9.4	SECTOR - 9	1.00			
(a)	SECTOR-1A	1.00			
	TOTAL	2.00	Set	117950.00	235900.00
9.5	Supplying, installing, testing and commissioning controllers with low voltage relays, stainless steel probes and PVC shroud wiring from tank top to probes of required.				
9.5	Level Controller For Water Supply Pump:				
(a)					

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	To start pump when water level is low in Domestic Water U.G. tank and shut off pump when Domestic Water U.G. tank is full. Also to stop when water level is low in raw water underground tank.				
	SECTOR - 9	1.00	Each	16850.00	33700.00
	SECTOR-1A	1.00			
	TOTAL	2.00			
9.5 (b)	Level Controller For Sump Pumps:				
	To start pump when water level is high in sump and shut off pump when sump is empty. Both pumps are start when sump is overflowing.				
	SECTOR - 9	2.00	Each	16850.00	67400.00
	SECTOR-1A	2.00			
	TOTAL	4.00			
9.6	Providing and fixing GI pipes complete (IS:1239 Heavy Class) with GI fittings and clamps including MS pipe supports, enamel paint as per specifications cutting and making good the walls etc. complete.				
9.6 (a)	50 mm dia				
	SECTOR - 9	10.00	Rmtr.	980.10	19602.00
	SECTOR-1A	10.00			
	TOTAL	20.00			
9.6 (b)	65 mm dia				
	SECTOR - 9	10.00	Rmtr.	1152.36	23047.20
	SECTOR-1A	10.00			
	TOTAL	20.00			
9.6 (c)	80 mm dia				
	SECTOR - 9	10.00	Rmtr.	1339.47	20092.05
	SECTOR-1A	5.00			
	TOTAL	15.00			
9.6 (d)	100 mm dia				
	SECTOR - 9	5.00	Rmtr.	1832.49	9162.45
	SECTOR-1A	0.00			
	TOTAL	5.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
9.6 (e)	150 mm dia				
	SECTOR - 9	5.00			
	SECTOR-1A	0.00			
	TOTAL	5.00	Rmtr.	2518.56	12592.80
9.7	Butterfly valve (manual) with C.I body SS disc nitrile sheet & O ring & PN 16 Pressure rating as specified.				
9.7 (a)	50 mm dia				
	SECTOR - 9	4.00			
	SECTOR-1A	2.00			
	TOTAL	6.00	Each	2518.56	15111.36
9.7 (b)	65 mm dia				
	SECTOR - 9	4.00			
	SECTOR-1A	2.00			
	TOTAL	6.00	Each	2808.63	16851.78
9.7 (c)	80 mm dia.				
	SECTOR - 9	2.00			
	SECTOR-1A	2.00			
	TOTAL	4.00	Each	2984.85	11939.40
9.7 (d)	100 mm dia.				
	SECTOR - 9	2.00			
	SECTOR-1A	0.00			
	TOTAL	2.00	Each	4078.80	8157.60
9.7 (e)	150 mm dia				
	SECTOR - 9	1.00			
	SECTOR-1A	0.00			
	TOTAL	1.00	Each	5387.58	5387.58
9.8	Non - return valve with dual plate of CI Body SS plates vulcanized NBR seal flanged end & PN 16 rating as specified.				
9.8 (a)	50 mm dia				
	SECTOR - 9	4.00			
	SECTOR-1A	2.00			
	TOTAL	6.00	Each	2293.38	13760.31
	65mm dia.				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
9.8 (b)	SECTOR - 9	2.00	Each	2849.22	11396.88
	SECTOR-1A	2.00			
	TOTAL	4.00			
9.8 (c)	80 mm dia.		Each	3107.61	12430.44
	SECTOR - 9	2.00			
	SECTOR-1A	2.00			
	TOTAL	4.00			
9.9 (a)	50 mm dia		Each	3137.31	18823.86
	SECTOR - 9	4.00			
	SECTOR-1A	2.00			
	TOTAL	6.00			
9.9 (b)	65 mm dia		Each	3505.59	21033.54
	SECTOR - 9	4.00			
	SECTOR-1A	2.00			
	TOTAL	6.00			
9.9 (c)	80 mm dia		Each	4210.47	16841.88
	SECTOR - 9	2.00			
	SECTOR-1A	2.00			
	TOTAL	4.00			
9.10	Providing and fixing heavy duty armoured cables 1.1 KVA grade including necessary support clamps at ceiling level and connection lugs complete in all respects.				
9.10 (a)	Power cable Copper 3 core 10 sq.mm		Metr e	295.00	10325.00
	SECTOR - 9	20.00			
	SECTOR-1A	15.00			
	TOTAL	35.00			
9.10 (b)	Power cable Copper 3 core 6 sq.mm		Metr e	252.00	8820.00
	SECTOR - 9	20.00			
	SECTOR-1A	15.00			
	TOTAL	35.00			
9.10 (c)	Power cable Copper 3 core 4 sq.mm		Metr e	209.00	6270.00
	SECTOR - 9	20.00			
	SECTOR-1A	10.00			
	TOTAL	30.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
9.10 (d)	Control cable copper 2 core 1.5 sq.mm				
	SECTOR - 9	20.00	Metre	166.00	4980.00
	SECTOR-1A	10.00			
	TOTAL	30.00			
9.11	Supply of MSEP vessel filter with all necessary accessories. Filter shall be suitable for minimum working pressure of 5 kg / cm ² and shall include media, standard fittings like pressure gauges, sampling cock, rinse drain, vacuum breaker etc. The MS sheet thickness for shell shall be min. 8 mm and for dishes shall 10 mm. The internal surfaces of tank shall be treated with epoxy coating and external surface with primer and anticorrosive enamel paint (Min. 2 coats). with frontal piping shall be 100 mm dia MSEP along with valves PN 1.0, test cock, air inlet for back washing and pressure gauges at inlet and outlet.				
9.11 (a)					
9.11 (a) (i)	SECTOR 9				
	Dual Media Filter For Domestic Water Supply				
	Capacity- 11250 LPH				
	Filtration rate- 16000 LPH/Sqm.				
	Filter dia approx. - 950 MM				
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4.5 Kg/sq cm	1.00	Each	189544.41	189544.41
9.11 (a) (ii)	SECTOR-1A				
	Dual Media Filter For Domestic Water Supply				
	Capacity- 1250 LPH				
	Filtration rate- 16000 LPH/Sqm.				
	Filter dia approx. - 400 MM				
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4.5 Kg/sq cm	1.00	Each	113726.25	113726.25
9.11 (b)					

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
9.11 (b) (i)	SECTOR - 9				
	Activated Carbon Filter For Domestic Water Supply				
	Capacity- 11250 LPH				
	Filtration rate- 16000 LPH/Sqm.				
	Filter dia approx. - 950 MM				
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4. 5 Kg/sq cm	1.00	Each	221135.31	221135.31
9.11 (b) (ii)	SECTOR-1A				
	Activated Carbon Filter For Domestic Water Supply				
	Capacity- 1250 LPH				
	Filtration rate- 16000 LPH/Sqm.				
	Filter dia approx. - 400 MM				
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4. 5 Kg/sq cm	1.00	Each	132680.79	132680.79
9.12 (a)	SECTOR - 9				
	Hardness-				
	Inlet- 500-600 PPM				
	Outlet- Less than 100 PPM				
	Capacity- 11250 LPH				
	Regeneration period 12 hrs.				
	Quantity of soft water between two regenerations = 135000 lit				
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4. 5 Kg/sq cm	1.00	Each	315907.02	315907.02
9.12 (b)	SECTOR-1A				
	Hardness-				
	Inlet- 500-600 PPM				
	Outlet- Less than 100 PPM				
	Capacity- 1250 LPH				
	Regeneration period 12 hrs.				
	Quantity of soft water between two regenerations = 15000 lit				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4.5 Kg/sq cm	1.00	Each	176908.05	176908.05
9.13(a)	SECTOR - 9				
	Supply Installation, Testing & Commissioning of "Cation" apex thermocon Water Softener fabricated from MS plate as per IS: 2825 (minimum thickness of shall 6 mm and dished end 8 mm) complete with initial charge of resins , GI class 'C' face piping, CI butterfly valves, pressure gauge, hydraulic brine injector, accessories, painting inside with epoxy paint, including 500 liters capacity PVC / HDPE brine tank suitable for 2 regeneration capacity, testing and commissioning complete with resins of approved quality and make.				
	Hardness-				
	Inlet- 500-600 PPM				
	Outlet- Less than 100 PPM				
	Capacity- 11250 LPH				
	Regeneration period 12 hrs.				
	Quantity of soft water between two regenerations = 135000 lit				
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4.5 Kg/sq cm	1	Each	315939.00	315939.00
9.13(b)	SECTOR-1A				
	Supply Installation, Testing & Commissioning of "Cation" apex thermocon Water Softener fabricated from MS plate as per IS: 2825 (minimum thickness of shall 6 mm and dished end 8 mm) complete with initial charge of resins , GI class 'C' face piping, CI butterfly valves, pressure gauge, hydraulic brine injector, accessories, painting inside with epoxy paint, including 500 liters capacity PVC / HDPE brine tank suitable for 2 regeneration capacity, testing and commissioning complete with resins of approved quality and make.				
	Hardness-				
	Inlet- 500-600 PPM				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Outlet- Less than 100 PPM				
	Capacity- 1250 LPH				
	Regeneration period 12 hrs.				
	Quantity of soft water				
	between two regenerations = 15000 lit				
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4.5 Kg/sq cm	1	Each	176926.00	176926.00
	WATER SUPPLY,DRAINAGE PUMPS & WATER TREATMENT EQUIPMENT WORKS SUB HEAD TOTAL for sector 9 & sector 1A				5697720.96
	TOTAL AMOUNT (S.H-1 TO S.H-9) of Plumbing Works				80782425.21

C FIRE FIGHTING WORKS					
S. No.	Description	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SUB HEAD- I:-PUMPS				
	1.NOC from fire authority shall be in the scope of Contractor. Only fee paid to the fire authority shall be reimbursed against the submission of the receipt and nothing shall be paid extra.				
	2. All the Fire Fighting works shall be done in compliance of Fire Fighting authority requirement.				
1	Pump shall be capable of furnishing not less than 150% of rated capacity at a head not less than 65 % of rated head. The shut off head shall not exceed 120% of rated head.				
	Supplying, installation, testing and commissioning of electric driven terrace pump suitable for automatic operation and consisting of following, complete in all respects, as required: (Terrace Pump)				
	Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical conforming to IS : 1520.				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Suitable HP squirrel cage induction motor TEFC type suitable for operation on 415 volts, 3 phase, 50 Hz, AC supply with IP55 class of protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS-325.				
	M.S. fabricated common base plate, coupling, coupling guard, foundation bolts etc.as required.				
	Suitable cement concrete foundation duly plastered and with antivibration pads.				
1.1 (a)	900 lpm at 35 m Head (1W+1S)				
	SECTOR - 9	18.00			
	SECTOR-1A	0.00			
	TOTAL	18.00	Set	115492.32	2078861.76
1.1 (b)	450 lpm at 35 m Head (1W+1S)				
	SECTOR - 9	2.00			
	SECTOR-1A	6.00			
	TOTAL	8.00	Set	97581.43	780651.44
	PUMPS WORKS SUB HEAD TOTAL for sector 9 & sector 1A				2859513.20
2	SUB HEAD-II:- CONTROL PANELS				
2.1	Supplying, Installation, testing & commissioning of dust & vermin proof double door with canopy type tapered roof wall / floor mounted compartmentalised feeder pillar type cubical control Panel for fire fighting terrace pump of front area not less than 1.0 Sqmtr. and depth not less than 300 mm, made out of 2mm thick CRCA sheet with 100 Amp. 4 strip aluminium bus bars with front openable door & locking arrangement, interconnection, control wiring, integration with pressure switch i/c supplying & fixing following switchgears & control gears/starters etc. as required.				
	Incoming				
	100 Amps. 16ka breaking capacity 4 pole MCCB-1 Nos.				
	Voltmeter (0-500 Volt) with selector switch.-1 Nos.				
	Ammeter (0-100 Amps.) with selector switch -1 Nos.				
	Set of 3 phase indication lamp-1 Set				
	100 Amps. 4 strip insulated bus bars-1 Nos.				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	Outgoing				
	63 Amps. 10ka breaking capacity 3 pole MCCB--2 Nos.				
	Ammeter (0-60 Amps.) with selector switch-2 Nos.				
	Suitable HP fully automatic Star/Delta Starter with over load protection, current sensing type single phase preventor complete with all accessories and internal wiring required for automatic operation.- 2 Set				
	Selector switch for local/remote, auto/manual/off operation ON/OFF indication etc.- 2 Set				
	SECTOR - 9	10.00			
	SECTOR-1A	3.00			
	TOTAL	13.00	Set	33015.5 1	429201.63
2	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required. It should be complete as per specifications & directions of Engineer-in-charge.				
	4 x 25 sqmm (28 mm)				
2.2 (a)	SECTOR - 9	10.00			
	SECTOR-1A	3.00			
	TOTAL	13.00	Each	315.00	4095.00
2.2 (b)	3 X 10 sq. mm (22mm)				
	SECTOR - 9	40.00			
	SECTOR-1A	6.00			
	TOTAL	46.00	Each	257.00	11822.00
2.3	Supplying & laying one number XLPE insulated PVC sheathed Aluminium Conductor armoured UG cable of 1.1 KV grade Conforming to IS 7098/1988 with upto date amendment of following size in the existing RCC/HUME/ METAL /GI /CI /Stoneware/DWC pipe/masonry Open Duct/ cable tray/ open in air etc. as required.				
	3 core,10 sq.mm. Aluminium Armoured				
2.3 (a)	SECTOR - 9	100.00			
	SECTOR-1A	30.00			
	TOTAL	130.00	Metre	136.00	17680.00

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	CONTROL PANELS WORKS SUB HEAD TOTAL for sector 9 & sector 1A				467134.00
3	SUB HEAD-III:- PIPES & ACCESSORIES				
3.1	Providing laying, testing & commissioning of 'C' class heavy duty MS Pipe conforming to IS 1239/3589 i/c fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. in ground including welding, excavation & providing cement concrete blocks as supports, anticorrosive treatment with coaltar/asphalt tape as per IS 10221, refilling the trench etc. of following sizes complete as required. (For Underground)				
3.1 (a)	100 mm. Dia				
	SECTOR - 9	95.00	Metr e	1893.87	236733.75
	SECTOR-1A	30.00			
	TOTAL	125.00			
3.2	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required. (Plant Room piping/Vertical Riser/Downcomer/Floor)				
3.2 (a)	25 mm dia				
	SECTOR - 9	54.00	Metr e	533.48	33609.32
	SECTOR-1A	9.00			
	TOTAL	63.00			
3.2 (b)	80 mm dia				
	SECTOR - 9	36.00	Metr e	1270.84	48292.04
	SECTOR-1A	2.00			
	TOTAL	38.00			
3.2 (c)	100 mm dia				
	SECTOR - 9	287.00	Metr e	1697.86	597646.68
	SECTOR-1A	65.00			
	TOTAL	352.00			

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
3.3	Supplying and fixing single headed internal hydrant valve with instantaneous Gunmetal/Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Gunmetal/Stainless Steel cap and chain as required:				
	Single headed Gunmetal				
	SECTOR - 9	54.00	Set	8488.15	475336.46
	SECTOR-1A	2.00			
TOTAL	56.00				
3.4	Supplying and fixing Single headed external yard hydrant valve with 1 No. 63 mm dia instantaneous FM Gunmetal/Stainless Steel coupling and castiron wheel, ISI marked, conforming to IS 5290 (type A) with blank Gunmetal/Stainless Steel cap and chain as required:				
	Single headed Gunmetal				
	SECTOR - 9	10.00	Set	8488.15	93369.66
	SECTOR-1A	1.00			
TOTAL	11.00				
3.5	Supplying, fixing, testing and commissioning of butterfly valve of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required:				
3.5 (a)	80 mm dia				
	SECTOR - 9	10.00	Set	5484.33	54843.33
	SECTOR-1A	0.00			
TOTAL	10.00				
3.5 (b)	100 mm dia				
	SECTOR - 9	20.00	Set	7310.18	190064.67
	SECTOR-1A	6.00			
TOTAL	26.00				
3.6	Providing, installation, testing and commissioning of non-return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc.as required:				
	100 mm dia				
	SECTOR - 9	20.00	Set	12273.50	319110.88
SECTOR-1A	6.00				

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	TOTAL	26.00			
3.7	Providing, installation, testing and commissioning of stainless steel Y-strainer fabricated out of 1.6 mm thick stainless steel, Grade 304, sheet with 3 mm dia holes with stainless steel flange.				
	100 mm dia				
	SECTOR - 9	10.00			
	SECTOR-1A	0.00			
	TOTAL	10.00	Set	7305.66	73056.56
3.8	Supplying and fixing 63 mm dia, 15 m long RRL hose pipe with 63 mm dia male and female couplings duly bound with GI wire, rivets etc. conforming to IS 636 (type-A) as required:				
	Gun Metal				
	SECTOR - 9	128.00			
	SECTOR-1A	6.00			
	TOTAL	134.00	Set	5876.23	787415.37
3.9	Supplying and fixing first-aid Hose Reel with MS construction spray painted in post office red, conforming to IS 884 complete with the following as required.				
	20 mm nominal internal dia water hose thermoplastic (Textile reinforced) type -2 as per IS: 12585				
	20 mm nominal internal dia gun metal globe valve & nozzle.				
	Drum and brackets for fixing the equipments on wall. Connections from riser with 25 mm dia stop gun metal valve & M.S. Pipe and socket.				
	40 m				
	SECTOR - 9	54.00			
	SECTOR-1A	11.00			
	TOTAL	65.00	Set	11430.80	743001.83
3.10	Supplying & fixing 63 mm dia gun metal short branch pipe with 20 mm nominal internal diameter size nozzle conforming to IS 903 suitable for instantaneous connection to interconnect hose pipe coupling as required:				
	Gun metal				
	SECTOR - 9	64.00	Set	2720.65	182283.46

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	3.00			
	TOTAL	67.00			
3.11	Supplying and fixing of fire brigade connection of cast iron body with gun metal male instantaneous inlet couplings complete with cap and chain as reqd. for suitable dia MS pipe connection conforming to IS 904 as required:				
	2 way-100 mm dia M.S. Pipe. (FOR UG TANK & BUILDINGS)				
	SECTOR - 9	10.00			
	SECTOR-1A	3.00			
	TOTAL	13.00	Set	7464.22	97034.91
3.12	Supplying and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200 mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25 mm dia gun metal wheel valve with required accessories, pressure gauge and painting with synthetic enamel paint of approved shade as required.				
	SECTOR - 9	10.00			
	SECTOR-1A	3.00		20398.0	
	TOTAL	13.00	Set	6	265174.77
3.13	Providing & fixing of pressure switch in M.S. pipe line including connection etc. as required.				
	SECTOR - 9	20.00			
	SECTOR-1A	6.00			
	TOTAL	26.00	Each	1708.05	44409.22
3.14	Providing and fixing in position the industrial type pressure gauges with gun metal / brass valves complete as required				
	SECTOR - 9	64.00			
	SECTOR-1A	12.00			
	TOTAL	76.00	Each	1239.13	94174.15
3.15	Providing and fixing standard fireman's axe with heavy insulated rubber handle conforming to IS: 926 complete.				
	SECTOR - 9	54.00			
	SECTOR-1A	11.00			
	TOTAL	65.00	Each	505.89	32882.85

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
3.16	Providing and fixing hose BOX of size 900mmx2100mm made of 16 gauge thick MS sheet with 4 mm thick front glass doors in front painted "FIRE" in red paint i/c necessary locking /Key arrangement shall be painted with one coat of primer & two coat of finished stove enamelled post office red colour paint.				
	SECTOR - 9	54.00	Each	11934.4 5	775739.25
	SECTOR-1A	11.00			
	TOTAL	65.00			
3.17	Providing and fixing hose cabinet of size 750mmX600X250mm made of 16 gauge thick MS sheet with 4 mm thick float glass doors in front painted "FIRE" in red paint i/c necessary locking arrangement suitable to accommodate external hydrant with butterfly valve 2 nos. 15 mtr. long hose pipe. 1 no. brach pipe mounted on wall or raised brick platform & duly painted with post office red externally and white internally with synthetic enamel paint complete in all respects for external hydrant.				
	SECTOR - 9	10.00	Each	6468.66	71155.26
	SECTOR-1A	1.00			
	TOTAL	11.00			
3.18	Providing, Fixing, testing and commissioning of resilient rubber lined single arch vibration eliminators suitable for raw water up to 45 deg. C temperature, working pressure 8 Kg/cm ² and test pressure 16 Kg/cm ² to provide relief from stresses at pipe flanges.				
	80 mm dia				
	SECTOR - 9	40.00	Nos	4089.69	212663.88
	SECTOR-1A	12.00			
TOTAL	52.00				
3.19	Supply and fixing of 4 Nos G.I round bottom FIRE BUCKET of 9 LTR. Capacity field with sand including proper supporting /mounting arrangement MS Angle Iron Frame painted by fire red colour over 2 coats of red oxide paint and written with white paint FIRE complete in all respects as per direction of Engineer Incharge .				
	SECTOR - 9	12.00	Each	2148.30	36521.10

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
	SECTOR-1A	5.00			
	TOTAL	17.00			
	PIPES & ACCESSORIES WORKS SUB HEAD TOTAL for sector 9 & sector 1A				5464519.40
4	SUB HEAD-IV:-FIRE EXTINGUISHER				
4.1	Providing, storing, handling, shifting, installation, testing and commissioning of halon free portable fire Extinguishers as described below:				
	Concealed work, including cutting chases and making good the walls etc.				
4.2	4.5 kg carbon dioxide extinguisher, IS marked, with high pressure discharge tube, horn, control valve, CCE approved cylinder.				
	SECTOR - 9	64.00			
	SECTOR-1A	13.00			
	TOTAL	77.00	Nos	7129.00	548933.00
4.3	6 kg Mono Ammonium Phosphate (ABC) type cartridge operated extinguishers.				
	SECTOR - 9	64.00			
	SECTOR-1A	13.00			
	TOTAL	77.00	Nos	4009.00	308693.00
4.4	Providing, fixing, testing and commissioning of 50 Litres (trolley mounted) Mechanical Foam type Fire Extinguisher. In HP Mild Steel Cylinders ISI marked TAC approved fitted with pressure indicating gauge, internal tube, squeeze lever type valve fully charged complete in all respects including wall suspension bracket / trolley mounted and conforming to IS:910 .				
	SECTOR - 9	1.00			
	SECTOR-1A	1.00			
	TOTAL	2.00	Nos	11159.00	22318.00
				0	

S.No	Description of work	Total Quantity	Unit	Rate (In Rs.)	Amount (In Rs.)
4.5	Providing, fixing, testing and commissioning of CO2 type Fire Extinguisher of capacity 22.5 kg filled with Co2 Gas as per IS 15222 with control discharge mechanism fitted with Hose, Horn & TROLLEY confirms to IS 2878 bearing ISI mark. Co2 Cylinder as per IS 7285.				
	SECTOR - 9	1.00			
	SECTOR-1A	1.00		18351.0	
	TOTAL	2.00	Nos	0	36702.00
4.6	Providing and fixing 2 kg capacity clean agent-HFC 236FA Stored Pressure type fire extinguisher ISI marked under IS:15683 complete with imported Novec 1230 manufactured by 3M, with Zero Ozone Depletion Potential and Very Low Global Warming Potential of 1 with 20 Years Blue Sky Warrantee against any regulatory Bans and Restrictions.				
	SECTOR - 9	1.00			
	SECTOR-1A	1.00			
	TOTAL	2.00	Nos	7164.00	14328.00
4.7	Providing and fixing Fire related signages printed on photoluminescent U1000 aluminium sheet of 1.0 mm (+-10%) containing Lumigen II as base chemical, covered under UV stabilized coating and of appropriate size including fixing on wall, door, ceiling etc. with proper clamps, hangers, cleats, anchor fasteners etc.				
	SECTOR - 9	895.00			
	SECTOR-1A	700.00	Squa re Inch		
	TOTAL	1595.00		12.00	19140.00
	FIRE EXTINGUISHER WORKS SUB HEAD TOTAL for sector 9 & sector 1A				950114.00
	TOTAL AMOUNT (S.H-1 TO S.H-4) of Fire Fighting works				9741280.60
	TOTAL AMOUNT OF MAJOR WORKS (CIVIL + PLUMBING + FIRE FIGHTING) for Sector 9 and Sector 1 A				710976402.38

SECTION X

**TECHNICAL SPECIFICATIONS (INCLUDING
APPROVED MAKE OF MATERIALS AND BASIC
PRICES): MINOR COMPONENT**

1.0 GENERAL CONDITIONS FOR ELECTRICAL WORK

1. All the works shall be carried out as per CPWD General Specification for Electrical Works, Part-I (Internal) 2013 & Part-II (External) 1995, amended up to date and should also comply with relevant provisions of the Indian Electricity Rules and Acts as applicable, amended up to date.
2. The order of preference in case of any discrepancy as indicated in condition No. 8.1 under "Conditions of Contract" given in standard CPWD Contract form may be read as the following:
 - (a) Nomenclature of items as per Schedule of Quantities
 - (b) General/ Special Conditions and Particular Specifications as provided forming part of the tender document.
 - (c) CPWD Specifications with up to date Correction slips
 - (d) Architectural/Structural/Electrical Drawings
 - (e) Indian Standard Specifications of BIS
 - (f) National Building Code - 2016
 - (g) Manufacturer's specifications.
 - (h) Sound Engineering Practices
 - (i) Decision of Engineer-in-charge

A reference made to any Indian Standard Specifications in these documents, shall imply reference to the latest version of that standard, including such revisions/amendments as issued by the Bureau of Indian Standards upto last date of receipt of tenders. The contractor shall keep at his own cost all such publications of relevant Indian Standards applicable to the work at site.

3. The contractor shall take all safety precautions to avoid accidents by exhibiting caution boards, red flags, red lights and by providing necessary barriers and all other measures required from time to time. The contractor shall be responsible for all damages and accidents due to negligence on his part.
4. The contractor shall give due notices to Municipality, Police and/or other authorities that may be required under the law/rules under force and obtain all requisite permissions/licenses for temporary obstructions/enclosures and pay all charges which may be livable on account of his execution of the work under the agreement. Nothing extra shall be payable on this account.
5. The contractor shall leave such recesses, holes, openings, etc., as may be required for the electric, air-conditioning and other related works. (For this purpose, any required inserts, sleeves, brackets, conduits, base plates, insert plates, clamps etc. shall be arranged by the contractor and fix the same at the time of casting of concrete, stone work & brick work, if required, and nothing extra shall be payable on this account.

6. The contractor shall give a trial run of the equipment and machinery for establishing its capability to achieve the specifications within laid down tolerances to the satisfaction of the Engineer-in-charge before commencement of work.
7. The work will be carried out in close coordination with the building work and other agencies. Conduits will be laid in the slab within the specified time and it will have to be ensured that the casting of slabs is not delayed for want of laying of conduits. The conduits will also be laid in walls before the Plaster work is undertaken so as to avoid breaking cutting of plaster while making chase for laying of conduits subsequently. The contractor will have to employ adequate labour for carrying out the work. No claim regarding the idle labour for any reason will be entertained by the Bank.
8. No tools and plants including special T&P etc. shall be supplied by the Bank and the contractor will have to make his own arrangements at his expenses.
9. All tools, plant and machinery provided by the contractor shall, when brought at the site, be deemed to be exclusively intended for the construction and completion of this work and the contractor shall not remove the same or any part thereof (save for the purpose of moving it from one part of the site to another) without the consent of the Engineer-in-charge.
10. All materials shall be got checked & approved by the Engineer-in-charge on receipt of the same at site before use and rejected material is to be removed from the site immediately.
11. No foreign exchange shall be made available by the Bank for the purchase of equipment, plants, machinery, materials of any kind or any other items required to be carried out in execution of work.
12. The contractor shall carry out his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor (s) or by the Engineer-in-charge and shall as far as possible arrange his work and shall place and dispose of the materials being used or removed, so as not to interfere with the operations of other contractors, or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the entire satisfaction of Engineer-in-charge.
13. All items which are not covered while carrying out electrical work shall be removed and shall be cleared by the contractors as soon as the work is completed.
14. The contractor shall give the Engineer-in-charge in every fortnight, a progress report of the work done during the previous fortnight. The progress of work will be reviewed periodically by the Engineer-in-charge with the contractor and shortfalls, if any, sorted out. The contractor shall thereupon take such action as may be necessary to bring back his work to schedule without any additional cost to the Bank.
15. It shall be responsibility of the main contractor to sort out any dispute involved with the associated contractor without any time and cost overrun to the Bank. The main contractor shall be solely responsible for settling the dispute/litigation arising out of his agreement

with the associate contractor. The contractor shall ensure that the work shall not suffer on this account.

16. The main contractor shall be responsible for coordinating the activities of all works and essential progress of works as per milestone and laid down program.
17. The contractor shall be responsible for the watch and ward of the site/property/material provided by him and materials issued by the Bank against pilferage and breakage during the period of execution and thereafter till the work is completed and physically handed over to the Bank.
18. Samples of all materials, fittings and other materials/articles required for execution of the work shall be got approved from the Engineer-in-charge. Materials/articles manufactured by the firms of repute as indicated in tender documents and approved by the Engineer-in-charge shall only be used.
19. The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material or work beyond set out tolerance limits shall be summarily rejected by the Engineer-in-charge.
20. Even ISI marked materials shall be subjected to quality test at the discretion of the Engineer-in-charge besides testing of other materials as per the specifications described for the item/material. Whenever ISI marked materials are brought to the site of work; the contractor shall, if required by the Engineer-in-charge, furnish manufacturers test certificates to establish that the materials procured by the contractor for incorporation in the work satisfy the provisions of IS codes relevant to the material and/or the work done.
21. The contractor shall have to engage well experienced skilled labour and deploy modern T&P and other equipment to execute the work.
22. The associate contractors executing the electrical works must fulfill the eligibility criteria mentioned in the tender otherwise they will not be permitted to execute the electrical works.
23. The contractor shall be responsible for removal of all defects in the work during the guarantee/warranty period. The Bank shall carry out routine maintenance only. However, if any failure is noticed during this period which is attributable to poor quality of material and bad workmanship, the contractor will be required to rectify the same at his own cost, failure of which the Bank will be at liberty to get the defects rectified at the risk & cost of the contractor. The contractor will also be required to carry out his own inspection/testing during the guarantee/warranty period and attend to any defect taking place during this period.
24. Priority to arrange the material shall be decided by the Bank. However, material required for the work shall be brought at site only at the appropriate time keeping in view the progress of building works as well as Electrical & Mechanical works. Decision of Engineer-in-charge in this regard shall be final.
25. The contractor has to intimate his authorized representative, who will be receiving instructions in his absence. The contractor /his authorized representative is bound to sign

the site order book as and when required by the Engineer-in-charge and to comply with the instructions therein.

26. Suitable back plates providing for fixing the wall brackets and ceiling flush fittings shall be supplied by the contractor and the cost towards the same shall be included in the main item
27. It shall be responsibility of contractor to provide polythene/PVC plastic cover for all SDBs/meter boards/feeder pillars/panels etc. so as to protect them from wear & tear/damage during execution stage. Contractor shall provide the covers for the materials if any being supplied by Bank also. Nothing extra shall be paid on this account.
28. Contractor is fully responsible for any kind of damage to the LT/HT cable during execution of work. No joints shall be allowed if the cable is damaged. Contractor has to replace the full length at his own cost.
29. A suitable brass/tinned copper neutral link shall be fixed at suitable place in the Metallic outlet boxes of all sizes to terminate neutral wire properly. Nothing extra shall be paid on this account.
30. An earth termination with earth stud of brass/tinned copper i/c 2 No. metallic washers or suitable earth bar of Brass/tinned copper with tinned copper thimbles/ferrules/lugs should be suitably fixed at suitable place in the Metallic outlet box for termination of protective earth conductor. Nothing extra shall be paid on this account.
31. In the outlet boxes, phase from one switch to other switch shall be looped with suitable size of solid copper conductor. Nothing extra shall be paid on this account. Stranded conductor shall not be accepted.
32. Only required number of knockouts should be removed from Metallic outlet boxes for entry of conduits. If more than required number of knockouts are removed, the Metallic outlet box shall not be accepted.
33. Separate G.I. boxes shall be used for staircase light switches and bell push. Nothing extra shall be paid on this account.
34. Metal sheath of Co-axial T.V. cable shall be terminated using 'U' shape thimble/lugs/ferrules. Nothing extra shall be paid on this account.
35. To facilitate drawing of wires 16/18 SWG GI fish wire be provided along with laying of recessed conduit. Nothing extra shall be paid on this account.
36. Cable connection to switch gear is deemed to be included in the item of end termination. No extra payment shall be made for that.

2.0. ADDITIONAL CONDITIONS FOR ELECTRICAL WORKS

1.0 All the works shall be carried out as per CPWD General Specifications for Electrical Works - 2013(Part-1) for Internal, 1995 (Part-II) for External, 2013(Part-IV) for Sub-station,2013 (Part-III) for Lift, 2013(Part-VII) for DG Set, (Part-V) for wet riser and sprinkler and 2017 HVAC works, as amended up to date and should also comply with relevant provisions of the Indian Electricity Rules and Acts as applicable, amended up to date.

2.0 The contractor is advised to visit the site of work to have an idea of the execution of the work; failure to do so shall not absolve them from their responsibility to do the work as specified in agreement.

3.0 Completeness of Tender:

All sundry fittings, assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections as required, and all other sundry items which are useful and necessary for proper assembly and efficient working of the various components of the work shall be deemed to have been included in the tender, whether such items are specifically mentioned in the tender documents or not.

4.0 Works to be arranged by the Bank:

Unless and otherwise specified in the tender documents, the following works shall be arranged by the Bank:

(i) Supply of materials to the contractor if stipulated in the tender documents.

5.0 Works to be done by the contractor:

Unless and otherwise mentioned in the tender documents, the following works shall be done by the contractor, and therefore their cost shall be deemed to be included in their tendered cost:-

- (i) Foundations for equipment and components where required, including foundations bolts.
- (ii) Cutting and making good all damages caused during installation and restoring the same to their original finish.
- (iii) Sealing of all floor openings provided by him for pipes and cables, from fire safety point of view, after laying of the same.
- (iv) Painting at site of all exposed metal surfaces of the installation other than pre-painted items like fittings, fans, switchgear/distribution gear items, cubical switchboard etc. Damages to finished surfaces of these items while handling and erection, shall however be rectified to the satisfaction of the Engineer-in-Charge.
- (v) Testing and commissioning of completed installation.
- (vi) Storage space for all equipment, components and materials for the work

6.0 **Storage and Custody of Materials:**

The contractor has to make his own arrangement for the storage of the material at site & necessary watch and ward of the electrical installation during the execution of work till the same is handed over to the Bank. No extra payment will be made on this account. The storage space shall however be arranged by the Bank at site, if available.

7.0 **Electric Power Supply and Water Supply:**

Power and water supply will be arranged by the contractor at the site for installation, testing and commissioning purpose. Contractor will take due care to ensure safety of electrical installation during execution of work.

8.0 **Tools for handling and Erecting:**

All tools and tackles required for handling of equipment and materials at site of work as well as for their assembly and erection and also necessary test instruments shall be the responsibility of the contractor.

9.0 **Payment Terms:**

Payment shall be made as per the relevant clauses of form forming part of the tender documents.

10.0 **Co-ordination with other agencies:**

The contractor shall co-ordinate with all other agencies involved in the building work so that the building work is not hampered due to delay in his work. Recessed conduit and other works, which directly affect the progress of building work, should be given priority.

10.1. **Care of buildings:**

Care shall be taken by the contractor to avoid damage to the building during execution of his part of the work. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove, at his costs, all unwanted and waste materials arising out of his work, from the site.

11.0 **Structural Alterations to Buildings:**

- (i) No structural member in the building shall be damaged/altered, without prior approval from the competent authority through the Engineer-in-charge.
- (ii) Structural provisions like openings, cutouts, if any, required to be made, such contingent works shall be carried out by the contract at his cost.
- (iii) All such openings in floors shall be closed by the contractor after installing the cables/conduits/rising mains etc. as the case may be, by any suitable means as approved by the Engineer-in-charge without any extra payment.
- (iv) All chases required in connection with the electrical works shall be provided and filled by the contractor at his own cost to the original architectural finish of the buildings.

12.0 **Drawings:**

- (i) The work shall be carried out in accordance with the drawings and the tender documents and also in accordance with modification thereto from time to time as approved by the Engineer-in-charge.
- (ii) All wiring diagrams shall be deemed to be 'Drawings' within the meaning of the term . They shall indicate the main switch board, the distribution boards (with circuit numbers controlled by them), the runs of various mains and sub mains and the position of all points with their controls.
- (iii) After award of the work, the firm will be required to submit the drawings for the proposed work including layout plan, conduit routes showing location of points and height etc. Work will be carried out as per the approved drawings before start of work.

13.0 **Conformity to IE act, IE Rules, and standards:**

- 13.1. All electrical works shall be carried out in accordance with the provisions of The Electricity Act, 2003 and Indian Electricity Rules, 1956 amended up to date (Date of call of tender unless specified otherwise). List of rules of particular importance to electrical installations under these General Specifications is given in Appendix C for reference.

14.0 **General requirements of components:**

- 14.1. **Quality of material:** All materials and equipment supplied by the contractor shall be new. They shall be of such design, size and materials as to satisfactorily function under the rated conditions of operation and to withstand the environmental conditions at site.

15.0 **Inspection of materials and equipment:**

- 15.1. Materials and equipment to be used in the work shall be inspected by the Bank's officers. The travelling, lodging and boarding expense toward the Bank's representative(s) shall be borne by the Bank. However, the cost / expenses toward the test shall be borne by the contractor. Such inspection will be of following categories:
- (i) Inspection of materials / equipment to be witnessed at the Manufacturer's premises in accordance with relevant BIS /Agreement Inspection Procedure.
 - (ii) To receive materials at site with Manufacturer's Test Certificate(s)
 - (iii) To inspect materials at the authorized dealer's go downs to ensure delivery of genuine materials at site.
 - (iv) To receive materials after physical inspection at site.
- 15.2. Adequate care to ensure that only tested and genuine materials of proper quality are used in work shall be ensured by firm. The firm shall ensure that:
- (i) Material will be ordered & delivered at site only with the prior approval of the Bank.
 - (ii) As and when the order is placed for the fittings/ fixtures, cables, switchgears, poles, rising main, other main items etc., its copy shall be endorsed to the Bank.
 - (iii) The firm will be required to procure material like exhaust fans, MCB's & DB's, switches & sockets, wires & cables, conduits and switchgears etc directly from

the manufacturer/ authorized dealers to ensure genuineness & quality and as per the approved makes only. Proof in this regard shall be submitted by the contractor before installation at site to the Bank.

- (iv) Inspection at factory or at godown of the manufacturer, as required, shall be arranged by the firm for a mutually agreed date. Certificate for genuineness of the fittings shall have to provided duly signed by the manufacturer's officer not below the rank of Regional Manager.
- (v) Delivery of material shall be taken up only with the consent of Bank, after clearance of the material.
- (vi) Bank shall reserve the right to waive inspection in lieu of suitable test certificate, at its discretion.

15.3. Similarly, for fabricated equipment, the contractor will first submit dimensional detailed drawings for approval before fabrication is taken up in the factory. Suitable stage inspection at factory also will be made to ensure proper use of materials, workmanship and quality control.

16.0 Ratings of components:

- 16.1. All components in a wiring installation shall be of appropriate ratings of voltage, current and frequency, as required at the respective sections of the electrical installations in which they are used.
- 16.2. All conductors, switches and accessories shall be of such size as to be capable of carrying the maximum current, which will normally flow through them, without their respective ratings being exceeded.

17.0 Conformity to standards:

- 17.1. All components shall conform to relevant Indian Standard Specifications wherever existing. Materials with ISI certification mark shall be preferred.
- 17.2. Relevant Indian Standards including amendments or revisions thereof up to the date of tender acceptance shall be applicable in the respective contracts for respective items, firm to ensure its compliance.

18.0 Interchangeability:

Similar parts of all switches, lamp holders, distribution fuse boards, Switch gears, ceiling roses, brackets, pendants, fans and all other fittings of the same type shall be interchangeable in each installation.

19.0 Workmanship:

- 19.1. Good workmanship is an essential requirement to be complied with. The entire work of manufacture/fabrication, assembly and installation shall conform to sound engineering practice.
- 19.2. Proper supervision/skilled workmen: The contractor shall be a licensed electrical contractor of appropriate class suitable for execution of the electrical work. He shall engage suitably skilled/licensed workmen of various categories for execution of work

supervised by supervisors / Engineer of appropriate qualification and experience to ensure proper execution of work. They will carry out instruction of Engineer-in-charge and other senior officers of the Bank during the progress of work.

- 19.3. Use of quality materials: Only quality materials of reputed make as specified in the tender will be used in work.
- 19.4. Fabrication in reputed workshop: Switch boards and LT panels shall be fabricated in a factory/workshop having modern facilities like quality fabrication, seven tank process, powder/epoxy paint plant, proper testing facilities, manned by qualified technical personnel. These shall be as per make / item approved.

20.0 Testing:

All testes prescribed in this General Specification, to be done before, during and after installation, shall be carried out, and the test results shall be submitted to the Engineer-in-charge in prescribed Performa, forming part of the Completion Certificate.

21.0 Commissioning on completion:

- (ii) After the work is completed, it shall be ensured that the installation is tested and commissioned.

22.0 Completion plan and completion certificate:

- 22.1. For all works completion certificate after completion of work shall be submitted to the Engineer-in-charge.
- 22.2. Completion plan drawn to a suitable scale in A2 Sheet (It shall be laminated if desired by the Site- in-Charge) indicating the following, and three copies of the same shall also be submitted.
- (i) General layout of the building.
 - (ii) Locations of main switchboard and distribution boards, indicating the circuit numbers controlled by them.
 - (iii) Position of all points and their controls.
 - (iv) Types of fittings, viz. fluorescent, pendants, brackets, bulk head, fans, exhaust fans etc.
 - (v) Name of work, job number, tender reference, actual date of completion, names of site and name of the firm who executed the work with their signature.
 - (vi) Cable layout showing general distribution diagram alongwith position of cable joints, if any.

23.0 Guarantee / Defect Liability

The installation will be handed over to the Bank after necessary testing and commissioning alongwith the complete Project. The installation will be guaranteed against any defective design/workmanship. Similarly, the materials supplied by the contractor will be guaranteed against any manufacturing defect, inferior quality. The guarantee period will be for a period of 12 months from the date of handing over of the complete project to the Bank. Installation/ equipments or components thereof shall be

rectified/ repaired to the satisfaction of the Engineer-in-charge. The firm will be required to submit guarantee of material from the manufacturer to the Bank.

Note : The quantity of material in the BOQ is indicative. Contractor has to assess the actual requirement of material at site before placing the order keeping in view the drawing and site requirement from the shortest route. No claim for payment for unused excess material shall be entertained.

3.0 CONDITIONS FOR ASSOCIATE AGENCY FOR E&M WORKS

1. The tenderer (Main contractor) should either himself meet the eligibility conditions for execution of minor component of work i.e. E&M work (i/c Associated E&M Works) or otherwise he will have to associate with agencies, fulfilling the eligibility requirements for respective category prescribed in the tender document. After duly taking prior approval from Bank.
2. In case the main contractor is himself eligible (as per eligibility criteria) for executing all or some components of E&M work and intends doing job himself, he may not be required to associate with another agency for such components of E&M work. In such cases the main contractor also has to submit the documents as per eligibility criteria mentioned for associated agency of individual E&M component(s) within one month of award of work or 15 days before start of electrical related work whichever is earlier.
3. In case, the main contractor himself is not eligible (as per eligibility criteria) for executing any of the components of E&M work he will have to associate with him eligible agencies for executing such components of E&M work. In such cases the main contractor has to submit proposal for approval of associate agency along with documents in support of fulfilling eligibility criteria mentioned for associated agency of individual E&M components within one month of award of work or 15 days before start of such work whichever is earlier.
4. Bipartite agreement between RBI and Associated agency shall be executed for performance of Comprehensive Annual maintenance Contract (CAMC) wherever applicable.
5. In the event of the associated E&M agency not performing satisfactorily or failure of associate agency to complete the E&M work, the main contractor, shall remove the Associate agency deployed on the work and shall submit proposal for approval of new associate agency without any loss of time or variation in cost to the Bank. Such new associate agency shall also give an undertaking along with the main tenderer that both of them shall complete the work as per terms and conditions of the tender. No change of associate agency will be allowed without prior approval of the Engineer-in-charge of the work.
6. The main contractor shall be responsible and liable for proper and complete execution of the all the works and ensure coordination and completion of both civil and electrical work.
7. Payment against the work carried out by the Associated shall be released to the main contractor. The payment to the Associated Agency shall be made by the main contractor as per terms of payment between them.
8. The associate contractor shall attend the inspection of the work by the Engineer-in-charge of E&M works as and when required.

9. ELIGIBILITY CRITERIA FOR MAIN CONTRACTOR/ASSOCIATED AGENCY FOR E&M WORKS:

- 9.1. The main contractor must associate eligible agencies to execute components of E&M Works who fulfill the prescribed eligibility criteria given below after duly taking prior

approval from Bank. However, the main contractor shall also be eligible to carry out himself any or all of the components of E&M Works without associating any Associated Agency provided.

A. The general eligibility criteria applicable for all categories of minor works stated below shall be as follows

Experience:

- (i) The associate agency should have minimum 7 years of experience in executing similar works*, ending previous day of last date of submission of tender.
- (ii) The Associate agency should have successfully completed "Similar Works" during last 7 years ending previous day of last date of submission of tender as under:

Three Similar works each costing not less than 40% of Estimated cost of that work.

or

Two Similar works each costing not less than 50% of Estimated cost of that work.

or

One Similar work costing not less than 80% of Estimated cost of that work.

The estimated cost of various categories is as under:

S. No.	Category of work	Estimated cost (Rs. In Lakhs)
1	Internal Electrical Installations / wiring etc.	416
2	Lifts	366
3	Sub-Station External Electrification etc.	352
4	DG Set	29
5	Fire Detection and Alarm and System	5
6	Solar Photo voltaic Power System	18
7	EPBAX System	13
8	Boom Barrier	10

B. Special eligibility condition for associate agency: In addition to the above general eligibility criteria the associated agency shall also fulfil the following requirements

9.1.1. Internal Electrical Installations/ wiring etc.:

The associate agency should have a valid electrical license.

*similar work: Supply installation, testing and commissioning of internal Electrical Installation

9.1.2. Lifts:

(i) The associated agency for the lift work should be one of the OEM mentioned as acceptable make in this tender.

(ii) The OEM shall have service set-up in Jammu

*similar work: Supply installation, testing and commissioning of Lifts

9.1.3. Fire Alarm system:

(i) associated agency should have service set-up in Jammu, Chandigarh and/or New Delhi etc.

(ii) The associated agency shall have the applicable licenses for installation and maintenance of Fire Alarm system.

*similar work: Supply installation, testing and commissioning of Fire Alarm system

9.1.4. Sub-Station and External Electrification:

(i) The Associate agency must have valid electrical contractor license

*Similar Work: The associated agency should have completed the qualifying works (SITC of substation and external electrification) mentioned above with capacity of individual Transformer not less than 400 kVA of individual capacity.

9.1.5. DG Set:

(i) The Associate agency must have valid electrical license.

*Similar Work: The associated agency should have completed the qualifying works (SITC of DG set) mentioned above with capacity of individual DG set not less than 200 kVA of individual capacity.

9.1.6. Solar Power System:

The Associate agency must have valid electrical license.

9.1.7. EPABX System:

(i) The Associate agency must be either OEM or authorized partner of the OEM of offered EPABX system.

(ii) The associated agency should have service set-up in Jammu.

*Similar Work: SITC of EPABX

10. SUBMISSION OF PROPOSAL FOR APPROVAL OF ASSOCIATED AGENCY:

- 10.1. In support of the eligibility conditions of the proposed associated E&M agency, copy of their registration documents, Electrical Contractor's License, PAN Card, GST Registration duly attested by the applicants (Main Contractor) and applicable undertaking for carrying out AMC as per format of NIT (for Fire alarm system, Lift, & EPBAX work) shall be submitted to the Engineer-in-charge for approval. Each such electrical contractor will certify that they are not debarred as on the day of application. Proposal for associating agency for minor components of work shall be submitted, as per proforma given in this tender document, from each associate independently for all E&M components. The associate agency shall be engaged by the contractor after taking prior approval of the same from engineer-in-charge.

PROPOSAL FOR ASSOCIATING AGENCY FOR E&M WORKS

I/we hereby propose the following agency for execution of E&M work component mentioned herein. Consent Letter from the proposed associated agency is enclosed.

- (i) Name of work :
- (ii) Component of E&M Work :
- (iii) Name of Associated Agency :
- (iv) Copy of electrical contractor license attached: (Yes /No)
- (v) Copy of certificates / documents in support of eligibility criteria as mention in the above clause attached : (Yes /No)
- (vi) Copy GST Registration attached : (Yes/No)
- (vii) Copy PAN Card Attached : (Yes/No)
- (viii) Consent Letter of agency attached : (Yes/No)
- (ix) undertaking from associated agency for carrying out applicable CAMC Work : (Yes/ No)

Encls: Self Attested photocopies of as stated above

Seal & Signature of the Main Contractor

CONSENT LETTER FROM ASSOCIATE AGENCY FOR E&M WORKS

Name of Work:

I / We hereby give my consent to associate with M/s, for executing the (mention category) component of E&M work of the above-mentioned work.

I / We will execute the work as per specifications and conditions of the agreement for the work and as per directions of the Engineer-in-Charge for the said component of E&M work till the completion of the work.

I / We will be responsible for necessary action to handover the installations and for rectification of defects and repair during the maintenance / warranty / AMC period.

I / We will employ full time technically qualified Engineer / supervisor for the said component of E&M work as required for the work.

I / We will attend inspection of officers of the Bank as and when required.

Dated:

Seal & Signature of Associate Agency for E&M

MEMORANDUM OF UNDERSTANDING (MoU)

- 1] M/s [Name of the firm with full address]
[Henceforth called the main contractor]
And
- 2] M/s [Name of the firm with full address]
[Henceforth called Associated E&M Contractor or Electrical Contractor]

For the execution of(mention category) component of E&M work in the contract for the work : ” as per Schedule of Quantities, Specifications, Terms and Conditions of the said contract.

We state that MoU between us will be treated as an agreement and has legality as per Indian Contract Act (amended up to date) and the Reserve Bank of India can enforce all the terms and conditions of the agreement for execution of the above work. Both of us jointly and severally shall be responsible for the execution of work.

We have agreed as under:

- 1. The electrical contractor will execute all electrical works in the wholesome manner as per terms and conditions of the agreement.
- 2. The electrical contractor through the main contractor shall be liable for disciplinary action if he fails to discharge the action(s) and other legal action as per agreement.
- 3. All the machinery and equipment, tools and tackles required for execution of the electrical works, as per agreement, shall be the responsibility of the Electrical Contractor.
- 4. The Technical and other site staff required for the said E&M work shall be arranged by the Electrical Contractor as per terms and conditions of the agreement.
- 5. Site order book maintained for the said work shall be signed by the main contractor as well as by the Engineer of the Associated E&M Contractor or Associated E&M Contractor himself.
- 6. All the correspondence regarding execution of the electrical work shall be done by the Bank with the Main Contractor with a copy to the Associated contractor. In case of non-compliance of the provisions of agreement, the main contractor, as well as the associated contractor shall be responsible. The action under clauses 2 and 3 shall be initiated and taken against the main contractor.

Date:

Place:

Signature of Main Contractor

Signature of Associated E&M Contractor

1. Witness with address

2. Witness with address

(From major component contractor side)
contractor

(From minor component contractor side)
contractor

**4.0 COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (CAMC) FOR
MAINTENANCE AND SERVICES OF FIRE ALARM SYSTEM, LIFTS, AND EPABX
SYSTEM ETC.**

Summary: The Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu come up as a comprehensive project together with Civil and E&M Works and all Services included. For smooth and efficient maintenance of various specialized electrical installations / equipment (Fire Alarm, Lifts and EPABX System, henceforth called “Respective Equipment/system”), the contractor is required to ensure that these systems are maintained by the respective OEM or the system integrator who has installed the respective system in the Bank (hereafter referred as “Service Provider” or “Maintenance Contractor”) for their minimum expected life including defect liability period. The successful tenderer shall ensure that bipartite agreement(s) is/are executed between the Bank and the respective Service Provider at the time taking over of the system by the Bank for carrying out the maintenance during DLP and CAMC period of referred equipment(s).

Broad Parameters: For this purpose, the requisite amount of the works (Say Fire Alarm System, Lifts and EPABX system etc., henceforth called “Respective Equipment”) and their corresponding tender cost is to be calculated. From this tender cost, a Proportional amount of the complete Bank Guarantee (BG), i.e. in proportion to the cost of for the respective equipment(s) to the total tender, will be held back by RBI. This Part Bank Guarantee will be paid back only after the execution of all relevant CAMC Bipartite contracts by the maintenance contractor (Service Provider) directly with the RBI. Together with the successful signing of the CAMC contract with the RBI, the Service Provider shall submit an equivalent Bank Guarantee of 5% of the Capital Cost of the respective equipment as quoted.

On showing proof for the same, the Part Bank Guarantee shall be released by the RBI. In case of not doing either of these, the Part Amount of the BG shall be forfeited and RBI shall be free to engage their own Maintenance contractors.

The minimum expected life of these systems will be considered as given below:

S. No.	Equipment / System	Minimum Expected Life (years)
1	Fire Alarm System	8
2	Lifts	20
3	EPABX	10

ADDITIONAL CONDITIONS FOR THE CAMC.

1. **Undertaking from the Service Provider:** The successful tenderer shall submit an undertaking from the OEM/System integrator from whom the above captioned works is intended to be executed **before the approval of that agency (Service Provider) by RBI** in the attached format given at Annexure-1.
2. The successful tenderer shall ensure that a **bipartite agreement (s)** as per the format given at Annexure-2 is executed between the Bank and the Service Provider for carrying out the CAMC of respective equipment(s) **at the time taking over of the system by the Bank.**
3. **Submission of Bank Guarantee (BG) by Service provider:** The successful tenderer shall ensure that in addition to the bipartite agreement, service provider submits an irrevocable BG (issued by a scheduled Bank) to the Bank for the performance of CAMC of the respective system for an amount of 5% of capital cost of that system valid for a period of 5 years from the date of handing over of the system to the Bank. The BG shall be submitted alongwith the bipartite agreement to the Bank.
4. **Rate of comprehensive CAMC:** The rates of CAMC for the above systems for the first year shall not be more than 4% of the quoted capital cost of the respective system / equipment. In case a tenderer quotes more than this limit, the CAMC shall be executed at the herein mentioned limit of 4 % only.

(a)	Period of CAMC	Expected life of the system as indicated excluding DLP
(b)	Payment terms of CAMC	Quarterly payment after satisfactory completion of the service

Renewal of Rate of comprehensive CAMC: The rate of CAMC for further period till the expected minimum life as given above shall be renewed based of the following formula :

	$A_C = \frac{A_P}{100} \left(15 + 70 \times \frac{EPC}{EPP} + 15 \times \frac{WIC}{WIP} \right)$	
	A_C	= The contract amount for the current year.
	A_P	= The contract amount for the previous year.
	EPC	= Wholesale Price Index for electrical products 6 months prior to the commencement date of contract for the current year.
	EPP	= Wholesale Price Index for electrical products 6 months prior to the commencement date of contract for the previous year.

	WIC	=	Consumer Price Index for industrial workers (respective location of installation city) 6 months prior to commencement date of contract for the current year.
	WIP	=	Consumer Price Index for industrial workers respective location of installation city) 6 months prior to commencement date of contract for the previous year.

- i. **Scope of CAMC:** During the CAMC of Fire Alarm, Lifts and EPABX System, the same shall be maintained by Service Provider as per the scope indicated in the Annexure-A to Annexure-C.
- ii. **Penalty provisions for non-performance of CAMC:** During the CAMC of the above systems / equipments, the same shall be maintained as per the scope indicated in the Annexure-A to Annexure-C.
- iii. **Terms of payment during CAMC:** Quarterly payment shall be made subject to statutory deductions, penalties etc if any, by the Bank directly to the Service Provider after rendering satisfactory services during the previous quarter by the service provider subject to submission of bill alongwith requisite service reports etc.

ANNEXURE-1

(To be submitted by the respective Service Provider (OEM or the System Integrator who have installed the Fire Alarm System / Lifts / EPABX) on their letter head)

Undertaking for the CAMC of(Name of respective equipment).....

To
Regional Director,
Reserve Bank of India,
Jammu

Dear Sir/Madam

Supply, Installation, Testing and Commissioning of Fire Alarm System/ Lifts / EPABX in RBI Officers Quarter Jammu – Comprehensive Annual Maintenance Contract

We hereby confirm that we have understood the followings in respect of the Comprehensive Maintenance Contract (CAMC) of above referred system:

1. The system provided will be maintained by us during defect liability period of one year and thereafter under Comprehensive Annual Maintenance Contract (CAMC) for a **minimum period of** (Expected life of the system excluding one year of DLP)..... years after handing over of the system to the Bank.
2. We have understood the **detailed scope of CAMC** and its terms and conditions and agree to abide by the same.
3. The rates for the first year of CAMC after one year of DLP will be (as per BOQ) Totalling Rs.....(Rates quoted by the main contractor) per annum and the rates of CAMC for further period till the expected minimum life as given above shall be renewed as per the provision indicated in the attached bipartite agreement.
4. We agree to enter into a bipartite agreement with the Bank for the execution of the said CAMC as per the enclosed draft. The cost toward the agreement (charges for stamp paper as per stamp act and other charges) shall be borne by us. A signed copy of the draft agreement in support of having accepted the Scope, terms and conditions of the CAMC is attached.
5. We agree to submit irrevocable **Bank Guarantee** to Bank of required amount and required validity alongwith the bipartite agreement for CAMC, as a performance guarantee for due fulfilment of the terms of CAMC for specified period.

Yours faithfully,

(Seal and signature)

Enclosure: Signed copy of the **Annexure-2** (Draft Bipartite Agreement for the CAMC) along with the **Annexure -A to Annexure-C** for the scope of work for respective equipment.

ANNEXURE-2

BIPARTITE AGREEMENT FOR COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT
(CAMC) FOR MAINTENANCE AND SERVICES
FIRE ALARM SYSTEM, LIFTS AND EPABX SYSTEM

This agreement is made on this _____ day of _____ between **M/s.**
 _____ **(Name of CAMC vendor)**, having its office at
 _____ hereinafter referred to as Service
 Provider, the party of the **FIRST PART**, (which expression where the context admits shall this
 include its successors in interest and assigns);

And

Reserve Bank of India, constituted under the Reserve Bank of India Act, 1934, having its
 Central Office at Mumbai (hereinafter referred to as the "Bank"), through
 _____ **(Name and address of the Bank's**
office where contract is being executed), (hereinafter called the "Bank") and collectively
 the party of the **SECOND PART**;

Whereas:

- (a) In terms of the Contract Agreement dated _____ between the Regional
 Director, Reserve Bank of India, Jammu and the for the construction of the
 _____, **the Service Provider** herein was selected by
 the **(Name of the Main contractor)** vide Order No.
 _____ DATED _____ after acceptance by
 Regional Director, Reserve Bank of India, Jammu for Supply, Installation, Testing and
 Commissioning of Fire Alarm System / Lifts / EPABX system for **(Name of the System**
as applicable) and entered into an agreement with the Service Provider for the same
 including carrying out Comprehensive Annual Maintenance (CAMC) for a period of
 minimum years *(as per expected life mentioned)* after one year of Defect
 Liability Period.
- (b) The Service Provider, being the Original Equipment Manufacturer (OEM) / system
 integrator of Fire Alarm System / Lifts / EPABX system has agreed to provide
 Comprehensive Annual Maintenance Contract (CAMC) for the system installed by
 them for the captioned project for a period of minimum years *(as per expected life*
mentioned) after expiry of DLP of one year in consideration of the amount of Rs.

.....Per Annum to be paid by the Bank subject to revision in the rates as per the formula indicated in this agreement.

AND

(c) Under the contract agreement with reference to agreement Dated _____ between (*Name of the main contractor*) and the RBI, a bipartite agreement(s) is required to be executed between the Bank and the Service Provider for smooth implementation of Comprehensive Annual Maintenance Contract (CAMC) of Fire Alarm System / Lifts / EPABX system installed by it at the Bank's Officer Quarter at Jammu on the terms and conditions as contained herein.

NOW THE PARTIES TO THIS AGREEMENT BEING DESIROUS OF REDUCING TO WRITING ALL THE TERMS AND CONDITIONS AGREE AS FOLLOWS:

(A) General:

1. The parties hereto shall respectively and faithfully abide by the terms and conditions and stipulations contained in this agreement and perform/discharge their part of the obligation of the agreement accordingly.
2. The Indian laws shall apply for interpretation of this Agreement.
3. Four sets of this agreement shall be signed and one set each of this agreement shall remain with the Service Provider,(*Main Contractor*), Bank and the RBI and the cost towards the stamp duty for all these agreements shall be borne by Service Provider.
4. The Parties hereto represent and warrant that the respective signatories are duly authorized to sign this Agreement and bind the respective parties.
5. All disputes arising out of or any way connected with this agreement and the Work Order No. _____ (work order issued by Bank for this work), shall be deemed to have arisen at Jammu and courts in Jammu shall have jurisdiction to determine the same.
- 6. The scope of work and other terms and conditions of the CAMC shall be as per the attached annexure.**
7. The parties to this Agreement agree to settle their disputes arising under this Agreement, by mutual consultations at the first instance with the aid of an escalation matrix, failing which the parties agree to settle their disputes by way of arbitration by a sole arbitrator to be appointed by mutual consent. However, the person to be appointed as the sole arbitrator shall be one who is adequately qualified and experienced to resolve the dispute sought to be raised before the said arbitrator. The place of arbitration shall be Jammu.

8. Where the business or undertaking of the service provider, is taken over by any other person in any legally recognized mode of take-over, then unless the service provider is entitled to continue to provide to the Bank the services contemplated under this Agreement, it shall be duty of the service provider to ensure that such other person is obligated to provide the services contemplated under this Agreement under the same terms and conditions. In case the service provider does not so ensure and consequently maintenance services are not provided or the successor of the service provider fails to honour the terms of this Agreement, then –
 - a. Any sums due to the service provider towards CAMC shall be liable to be forfeited and successors of the service provider shall not be entitled to claim any money due to the service provider; and
 - b. The Service Provider shall arrange to get the CAMC services through their successor or any other service provider mutually agreed with the Bank, at the risk and cost of the Service Provider/ successor, as the case may be.
9. The Bank shall have right to forfeit the CAMC performance Bank Guarantee submitted by the Service Provider in case of failure by the Service Provider to provided satisfactory services even after expiry of written notice period of 15 days to comply with the above.

(B) Obligations of the FIRST PARTY (SERVICE PROVIDER):

1. The FIRST PARTY shall provide all-inclusive Comprehensive Annual Maintenance for the system which includes periodic routine/preventive and breakdown maintenance and also any number of breakdown calls along with supply of all spares and labour involved as per Original Equipment Manufacturer's O&M Manual for the supplied/installed equipment and its accessories in order to ensure proper functioning of the system. The CAMC period will commence from expiry of defects liability period and accordingly shall be valid for a period of years (*as per expected life mentioned*).
2. The Service Provider shall make good for any direct damages/loss caused to the Bank due to the actions/omissions of persons employed by it or because of its actions/omissions during the execution of the contract.
3. The Service Provider shall submit an irrevocable BG issued to the Bank for the performance of CAMC of the respective system for an amount of 5% of capital cost of the system for a period of 5 years from the date of start of CAMC. The BG (issued by a scheduled Bank) shall be submitted to the Bank at least 15 days before the expiry of DLP.

4. The firm shall ensure that the required spares etc. for proper maintenance are readily available with them for the complete life span of the lift.
5. The complaints lodged by the Estate Department, Reserve Bank of India, Jammu /(Name of the main Contractor) in respect of the equipment for any repair or break down (any number of breakdowns) must be attended at top most priority by the Service Provider.
6. The Complaint/Message may be sent to the address/Telephone Number/ email of the service provider
7. While submitting the invoice towards annual maintenance to Bank, the Service Provider has to furnish a satisfactory working service reports from the Bank. The certification given by the Bank is final and shall not be subject to any question
8. The Service Provider has to replace any defective parts with the Manufacturer's genuine parts under intimation to the Bank's authorized personnel.
9. The service provider shall be responsible to take and accordingly obtain all the insurance required for its employees carrying out the CAMC works under this agreement, such as Workmen Compensation or any other requisite and necessary insurance.
10. The Service provider shall keep the Bank indemnified in case any action is taken against them by any Authority on account of contravention by the Service Provider or its employees, of any of the provision of any act or rules made there under pertaining to maintenance of the equipment(s). If the Bank is made liable to pay or reimburse any amount due to non-observance, if any, on the part of Service Provider, of any provision stipulated in the notification by law/act/rules/regulations etc., then Bank, shall have the right to deduct any money due to the Service Provider under this Agreement.
11. The Service Provider shall deploy adequate number of qualified and duly experienced service engineers and such other skilled personnel with necessary certification wherever necessary for carrying out the services under this Agreement and considering the nature of working of the Bank, shall ensure availability of its maintenance personnel as and when required.
12. The Service Provider shall only employ its own employees for rendering the services contemplated under this Agreement. The service provider shall ensure that all the personnel deployed by it, act with proper demeanor and in case the Bank notifies the service provider that any of its personnel need to be replaced for any reason, the service provider shall promptly act upon such notice by the Bank or college and replace the concerned personnel.

13. The Service Provider shall familiarize itself and fully comply with the provisions of all the Acts/Rules/Regulations and orders of the State/Central Government applicable to the work, including the Payment of the Wages Acts, Workman’s Compensation Acts, Contract Labour (R&A) Act etc. and shall be fully responsible and liable for due observance of the same.
14. The Service Provider shall abide by all existing or future labour related enactments and rules and regulations made there under, notifications issued, etc. by the State or Central Govt. or Local Authorities.

(C) Obligations of the SECOND PARTY (Bank):

1. **Terms of Payment:** Bank shall be responsible for making all payments to Service Provider during the CAMC period for rendering satisfactory maintenance services as per scope of works stated herein. **Quarterly payment** shall be made by the Bank to the service provider after rendering of satisfactory services during the quarter by the service provider subject to submission of bill alongwith requisite service reports.
2. **Renewal of Rate of comprehensive CAMC:** The rate of CAMC for further period till the expected minimum life as given above shall be renewed based of the following formula.

$$AC = \frac{AP}{100} (15 + 70 \times \frac{EPC}{EPP} + 15 \times \frac{WIC}{WIP})$$

- AC = The contract amount for the current year.
- AP = The contract amount for the previous year.
- EPC = Wholesale Price Index for electrical products 6 months prior to the commencement date of contract for the current year.
- EPP = Wholesale Price Index for electrical products 6 months prior to the commencement date of contract for the previous year.
- WIC = Consumer Price Index for industrial workers (respective location of installation city) 6 months prior to commencement date of contract for the current year.
- WIP = Consumer Price Index for industrial workers respective location of installation city) 6 months prior to commencement date of contract for the previous year.

The parties hereto agree that the several parts of this contract have been read by all of them and having fully understood, in witness whereof the parties have hereunto set and subscribe their respective hands and seals at _____ on the date, month and year above written.

Signed and Delivered

By the said Second Party

Signature

Name:

Address: _____ :

1) Witness & Signature

By the said First Party

Signature.

Name:

Address:

Address:

ANNEXURE-A

**ANNEXURE FOR THE BIPARTITE AGREEMENT FOR THE
CAMC OF FIRE ALARM SYSTEM**

FIRE ALARM SYSTEM:

- (A) The scope of work shall include the following:
- a. Comprehensive AMC of the Fire Alarm system shall include all detectors, Panels, Control modules, Hooters, Monitor modules, cables of all types and all hardware and software etc. provided for Fire Alarm system.
 - b. All **software updates**, releases, Version upgrades, New Versions etc. as and when required for smooth functioning of the system shall be included in the scope in scope of CAMC, The service provider shall have to provide all software (IOS) updates, releases, Version upgrades, New Versions etc. of all the Application Software and Custom Software including renewal of all licences provided for this system. The service provider will also undertake to carry out implementation / operationalisation / customisation of such software updates, releases, Version upgrades, New Versions etc. Accordingly the service provider should include the cost for the above in the quoted cost for the CAMC.
 - c. 24x7 support should be made available by the service provider for all the equipments.
 - d. During DLP and CAMC period, full servicing and cleaning of devices **once in a quarter** shall be done including attending to ANY NUMBER of breakdown calls.

The System will be required to be checked by deputing a competent, trained service engineer on **WEEKLY basis** by creating a fire / smoke simulation in the loops

Critical area detectors viz server rooms etc should be invariably included and checked during the weekly and quarterly visits. Suitable log register indicating faults, rectification done with date & time of breakdown should be maintained and got signed from the security/Fire officer. Bank will not provide any assistance in the form of men/material. The service provider will have to make their own arrangements for deputing a helper to skilled personnel including all necessary spares for rectification of the defects reported/observed.

- e. During the DLP and the currency of the Comprehensive Annual Maintenance Service Contract, all care shall be taken so that the downtime of the system is

kept minimum and in any case, not more than the allowed time for attending to rectify as under:

		Rectification time*	Penalty
(a)	Any defects resulting in total failure of the system	12 hours	₹.2000/- per day
(b)	Any defects in independent devices, components, cables which may not result in total failure of the system	24 hours	₹.500/- per day

* From the time of reporting complaint in writing (complaints through SMS, e-mails, fax etc. shall also be treated as complaints in writing).

- f. The scope of work shall also include all the labour, tools etc. **for relocation/ shifting of any detector/device** from one place to another within the Bank's Premises as per Bank's requirements and instructions. For such relocation or shifting, if additional cable/item is required, the cost of the additional cable/item only shall be paid as per the rates quoted by the firm in the tender after applying necessary escalation as per the escalation formula for CAMC in the tender and no other cost shall be paid. For ascertaining the reasonability of the rates so arrived, current market cost of same/similar item will be submitted by the service provider and lesser of the two rates will apply.
- g. The rates quoted should include for **repair/replacement of the equipment** in case it develops any defect including re-loading software etc. In case of any defect(s) in the detectors, Panels, Control modules, Hooters, Monitor modules, cables etc, the same shall be repaired within specified period including replacement of spares/ components/ sub-system/ cards and any other component, part or whole, which may need **replacement/ repairs. In case the repair is not possible** due to any reason what so ever, then the defective item/equipment shall be replaced with the new equipment without any additional cost to the Bank. During such period of repairs or replacement, the service provider shall provide similar standby/spare equipment temporarily for keeping the system in proper working condition.
- h. The service provider shall keep the **sufficient stock** of the spares at site as well as at their service centre as required for proper functioning of the system. Non availability of spares/standby units/components will not be accepted as a reason for waiving of penalty towards delay in rendering prompt service.

- i. The **additional requirement** of the equipments during the DLP and CAMC shall be met by procuring the equipments from the system integrator based on the quotes rates and variations on the exchange rate, prices indices etc. In case the rates so offered are not found acceptable by the Bank due to any reason, the Bank may procure the same directly from the market and the same shall be handed over to the service provider alongwith all the warranty documents etc. for installation, testing and commissioning, The system integrator will be paid 5% of the cost of procured material for installation and configuration of the additional items.

The items so installed will be an integral part of the Fire Alarm system and the service provider shall maintain alongwith entire Fire Alarm system. After installation, these items shall remain under warranty for one year from their installation and thereafter shall be covered under CAMC. During first year CAMC, the CAMC charges for these items will be paid to the system integrator on pro rata basis (based on the cost of such additional installation) at rate the quoted by the system integrator in their tender.

Example:

Capital Cost of Fire Alarm system : Say ₹10,00,000/-

CAMC Charges quoted by the firm in their tender : Say ₹60,000/-

Cost of Additional installation : Say ₹1,00,000/-

The pro rata CAMC Charges for additional installation : ₹6,000/-

The CAMC charges will be revised for further years as per the renewal formula in the tender.

Note: Notwithstanding the above penal provisions, in addition to the penalty, the Bank reserves the right to encash the BG submitted for the due fulfilment of the terms and obligations the DLP and CAMC contract.

ANNEXURE-B**Annexure for the Bipartite agreement for the CAMC of Lifts**

The scope of work shall include the following:

- a. Comprehensive AMC of the Lifts **shall include the complete lift system** including all hardware and software etc. installed by the service provider.
- b. **Preventive Maintenance/ Routine servicing/ troubleshooting/ setting/ adjustments/ cleaning/ lubrication/ checking of safeties** etc. at least once per month to ensure smooth running and trouble free working of the lift.
- c. **Repairs/ replacement** to the lift including re-loading software etc. in the event of any breakdown including replacement of spares/ components/ sub-system/ cards/ motors/ ropes and any other component, part or whole, which may need replacement/ repairs.
- d. The rates quoted should include for repair/replacement of the any of component of the lift in case it develops any defect including re-loading software etc. In case of any defect in the any of its component, the same shall be repaired within specified period including replacement of spares/ components/ sub-system/ cards and any other component, part or whole, which may need **replacement/ repairs. In case the repair is not possible** due to any reason what so ever, then the defective item/equipment shall be replaced with the new equipment without any additional cost to the Bank. During such period of repairs or replacement, the service provider shall provide similar standby/spare equipment temporarily for keeping the system in proper working condition.
- e. Keeping the **sufficient stock** (including importing, if required) of the spares at site as well as at their service centre / site as required for proper functioning of the system. Non availability of spares/standby units/components will not be accepted as a reason for waiving of penalty towards delay in rendering prompt service.
- f. All **manufacturers preventive maintenance schedules/** replacement periodicity of components like ropes, electrical/ electronic parts including checking of safety devices, protections like rope slip, load testing etc. shall be strictly followed as per the manufacturer's periodicity or as required in addition to the scope of maintenance indicated above.
- g. The scope of maintenance in addition to periodic maintenance will also include **attending to /any number of breakdown** calls.

- h. 24x7 support should be made available by the service provider for all the equipments.
- i. The payment towards AMC charges will be made every quarter after satisfactory completion of the service.
- j. During the DLP and the currency of the Comprehensive Annual Maintenance Service Contract, all care shall be taken so that the downtime of the lift is kept minimum and in any case, the lift shall be attended immediately and maximum within 3 hours of receiving the complaint.

(B) Penalty for delay in service during defect liability period (DLP) and CAMC period:-

- a. In case, the lift remains under breakdown for more than a day (requiring repair other than major repair), then a penalty equivalent to 4 times the daily rate of Comprehensive AMC charges shall be recovered from the payment due to the contractor during CAMC period and the warranty period (DLP) will be extended by 4 times the number of days of delay in rectification of the defects during DLP.
- b. If any major repair resulting in stoppage of the lift is not rectified within 3 days then a penalty equivalent to 4 times the daily rate of Comprehensive AMC charges shall be recovered from the payment due to the contractor during CAMC period and the warranty period (DLP) will be extended by 4 times the number of days of delay in rectification of the defects during DLP. For the purpose of penalty the following items will be considered as Major repair:
 - i. Rewinding of motor
 - ii. Replacement of rope
 - iii. Replacement of bearings, gears etc. in gear box
 - iv. Replacement of guide shoes for the car and counter weight
 - v. Replacement of trailing cables/ control wiring
 - vi. VVVF Controller replacement

Note: Notwithstanding the above penal provisions, in addition to the penalty, the Bank reserves the right to encash the BG submitted for the due fulfilment of the terms and obligations the DLP and CAMC contract.

ANNEXURE-C**ANNEXURE FOR THE BIPARTITE AGREEMENT FOR THE CAMC OF EPABX****EPABX SYSTEM:****(A) The scope of work shall include the following:**

- a. Comprehensive AMC of the EPABX system shall include all its component, cards, all type hardware and software etc. provided for functioning of EPABX.
- b. The service provider will have to provide, at no additional cost to the Bank, all software updates, releases, Version upgrades, New Versions etc. as and when required for smooth functioning of the EPABX system.
- c. Routine preventive maintenance shall also be carried out during the CAMC period at least quarterly in accordance with the Bank's requirements. All performance checks should be undertaken and recorded in the system log book. As a minimum, the following performance checks must be undertaken on each maintenance visit.
 - i. Remove dust and dirt from the exterior of the EPABX system (Inside & outside) using a soft brush or a lint cloth. A solvent which is harmless to the finishes of metal and plastic may be applied to more stubborn stains.
 - ii. Examine the exterior of the enclosure for any signs of damage or loose cable glands and rectify any faults found.
 - iii. Remove any dust or dirt form the interior of the EPABX equipment(s) using a soft brush or a vacuum cleaner.
 - iv. Examine the printed circuit boards for signs of over-heating, dry joints and/or damaged tracks.
- d. The system shall be maintained by the service provider for a minimum period of 9 years under CAMC, after the completion of Defect Liability Period (DLP) of one year, at the rate quoted and terms and conditions
- e. 24x7 support should be made available by the service provider for EPABX system
- f. The system shall be serviced regularly and maintained in proper working condition round the clock.
- g. The contractor shall keep the sufficient stock of the spares at site as well as at their service centre as required for proper functioning of the system. Non availability of spares/standby units/components will not be accepted as a reason for waiving of penalty towards delay in rendering prompt service.
- h. The scope of maintenance will also include attending to any number of breakdown calls in addition to preventive maintenance schedule.
- i. The rates quoted should include for repair/replacement of the equipment in case it develops any defect including the defect while re-loading software etc. In case of

any defect in the EPABX, its Card etc, the same shall be repaired within specified period including replacement of spares/ components/ sub-system/ cards and any other component, part or whole, which may need **replacement/ repairs**. **In case the repair is not possible** due to any reason what so ever, then the defective item/equipment shall be replaced with the new equipment without any additional cost to the Bank.

- j. **Software upgrades and Renewal of Licences to be provided:** The service provider shall have to provide all software updates, releases, Version upgrades, New Versions etc. of all the Application Software and Custom Software included in the Products including renewal of all licences provided. The service provider will also undertake to carry out implementation / operationalization / customisation of such software updates, releases, Version upgrades, New Versions etc. Accordingly the service provider should include in his quoted cost the following:
- i. The rate shall include for providing required software upgrades released by the OEM and the same should be provided.
 - ii. The rate shall include the cost of renewal of licenses, if any, for **all the software provided by the service provider** for the entire system and for all the users and such renewal should be done well in time.
- k. During the DLP and the currency of the Comprehensive Annual Maintenance Service Contract, all care shall be taken so that the downtime of the system is kept minimum and in any case, not more than the allowed time for attending to repairs as under:
- i. Any minor defects in the EPABX system not resulting in complete failure of the exchange shall be responded within 2 hours and shall be repaired **within 12 working hours** from the time of reporting complaint in writing (complaints through SMS, e-mails, fax etc. shall also be treated as complaints in writing).
 - ii. Any defect resulting in failure of exchange leading to complete breakdown of the EPABX system, shall be responded within 2 hours and shall be repaired **within 12 working hours** from the time of reporting complaint in writing (complaints through SMS, e-mails, fax etc. shall also treated as complaints in writing).

(B) Penalty for delay in service during the Defect liability period and the CAMC period: Any defects/ problems associated with the software or hardware of EPABX shall be attended by the service provider as per above schedule, failing which the penalties as

below may be imposed. And the recovery shall be made from any payments due to the service provider at the following rates:

Sr. No.	Defect	Rectification time	Penalty
1	Defects resulting in failure of exchange	12 working hours	₹500/- per day
2	Any other minor defect	12 working hours	₹200/- per day

Note: Notwithstanding the above penal provisions, in addition to the penalty, the Bank reserves the right to encash the BG submitted for the due fulfilment of the terms and obligations the DLP and CAMC contract.

5.0 PARTICULAR SPECIFICATIONS FOR E&M WORKS

A. GENERAL:

1. All hardware items such as screws, thimbles, connectors, earth/neutral terminals, wires etc. which are essentially required for completing any item as per specifications will be deemed to have been included in the item even when the same have not been specifically mentioned.
2. All hardware material such as nuts/bolts/screws/washers etc. to be used in the work shall be zinc/cadmium plated iron. The galvanized boxes of modular switch/sockets etc. shall be of the same make as of switch/socket etc.
3. While laying conduit, suitable minimum number of junction boxes shall be left for pulling the wires. These shall be placed in such a way that the same do not remain noticeable.
4. Any conduit which is not be wired by the contractor shall be provided with GI fish wire for wiring by some other agency subsequently. Nothing extra shall be paid for the same.
5. Multi stranded FRLS PVC insulated copper conductors wires are to be used in the work. Termination of multi-stranded conductors shall be done using crimping type copper thimbles at both the ends. Nothing extra shall be paid for the same.
6. The connections of switches, sensors, earthing conductors & interconnections cables shall be made by adequate rating thimbles of approved standard makes only and nothing extra on this account shall be paid.
7. Check nuts shall be provided while terminating the M.S. conduits (wherever applicable) in switch board boxes for which nothing extra shall be paid.
8. All distribution boards shall be marked with circuits controlling the rooms/area/SDB controlled
9. Material to be used in the work shall be one of the approved makes and shall be ISI marked. The makes of material have been indicated in the list of acceptable makes. No other make will be acceptable. The material to be used in the work shall be got approved from the Engineer-in-charge before its use at site. The Engineer-in-charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specifications
10. While deciding the size of switch boxes for light points/fan point, exhaust fan point items, extra two modules will be provided for each fan point for fixing of regulator(s) (fan regulator is to be provided under different item). Wherever extra modules are available, the same shall be provided with blanking plates.
11. Modular type switches/sockets/telephone outlets/TV sockets are to be provided wherever indicated in the items. The same shall be of only one make. The modular plates of switches, sockets, telephone & TV sockets etc. shall be in two parts i.e. plates with frames with in quoted rates.

12. The building shall be provided with false ceiling in various areas. In order to avoid maintenance problem the contractor will not provide any ceiling rose/connector/looping box etc. above the false ceiling. The point wiring in that case will be extended up to the fitting/fan etc. directly without provisions of any termination arrangement in between. The wire from the end point up to the fixture shall be considered to be included in the point wiring. Nothing extra shall be paid for the same.
13. Wherever it is not possible to provide rigid conduits, flexible conduit pipe shall be provided for drawing/running the wires. However, such arrangement has to be kept to the barest minimum and only with the prior approval of Engineer-in-charge.
14. Earthing and all hidden items of work shall be carried out in the presence of the Engineer-in-charge or his authorized representative.
15. The fan box cover shall be made from 3mm thick phenolic laminated sheet as per CPWD specification.
16. The junction boxes & looping boxes shall be covered with approved makes of phenolic laminated sheet.
17. The firm has to go through the site order book kept with the Bank's Engineer regularly and has to sign the same and carryout the instructions recorded therein by various officers of the Bank.
18. The quantities of various items may vary from the quantities given in schedule of work. The agency shall bring the various items & materials as per actual requirement at site at the time of execution of work. Excess quantities shall not be accepted & paid by the Bank.
19. The ceiling roses wherever required to be provided are included in the scope of work and the same shall also be of modular type & of the same make as that of switches & sockets along with earthing provision.
20. The MCB should be of same make as that of MCB DBs.
21. The MCB distribution boards shall be factory fabricated in the works of the manufacturer of the MCB's of any of the makes specified and the same shall be duly pre-wired in the works. The board shall be brought to site in ready for installation condition. The MCBs and the MCB distribution board shall be of the same make.
22. MCCB should have centrally adjustable overload setting 80% to 100% & short circuit setting adjustable from 500% to 1000% of nominal current for thermal type & overload setting 40% to 100% & short circuit setting adjustable from 150% to 1000% of nominal current for microprocessor type MCCB. All MCCB should be ICS=ICU.

Suitable crimping tools shall be used for crimping the lugs/thimbles/ferrules. Nothing extra shall be paid on this account. The lugs/thimbles/ferrules pressed by conventional/ordinary pliers shall not be accepted.

6.0 Technical Specifications

Sub Head I – Internal Electrical Installation

1. GENERAL

The system of wiring shall consist of single-core / multi-core PVC insulated Copper conductor wires in Metallic /PVC conduits concealed/exposed as called for.

2 STANDARDS AND CODES

Updated and current Indian Standard Specifications and Codes of Practice as stipulated below shall apply to the equipments and the work covered in this section. In addition the relevant clauses of the CPWD Specification for Electrical Works-2013, The Electricity Act 2003, Indian Electricity Rules 1956, National Building Code 2016, National Electric Code 1985, Code of Practice for Fire Safety of Building (general) : General Principal and Fire Grading – IS 1641 and IEE wiring regulation 16th edition as amended upto date shall also apply. Wherever appropriate Indian Standards are not available, relevant British and/or IEC Standards shall be applicable.

660/1100 V grade FRLS PVC insulated wires.	IS 694 : 1990
PVC Conduits	IS 2509, 3419, 6946
Accessories for rigid steel conduits	IS 3837 : 1990
Flexible steel conduits for electrical wiring	IS 3480 : 1990
Switch socket outlets	IS 4615 : 1990
3 pin plugs and socket outlets upto 250 volts	IS 1293 : 1988
Glossary of items for electrical cables and conductors	IS 1885 : 1971
Conductors for insulated electric cable	IS 8130 : 1984
General and safety requirements for fluorescent lamps luminaries	IS 1913 : 1978
Switches for domestic and similar purposes	IS 3854 : 1997
Boxes for the enclosure of electrical accessories	IS 5133 : Parts I & II
1969	
Danger notice plates	IS 2551 : 1982
Code of practice for personal hazard fire safety of buildings	IS 1644: 1998

Code of practice for electrical installation fire safety of buildings	IS 1646 : 1997
Code of practice for electrical wiring installations	IS 732 : 1989
Code of practice of fire safety buildings (General- Electrical installations)	IS 1646 : 1982
Guide for safety procedure and practices in electrical works	IS 5216 : 1982

3. **CHECKING OF DRAWINGS**

Before commencing the conduiting work, the Contractor shall carefully examine the drawings indicating the layout of conduits, check the number and size of conduits with respect to number of wires, location of junction boxes, sizes and location of switch boxes and other relevant details. Any changes suggested by the Contractor shall be got approved from the Bank before the actual laying of conduits. Any discrepancy found in the drawings shall be brought to the notice of the Bank promptly before execution of the work.

4. **MATERIAL**

4.1 Conduits shall be black enameled mild steel and be solid drawn or lap welded conduits, stove enameled inside and outside with minimum wall thickness of 1.6 mm for conduits upto 25 mm diameter and 2 mm wall thickness for conduits above 25 mm diameter.

The PVC conduits shall be 2 mm thick. PVC Conduits shall be rigid unplasticised PVC conduits of 2 mm thickness. The conduits shall be delivered to the site in original bundles and each length of conduit shall bear the label of the manufacturer. The number of insulated copper conductor wires that may be drawn in the conduits of various sizes are given below and the

conduit fill shall not exceed 40%. The minimum size of conduits shall be 20mm diameter for lighting and outlets and conduit size shall be increased as per relevant IS code depending on the number of wires. Wires shall be FRLS PVC insulated copper conductor and ISI marked.

4.2 **FRLS PVC insulated wires**

Flame Retardant Low Smoke (FRLS) PVC insulated wires shall be single core unsheathed in voltage grade 1100 V as per IS 694 – 1990 with 99.97% pure electrolytic grade bright annealed stranded bare copper conductors. Special parameters of FRLS PVC insulation like critical oxygen index, temperature index, smoke density and flammability test shall conform to relevant IEC and ASTM Standards. Coil packings shall be ISI marked as stipulated in IS 694

5. CONDUIT FILL:-

The maximum number of 650/1100 Volts grade PVC insulated copper conductor wires that may be drawn in the conduits of various sizes are given below.

Nominal cross sectional area of conductor in sq.mm.	20 mm		25 mm		32 mm		38 mm		51 mm		64 mm	
	S	B	S	B	S	B	S	B	S	B	S	B
1	2	3	4	5	6	7	8	9	10	11	12	13
1.50	5	4	10	8	18	12	-	-	-	-	-	-
2.50	5	3	8	6	12	10	-	-	-	-	-	-
4	3	2	6	5	10	8	-	-	-	-	-	-
6	2	-	5	4	8	7	-	-	-	-	-	-
10	2	-	4	3	6	5	8	6	-	-	-	-
16	-	-	2	2	3	3	6	5	10	7	12	8
25	-	-	-	-	3	2	5	3	8	6	9	7
35	-	-	-	-	-	-	3	2	6	5	8	6
50	-	-	-	-	-	-	-	-	5	3	6	5
70	-	-	-	-	-	-	-	-	4	3	5	4

The columns headed 'S' apply to runs of conduits which have distance not exceeding 4.25 m between draw in boxes and which do not deflect from the straight by an angle of more than 15 degrees. The columns headed 'B' apply to runs of conduit, which deflect from the straight by an angle of more than 15 degrees.

6. JOINING OF CONDUITS:-

PVC Conduits shall be joined by means of PVC solvent cement. Proper jointing compound recommended by manufacturers shall be used for the same. Where there are long runs of straight conduit, inspection boxes shall be provided at 10 meter intervals. Junctions between conduits and adaptable boxes, switch outlet boxes must be provided with entry spouts and smooth PVC bushes.

7. CONDUIT CONNECTIONS:-

The threads of pipe and sockets shall be free from grease and oil and shall be thoroughly cleaned before making the screwed joints. All joints shall be fully water tight. Junction boxes and running joints shall be provided at suitable places to allow for subsequent extension if any, without undue dismantling of conduit system. As far as possible, diagonal run of conduits

and adaptable boxes, back outlet boxes, switch boxes and the like must be provided with entry spouts and smooth rubber bushes. Joint between conduit and iron clad distribution boards and control gear shall be effected by means of conduit couplers into each of which will be coupled smooth rubber bushes from the inside of box or case.

Conduit system shall be vertical and straight as far as possible. Traps where water may accumulate from condensation shall be avoided, however if it is unavoidable suitable provision for draining the water shall be made. Separate conduits shall be run for lighting and 15 amps power outlet wiring. Wires belonging to different phases shall not be run in the same conduit. For every phase wire a separate neutral wire shall be run. Conduits connections for MS conduits shall be screwed metal to metal and be painted with one coat of self-etching zinc chromate primer and two coats of enamel paint. The threads and sockets shall be free from grease and oil. Connections between screwed conduit and sheet metal boxes shall be by means of a rubber bush. The joints in conduits shall be free of burrs to avoid damage to insulation of conductors while pulling them through the conduit. External conduits (exposed to elements) should be insulated through clamp and water tight fitting.

8. BENDS IN CONDUIT:-

Where necessary, bends may be carried out by means of conduit bends and/or circular inspection boxes with adequate and suitable inlet and outlet screwed joints. In case of recessed system, each junction box shall be provided with a cover properly secured and flushed with the finished wall/ceiling surface, so that the conductors inside the conduit are accessible. No bends shall have radius less than 2.5 times the outside diameter of the conduit. Special spring may be used for bending the conduit. Heating to soften the conduit for bending is not allowed. Caution should be exercised in using PVC conduits in location where ambient temperature is 50° C. Use of PVC conduits where temperature is 60°C. or above is prohibited

Large right angle bends (more than 75 mm radius) or non right angle bends in conduit runs shall be made by means of conduits bending machines carefully so as not to cause any crack in the conduit. Small right angle bends in conduits runs can be made by standard conduit accessories (solid/inspection bends/elbows). No run of conduit shall have more than four right angle bends from outlet to outlet. Bends in multi runs of conduits shall be parallel to each other and neat in appearance, maintaining the same distance as between straight runs of conduits.

9. Flexible Conduit

All final connections specially to vibrating equipments shall be made through steel flexible conduits. However the use shall be restricted to only those areas where it is not possible to use rigid PVC conduits with approval of Project Manager.

10. Conduit Accessories.

10.1 Standard accessories

PVC standard conduit fittings and accessories like standard/extra-deep circular boxes, looping in boxes, junction boxes, solid /inspection elbows , solid/inspection tees, couplers, nipples, saddles, check nuts, earth clips, ball socket joints, bushes etc. shall be of superior quality and of approved makes. Heavy duty covers screwed with approved quality screws shall be used. Samples of all conduits fittings and accessories shall be got approved by Project Manager before use.

10.2 Fabricated accessories

Wherever required, outlet/junction boxes of required sizes shall be fabricated from 1.6 mm thick MS sheets excepting ceiling fan outlet boxes which shall be fabricated from minimum 3 mm thick sheets. The outlet boxes shall be of approved quality, finish and manufacture. Suitable means of fixing connectors etc., if required, shall be provided in the boxes. The boxes shall be protected from rust by zinc phosphate primer process. Boxes shall be finished with minimum 2 coats of enamel paint of approved colour. A screwed brass stud shall be provided in all boxes as earthing terminal.

- Outlet Boxes For Light Fittings.
These shall be minimum 75mm x 75mm x 50mm deep and provided with required number of threaded collars for conduit entry. For ceiling mounted florescent fittings, the boxes shall be provided 300 mm off centre for a 1200 mm fitting and 150 mm off centre for a 600 mm fitting so that the wiring is taken directly to the down rod. 3 mm thick perspex/hylam sheet cover of matching colour shall be provided.
- Outlet Boxes For Ceiling Fans
Outlet boxes for ceiling fans shall be fabricated from minimum 3 mm thick MS sheet steel. The boxes shall be hexagonal in shape of minimum 100 mm depth and 60 mm sides. Each box shall be provided with a recessed fan hook in the form of one 'U' shaped 15 mm dia rod welded to the box and securely tied to the top reinforcement of the concrete slab for a length of minimum 150 mm on either side. 3 mm thick Perspex/hylam sheet cover of matching colour shall be provided.

11. Modular Cover Plated Mounted Wiring Accessories

11.1 Switches

All 6 and 16 amps switches shall be of the modular enclosed type flush mounted 220 Volt AC of the best quality and standard. The switch moving and fixed contacts shall be of silver nickel and silver graphite alloy and contact tips coated with silver. The housing of switches shall be made from high impact resistant, flame retarding and ultra violet stabilized Project Managerring plastic material. The switch shall be connected on to the phase wire of the circuit.

11.2 Molded Cover Plates

Switches, receptacles and telephone system outlets in wall shall be provided with molded cover plates of shape, size and colour approved by the Project Manager made from high impact resistant, flame retarding and ultra violet stabilized Project Managerring plastic material, and secured to the box with counter sunk round head chromium plated brass screws. Where two or more switches are installed together, they shall be provided with one common switch cover plate as described above with notches to accommodate all switches either in one, two or three rows.

One and two gang switch cover plate, telephone outlet cover plate, 6 and 16 amps switched/unswitched plates, shall have the same shape and size. Three and four gang switch cover plates shall have the same shape and size. Six and eight gang switch cover plates shall have the same shape and size. Nine and twelve switch cover plates shall have the same shape and size. Wherever five switches, seven switches, ten switches and eleven switches are to be fixed the next higher size of gang switch cover plate to be used and openings shall be provided with blank-off covers at no extra cost.

11.3 Wall Socket Outlets

All 6/16 amps wall socket outlets unless otherwise mentioned on the drawings shall be switched, with round pins and fitted with automatic linear safety shutters to ensure safety from prying fingers. Unswitched 6/16 amp wall socket outlets where called for in the drawings shall be of three pin type. The socket outlets shall be made from high impact resistant, flame retarding and ultra violet stabilized Project Managerring plastic material. The switch and sockets shall be located in the same plate. The plates for 6 amp switched/unswitched plugs and telephone outlets shall be of the same size and shape. All the switched and unswitched outlets shall be of the best standard. The switch controlling the socket outlet shall be on the phase wire of the circuit. An earth wire shall be provided along the cables feeding socket outlets for electrical appliances. The earth wire shall be connected to the earthing terminal screw inside the box. The earth terminal of the socket shall be connected to the earth terminal provided inside the box.

12. CONDUIT INSTALLATION

12.1 System

The whole conduit system shall be installed to comply fully with relevant provision in Indian Standard Specifications, Indian Electricity Rules and IE wiring regulations. Conduits shall be laid either recessed in walls and ceilings or on surface on walls and ceilings or partly recessed and partly on surface, as required. **Same rate** shall apply for recessed and surface conduiting in this contract. Stranded copper conductor insulated wire of size as per schedule of quantities shall be provided in entire conduiting for loop earthing. steel wire of suitable size to serve as a fish wire shall be left in all conduit runs to facilitate drawing of wires after completion of conduiting.

12.2 Layout

- Conduits layout and routes shall be submitted for Project Manager's approval prior to execution. Allowance for adjustments due to site conditions shall be provided with no extra cost.

- Conduit routes shall be chosen for easy, straight runs with a minimum of bends and crossings. Generally they shall follow the structure of building, running at right angles or in parallels to floors and ceilings. Conduit shall be kept within 300 mm of floors and ceiling when running parallel to them.
- Outlets boxes for housing accessories shall be used as draw boxes. The total number of draw boxes shall be kept to a minimum and shall be provided so that conduits runs do not exceed 12 m or have more than two right angle bends.
- All conduits shall be kept clear of gas and water pipes. In particulars, conduits shall be at least 150 mm away from gas pipe. Where proximity to these pipes is unavoidable, they shall be effectually segregated e.g. using rubber or other insulating material to prevent appreciable voltage difference at possible points of contact. Segregation from extra low voltage circuits and telecommunication circuits shall also apply unless these are wired to the same voltage requirements as lighting and power circuits.
- Conduits from different distribution boards shall not be connected to the same junction box. Each run of conduit shall be assembled complete with draw in wires.

12.3 Joints and terminations

- Electrical and mechanical continuity shall be maintained throughout all conduits joints and terminations. Conduit threads shall be thoroughly cleaned and the conduits tightly screwed. The conduit system shall be watertight after installation.
- Conduits shall be connected using couplers or via boxes. With a coupler, the ends of the conduit shall butted close together and the running coupler is screwed tightly on and tightened by a locknut.
- Conduits terminating into boxes provided with spouts shall be threaded so that there are no exposed threads. For boxes with no spouts, the termination shall be made using a brass bush and a coupler. The conduit is pushed through the knockout or drilled entry and the bush is screwed tightly onto its end. The coupler is screwed to butt firmly against the exterior wall of the box.
- Where conduits are not jointed or terminated in boxes, they shall be terminated in a screwed brass bush.
- In all joints and terminations, conduits threads shall not be exposed. Where this cannot be avoided as in a running coupler, the exposed threads shall be coated with red lead paint to seal against the ingress of water.

12.4 Bends

- Conduits shall be bent cold with an approved type of bending block or bending machine, without altering the dimensions of their sections.
- All conduits bends shall be such as to permit compliance to the requirements for bends in cables to as stated in the IEE regulations
- Bends shall be made with as large a radius as the position of the conduit within the building permits. Where the bend is more than 90 degree, circular or rectangular junction boxes shall to be used for connecting conduits.

12.5 Recessed Conduiting

Conduits recessed in concrete members shall be laid before casting, in the upper portion of slabs or otherwise as may be instructed, so as to embed the entire run of conduits and ceiling outlet boxes with a cover of minimum 12 mm concrete. Conduits shall be adequately tied to the reinforcement to prevent displacement during casting at intervals of maximum 1 meter. No reinforcement bars shall be cut to fix the conduits. Suitable flexible joints shall be provided at all locations where conduits cross expansion joints in the building.

Conduits recessed in brick work shall be laid in chases to be cut by electrical Contractor in brick work before plastering. The chases shall be cut by a chase cutting electric machine. The chases shall be of sufficient width (minimum 10 mm spacing between adjacent conduit) to accommodate the required number of conduits and of sufficient depth to permit full thickness of plaster (minimum 6 mm) over conduits. The conduits shall be secured in the chase by means of heavy duty pressed steel clamps screwed to MS flat strip saddles at intervals of maximum 1 meter. The chases shall then be filled with cement and coarse sand mortar (1:3) and properly cured by watering. For chases more than 75 mm width, a wiremesh shall be provided for the full length and width of the chase in the plaster to prevent cracking.

Junction boxes intended for facilitating drawing of wires in conduiting system shall be located in accessible locations to permit redrawing of wires in future. Open ends of conduits laid in slabs and walls shall be suitably plugged before pouring concrete / plastering to prevent ingress of water / debris in to the conduits

Entire recessed conduit work in concrete members and in brick work shall be carried out in close coordination with progress of civil works. Conduits in concrete members shall be laid before casting and conduits in brick work shall be laid before plastering. Should it become necessary to embed conduits in already cast concrete members, suitable chase shall be cut in concrete for the purpose. For minimising this cutting, conduits of lesser diameter than 25 mm and outlet boxes of lesser depth than 50 mm could be used by the Contractor for such extensions only after obtaining specific approval from Project Manager. For embedding conduits in finished and plastered brick work, the chase would have to be made in the finished brick work. After fixing conduit in chases, chases shall be made good in most workmanlike manner to match with the original finish.

Cutting chases in finished concrete or finished plastered brick work for recessing conduits and outlet boxes etc shall be done by the Contractors without any extra cost. In the concealed MS/PVC conduit system all boxes for accessories and draw/junction boxes shall be installed such that the outer rim is flush with the finished surface of the wall.

12.6 Surface Conduiting

Wherever so desired, conduit shall be laid in surface over finished concrete and/or plastered brickwork. Suitable spacer saddles of approved make and finish shall be fixed to the finished structural surface along the conduit route at intervals not exceeding 600 mm. Holes in concrete or brick work for fixing the saddles shall be made neatly by electric drills using masonry drill bits. Conduits shall be fixed on the saddles by means of good quality heavy duty GI clamps screwed to the saddles by counter sunk screws. Neat appearance and good workmanship of surface conduiting work is of particular importance. The entire conduit work shall be in absolute line and plumb. Conduits above false ceiling shall be fixed on suitable hangers supported from the structural ceiling. All surface conduits shall be run in a vertical or horizontal direction. Diagonal runs shall not be permitted.

12.7 Fixing of conduit fittings and accessories

For concealed conduiting work, the fittings and accessories shall be completely embedded in walls/ceilings leaving top surface flush with finished wall/ceiling surface in a workman like manner.

Loop earthing wire shall be connected to a screwed earthstead inside outlet boxes to make an effective contact with the metal body.

12.8 Protection of Conduits

To safeguard against filling up with mortar/plaster etc. all the outlet and switch boxes shall be provided with temporary covers and plugs which shall be replaced by sheet/plate covers as required. All screwed and socketed joints shall be made fully water tight with white lead paste.

12.9 Cleaning of Conduit Runs

The entire conduit system including outlets and boxes shall be thoroughly cleaned after completion of erection and before drawing in of cables.

12.10 Protection Against Dampness

All outlets in conduit system shall be properly drain and ventilated to minimise chances of condensation/sweating.

12.11 Expansion Joints

When crossing through expansion joints in buildings, the conduit sections across the joint shall be through approved quality heavy duty metal flexible conduits of the same size as the rigid conduit.

12.12 Loop Earthing

Loop earthing shall be provided by means of insulated stranded copper conductor wires of sizes as per Schedule of Quantity laid alongwith wiring inside conduits for all wiring outlets and sub-mains. Earthing terminals shall be provided inside all switch boxes, outlet boxes and draw boxes etc.

13. LAYING AND DRAWING OF WIRES

13.1 Bunching of Wires

Wires carrying current shall be so bunched in conduits that the outgoing and return wires are drawn into the same conduit. Wires originating from two different phases shall not be run in the same conduit. No joint shall be permitted in the run of wires.

13.2 Drawing of Wires

The drawing of wires shall be done with due regard to the following precautions:-

- No wire shall be drawn into any conduit, until all work of any nature, that may cause injury to wire is completed. Burrs in cut conduits shall be smoothed before erection of conduits. Care shall be taken in pulling the wires so that no damage occurs to the insulation of the wire. Approved type bushes shall be provided at conduit terminations.
- Before the wires are drawn into the conduits, conduits shall be thoroughly cleaned of moisture, dust, dirt or any other obstruction by forcing compressed air through the conduits if necessary..
- While drawing insulated wires into the conduits, care shall be taken to avoid scratches and kinks which cause breakage of conductors.
- There shall be no sharp bends.
- The Contractor shall, after wiring is completed, provide a blank metal/sunmica plate on all switch / outlet / junction boxes for security and to ensure that wires are not stolen till switches / outlets etc.. are fixed at no extra cost. The contractor shall be responsible to ensure that wires and loop earthing conductors are not broken and stolen. In the event of the wire being partly / fully stolen , the contractor shall replace the entire wiring alongwith loop earthing at no extra cost. No joint of any nature whatsoever shall be permitted in wiring and loop earthing .

13.3 Termination /Jointing of Wires

- Sub-circuit wiring shall be carried out in looping system. Joints shall be made only at distribution board terminals, switches/buzzers and at ceiling roses/connectors/lamp holders terminals for lights/fans/socket outlets. No joints shall be made inside conduits or junction/draw/inspection boxes.
- Switches controlling lights, fans or socket outlets shall be connected in the phase wire of the final sub circuit only. Switches shall never be connected in the neutral wire.
- **Wiring conductors shall be continuous from outlet to outlet. Joints where unavoidable, due to any special reason shall be made by approved connectors. Specific prior permission from Project Manager in writing shall be obtained before making such joint.**
- Insulation shall be shaved off for a length of 15 mm at the end of wire like sharpening of a pencil and it shall not be removed by cutting it square or wringing.

- Strands of wires shall not be cut for connecting terminals. All strands of wires shall be twisted round at the end before connection..
- Conductors having nominal cross sectional area exceeding 1.5 sq. mm shall always be provided with crimping sockets. Tinning of the strands shall be done wherever crimping sockets are not available as per instructions of the Project Manager
- All wiring shall be labelled with appropriate plastic ferrules for identification.
- At all bolted terminals, brass flat washer of large area and approved steel spring washers shall be used.
- Brass nuts and bolts shall be used for all connections.
- The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less.
- Only certified valid license holder wiremen shall be employed to do wiring/jointing work.

13.4 Load Balancing

The Contractor shall plan the load balancing of circuits in 3 phase installation and get the same approved by Project Manager before commencement of the work.

13.5 Colour Code of Conductors

Colour code for normal supply – Red, Yellow, Blue for three Phases, Black for Neutral and Green for Earth – shall be maintained for the electrical wiring installation

Colour code for UPS supply – Red/white, Yellow/white, Blue/white for three Phases, white for Neutral and Green for Earth

14. LIGHTING FIXTURES

The light fixtures and fittings shall be assembled and installed complete and ready for service, in accordance with details, drawings, manufacturer's instructions and to the satisfaction of the Project Manager.

Wires brought out from junction boxes shall be encased in PVC flexible pipes for connecting to fixtures concealed in suspended ceiling. The flexible pipes shall be provided with a checknut at the fixture end.

Pendant fixtures specified with overall lengths are subject to change and shall be checked with conditions of the job and installed as directed.

All suspended fixtures shall be mounted rigid and fixed in position in accordance with drawings, instructions and to the approval of the Project Manager.

Fixtures shall be suspended true to alignment, plumb, level and capable of resisting all lateral and vertical forces and shall be fixed as required.

All suspended light fixtures etc. shall be provided with concealed suspension arrangement in the concrete slab/roof members. It is the duty of the Contractor to make these provisions at the appropriate stage of construction.

All switch and outlet boxes shall be bonded to earth with insulated stranded copper wire as specified.

Wires shall be connected to all fixtures through connector blocks.

Flexible pipes, wherever used, shall be of make and quality approved by the Project Manager.

15. MEASUREMENT AND PAYMENT OF WIRING

Wiring for lights, fans and convenience socket outlets shall be measured and paid for on **Point Basis** as itemized schedule of quantities and as elaborated as below (unless otherwise stated).

15.1 Average wiring Length.

The point wiring basis for wiring for lights, fans and convenience socket outlets shall assume average wiring length and average conduiting length per point based on parameters stipulated in para 15.3 below. The average wiring length and average conduiting length forming the basis of point wiring payment, shall take the electrical layouts of the entire project into consideration. Tenderers are advised to seek clarifications, if they so desire, on this aspect before submitting their tenders. No claim for extra payment on account of electrical layouts in part or whole of the project requiring larger average wiring and conduiting length per point, whether specifically shown in tender drawings or not, shall be entertained after the award of contract.

15.2 Point wiring for Lights – Primary and Secondary Light Points.

In respect of group control of lights (more than one light controlled by one switch or MCB), wiring upto the first light in the group shall be within the primary light point. Wiring for other lights looped in one group for switch controlled as also MCB controlled lights shall be as secondary light points. Primary light points for switch controlled lights shall include the cost of control switch. The cost of MCB controlling such lights shall not be included in the primary light point rate since the MCB shall be paid for in the item of DB. Primary light points shall include the cost of circuit wiring (wiring from DB terminal to the first switch in the sub circuit)

15.3 Design Parameters: Wiring shall be carried out as per following design parameters in recessed/ surface conduit/conduit cum raceway system.

- Only looping system of wiring shall be adopted throughout. No joints excepting at wiring terminals shall be permitted.
- All accessories shall be flush type unless otherwise stated.
- For estimation of load, following loads per point shall be assumed.

Light points 60/100 Watts.

6 amps socket outlet points 100 Watts.

Fan points 60 Watts.

Exhaust fan points 100 Watts unless otherwise specified.

16 amp socket outlet points 500/1000 Watts. unless otherwise specified

- Light and fan points shall be wired on a common final sub-circuit. Each sub circuit shall not have more than a total of 10 nos lights and fans or a load of 800 watts whichever is lesser unless specifically stipulated otherwise. Wiring shall be carried out in PVC conduiting system.

15.4 Scope of Point Wiring

15.4.1 Wiring for Lights

Primary Light Points: Wiring for Primary light points, as defined in para 15.2 above, shall commence at the DB terminals and shall terminate at the ceiling rose/connector via the control switch (for switch controlled lights). Rates for Primary light point wiring shall be deemed to be inclusive of the cost of entire material and labour including the switch, socket and modular cover plate require for completion of Primary light point thus defined including : .

- Recessed / surface conduiting system with all accessories, junction/draw /inspection boxes, bushes, check nuts etc. complete as required,
- Wiring with multi-stranded copper conductor FRLS PVC insulated 660/1000 volt grade wires including terminations etc. complete as required.
- Loop earthing with insulated copper wires.

Secondary Light points :

Secondary light points, as defined in para 15.2 above, shall cover the cost of interconnection wiring between group controlled light fittings and shall be deemed to be inclusive of the cost of entire materials and labour required for completion of the secondary light point thus defined including

- Recessed / surface conduiting system with all accessories, junction/draw/inspection boxes, bushes, check nuts etc. complete as required,
- Wiring with stranded copper conductor FRLS PVC insulated 660/1000 volt grade wires including terminations etc. complete as required.
- Loop earthing with insulated copper wires.

15.4.2 Wiring for Ceiling Fans

Wiring for ceiling fan points shall be same as for Primary light points and shall, in addition, include ceiling outlet box with recessed fan hooks and installation of fan regulator.

15.4.3 Wiring for Exhaust Fans

Wiring for exhaust fan points shall be same as for Primary light points and shall in addition include ceiling rose as required.

15.4.4 Wiring for Convenience Socket Outlets

Wiring for 6 amps socket outlets on work tables shall be carried out partly in PVC conduits as indicated in electrical layout drawings.

Point wiring for 5 pin 6 amps convenience socket outlets

Point wiring for 5 pin 6 amps socket outlets on point wiring basis shall be the same as Primary light points defined in para 15.4.1. including loop earthing of the third pin complete as required and as itemised in scheduled of quantities.

Point wiring for 5 pin 6/16 amps convenience socket outlets

Point wiring for 5 pin 6/16 amps socket outlets on point wiring basis shall be the same as Primary light point defined in para 15.4.1. including loop earthing of the third pin complete as required and as itemised in scheduled of quantities.

15.4.5 Submains wiring

Submains wiring shall be measured and paid for on linear basis as per the length of conduit actually installed between terminations. This shall include conduit system with all accessories, wires and insulated loop earthing conductors as itemised in schedule of quantities. The quoted rates shall include termination of wiring at either end. Cost of wires only without conduits at either end required for end terminations and taken inside switchboards etc shall be deemed to be included in the liner running meter rate of Submain wiring in conduit and no extra shall be paid for such additional wiring without conduit..

16. ROUTINE AND COMPLETION TESTS

16.1 Installation Completion Tests

At the completion of the work, the entire installation shall be subject to the following tests:

1. Wiring continuity test
2. Insulation resistance test
3. Earth continuity test
4. Earth resistivity test

Besides the above, any other test specified by the local authority shall also be carried out. All tested and calibrated instruments for testing, labour,

materials and incidentals necessary to conduct the above tests shall be provided by the contractor at his own cost.

16.2 Wiring Continuity Test

All wiring systems shall be tested for continuity of circuits, short circuits, and earthing after wiring is completed and before installation is energised.

16.3 Insulation Resistance Test

The insulation resistance shall be measured between earth and the whole system conductors, or any section thereof with all protection in place and all switches closed and except in concentric wiring all lamps in position of both poles of the installation otherwise electrically connected together, a direct current pressure of not less than twice the working pressure provided that it does not exceed 1100 volts for LT circuits. Where the supply is derived from AC three phase system, the neutral pole of which is connected to earth, either direct or through added resistance, pressure shall be deemed to be that which is maintained between the phase conductor and the neutral. The insulation resistance measured as above shall not be less than 50 megohms divided by the number of points provided on the circuit the whole installation shall not have an insulation resistance lower than one megohm.

The insulation resistance shall also be measured between all conductors connected to one phase conductor of the supply and shall be carried out after removing all metallic connections between the two poles of the installation and in those circumstances the insulation shall not be less than that specified above.

The insulation resistance between the frame work of housing of power appliances and all live parts of each appliance shall not be less than that specified in the relevant Standard specification or where there is no such specification, shall not be less than half a megohm or when PVC insulated cables are used for wiring 12.5 megohms divided by the number of outlets. Where a whole installation is being tested a lower value than that given by the above formula subject to a minimum of 1 Megohms is acceptable.

16.4 Testing Of Earth Continuity Path

The earth continuity conductor including metal conduits and metallic envelopes of cable in all cases shall be tested for electric continuity and the electrical resistance of the same alongwith the earthing lead but excluding any added resistance of earth leakage circuit breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm.

16.5 Testing Of Polarity Of Non-Linked Single Pole Switches

In a two wire installation a test shall be made to verify that all non-linked single pole switches have been connected to the same conductor throughout, and such conductor shall be labeled or marked for connection

to an outer or phase conductor or to the non-earthed conductor of the supply. In the three or four wire installation, a test shall be made to verify that every non-linked single pole switch is fitted to one of the outer or phase conductor of the supply. The entire electrical installation shall be subject to the final acceptance of the Project Manager as well as the local authorities.

16.6 Earth Resistivity Test

Earth resistivity test shall be carried out in accordance with IS Code of Practice for earthing IS 3043.

16.7 Performance

Should the above tests not comply with the limits and requirements as above the contractor shall rectify the faults until the required results are obtained. The contractor shall be responsible for providing the necessary instruments and subsidiary earths for carrying out the tests. The above tests are to be carried out by the contractor without any extra charge.

16.8 Tests And Test Reports

The Contractor shall furnish test reports and preliminary drawings for the equipment to the Project Manager for approval before commencing supply of the equipment. The Contractor should intimate with the tender the equipment intended to be supplied with its technical particulars. Any test certificates etc., required by the local Inspectors or any other Authorities would be supplied by the Contractor without any extra charge. All test reports shall be approved by the Project Manager prior to energizing of installation.

LED Luminaire Specifications

<i>S.No</i>	<i>Criteria</i>	<i>Specification</i>
<i>1</i>	<i>Luminaries configuration / technical requirement</i>	<i>As per the description mentioned in BOQ</i>
<i>2</i>	<i>Housing / body of fitting</i>	<i>CRCA/ Extruded Aluminium/ Pressure Die cast Aluminium</i>
<i>3</i>	<i>Cover / Diffuser</i>	<i>Poly carbonate/ Acrylic UV protected/ PMMA for indoor and Toughened glass / PMMA for outdoor.</i>
<i>4</i>	<i>Finish</i>	<i>Aesthetically designed housing with corrosion resistant powder coating.</i>
<i>5</i>	<i>Protection (Minimum)</i>	<i>IP 20 for indoor & IP 65 for outdoor</i>
<i>6</i>	<i>Operating Voltage</i>	<i>150V to 270V universal electronic driver with internal surge protection.</i>

7	<i>Frequency</i>	<i>50 Hz</i>
8	<i>Fixture Ambient</i>	<i>+ 40 deg. centigrade</i>
9	<i>Operating temperature Range</i>	<i>0 to +55 deg. centigrade</i>
10	<i>Power factor</i>	<i>>0.9</i>
11	<i>Optical assembly</i>	<i>Array of medium power LEDs/ COB</i>
12	<i>Luminous flux</i>	<i>As per BOQ</i>
13	<i>Efficacy of luminaire (including power loss)</i>	<i>>120 lumen per watt</i>
14	<i>Efficacy of LED</i>	<i>>150 lumen per watt</i>
15	<i>Co-related colour Temperature</i>	<i>4000 deg. Kelvin to 6500 deg. Kelvin</i>
16	<i>C.R.I.</i>	<i>> 90%</i>
17	<i>Heat dissipation/ Heat sink</i>	<i>Well designed thermal management system with aluminium heat sink.</i>
18	<i>LED drive current</i>	<i>Not more than 750 mA</i>
19	<i>Driver efficiency</i>	<i>> 85%</i>
20	<i>Make of LED</i>	<i>CREE/ Philips Lumileds/ Osram/ NICHIA</i>
21	<i>Surge protection Drive</i>	<i>>2.5 KV</i>
22	<i>Certificates to be submitted</i>	<i>LM 79 and LM 80</i>

SUBHEAD II

LIFTS

1. SCOPE

This specification covers:

- Supply, all preparatory work, Assembly and Installation, Testing and Commissioning of the traction electric passenger Lifts at site.
- Power supply shall be made available at three phase, 415 V, 4 Wire, 50 Hz. at one point in / near the Lift machine area through Lift Panel with one no. 63A MCCB as incomer and two nos. 63 Amps 4P RCBO as outgoing. Further distribution shall be done by the lift supplier.
- The bidder shall assist the Bank's Architect in obtaining the Statutory clearance from the inspecting authorities for the safe operation of the lifts shall form a part of the scope of work.

2. SPECIFIC TECHNICAL REQUIREMENTS

2.1. The 'Passenger lift' shall meet the following site requirement:

- No. of lifts : Refer BOQ.
- Type of Lift : (Refer BOQ).
- Lift Capacity : Refer BOQ.
- No. of operating floors : Refer BOQ.
- Distance between floors : Refer enclosed drawings.
- Lift Well dimension : Plaster finished. (Refer enclosed drawing).
- Type of Lift Door : Center opening (Horizontal), Electric powered, automatic, Stainless steel hair line finish.
- Floor Landing Door : Center opening (Horizontal) doors made of stainless steel hair line finish shall have Infra Red full door safety Sensors.
- Type of Car Interior : Stainless steel hair line finish.
- Speed of Travel : As per BOQ.
- Type of drive : A.C. Variable Voltage, Variable - frequency (VVVF) drive with regenerative braking and PMSM motor.
- Type of Control : Microprocessor based Collective-selective Control where ever two lifts are provided in a building, both should have duplex control.
- Fireman's Control : Required (as per approving authority).
- Lift operation : With & without attendant.
- Operational Features & controls:

The entire lift equipment should be suitable for operation at +5% to -10% of the rated supply voltage

- Speed variation: ± 1 % of rated speed.
- Leveling accuracy: ± 5 mm at all load conditions.
- Over-load control (non-start with audio-visual warning indication).

- Landing calls automatic by-pass on lift-car loading > 80 % rated load.
- **Emergency rescue device** on 'Mains' failure; lift to come on nearest landing; lift door opens.
- Up / Down direction indication with lift floor position on all floors
- Lift call panel on all floors for each lift.
- Control Panel inside the car shall have push buttons with LED illumination for
 - All the floors served by the lift
 - Emergency stop push button
- Emergency Alarm & Light inside the lift-cabin with chargeable battery.
- Auto-shut off of car fan when lift is not in operation.
- Intercom device in lift car.
- Infra-red full door safety screen in addition to the mechanical nose safety shoes.
- Audio-visual announcement of lift on approaching the landing with single stroke of gong.
 - Voice announcement in the lift car on approaching the landing.
 - Door closing over-ride through push button in lift car.

All Push buttons inside the car and on the landings shall be luminous type and braille markings.

2.2. CAR DOOR

The car doors shall be electrically controlled, automatic center opening type providing automatic opening and closing of both the car and corresponding landing door simultaneously.

2.3. GUIDE RAILS

'T' section single rails shall be anchored on the side walls of the elevator wall to serve as a guided track for the vertical motion of the elevator car.

2.4. SUSPENSION ROPE

Ropes of high tensile wire construction shall be steel-cored to attain the travel height in multiple modes to suspend the elevator car. Individual rope shall be provided with rope anchor at its ends to facilitate total flexibility.

2.5. COUNTER WEIGHT

The counter-weight for the lift car shall be designed to balance the weight of the empty lift car plus 50% of the rated load. It shall be secured for relative movement and two guide shoes to run on the guide rails anchored on the side

walls of the elevator well to serve as a guided track for the vertical motion of the counter weight.

2.6. CONTROLLER

It shall be housed in a dust proof steel cabinet.

2.7. OVERSPEED GOVERNOR

In case of the failure of suspension rope system, the downward motion over-speed of the lift car shall be checked by actuating the safety gear and stopping the elevator car. The over-speed governor shall be calibrated, tested and sealed in accordance with the elevator regulation. Governor gears shall have self-lubricating bearings which do not require frequent attention as per I S: 14665.

3. BUFFERS

Suitable hydraulic or spring buffers conforming to IS: 14665 Part 3 & 4 - 2000 shall be provided for smooth stoppage of car and counter-weights (electric traction lifts) at the extreme limit of travel. Buffers shall be mounted on steel channels. These channels shall extend between the car and counterweight guide rails. The buffers shall be located symmetrically with reference to the vertical center line of the car frame.

4. TERMINAL STOPPING AND FINAL LIMIT SWITCHES

The lift shall be provided with upper and lower normal terminal limit switches to stop the car automatically within the limits of top car clearance and bottom run by over travel in normal operation. Such limit switches shall act independently of the operating device, ultimate or final limit switches and the buffers.

5. ULTIMATE OR FINAL LIMIT SWITCHES

The lift shall be provided with ultimate or final limit switches arranged to stop the car automatically within the top and bottom clearances independently of the normal operating device and the terminal limit switches. The switch shall open before the buffers are engaged.

6. AUTOMATIC RESCUE DEVICE (ARD)

The lifts shall be provided with an Automatic Rescue Device (ARD). In the event of failure of power supply, the automatic rescue device shall bring the lift to nearest landing and facilitate the rescue of the passengers in the lift.

7. SITE TESTS

Following tests shall be carried out on the lifts on completion of erection in addition to any other tests that may be required to determine their safe operational requirement:

- Insulation of Electrical system (should be $> 0.5 \text{ M Ohm.}$)
- Earth continuity tests.
- Function of Motor, Brake control equipment and Door locking devices.
- Rated Load Test of the lifts.
- Rated speed test at 'Full load & No load'.
- Safety gear stopping the Lift on Landings at rated Load.
- Tests as per the 'General Specifications for Electrical Works (part-III-Lifts & Elevators) 2013 of CPWD
- ARD function testing

SUBHEAD III

EARTHING AND LIGHTNING PROTECTION

EARTHING

1. DESCRIPTION OF WORK

The non-current carrying metal parts of electrical installation shall be earthed properly. All metallic structure, enclosures, junction boxes, outlet boxes, cabinets, machine frame, portable equipments, metal conduits, trunking, cable armour, switchgear and all other parts made of metal in close proximity with electrical circuits shall be bonded together and connected by means of specified earthing conductors to an efficient earthing system. Every item of equipment served by the electrical system shall be bonded to earthing system.

2. CODES AND STANDARDS

- a) Indian Electricity Rules, 1956
- b) IS: 3043

3. SUBMITTALS DRAWING DATA

- a) Earthing pits layout along with earthing tape routing etc.
- b) Block Diagram for earthing showing all earthing pits and their connections.

4. TESTS & TEST REPORT

- a) Test results of all Earthing pit test carried out at site with multiple electrode testing procedure.

5. SPECIFICATION

5.1 EARTHING CONDUCTORS

G.I. earthing system shall be provided except for neutral earthing of transformers and DG sets for which Cu earthing system shall be provided. All the bus ducts/cable trays shall be provided with suitable size of 2 nos. G.I. strips in the full length. All electrical equipment shall be earthed with 2 nos. G.I. strips/wires.

The resistance to each earthing system shall not exceed 1.0 ohm.

5.2 EARTHING STATION

PLATE ELECTRODE EARTHING

Earthing electrode shall consist of a **G.I. plate of dimensions 600 mm x 600 mm x 6.3 mm** thick or **Copper plate of 600 mm X 600 mm X 3 mm** as called for in the Bill of Quantity. The plate electrode shall be buried as far as practicable below permanent moisture level but in any case not less than **3 meters below ground level**. Wherever

possible, earth electrode shall be located as near the water tap, water drain or a down take pipe as possible. Earth electrode shall be kept clear of the building foundations and in no case shall it be nearer than 2 meters from the outer surface of the wall.

5.3 CONNECTION OF EARTHING CONDUCTORS

Main earthing conductor shall be taken from the earth connections at the main distribution panel to the main L.T. panel with which the connection is to be made. For distribution boards, earthing conductors shall run from main distribution boards. Circuit earthing conductor shall run from the exposed metal of equipment and shall be connected to any point on the main earthing conductor, or its distribution boards or to an earth leakage circuit breaker. Metal conduits, cable sheathing and armouring shall be earthed at the ends adjacent to switch boards at which they originate, or otherwise at the commencement of the run by an earthing conductor in effective electrical contact with cable sheathing. Where equipment is connected by flexible cord, all exposed metal parts of equipment shall be earthed with 2 no. G.I. strips/wires and non current carrying metallic parts with, 1 no. G.I. strips/wires.

Neutral conductor, sprinkler pipes, or pipes conveying gas, water or inflammable liquid, structural steel work, metallic enclosures cables and conductors, metallic conduits and lightning protection system conductors shall not be used as a means of earthing an installation or even as a link in earthing system. The Electrical resistance of metallic enclosures for cables and conductors measured between earth connections at the main switch boards and any other point on the completed installation shall be low enough to permit the passage of current necessary to operate circuit breakers and shall not exceed 1 OHM.

5.4 EARTH CONNECTIONS

All metal clad switches and other equipment carrying single phase circuit, shall be connected to earth by a single connection. All metal clad switches carrying 3 phase shall be connected with earth by two separate and distinct connections. The earthing conductor inside the building wherever exposed shall be properly protected from mechanical injury by running the same in GI pipe of adequate size. The earthing conductor shall be painted to protect it against corrosion. Earthing conductor outside the building shall be laid 600 mm below finished ground level. The over lapping in **G.I.** strips in joints shall be welded. Lugs of adequate capacity and size shall be used for all termination of conductor wires. Lugs shall be bolted to the equipment body to be earthed after the metal is cleaned of paint and other oily substance and properly tinned.

5.5 PROTECTION FROM CORROSION

Connection between copper and galvanized equipment shall be made on vertical face and protected with paint and grease. Galvanized fixing clamps shall not be used for fixing earth conductors. Only copper fixing clamp shall be used for fixing earth conductors. When there is evidence that the soil is aggressive to copper, buried earthing conductors shall be protected by suitable serving and sheathing.

5.6 ARTIFICIAL TREATMENT OF SOIL

If the earth resistance is too high and the multiple electrode earthing does not give adequate low resistance to earth, as specified in Clause no. 6.12.5.4 then the soil resistivity immediately surrounding the earth electrodes shall be reduced by adding

sodium chloride, Calcium chloride, sodium carbonate, copper sulphate, salt and soft coke or charcoal in suitable proportions.

5.7 INSTALLATION

The earth plate shall be set **vertically** and surrounded with 150 mm thick layer of charcoal dust and salt mixture. A 20 mm dia GI pipe shall run from the top edge of the plate to the ground level. The top of the pipe shall be provided with a funnel and a mesh for watering the earth through the pipe. The funnel over the GI pipe shall be housed in a masonry chamber approximately 300 mm x 300 mm x 300 mm deep. The masonry chamber shall be provided with a cast iron cover resting over a RCC frame. Test facility shall be provided with test links for the earthing station.

5.8 TESTING AND COMMISSIONING

- A. Test grounding and bonding system conductors and connections for tightness and proper installation.
- B. Use suitable test instrument to measure resistance to ground of system. Perform testing in accordance with test instrument manufacture's recommendations using fall-of-potential method, with multiple electrodes.

LIGHTNING PROTECTION

1. SCOPE

This chapter covers the detailed requirements of installation of lightning conductor system for protection of buildings against lightning. For details not covered in these specifications, reference may be made to IS 2309 : 1989.

2. PRINCIPAL COMPONENTS

The principal components of a lightning protective system are :-

- (a) Air terminations,
- (b) Down conductors,
- (c) Joint and bonds,
- (d) Testing joints,
- (e) Earth terminations, and
- (f) Earth electrodes.

3. MATERIALS

The materials of air terminations, down conductors, earth termination etc. of the protective system shall be reliably resistant to corrosion, or be adequately protected against corrosion. The material shall be as per BOQ.

4. DOWN CONDUCTORS

The number and spacing of down conductors shall be as specified, or as directed by the Engineer-in-charge.

5. INSTALLATION

5.1 GENERAL

- (i) The entire lightning protective system should be mechanically strong to withstand the mechanical forces produced in the event of a lightningstrike.
- (ii) Conductors shall be securely attached to the building, or other object to be protected by fasteners, which shall be substantial in construction, not subject to breakage, and shall be of galvanized steel or other suitable materials, with suitable precautions to avoid corrosion.

The lightning conductor shall be secured not more than 1.2 m apart for horizontal run, and 1 m for vertical run

5.2 AIR TERMINATIONS

All air terminals shall be effectively secured against overturning either by attachment to the object to be protected, or by means of substantial bracings and fixings which shall be permanently and rigidly attached to the building. The method and nature of the fixings should be simple, solid and permanent, due attention being given to the climatic conditions and possible corrosion.

5.3 DOWN CONDUCTORS

- (i) The down conductor system must, where practicable, be directly routed from the air termination to the earth termination network, and as far as possible, be symmetrically placed around the outside walls of the structure starting from the corners. In all cases consideration to side flashing must always be given.
- (ii) (a) Practical reasons may not sometimes allow the most direct route to be followed. While sharp bends, such as a rise at the end of roof are inescapable (and hence permissible), re-entrant loops in a conductor can produce high inductive voltage drops so that the lightning discharge may jump across the open side of a loop. As a rough guide, this risk may arise when the length of the conductor forming the loop exceeds 8 times the width of the open side of the loop.
- (b) When large re-entrant loops as defined above cannot be avoided, such as in the case of some cornices or parapets, the conductors should be arranged in such a way that the distance across the open side of a loop complies with the requirement indicated above. Alternatively, such cornices or parapets should be provided with holes through which the conductor can pass freely.
- (iii) **Bonding to Prevent Side Flashing**
Any metal in, or forming a part of the structure, or any building services having metallic parts which are in contact with the general mass of the earth, should be either isolated from, or bonded to the down conductor. This also applies to all exposed large metal items having any dimension greater than 2 m whether connected to the earth or not.

5.4 JOINTS AND BONDS

5.4.1 Joints

- (i) A lightning protective system should have as few joints as possible.
 - (ii) Joints should be mechanically and electrically effective, for example, clamped, screwed, bolted, crimped, riveted or welded.
 - (iii) With over lapping joints, the length of the overlap should not be less than 20 mm for all types of conductors.
 - (iv) Contact surfaces should first be cleaned, and then inhibited from oxidation with a suitable non-corrosive compound.
- Joints of dissimilar metals should be protected against corrosion or erosion from the elements, or the environment and should present an adequate contact area

5.4.2 BONDS

- (v) Bonds have to join a variety of metallic parts of different shapes and composition, and cannot therefore be of a standard form.
 - (vi) There is the constant problem of corrosion and careful attention must be given to the metals involved, i.e. the metal from which the bond is made, and those of the items being bonded.
 - (vii) The bond must be mechanically and electrically effective, and protected from corrosion in, and erosion by the operating environment.
 - (viii) External metal on, or forming part of a structure, may have to discharge the full lightning current, and its bond to the lightning protective system should have a cross-sectional area not less than that employed for the main conductors.
 - (ix) Structures supporting overhead electric supply, telephone and other lines must not be bonded to a lightning protective system without the permission of the appropriate authority.
- Gas pipe in no case shall be bonded to the lightning protective earth termination system.

5.4.3 TEST JOINTS

Each down conductor should be provided with a test joint in such a position that, while not inviting unauthorized interference, it is convenient for use when testing.

6. EARTH TERMINATION NETWORK

- (i) An earth station comprising one or more earth electrodes as required, should be connected to each down conductor. This shall be specified.
- (ii) Each of the earth stations should have a resistance not exceeding the product given by 10 ohms multiplied by the number of earth electrodes to be provided therein. The whole of the lightning protective system,

including any ring earth, should have a combined resistance to earth not exceeding 10 ohms without taking account of any bonding.

- (iii) If the value obtained for the whole of the lightning protection system exceeds 10 ohms, a reduction can be achieved by extending or adding to the electrodes, or by interconnecting the individual earth terminations of the down conductors by a conductor installed below ground, sometimes referred to as a ring conductor. Buried ring conductors laid in this manner are considered to be an integral part of the earth termination network, and should be taken into account when assessing the overall value of resistance to earth of the installation.

A reduction of the resistance to the earth to a value below 10 ohms has the advantage of further reducing the potential gradient around the earth electrode when discharging lightning current. It also further reduces the risk of side flashing to metal in, or of structure

Substation and External Electrification

A. TRANSFORMERS

11KV/0.415KV DISTRIBUTION TRANSFORMER (OIL FILLED)-

1. GENERAL

The transformer shall comply with the latest edition of the relevant Indian Standards / Manual. The transformer shall be copper double wound core type, oil natural air natural cooled suitable for outdoor installation. The transformer shall be designed and manufactured as per IS – 2026 & 9815 with up to date amendments. Transformer shall be suitable for continuous rating as stated in BOQ and on drawings. The transformer winding shall be of electrolytic copper conductors covered with a special material having high tensile and dielectric strength. The Core shall be made up of high grade low loss cold rolled grain oriented steel sheets (CRGO). Core shall be treated with high temperature resistant paint to prevent corrosion at edges of the core plates. Distribution Transformer with off load tap changer, Balanced supply and unbalanced load.

<u>INPUT</u>	:	11 KV, 3 Phases, 3 Wire, 50 Hz.
<u>OUTPUT</u>	:	0.415 KV, 3 Phases, 4 Wires, 50 Hz.
<u>RATING</u>	:	(i) 500 KVA (ii) 150 KVA
<u>VECTOR GROUP</u>	:	Dyn-11
<u>OFF LOAD TAP CHANGER</u>	:	+5.0% TO -5.0% IN STEP OF 2.5%
<u>AMBIENT TEMP</u>	:	As per IS: 1180
<u>OIL TEMP RISE</u>	:	As per IS: 1180
<u>WINDING TEMP RISE</u>	:	As per IS: 1180
<u>WINDING TEMP</u>	:	As per IS: 1180
<u>OIL TEMP</u>	:	Oil temp. Indicator with NO/NC contact to be provided.
<u>IMPEDANCE</u>	:	4.5%
<u>LOAD LOSSES</u>	:	AS per ECBC-2017

2. TANKS & RADIATORS

Tanks shall be of MS. Plates and structures, electrically welded. The construction shall be robust and substantial, suitable for road/rail transport and to withstand vibration. Radiator tubes shall be electrical resistance welded type, round or elliptical or rectangular. They may be welded to the transformer tank or in case of very large sizes to separate detachable radiator banks connected through intermediate leak proof valves. Detachable radiator banks shall have top and bottom headers with flanged connections, with drain and vent fittings. Tanks shall be provided with lifting lugs and

jacking lugs. Inspection hole with cover should also be provided for large transformers. Oil conservators shall be mounted on brackets attached to the top cover on tank. Dimensions of the conservator shall be such as to allow change in volume of oil due to change in temperature from 0°C to 100°C.

Tanks shall be thoroughly cleaned, degreased and sand blasted inside and outside. A coat of rust resisting primer shall immediately be given on outside surface. Inside surface shall be painted with oil resistance enamel paint. Tank and radiators shall be hydraulically pressure tested. Tanks shall also be tested for full vacuum.

3. CORES

Cores shall be built from cold rolled grain oriented silicone steel laminations. The core laminations shall be insulated from each other by suitable high temperature resistant, oil proof, adherent coating materials. Core clamps and clamping bolts shall be heavily insulated from the core laminations.

The insulations of core bolt shall be minimum of class 'A'. The bottom and top frames shall be connected with the tie rods to make a complete structure rigid for carrying the weight of core-coil assembly without unduly stressing the laminations or windings. Lifting eyes shall be provided on the frame for removal of core assembly from the tank. Completed core shall be flash tested for insulation with 2500 Volts between the core and each of the clamps or core bolts (core being connected to earth).

All the core frames shall be bonded together with two metallic strips and connected to the tank for earthing to ensure earth return and operation of protective gear in the event of a fault. Lifting eyes (or any other provision) for lifting the core from the tank shall be provided.

4. WINDING & INSULATION

Winding shall be three phase with minimum class 'A' insulation. High conductivity electrolytic quality **copper** shall be used for winding. Windings shall be suitably braced to withstand the dynamic forces due to short circuit. Winding insulation shall be uniform and windings shall have full insulation. Windings shall be individually vacuum dried before assembly as well as after assembly.

5. INSULATION OIL

Insulation oil shall conform to IS: 335. Transformers shall be supplied with initial fill of filtered oil.

6. GENERAL REQUIREMENTS

The transformer shall be outdoor type as specified. Unless otherwise specified the transformer in addition shall have thermal and dynamic ability to withstand external short circuit as per Clause 9 of IS: 2026 (Part I) 1977.

7. COOLING

Unless otherwise specified, the transformer shall be oil immersed natural air-cooled type (ONAN).

8. ACCESSORIES

The transformer shall be single tank type with 11 KV HV cable box as specified on HV side. LT side shall be suitable to receive the suitable for termination of LT Cable.

9. EXPLOSION VENT

Explosion vent or pressure relief device shall be provided of sufficient size for rapid release of any pressure that may be generated within the tank and which might result in damage to the equipment. The device shall operate at a static pressure less than the hydraulic test pressure for transformer tank. Means shall be provided to prevent the ingress of moisture and gas accumulation.

10. RATING AND DIAGRAM PLATES

The following plates shall be fixed to transformer tank in a visible position.

- a. A rating plate of weather proof material bearing the data specified in the appropriate clauses IS: 2026.
- b. A diagram plate showing the internal connections and also the voltage vector relationship of the several windings in accordance with IS: 2026 and a plan view of the transformer giving the correct physical relationship of the terminals.

11. JOINTS AND GASKETS

All gaskets used for making oil tight joints shall be of proven material such as granulated cork bonded with synthetic rubber gaskets or synthetic rubber.

12. TESTS

The transformer shall be subjected to the following routine tests at the manufacturer's works before dispatch.

- a) Measurement of winding resistance.
- b) Voltage ratio, polarity and phase relationship.
- c) Measurement of impedance voltage.
- d) Load losses.
- e) No load losses and no load current.
- f) Induced over voltage withstand.
- g) Separate source voltage withstands.
- i) Vector group.
- j) DV/DF Test.
- k) Magnetic Balance Test.
- l) High Voltage Test.
- m) Insulation Resistance Test
- n) All other test as specified in relevant IS Code.

The quoted rate for the transformer shall include all routine tests to be carried out at the manufacturer's works and all routine tests to be carried out at site as per specifications. The supplier shall give sufficient advance information about the test schedule to enable the owner to appoint his representative.

13. TESTING AT SITE

Prior to commissioning of the transformer, the following tests shall be performed.

- a. *Insulation resistance of the winding between phases and earth of H.V and M.V. Side.*
- b. *Voltage ratio test at principal tap, minimum tap & maximum tap position.*
- c. *Magnetic Balance Test.*
- d. *Performance/Settings of winding Temperature Indicator, Oil Temperature Indicator.*
- e. *Insulation Resistance Test*

B. MEDIUM VOLTAGE SWITCHGEAR:-**1. GENERAL**

This section covers specification of Medium Voltage Switchboards incorporating items of switchgear like Air Circuit Breakers, MCCB, MCB, metering and protection

2. STANDARDS AND CODES

The following Indian Standard Specifications and Codes of Practice will apply to the equipment and the work covered by the scope of this contract. In addition the relevant clauses of the Electricity Act 2003 and Indian Electricity Rules 1956 as amended upto date shall also apply. Wherever appropriate Indian Standards are not available, relevant British and/or IEC Standards shall be applicable.

BIS certified equipment shall be used as a part of the Contract in line with Government regulations. Necessary test certificates in support of the certification shall be submitted prior to supply of the equipment.

It is to be noted that updated and current Standards shall be applicable irrespective of those listed below.

Low Voltage switchgear & control gear IS 60947: 1993

Part I	:	General rules
Part II	:	Circuit Breakers
Part III	:	Switches, disconnectors, switch disconnectors and fuse combination units
Part IV	:	Contactors and Motor starters
Part V	:	Control circuit devices and switching elements

Marking of Switchgear bus bars IS 11353: 1985

Degree of Protection of Enclosures for low voltage switchgear. IS 2147: 1962

Electrical relays for power system protection IS 3231: 1986

Code of Practice for selection, installation and Maintenance

Of switchgear & control gear IS 10118: 1982

Low voltage switchgear & control gear assemblies IS 8623: 1993

3. SWITCHGEAR

Medium Voltage Air Circuit Breakers

The circuit breaker shall be of the air break type, robust and compact design suitable for indoor mounting and shall comply with the requirement of IS/IEC:60947 part II. Rupturing capacity shall be 35 MVA or 50KA RMS at 415 Volts AC as per schedule of quantities. The ACB should have $I_{cs}=I_{cu}=I_{cw}$ for 1sec. Manufacturer should submit test certificates for Combined sequence as per IS/IEC standards

All 4 Pole ACBs should have 100% Neutral rating (fully rated neutral pole)

4. CONSTRUCTIONAL FEATURES

The Circuit Breaker shall be of modular construction having double insulation (Class-II) with moving and fixed contacts totally enclosed for enhanced safety, flush front, metal clad, horizontal draw-out pattern, three/four pole as required and fully interlocked. Each Circuit Breaker shall be housed in a separate compartment enclosed on all sides.

The Circuit Breaker cradle shall be designed and constructed to permit smooth withdrawal and insertion. The movement shall be free of jerks, easy to operate and positive.

All current carrying parts in the breaker shall be silver plated and suitable arcing contacts shall be provided to protect the main contacts. In addition, Arc chutes shall be provided for each pole, and these shall be suitable for being lifted out for the inspection of the main and the arcing contacts without using any tools

Self-aligning cluster type isolating contacts shall be provided for the Circuit Breaker, with automatically operated shutters to screen live cluster contacts when the Breaker is withdrawn from the cubicle. Sliding connections including those for the auxiliary contacts and control wiring shall also be of the self-aligning type. The fixed portion of the sliding connections shall have easy access for maintenance purposes.

The cubicle for housing the Breaker shall be free standing dead front pattern, fabricated from the best quality sheet steel.

It should be possible to know the control voltage ratings for all electrical accessories from ACB front facial.

5. OPERATING MECHANISUM

The Circuit Breaker shall be trip free with independent manual spring operated or motor wound spring operated mechanism as specified and with mechanical ON/OFF indication. The operating mechanism shall be such that the circuit breaker is at all times free to open immediately the trip coil is energised.

The operating handle and mechanical trip push button shall be at the front of and integral with the Circuit Breaker.

The Circuit Breaker shall have the following four distinct and separate positions which shall be indicated on the face of the panel.

"Service" -- Both main and secondary isolating contacts closed

"Test" -- Main isolating contacts open and secondary isolating contacts closed

"Isolated" -- Both main and secondary isolating contacts open

6. CIRCUIT BREAKER INTERLOCKING

Sequence type strain free interlocks shall be provided to ensure the following:

It shall not be possible for the Breaker to be withdrawn from the cubicle when in the "ON" position. To achieve this, suitable mechanism shall be provided to lock the Breaker in the tripped position before the Breaker is isolated. The racking shutter should open only when ACB is OFF and Door interlock is defeated.

It shall not be possible for the Breaker to be switched "ON" until it is either in the fully inserted position or, for testing purposes, it is in the fully isolated position.

It shall not be possible for the Circuit Breaker to be plugged in unless it is in the OFF position.

Mechanical and electrical anti pumping devices shall be incorporated in the ACB's as required.

7. CIRCUIT BREAKER AUXILIARY

The Circuit Breaker shall have minimum 4 NO/NC auxiliary contacts rated at 16 amps 415 volts 50 Hz. These contacts shall be approachable from the front. They shall close before the main contacts when the Circuit Breaker is plugged in and vice versa when the Circuit Breaker is Drawn Out of the cubicle.

8. PROTECTIVE DEVICES

All ACBs shall be provided with CT operated microprocessor-based release having following protections:

Adjustable over Load (Phase & Neutral) with adjustable time delay

Adjustable Short Circuit with adjustable time delay

Adjustable Instantaneous S/C without intentional time delay

Adjustable Earth Fault protections with selectable time delay.

The Release should have LED/LCD display for current metering & fault History with time and date on real time basis.

The release should separate fault indication by LEDs for identification of type of fault

The release shall sense true RMS value of current to avoid nuisance tripping during starting.

The release shall meet the EMI / EMC requirements.

All Incomer ACBs (except bus couplers & APFC panels) shall have following additional protections & features other than mentioned above to be achieved thru Relays / releases:

Under & Over Voltage

Under & Over Frequency

Under Current & Current unbalance (for DG set only)

Maximum Demand

Restricted Earth Fault protection

Trip Circuit supervision

9. SAFETY FEATURES

Draw out ACBs shall be provided with automatically operated safety shutters to prevent accidental contact with live contacts when breaker is withdrawn from the Cradle.

For Draw-out breakers, an arrangement shall be provided to prevent rating mismatch between breaker and cradle. It shall not be possible to interchange two circuit breakers of different thermal ratings.

For safety of users, interlock should be provided between breaker operating mechanism & the arc chutes to prevent closing in case the arc chutes are not properly secured.

The insulation material used shall conform to Glow wire test as per IEC60695.

10. ACCESSORIES:

Under/no voltage trip coil as required.

Shunt trip coil for remote operation as required.

Door Interlock

Neutral CT should be provided for 3Pole ACBs for Earth Fault sensing

Common Fault Indication (O/L & S/C) Micro switch should be provided for all ACBs except bus couplers

11. INSTRUMENT TRANSFORMER

The Circuit Breaker shall have the required Current Transformers as specified for metering and protection mounted outside the Circuit Breaker compartment but within the free standing cubicle. The transformers shall comply to the relevant Indian Standards and the Class of Accuracy required for metering and protection. Separate sets of Current transformers shall be provided.

12. METERING

The metering required to be provided for each Circuit Breaker shall be as per the Schedule of Quantities. Such metering shall not be provided on the front panel of the Circuit Breaker compartment. A separate compartment shall be provided for the metering and Protective relays as required.

Square pattern flush mounting meters complying with the requirements of the relevant Indian Standards shall only be used.

Selector switches of the three ways and OFF pattern complying to the relevant Indian Standards shall be used.

13. INDICATING LAMPS

Neon type indicating lamps shall be provided for indication of phases and Breaker position as required in the Drawings/Schedule of Quantities.

14. CONTROL WIRING

All wiring for relays and meters shall be of copper conductor PVC insulated and shall be colour coded and labelled with appropriate plastic ferrules for identification. The minimum size of control wires to be used shall be 1.5 sq mm.

All control circuits shall be provided with protective MCB. Instrument testing plugs shall be provided for testing the meters.

15. EARTHING

The frame of the Circuit Breaker shall be positively earthed when the Circuit Breaker is racked into the cubicle.

16. TYPE TEST CERTIFICATE

The Contractor shall submit type test certificates from CPRI/ERDA or any International recognized test house for the Circuit Breakers offered.

17. MOULDED CASE CIRCUIT BREAKERS

MCCBs should be current limiting type with trip time of less than 10 msec under short circuit conditions. The MCCB should be either 3 or 4 poles as specified in BOQ.

MCCB shall comply with the requirements of the relevant standards IS/ IEC60947 – Part 2 and should have test certificates for breaking capacities from independent test authorities CPRI / ERDA/ any NABL accredited lab.

MCCB shall comprise of Quick Make -break switching mechanism, arc extinguishing device and the tripping unit shall be contained in a compact, high strength, heat resistant, flame retardant, insulating moulded case with high withstand capability against thermal and mechanical stresses.

The breaking capacity of MCCB shall be minimum 35 KA or as specified in drawings/schedule of quantities. The rated service breaking capacity should be equal to rated ultimate breaking capacities ($I_{cs}=I_{cu}$) at 415V AC. The rated operational voltage shall be minimum 415V AC. Rated insulation voltage (U_i): 690V AC and rated Impulse voltage 8 KV.

All MCCBs in Main LT/DG panels and at incomer level of other panels shall be provided with Microprocessor based release having inbuilt adjustable protections Over Load (L), Short Circuit (S) and Ground Faults (G). MCCBs at outgoing level should be provided with Thermal Magnetic type release with adjustable settings for Overload and fixed short circuit protections.

All MCCBs should be provided with the Rotary Operating Mechanism. All rotary mechanism should be with door interlock (with defeat feature) & padlock facility.

MCCB above 63A rating should be provided with Copper spreader links and phase barriers as standard feature

MCCB should have superior quality of engineering grade plastics used for insulation purpose and conform to glow wire test (Ref: IEC60695-2-1)

MCCBs shall be provided with following accessories, if specified in drawings/schedule of quantities

Under voltage trip

Shunt trip

Auxiliary and trip alarm contact

For Motor application, motor duty MCCBs (as SCPD) to be selected with reference to Type 2 coordination chart of manufacturer.

18. POWER CONTRACTOR

The contactors shall comply with the requirements of IEC 60947-4-1/ IS13947 – Part 4-1. Contactors for motor application should be of 3 Pole AC3 duty as specified in standards.

Main contacts of contactors shall be silver plated copper. Coil insulation should be of class H to withstand the higher temperature rise. Spare contact kits & spare coils replacement should be possible for the entire range for maintenance. The maintenance of contactors and replacement of spare kits should be possible with disturbing bus bar / cable termination.

The contactor should be having front and rear parts are in thermoplastics for rugged construction.

The contactor should confirm to glow wire tests as per IEC 60695-2-1 with superior quality of engineering grade plastic used for insulation purpose. Complete range should be suitable for AL termination.

Contactors should have the possibility of having finger proof structure safety feature.

19. THERMAL OVERLOAD RELAY

Thermal Overload Relay used in the circuit with contactor shall be in conformity with IS: 842 part 2-1966 and it shall withstand insulation test to IS: 12083 part 2. The relay shall be provided with adjustable current settings and with a provision of sealing the same to make it tamper proof.

The relay shall have built in single phasing protection and over load protection as per IEC60947- part 4. The relay shall have in built NO & NC contact. The thermal over load relay shall be suitable for Copper / Aluminum termination, with a maximum permissible temperature rise of 65°C, at the terminals, with maximum ambient temperature of 45°C.

For MCC Panels / motor feeders published Type II coordination chart of reputed manufacturers should be followed.

20. CURRENT TRANSFORMER

CTs shall confirm to IS 2705 (part -I, II and III) in all respects. All CTs used for medium voltage application shall be rated for 1 kV. CTs shall have rated primary current, rated burden and class of accuracy as specified in schedule of quantities/drawings. Rated secondary current shall be 5A unless otherwise stated. Minimum acceptable class for measurement shall be class 0.5 to 1 and for protection class 10. CTs shall be capable of withstanding magnetic and thermal stresses due to short circuit faults of 31 MVA on medium voltage. Terminals of CTs shall be paired permanently for easy identification of poles. CTs shall be provided with earthing terminals for earthing chassis, frame work and fixed part of metal casing (if any). Each CT shall be provided with rating plate indicating:

Name and make

Serial number

Transformation ratio

Rated burden

Rated voltage

Accuracy class

CTs shall be mounded such that they are easily accessible for inspection, maintenance and replacement. Wiring for CT shall be with copper conductor PVC insulated wires with proper termination works and wiring shall be bunched with cable straps and fixed to the panel structure in a neat manner.

21. POTENTIAL TRANSFORMER

PTs shall conform to IS 3156 (Part-I, II and III) in all respects.

22. MEASURING TRANSFORMER

Direct reading electrical instruments shall conform to IS 1248 or in all respects. Accuracy of direct reading shall be 1.0 of voltmeter and 1.5 for ammeters. Other instruments shall have accuracy of 1.5. Meters shall be suitable for continuous operation between -10°C and +50°C. Meters shall be flush mounting and shall be enclosed in dust tight housing. The housing shall be of steel or phenolic mould. Design and manufacture of meters shall ensure prevention of fogging of instrument glass. Pointer shall be black in colour and shall have Zero position adjustment device operable from outside. Direction of deflection shall be from left to right. Selector switches shall be provided for ammeters and volt meters used in three phase system.

23. ENERGY & REACTIVE POWER METER

Trivector meters shall be two element, integrating type, KWH, KVA, KVA hour reactive meters. Meters shall conform to IEC 170 in all respects. Energy meters, KVA, and KVARH meters shall be provided with integrating registers. The registers shall be able to record energy consumption of 500 hours corresponding to maximum current at rated voltage and unity power factor. Meters shall be suitable for operation with current and potential transformers available in the panel.

24. PROTECTION RELAYS

Protection relays shall be provided with flag type indicators to indicate cause of tripping. Flag indicators shall remain in position till they are reset by hand reset. Relays shall be designed to make or break the normal circuit current with which they are associated. Relay contacts shall be of silver or platinum alloy and shall be designed to withstand repeated operation without damage. Relays shall be of draw out type to facilitate testing and maintenance. Draw out case shall be dust tight. Relays shall be capable of disconnecting faulty section of network without causing interruption to remaining sections. Analysis of setting shall be made considering relay errors, pickup and overshoot errors and shall be submitted to Project Manager for approval.

25. OVER CURRENT & EARTH FAULT RELAYS

Three Phase Numerical 3 over Current + 1 Earth Fault relay with highest protection for both Over current and Earth Fault, Draw out type relay with internal CT shorting links and following features:

Digit seven segment LED display

Selectable Trip time characteristics like Normal Inverse (NI), Very Inverse Extremely Inverse (EI), and Definite Time (DT) etc

CT secondary 1/ 5 A site selectable through menu operations.

4. Relay Settings:

Over Current - 0.2 to 2.0 times I_n , in steps of $0.05I_n$

High set Over Current [I_{hs}] - 0.2 to 40 times I_n, in steps of 0.2 I_n or Disable

Earth Fault - 0.05 to 0.8 times On in steps of 0.05 On

High set Earth fault - 0.1 to 20 times On in steps of 0.1 On or Disable

Time Multiplier 0.1 to 1.6 in steps of 0.05 (independent settings for O/C & E/F modes)

Separate LED indications for Power ON, Trip status for R, Y, B & E (These LEDs blink when input crosses set point and become steady on when relay has tripped. LEDs have to be manually reset)

Output contacts: 4 NO contacts for trip signal on feeder fault.

Actual Measurement and display - RYB current and zero sequence current

26. **OVER/ UNDER VOLTAGE RELAY**

Over Voltage/Under Voltage Relay should be microcontroller based single-phase voltage relay suitable for Over voltage/ Under voltage protection schemes in LV, MV and HV Power distribution systems, generators, Synchronous motor, Induction motors, automatic change over schemes etc.

The relay shall have the following features

Two change over contact for tripping

Less Burden at PT & Auxiliary supply

Selectable Trip time characteristics

Selectable Voltage level on site

Separate LED indications for Power On, Over Voltage, Under Voltage Trip status, Trip time current Characteristics

C. **POWER FACTOR CORRECTION CAPACITORS**

1. **SCOPE**

Medium Voltage Capacitors and Control Panel to be used for improvement of power factor of the electrical system and shall be connected to Main L.T. Panel. The capacitor Panel shall be integrated with LT Panel. Automatic Power Factor Correction Panel shall function to improve power factor of the system in which it is connected. It shall improve power factor up to 0.99 from existing value.

2. **CODES AND STANDARDS**

Unless otherwise specified the capacitor and control panel shall conform to following.

- a. IS: 2834 - Shunt capacitors for power systems.
- b. IS: 2147 - Degree of protection provided by enclosures for low voltage switchgear and control gear.
- c. IS: 4237 - General requirements for switchgear and control gear for voltages not exceeding 1000V.
- d. IS: 8623 - Specification for factory built assemblies of switchgear and control gear (Up to 1000 volts).

- e. IS: 2208 - HRC cartridge fuse links up to 650 volts.
- f. IS: 4064 - Specification for Fuse Switch & Switch Fuse switchgear and control gear.
- g. IS: 2959 - AC contactors for voltage not exceeding 1000 volts.

3. SUBMITTALS

SHOP DRAWING AND TECHNICAL DATA

Complete technical data sheet including guarantee details giving the temperature rise, capacitor losses etc, Capacitor panel GA drawing, indicating mounting of capacitor units shall be furnished with the shop drawing.

4. SPECIFICATION

CAPACITORS

- i. The capacitor shall be 3 phase heavy duty box type capacitor 440 Volt, 50 Hz.
- ii. The temperature rise above the specified ambient (50°C) of any part of the capacitor and polyurethane resins associated equipment shall not exceed the permissible temperature as per IS: 2834.
- iii. 25/10/5 KVAR capacitor units shall be used to form a bank of capacitors of desired capacity. All these units shall be connected in a parallel by means of solid bus bars of adequate current carrying capacity. The combination of capacitor unit shall be such as not to exceed permissible over voltage across the healthy capacitor units in case of failure of one or more units. Capacitor banks shall be suitable for operation at 110% of rated RMS voltage and 150% of rated RMS current. Each unit shall satisfactorily operate at 135% of rated KVAR.
- iv. Construction-

The Capacitor banks shall be floor mounting type using minimum floor space. The container of capacitors shall be hermetically sealed in sturdy containers made out of 2 mm thick M.S. sheet steel. Dry type or synthetic non-inflammable oil shall be used for insulation. Each standard unit shall be provided with a built in silvered fuse.
- v. Discharge Resistance

Each capacitor unit shall be individually protected by MCCB with indication to show when it is in operation. The capacitors shall be provided with permanently connected discharge resistors so that residual voltage of the capacitors shall be reduced to 50 Volts or less within one minute after the capacitor is disconnected from the sources of supply.
- vi. Earthing

Two separate earthing terminals shall be provided for earth connection for each bank. All components and frame shall be properly earthed.

5. **CONTROL PANEL**

The panel shall be provided with necessary MCCB's, contactors, automatic required steps relays with associated CT's and power factor meter, indicating lamps, push buttons etc. Capacitors shall also be housed in the same panel. The panel shall be

free standing type, dead front cubicle and shall be constructed from 2 mm thick sheet steel. The degree of protection shall be IP 52. This panel shall be integrated with the main L.T. panel unless specified otherwise.

6. **PAINING**

As the capacitor panel is integrated with Main LT panel, it shall be painted as per specification in relevant Clause above.

D. **DISTRIBUTION PANEL**

1. **GENERAL**

Sub Distribution Board shall be metal clad totally enclosed, rigid, floor mounting, air insulated, cubicle type for use on 415 volts, 3 phase, 50 cycle system. Equipment shall be designed for operation in high ambient temperature and high humidity tropical atmospheric conditions.

2. **STANDARDS**

The equipment shall be designed to conform to the requirements of:

IS 8623 – Factory Built Assemblies of switchgear and control gear.

IS 4237 – General requirements for switchgear and control gear for voltages not exceeding 1000 volts.

IS 2147 – Degrees of protection provided by enclosures for low voltage switchgear and control gear.

IS 375 – Marking and arrangement of bus bars.

Individual equipment housed in the sub distribution boards shall conform to the following IS specifications:

- | | | | |
|----|------------------------------------|---|-----------------------------|
| a) | Moulded Case Circuit Breakers | - | IS: 13947-2/IEC 947-2 |
| b) | Miniature Circuit Breaker | - | IEC - 60898 |
| c) | Contractors | - | IEC – 947-4-1, IS 13947-4-1 |
| d) | Current Transformers | - | IS: 2705 |
| e) | Indicating Instruments (Analogue) | - | IS: 1248, |
| f) | Indicating Instruments (Digital) | - | IS: 13875 |
| g) | Integrating Instruments (Analogue) | - | IS: 722, IS: 13779-1999 |
| h) | Integrating Instruments (Digital) | - | IS: 13779- 1999, IS: 14697 |
| i) | HRC fuse links | - | IS: 13703 / IEC 269 |

3. **SUBMITTALS**

Shop Drawings and Technical Data-

The tenderer shall furnish relevant technical data of switchgears and associated equipment along with the offer.

The Contractor shall furnish relevant descriptive and illustrative literature on switchgears and associated equipment and the following for approval before manufacture of the panel.

- a) Complete assembly drawings of the panel showing plan, elevation and typical section views and locations of cable boxes, bus bar chamber, metering compartment and terminal blocks for external wiring connections.
- b) Typical and recommended schematic diagrams and control wiring.
- c) Foundation plan showing location of foundation channels, anchor bolts and anchors, floor plans and openings for cables etc.
- d) All drawings and data shall be in English.

4. CONSTRUCTIONS

Distribution boards shall be metal enclosed, indoor, floor mounted free standing and/or wall mounted type made up of the required vertical section, which when coupled together shall form continuous dead front. Distribution boards shall be dust and damp protected, the degree of protection being no less than IP: 54 to IS:2147. Sub distribution boards shall be fabricated with a framed structure with rolled/folded sheet steel channel section of Sheet steel shroud and partitions shall be of minimum 2mm thickness, doors and covers shall also be of 2mm thickness. All panel doors shall be pad lockable type. All sheet steel work forming the exterior of sub distribution boards shall be smoothly finished, leveled and free from flaws. The corners to be rounded. Front and rear doors to be fitted with dust proof including neoprene gasket with fasteners designed to ensure proper compression of the gaskets. When covers are provided in place of doors, generous overlap shall be ensured between sheet steel surfaces with closely spaced fasteners to preclude the entry of dust.

Following minimum clearance to be maintained after taking into account connecting bolts, clamps etc.

i)	Between Phases	-	32mm
ii)	Between Phases and neutral	-	26mm
iii)	Between Phases and earth	-	26mm
iv)	Between Neutral & earth	-	26mm

All insulating, materials used in the construction of the equipment shall be of non hygroscopic materials, duly treated to withstand the effect of high humidity, high temperatures, tropical ambient service conditions. SMC (Sheet Moulded Compound) supports & shrouds shall be used.

Functional units such as moulded case circuit breakers shall be arranged in multi-tier formation. The design of the sub distribution boards shall be such that each MCCB unit shall be fully compartmentalized.

Insulated barriers shall be provided with vertical section and between adjacent section to ensure prevention of accidental contact with main bus bars and vertical risers during operation, inspection or maintenance of functional units. All doors/covers providing access to live power equipment/circuits shall be provided with tool operated fastness to prevent unauthorized access. Sub distribution boards shall be so constructed that the cable alley shall be sufficient enough to accommodate all the outgoing and incoming cables.

For each cable alley, there shall be separate cable gland plate of detachable type at the bottom and/or top of the panel as required. Gland plate shall be 3 mm thick.

A base frame made out of 75mm x 40mm x 5.0mm M.S. Channel to be provided.

5. METAL TREATMENT AND FINISH

All metal work used in the construction of the sub distribution boards should have undergone a rigorous metal treatment process as follows:

- a) Effective cleaning by hot non alkaline degreasing solution followed by cold water rinsing to remove traces of alkaline solution
- b) Picking in dilute sulphuric acid to remove oxide scales & rust formation, if any, followed by cold water rinsing to remove traces of acidic solution.
- c) A recognized phosphating process to facilitate durable coating of the paint on the metal surfaces and also to prevent the spread of rusting in the event of the paint film being mechanically damaged. This again, shall be followed by hot water rinsing to remove traces of phosphate solution.
- d) Passivating in de-oxalite solution to retain and augment the effects of phosphating.
- e) Drying with compressed air in a dust free atmosphere.
- f) A finishing coat of powder coating of Siemens grey colour and thickness of powder coating shall not be less than 50 micron.

6. BUS BARS

The bus bars shall be air insulated and made of high conductivity, high strength Aluminium complying with the requirement of grade E-91E.

The bus bars shall be suitably braced with non-hygroscopic SMC supports to provide a through fault withstand capacity of 35KA RMS symmetrical for one second or as specified in BOQ/Drawing and a peak short circuit with stand capacity of 105 KA.

The neutral as well as the earth bar should be capable of withstanding the above level. Ridges shall be provided on the SMC supports to prevent tracking between adjacent bus bars. Large clearances and creepage distance shall be provided on the bus bar system to minimize the possibility of fault. The main phase bus bars shall have continuous current rating throughout the length of the panel. The cross section of neutral bus bars shall be same as that of the phase bus bar for bus bars of capacity up to 250 Amp; for higher capacities, the neutral bus bar shall not be less than half (50%) the cross section of that of the phase bus bars. Connections from the main bus bars to functional circuits shall be so arranged and supported to withstand without any damage or deformation the thermal and dynamic stresses due to short circuit currents. Bus bars shall be colour coded with PVC heat shrinkable sleeves.

The sub distribution boards shall be designed that the cables are not directly terminated on the terminals of MCCB etc. but are terminated on cable termination links. Capacity of aluminium bus bars shall be considered as **0.8 Amp per sq. mm** of cross section area of the bus bars.

7. MEASURING INSTRUMENTS, FOR METERING:- GENERAL

Direct reading electrical instruments shall be in conforming to IS 1248. The accuracy of direct reading shall be 1.0 for voltmeter and 1.5 for ammeters. Other type of instruments direct reading shall be 1.0 for voltmeter and 1.5 for ammeters. Other type of instruments shall have accuracy of 1.5. The errors due to variations in temperature

shall be limited to a minimum. The meter shall be of flush mounting type of 96mm square pattern. The meter shall be enclosed in a dust tight housing. The housing shall be of steel or phenolic mould. The design and manufacture of the meters shall ensure the prevention of fogging of instruments glass. Instruments meters shall be sealed in such a way that access to the measuring element and to the accessories with in the case shall not be possible without removal of the seal. The meters shall be provided with white dials and black scale markings.

The pointer shall be black in colour and shall have zero position adjustment device which could be operated from outside. The direction of deflection shall be from left to right.

Suitable selector switches shall be provided for all ammeters and voltmeters intended to be used on three phase supply.

The specifications herein-after laid down shall also cover all the meters, instrument and protective devices required for the electrical works. The ratings, type and quantity of meters, instruments and protective devices shall be as per the bill of quantities.

8. DIGITAL AMMETERS

Digital Ammeters shall be confirmed to IS: 13875. It shall be digital type 7 segment LED display. Ammeter shall be suitable for accuracy class 1.0 and burden 0.2 VA approx. The ammeters shall be capable of carrying sustained overloads during fault conditions without damage or loss of accuracy. The meter shall be suitable for working in ambient temp 0 degree to 50 degree and 95% humidity condition.

9. DIGITAL VOLTMETERS

Digital Voltmeters shall be confirmed to IS: 13875. It shall be digital type 7 segment LED display. Voltmeter shall be suitable for accuracy class 1.0 and burden 0.2 VA approx. The range for 3 phase voltmeters shall be 0 to 500 volts. The meter shall be suitable for working in ambient temp 0 degree to 50 degree and 95% humidity condition. The voltmeter shall be provided with protection MCB of suitable capacity.

10. CURRENT TRANSFORMERS

Current transformers shall be in conformity with IS: 2705 (Part I, II & III) in all respects. All current transformers used for medium voltage applications shall be rated for 1KV Current transformers shall have rated primary current, rated burden and class of accuracy as required. However, the rated secondary current shall be 5A unless otherwise specified. The acceptable minimum class of various applications shall be as given below.

Measuring : Class 1.0

Protection : Class 5 P10

Current transformers shall be capable of withstanding without damage, magnetic and thermal stresses due to short circuit fault of 50KA on medium voltage system. Terminals of the current transformer shall be marked permanently for easy identification of poles. Separate CT shall be provided for measuring instruments and protection relays. Each C.T. shall be provided with rating plate.

Current transformers shall be mounted such that they are easily accessible for inspection, maintenance and replacement. The wiring for CT's shall be copper

conductor, PVC insulated wires with proper termination lugs and wiring shall be bunched with cable straps and fixed to the panel structure in a neat manner.

11. CONTROL SWITCHES-

Control switches shall be of the heavy duty rotary type with escutcheon plates clearly marked to show the operating position. They shall be semi-flush mounting with only the front plate and operating handle projecting.

Indicating lamps shall be of the LED type, and with translucent lamps covers. Bulbs & lenses shall be easily replaced from the front.

Push buttons shall be on the momentary contact, push to actuate type fitted with self reset contacts & provided with integral escutcheon plates marked with its functions.

12. CABLE TERMINATIONS-

Cable entries and terminals shall be provided in the sub distribution boards to suit the number, type and size of aluminium conductor power cable and copper conductor control cable specified.

Provision shall be made for top or bottom entry of cables as required. Generous size of cabling chambers shall be provided, with the position of cable gland and terminals such that cables can be easily and safely terminated. Cable glands shall be brass compression type, barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit.

Cable risers shall be adequately supported to withstand the effects of rated short circuit currents without damage and without causing secondary faults.

13. CONTROL WIRING-

All control wirings shall be carried out with 1100V grade single core FRLS cable conforming to IS 694/IS 8130 having stranded copper conductors of minimum 1.5 sq. mm for potential circuits and 2.5 sq. mm for current transformer circuits. Wiring shall be neatly bunched, adequately supported and properly routed to allow for easy access and maintenance. Wiring shall be identified by numbering ferrules at each end. All control fuses shall be mounted in front of the panel and shall be easily accessible.

14. TERMINAL BLOCK-

Terminal blocks shall be 500 Volts grade of the stud type. Insulating barriers shall be provided between adjacent terminals. Terminals block shall have a minimum current rating of 10 Amps and shall be shrouded. Provisions shall be made for label inscriptions.

15. LABELS-

Labels shall be of anodized aluminium, with white engraving on black background. They shall be properly secured with fasteners.

16. TESTING AT MANUFACTURING WORK-

All routine tests specified in IS: 8623-1977 shall be carried out and test certificates submitted to the Engineer – in –Charge.

17. TESTING AND COMMISSIONING-

Commissioning checks and tests shall be included all wiring checks and checking up of connections. Primary/secondary injection tests for the relays adjustment/setting shall be done before commissioning in addition to routine meggar test. Checks and tests shall include the following:

- a) Operation checks and lubrication of all moving parts.
- b) Interlocking function check
- c) Insulation test: When measured with 500 V meggar, the insulation resistance shall not be less than 100 mega ohms.
- d) Trip tests & protection gear test.

D.E. AMF cum DG Power Distribution Panel:

The panel shall be able to start up the DG set on the Mains failure and transfer the load to DG set without requiring any human intervention as per the scheme prescribed for Sector-1A and Sector-9. Similarly, on restoration of the Mains supply it shall be able to switch off the DG set automatically.

The AMF control panel shall be fabricated from steel sheet of 2.0 mm thickness minimum duly pretreated and aesthetically finished. The control panel shall be totally enclosed, dust and vermin proof, floor mounted type with degree of protection IP-42 as per IS:2147/IEC : 60947 (Part-1) / 2007.

The Control panel shall consists of following switchgear and instruments of which any of the items can be supplied in a combined relay / meter also.

- (a) Microprocessor based AMF relay.
- (b) AC voltmeter (s) of class 1.5 accuracy, 0-500 volts with selector switch. Separate voltmeter shall be provided for Mains and Alternator.
- (c) AC Ammeter (s) of class 1.5 accuracy and of suitable range, with selector switch.
- (d) Mode selector switch for setting the panel on any on position such as off or auto or manual or test.
- (e) Engine ON-OFF switch (push button type).
- (f) 2 amp 10KA C-series SPMCB-6 nos. for instrumentation and control circuits.
- (g) Rectangular aluminium bus bars (1 No. for each phase, neutral and earthing terminal) of adequate rating duly colour coded with head shrinkable PVC sleeves.
- (h) **Incomer(s)**: One no. MCCB of suitable rating for 250 KVA DG sets complete with O/L, U/V release, short circuit and earth fault protection./ two Nos of power contactor and MCCBs of suitable rating for 62.5 KVA DG sets complete with O/L, U/V release, short circuit and earth fault protection.
- (i) **Outgoing** feeders as per the scheme
- (j) Under voltage relay for mains.
- (k) Three attempt engine start / engine cranking relay.
- (l) On delay timer for load change over.
- (m) On delay timer for engine shut off.
- (n) Pilot lamps three nos.
- (o) Battery charger complete with voltage regulator float or booster selector switch, ON-OFF switch, Voltmeter and Ammeter for charging the battery from Mains. This will be in addition to the battery charging alternator fitted on the engine.
- (p) Four nos. indicating lamps to indicate Load on Mains, DG set running, Load on set and Battery charger ON.
- (q) Audio Visual alarm for Low Lubricating Oil pressure, High water temperature, start Failure and DG O/L.
- (r) Overcurrent relay protection.

F. The bidder shall assist the Bank's Architect in obtaining the statutory clearance of installation of sub-station and LT distribution, as applicable and in obtaining the electrical connections as per scheme and Bank's requirement.

SUBHEAD IV

DG Set

Detailed Specification for Alternator, Turbo-Charged Diesel Engine and AMF Control Panel :-

Diesel Generating set complete with turbo charged Diesel Engine, Alternator and Auto Control panel conforming to the specification given below. Turbo charged Diesel engine and alternator shall be closely coupled or provided with flexible coupling and mounted on a base plate of robust in construction.

DG Set shall meet the requirements of environmental protection rules, 1986 as laid down by Ministry of Environmental & Forest read with GSR 371 (E) dated 17.05.2002, GSR 520(E) dated 01.07.2003, GSR 448(E) dated 12.07.2004, GSR 771 (E) dated 11.12.2013 & GSR 232 (E) dated 31.03.2014, Gazette Notification No. 167 dated 31.03.2014 and Gazette Notification No. 578 dated 11.11.2014 amended upto date in respect of "emission norms" for the engine and in respect of "noise norms" for DG sets.

All turbo charged engines shall confirm to IS: 10000/ ISO3046/BS:649/BS5514 (with latest Amendments.).

DG Set should have protection against under voltage, over voltage, under frequency, over frequency, low battery voltage, over current, earth fault, short circuit, phase sequence change etc.

(1) ALTERNATOR:

The alternator shall be self excited and self regulated with electronic AVR of specified KVA rating in three phase at 415 Volts, 50 Hz, 1500 RPM & 0.8 PF and shall conform to IS:4722 & IEC:34. The alternator shall be of brushless type only with VG-2 Grade of voltage regulation. The alternators shall be screen protected, drip proof with IP-21 or better degree of protection as per IS: 4722/BS:2613/1970 and IS:4889/BS:269.. The alternator should be suitable to take unbalanced load as per IS: 4722.

(2) TURBOCHARGED DIESEL ENGINE :

The turbocharged Diesel Engine shall be water cooled, electric start developing required BHP at 1500 RPM with electronic governer to deliver specified continuous KVA output at 0.8 Power Factor Lag at NTP conditions. The diesel engine should be capable of providing 10% overload for one hour in every 12 hours continuous running at full load. The turbocharged diesel engine shall conform to IS: 10,000/ ISO3046/BS:649/BS5514 (with latest Amendments.). Specific fuel consumption (SFC) shall be as per IS Specification.

The Turbocharged Diesel engine shall be complete with the following accessories:

- (a) Fuel tank with air breather, drain plug with capacity for 8 hours of continuous running at full load or 990 liters capacity, whichever is lesser fabricated from M.S. sheet with inlet, outlet connection, air vent tap, drain plug and level indicator, M.S.fuel piping from tank to engine with valves, flexible hose connection and floor mounting pedestals.
- (b) Engine instrument panel consisting of starting switch with key / password protection, lube oil temperature and pressure gauges, RPM indicator and hour meter with additional feature of auto start/remote start and auto stop.
- (c) Safety control to shut down the engine in the event of overspeed, low lube oil pressure and high engine water temperature.
- (d) Exhaust silencer residential type.

- (e) 24 V starting system complete charging alternator or dynamo and cutout.
- (f) Lead Acid / Semi-maintenance free batteries of suitable ratings with connecting cables. The batteries shall be supplied dry and in fully charged condition and shall conform to relevant IS. Only, the make of batteries shall be as per manufacturers standard.
- (g) Anti-Vibration mounting for complete DG set in case of flexible coupling and for turbocharged engine in case of direct coupling.
- (h) The fuel level should be indicated with the help of fuel gauge meter.
- (i) There should be provision for filling the fuel from outside (as in case of automobiles) with locking arrangement.
- (j) First fill of lubricating oil.

(3) ACCOUSTICS ENCLOSURE :

The accoustics enclosure shall conform to the drawings TYPE approved by a Govt. / NABL lab., for conformity to noise norms. This aspect shall also be verified by the Bank at the time of INSPECTION. The QA officer shall tally the enclosure offered with the approved drawing.

The Accoustic enclosure should consist of following :

- (a) The enclosure should be fabricated out of CRCA sheet of minimum 1.6 mm thick.
- (b) The sheet metal components should be suitably pretreated and should be powder coated to have long life of enclosure.
- (c) The battery should be accommodated in a separate tray in the enclosure.
- (d) There should be provision of drain plugs for draining lube oil and diesel.
- (e) The doors should be gasketed with quality gaskets to avoid leakage of sound.
- (f) The door handle should be lockable type.
- (g) Sound proofing of enclosures should be done with high quality rock wool/ mineral wool/ foam/ fiberglass wool
- (h) The rock, mineral, fiberglass wool is further covered with fiberglass cloth and perforated powder coated sheet.
- (i) A special residential silencer should be provided along with the enclosure to control exhaust noise.
- (j) Specially designed louvers should be provided to control sound at air entry to the container and exit from the container.
- (k) It should have Type approval certificate and also COP certificate (if applicable) from certification agencies mentioning MOEF notification No. 371 (E) dated 17. 05. 2002 or as amended and applicable at the time of supply.
- (l) Ambient temperature limit inside the canopy should be specified.
- (m) There shall be provision for emergency STOP from outside the enclosure.
- (n) Accoustic Enclosure shall conform to pollution noise norms stipulated in notification GSR 371 (E) dated 17. 05. 2002, amended upto date.

(4) AMF cum DG Power distribution panel:

As described in Sub-head II above

- (5) The Bidder shall assist the Bank's Architect in obtaining the NOC from competent authority for installation and operation of DG sets.

SUBHEAD V

FIRE DETECTION AND ALARM SYSTEM

1. GENERAL

Work Included

- a) The scope of work under this head shall include design (if required) supply and installation of Analogue Conventional Fire Detection Cum Alarm System. The work under this system shall consist of furnishing all materials, equipments and appliances and labour necessary to install the said system complete with Detectors, Hooters and Manual Push Button Stations and Fire Alarm Panel etc.

The Design consists of providing Analogue Conventional Detectors, Hooters, Manual Call Points, Response Indicators and Fire Alarm Panel as per specifications.

It shall include laying of wiring and conduits etc. necessary for installation of the system with supply of detectors as indicated in the specification and schedule of quantities. Any openings/ chasing in the wall/ ceiling required to be made for the installation shall be made good in appropriate manner.

b) **Related Work and Obligations**

- i) The general requirements apply to work specified in this section.
- ii) To examine all the other sections of the specification for requirements which may affect work of this section.
- iii) Co-ordinate works with all other trades affecting, or affected by activities of this section. Co-operate with such other trades to assure the steady progress of all operations under the Contract.
- iv) To assist the Bank's Architect in obtain the requisite NOC in respect of Supply, installation, testing, commissioning / operation of fire alarm system from competent authority, if required, as per local / statutory norms.

c) **General Requirements**

This specification covers requirements for supply, erection, testing and commissioning of Analogue Addressable Fire Alarm System.

d) **Codes and Standards**

The design, supply, installation and testing of the entire fire alarm system shall conform to BS : 5839 or NFPA 72. The detectors shall conform to relevant codes for Fire Alarm Systems.

e) **Quality Assurance**

The Contractor shall ensure that all materials furnished and installed by him under the Contract shall meet the requirements of relevant International and Indian Standards. The Contractor shall also verify all test results and ensure that these are in accordance with the requirements as mentioned in the specifications.

f) **Guarantee**

The contractor shall provide guarantee for work under this section. However, such guarantee shall be in addition to and not in lieu of all other liabilities which manufacturer and Contractor may have by other provisions of the Contract document.

The Fire Alarm System shall be guaranteed against trouble free operation, defective workmanship and materials for a period of 12 months from the date of handing over

the system to Bank. In case of any defects during this period detectors etc. shall be replaced free of cost by the Contractor.

g) **Delivery, Handling and Storage**

All Detectors, Hooters, MCPs, RIs and Fire Alarm Panel shall be carefully handled and stored at site in a neat and orderly manner for fixing the same at a later date.

2. Products

a) **General Detail**

The Fire Alarm System shall conform to BS : 5839 or EN 54 or NFPA 71/ 72 or Under writer's Laboratory in respect of design and installation and it shall give Audio / Visual Alarm Signals when the temperature in case of Heat Detector or smoke density in case of Photo Electric Detector exceeds the pre-set limit. The system shall give pin point location of fire with warning system and voice communication for commands and instruction if required.

b) **Optical Smoke Detectors.**

The optical smoke detector is based on Light Scattering principle. The LED (Light Emitting Diode) transmits light to the measuring chamber where it is absorbed. In case of fire, smoke enters the measuring chamber and the smoke particle scatter the light. The amount of light reaching to photo diode is converted into a proportional electrical signal. On operation of detector when the electrical signal reaches a pre determined threshold value it triggers the alarm on control panel.

c) **Manual Call Box.**

- i. The call box shall be of 1.5mm thick welded sheet steel or 3mm thick cast aluminium. The front face shall have a glass area designed to break by a steady application of pressure or by impact. Suitable arrangement like scratching by a diamond bit shall be incorporated in the frangible element so that when it breaks upon application of pressure by a finger, it does not hurt the finger.
- ii. The frangible element shall keep a push button pressed inside such that in the event of breaking of the frangible element, the push button is released to actuate an alarm in the control panel. The push button shall be partly depressed so as not to hinder breaking of the frangible element.
- iii. The call box shall have suitable knock out for termination of a 20mm conduit. This shall also have suitable provision for being fixed on surface or semi recessed in wall.
- iv. Where sheet steel is used for call box, this shall be thoroughly cleaned off dust, dirt, grease and rust if any and two coats of anti rust primer shall be given both inside and outside followed by two coat of synthetic enamel paint in signal red colour or epoxy or powder coated after seven tank process.
- v. In the case cast aluminium body for a call box, the surface shall be neatly finished with red colour paint as in (iv) above.
- vi. The words 'FIRE' shall be printed on the front of the call box in face of window.
- vii. The glass surface shall be minimum 30 sqcm in area and glass thickness shall not exceed 2 mm.

d) **Hooter**

- i. Hooter shall be provided for both panel sounders and fire alarm sounders. Bell may be provided as low intensity fire alarm sounders, only where so specified.
- ii. The frequency of sound from sounders shall lie in the 500-1000 Hz band. The sound level shall be at least 65dB(A) or 5 dB (A) above any other noise likely persists for a

period longer than 30 second at any part of the building. Sounders with a level greater than 120 DB(A) shall not be provided.

- iii. The sound shall be continuous although the frequencies and amplitude may vary and of the same characteristics from the fire alarm sounders in a building. Coded fire alarm signaling from sounders shall not be provided which may cause hearing damage.
- iv. 'Fault alarm' and 'Fire alarm' in a panel sounder shall be distinctly different.

e) **Response Indicators**

Lamp assembly consisting of lamp holder and lamp shall be suitable for mounting on walls, partition etc., Outside a room, and directly connected to the detector inside the room. In normal circumstances the lamp should not glow but in the event the detector inside the cabin senses a fire, the lamp should give steady glow.

f) **Fire Alarm Control Panel**

1. The main control panel shall be of modular construction type and consisting of all solid state circuitry enclosed in 16 gauge CRCA sheet steel, dust and vermin proof enclosure. The panel provides power to audio alarms for fire and also feeds supply to indicator signs.
2. The supply unit inside the MCP shall consist of transformers, bridge rectifier, filter condenser card and regulator cards. Secondary of the step down transformer shall feed a silicon diode bridge rectifier to get D.C. output which is filtered by filter condenser assembly to minimize ripple on secondary side. Unregulated D.C . supply shall finally be regulated to 24 Volts D . C. by regulator card containing integrated circuits.
3. Following switches, push buttons and indications shall be provided on panel facia:
 1. Mains 'ON' switch with indication.
 2. 'System ON' indication.
 3. 'Mains Failure' indication.
 4. 'Battery low' indication.
 5. 'Lamp test' push button.
 6. 'Fire' indication.
 7. 'Fault' indication.
 8. 'Fire' test push button per zone.
 9. 'Zone isolate' switch per zone.
 - 10.'Standby on' indication.
 - 11.'System reset' push button.
 - 12.'Alarm cancel' push button.
 - 13.'Trickle boost' toggle switch.
 - 14.Open /short circuit fault.

4. Control panel shall be complete with screw type terminal block and cable glands. Required potential free contacts under fire condition shall be provided.
5. Necessary end of line resistors shall be included in the MCP for the system. It shall be possible for the system to monitor the removal and pilferage of any of the detectors. The panel shall be complete with all internal wiring labels, and duly painted with two coats of red oxide primer and one coat of spray paint as required.
6. The panel is to be provided with a mimic diagram on a white/red acrylic sheet of suitable size mounted on a M.S. sheet box with suitable grills etc., screen printed and with L.E.D. indications for each zone/zonal panel as required.

g) **Battery & Battery Charger**

Adequately rated batteries shall be connected via mains failure relay to give 24 Volts regulated DC supply. In normal condition, battery shall be kept on constant trickle charge. Battery can be boost charged by manually operating trickle/boost toggle switch when battery low indication is observed on the control panel. In case of mains failure, battery shall automatically feed full supply load of the entire system consisting of fire alarm, and exit signs etc. Battery capacity shall be sufficient to provide back-up to the entire system for 8 hours at full load.

h. **Wiring**

Wiring for fire alarm system in general shall comply with IS : 2189-76 and IS 732 - 63. The detectors shall be wired upto the main junction boxes by 2 core 1.5 Sq. mm PVC insulated copper conductor wires of 1100 Volts grade in concealed conduits. Crimping type of lugs are also included in the scope for wherever necessary.

i. **TESTS**

All items shall be tested as per relevant standards and test certificates/listing shall be furnished by the supplier as issued by F.O.C. U.K. or U.L. USA.

j. **GUARANTEED PERFORMANCE**

All items shall be guaranteed for proper technical performance for a period of 12 months from the date of handing over of the commissioned installation.

k. **PAINTING**

All items shall be given two coats of primer. The final shade shall be of colour to be specified later to match interior decor.

l. **ADJUSTMENTS**

The sensitivity of all detectors shall be set/adjusted by the contractor to suit the site conditions.

m. COMMISSIONING AND ACCEPTANCE TESTS

- a. The commissioning and acceptance tests shall be apart from the standard or routine tests prescribed and normally conducted by the manufacturer/contractor and will be irrespective of the fact whether the same are covered by such tests or not.
- b. Each zone shall be tested by a test fire or by a heat source, such as hair dryer or shielded heat lamp below any one detector selected arbitrarily and the time required for detection shall be noted.
- c. Each sounder circuit shall be energised separately and the sound level reading taken to check for conformity with the minimum standards.
- d. Open circuit and removal of detector for each detection circuit shall be tested.
- e. Short circuit for each detection circuit will be tested.
- f. Mains failure performance.
- g. Battery disconnection test.
- h. Open circuit of each sounder circuit to be tested.
- i. Short circuit of each sounder circuit to be tested.

The results of the above tests either by fault warning or fire alarm shall be recorded in the log books which will be signed both by the contractor and the Project Manager.

SUBHEAD VI

Grid Interactive Rooftop Solar Photo Voltaic Power Generation System

General Description

The SPV power plant shall have a total capacity as per BOQ. The power plant shall provide a reliable and independent power supply to the Common Area Panel / DG panel of independent Blocks at 415 V. The capacities envisaged are as follows

Sector 1A = 1 No. 5kWp each

Sector 9 = 3 No. 8kWp each

1. **Solar Photovoltaic Modules**

- 1.1 The total Solar PV minimum array capacity shall be as per BOQ and should comprise of modules with latest technological features to provide minimum of 19% module efficiency with minimum 330 Wp and above wattage of module. Module capacity less than 330 Wp should not be supplied. The module type must be qualified as per IEC 61215. SPV module conversion efficiency should be equal to or greater than 19.0% under STC of 1000w/m² and cell operating temp of 25⁰ C and AM 1.5 radiations. Modules must qualify to IEC 61730 Part I and II for safety qualification testing. Certificate for module qualification from IEC or equivalent to be submitted as part of the bid offer.
- 1.2 The PV module shall perform satisfactorily in humidity up to 100% with temperature between – 40⁰C to + 85⁰C. Since the modules would be used in a high voltage circuit, the high voltage insulation test shall be carried out on each module and a test certificate to that effect provided.
- 1.3 Manufacturers / Contractors should confirm whether they are supplying PV module using a RF identification tag (RFID), which must contain the following information. The RFID can be inside or outside the module laminate, but must be able to withstand harsh environmental conditions.
- i. Name of the manufacturer of PV Module
 - ii. Name of the Manufacturer of Solar cells
 - iii. Month and year of the manufacture (separately for solar cells and module)
 - iv. Country of origin (separately for solar cells and module)
 - v. I-V curve for the module
 - vi. Peak Wattage, Im, Vm and FF for the module Unique Serial No and Model No of the module
 - vii. Date and year of obtaining IEC PV module qualification certificate
 - viii. Name of the test lab issuing IEC certificate
 - ix. Other relevant information on traceability of solar cells and module as per ISO 9000 series.

1.4 Other general requirement for the PV modules and subsystems shall be the following

- a. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP65 rated.
- b. Necessary I-V curves at 25⁰c, 45⁰c, 60⁰c and at NOCT are required to be furnished. Offers to provide PV module warranty of 10 years with no more than 10% degradation in performance/output and 20% degradation maximum in 25 years shall be provided from the manufacturer.

2. Inverter

2.1 Central / String inverters shall be used. The inverter should convert DC power produced by SPV modules, in to AC power and adjust the voltage & frequency levels to suit the local grid conditions. Inverter shall interconnect and feed power to the Common Area Panel of individual blocks and wherever required export surplus power to the grid at 11KV. Mandatory Technical Specification is as below:

Specification of INVERTER:

a.	AC side	As per Tender design
I	Nominal AC Power	As per BOQ
li	Output AC Voltage	230 V, 415V+/- 10%
lii	Frequency	50 Hz
Iv	Total harmonic distortion	< 3% at nominal
V	AC over / under voltage, under frequency protection.	Yes
Vi	Phase SIFT (COS Phi)	1
b.	DC Side	
i	PV Power	As per BOQ
ii	Maximum DC Voltage	800V
iii	MPPT Voltage range (Minimum range)	420-800V
iv	Maximum DC Current *	Design to be
v	DC voltage ripple	<3%
vi	DC over voltage protection	Yes
c.	Other Parameters	
i	Minimum efficiency (CE)	>98%
ii	Ambient temperature	0-50° C
iii	Humidity (Non Condensing)	95%
iv	Degree of protection for enclosure	IP 64 (Outdoor type)
vi	Dimension / Weight	As per Manufacturer
vii	Noise level	< 65 dBA
viii	Cooling	Forced Air

2.2 Other important Features/Protections required in the INVERTER

- (i) Automatic morning wake-up and nightly shutdown
- (ii) Inverter must have the feature to work in tandem with other similar inverters and be able to be successively switched ON and OFF automatically based on solar radiation variations during the day.
- (iii) Mains (Grid) over-under voltage and frequency protection
- (iv) Fool proof protection against ISLANDING.
- (v) Included authentic tracking of the solar arrays maximum power operation voltage (MPPT).
- (vi) Array ground fault detection.
- (vii) LCD and piezoelectric keypad operator interface Menu driven Automatic fault conditions reset for all parameters like voltage, frequency and/or black out.
- (viii) MOV type / Category II surge arresters/ on AC and DC terminals for over voltage protection from lightning-induced surges or else suitable arrangement shall be provided externally.
- (ix) The inverter shall have AC /DC side dis-connector of appropriate rating or else suitable arrangement shall be provided externally
- (x) INVERTER should be rated to operate at 0 –55 deg centigrade unless provision for air conditioning is included in INVERTER
- (xi) All parameters should be accessible through an industry standard communication link.

2.3 Parallel Operation with Grid

- a. The INVERTER shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line-to-line fault currents and line to- ground fault currents.
- b. The INVERTER shall include appropriate self protective and self diagnostic features to protect itself and the PV array from damage in the event of INVERTER component failure or from parameters beyond the INVERTER's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the INVERTER front panel to cause the INVERTER to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the INVERTER, including commutation failure, shall be cleared by the INVERTER protective devices and not by the existing site utility grid service circuit breaker.
- c. The INVERTER shall go to shut down/standby mode, with its contacts open, under the following conditions before attempting an automatic restart after an appropriate time delay; in sufficient solar power output.
- d. Insufficient Solar Power Input.
- e. When the power available from the PV array is insufficient to supply the losses of the INVERTER, the INVERTER shall go to a standby/shutdown mode. The INVERTER control shall prevent excessive cycling during rightly shut down or extended periods of insufficient solar radiation.
- f. Utility-Grid Over or Under Voltage
- g. The INVERTER shall restart after an over or under voltage shutdown when the utility grid voltage has returned to within limits for a minimum of two minutes.
- h. Utility-Grid Over or Under Frequency

- i. The INVERTER shall restart after an over or under frequency shutdown when the utility grid voltage has returned to the within limits for minimum of two minutes.
- j. The INVERTER Power factor at the point of utility service connection shall be >0.99 lagging or leading when operating at above 25 percent of the rated output, but may be less than 0.99 lagging below 25 percent of the rated output
- k. The high voltage and power circuits of the INVERTER shall be separated from the low-voltage and control circuits. The internal copper wiring of the INVERTER shall have flame resistant insulation. Use of PVC is not acceptable. All conductors shall be made of standard copper.
- l. The INVERTER shall withstand a high voltage test of 2000 V rms, between either the input or the output terminals and the cabinet (chassis).
- m. Full protection against accidental open circuit and reverse polarity at the input shall be provided.
- n. The INVERTER shall not produce Electromagnetic Interference (EMI) which may cause malfunctioning of electronic and electrical instruments including communication equipment, which are located within the facility in which the INVERTER is housed.
- o. The INVERTER shall have an appropriate display on the front panel to display the instantaneous AC power output and the DC voltage, current and power input. Each of these measurement displays shall have an accuracy of 1 percent of full scale or better. The display shall be visible from outside the INVERTER enclosure. Operational status of the INVERTER, alarms, trouble indicators and ac and the dc disconnect switch positions shall also be communicated by appropriate messages or indicator lights on the front cover of the INVERTER enclosure.
- p. Communication Modbus protocol with LAN/WAN options along with remote access facility shall be provided.

2.4 Electrical safety, Earthing and protection

- (i) Internal Faults: In built protection for internal faults including excess temperature, commutation failure, overload and cooling fan failure (if fitted) is obligatory.
- (ii) Galvanic Isolation: Galvanic Isolation is required to avoid any DC component being injected into the grid and the potential for AC components appearing at the array (required inc central inverters).
- (iii) Over Voltage Protection: Over Voltage Protection against atmospheric lightning discharge to the PV array is required. Protection is to be provided against voltage fluctuations in the grid itself and internal faults in the power conditioner, operational errors and switching transients.
- (iv) Earth fault supervision: An integrated earth fault device shall have to be provided to detect eventual earth fault on DC side and shall send message to the supervisory system.
- (v) Cabling practice: Cable connections must be made using PVC Cu cables, as per BIS standards. All cable connections must be made using suitable terminations for effective contact. The XLPO DC Grade Cu cables of 1.1 kV grade must be run in GI trays with covers for protection.

- (vi) Fast acting semiconductor type current limiting fuses at the main bus-bar to protect from the grid short circuit contribution. The INVERTER shall include an easily accessible emergency OFF button located at an appropriate position on the unit
- (vii) The INVERTER shall include ground lugs for equipment and PV array grounding. The DC circuit ground shall be a solid single point ground connection in accordance with IEC 69042.
- (viii) All exposed surfaces of ferrous parts shall be thoroughly cleaned, primed, and painted or otherwise

2.5 General Features of Inverter:

- (i) The INVERTER enclosure shall be weatherproof and capable of surviving **climatic changes and should keep the INVERTER** intact under all conditions in the room where it will be housed. **The INVERTER shall be located outdoor with suitable protection and should be either wall/ pad mounted.** Moisture condensation and entry of rodents and insects shall be prevented in the INVERTER enclosure. The enclosure for housing the inverter shall be minimum IP54 protection level. The inverter itself shall be minimum IP20 protection level.
- (ii) Components and circuit boards mounted inside the enclosures shall be which shall also serve to identify the items on the supplied drawings
- (iii) All doors, covers, panels and cable exists shall be gasket or otherwise designed to limit the entry of dust and moisture. All doors shall be equipped with locks. All openings shall be provided with grills or screens with openings no larger than 0.95 cm. (about 3x8 inch).
- (iv) In the design and fabrication of the INVERTER the site temperature (5^o to 55^o C), incident sunlight and the effect of ambient temperature on component life shall be considered carefully and derating shall be applied. Similar consideration shall be given to the heat sinking and thermal for blocking diodes and similar components.

2.6 Operating Modes:

The following operating modes are to be made available: Night or Sleep mode: Where the inverter is almost completely turned off, with just the timer and control system still in operation, losses should not exceed 1 watts per 5 kilowatt.

- a. Standby mode: Where the control system continuously monitors the output of the solar generator until pre-set value is exceeded (typically 10 watts)
- b. Operational or MPPT tracking mode : The control system continuously adjust the voltage of the generator to optimize the power available. The power conditioner must automatically re-enter stand-by mode when input power reduces below the standby mode threshold. Front Panel display should prove the status of the INVERTER, including AC Voltage, Current, Power output & DC Current, Voltage and Power input, pf and fault Indication (if any)

3. Module Mounting Structure:

Supply and installation of Module mounting structure / super structure on identified locations. The successful tenderer shall design their SPV Panel structure with Hot dipped galvanized steel and cement concrete (CC)

foundation suitable for site condition. Design of SPV structure shall be certified /vetted by a recognized Govt. Engineering College viz. IIT / NIT etc. or by a reputed structural consultant and submitted for approval before taking up the structure and foundation works.

- a) The module mounting structure to be designed in such a way that it will occupy minimum space without sacrificing the output from suitable number of solar modules in series.*
- b) The structure shall be designed to allow easy replacement of any module & shall be in line with the site requirements.*
- c) The frames and leg assemblies of the mounting structure should be of standard M.S. sections of angle, channel, tubes and any other sections conforming to IS: 2062. These structures should be hot dip galvanized for the long life in external weather conditions.*
- d) The mounting structure should be of Fixed Type, Tilt angle suitable to site, Foundation PCC, Fixing type with SS 304 fastener with clamp fitted to provide rigidity to the structure.*
- e) Galvanized Steel Structural must be considered for all type structural steel proposed for the power system.*
- f) The array structure shall be grounded properly using earthing kit.*
- g) Design drawings with material selected shall be submitted for prior approval of Bank.*

SUBHEAD VII

EPABX

The exchange shall be based on a Robust, Reliable, Virus Protected, Secured, Fully EPABX, exchange with Stored Program Control (SPC) using Pulse Code Modulation/Time Division Multiplexing (PCM/TDM) switching technique for connecting Analogue, Digital extensions confirming to latest ITU-T and / or CCITT and / or IEEE standards. The exchange shall be TEC/DOT Approved fully Non-blocking switching system. The offered model of the PBX should have valid TEC approval.

SYSTEM ARCHITECTURE
<i>The proposed system shall be housed in rack(s) which shall be modular in nature and capable of future expansions with field level upgrade without having to replace the base unit.</i>
<i>The entire exchange shall be able to operate without degraded performance even with partially installed cards.</i>
<i>The system topology should be fully duplicated</i>
<i>The system should have Universal ports for line/trunk cards. Wherein any peripheral card can be inserted in any slot of the peripheral shelf, thereby is enhancing the flexibility of the configuration.</i>
<i>The system shall support analog extension interfaces capable of giving CLI as well as NAME display of user (FSK technology).</i>
<i>The system shall have facility of Hot Swapping of all cards without switching off the system where the necessary cards can be interchanged or replaced even in online conditions.</i>
CONFERENCE CAPABILITY:
<i>It shall be possible for extension users to setup conference call with min 3 party having any combination of internal stations, external parties and also Tie Lines to talk to each other at the same time on the conference circuit. The conference call facility may be actuated by one of the extension users or by any attendant. Multiple conferences shall be supported simultaneously. Any participant of the conference shall be able to add a party to participate in the conference.</i>
Logical Partition
<i>The system should support logical partition</i>
NETWORKING
<i>The system shall work under the internationally recognized Networking protocol, QSIG or equivalent.</i>
<i>The system shall have ability of integrating with DOT / TEC approved exchange of Direct Inward Dialing and also for connectivity with other exchanges PRI Q SIG or equivalent.</i>

GENERAL
<i>An alert tone of specified frequency shall be provided in case of incoming external call or executive override.</i>
<i>The system shall allow user to assign passwords to their phones to prevent misuse of subscriber's facilities provided.</i>
<i>The system shall support/allow CLI on analogue phones for internal and external calls received.</i>
<i>The system shall identify the call types and play the appropriate greeting for internal and external calls engaged and no answer and out of office hour's calls.</i>
<i>The EPABX system should be complied with IEEE 802.1x.</i>
AUTO-ATTENDANT
<i>The system should transfer the caller to a subscriber using the call transfer feature of the EPABX.</i>
<i>Auto-Attendant should allow the caller to dial any other extension number in case the called extension number is busy or in no answer situation.</i>
Announcement
<i>The following announcements shall be automatically generated by the system in the following conditions:</i>
<ul style="list-style-type: none"> a. Dialing of an unallocated/un-allotted number. b. Dialing of an un-programmed access code.
AUTOMATIC CALL BACK:
<i>An extension, on encountering a busy signal at the called extension, if opted by the caller, the call shall be connected automatically to the desired extension once both the extensions are free.</i>
CONSULTATION HOLD:
<i>An extension engaged on an external call (incoming or outgoing) shall be able to hold the call whilst making calls to other extensions for private consultation. These consultations shall not be overheard by the external subscriber.</i>
CALL TRANSFER:
<i>The extension shall be able to transfer the call to other extension, across the network, without the assistance of the operator.</i>
CALL PICK-UP
<i>By dialing an access code, any subscriber shall be able to redirect any incoming call to his extension.</i>
CALL FORWARDING:
<i>Any extension shall be able to transfer all incoming calls, across the network, temporarily to another pre-selected extension. Such requests shall be registered by dialing an access code followed by the extension number. Similarly this facility shall be canceled by dialing another access code.</i>

CALL FORWARD RESTRICTIONS:
<i>Any subscriber can prevent calls being forwarded to his extension.</i>
INSTRUMENT SUPPORT:
<i>The system shall support all standard instruments with CLI, message lamp, digital and IP.</i>
IDENTIFICATION of INCOMING CALLS:
<i>All internal calls shall show a visual display on telephone instruments having LCD alpha-numeric displays. It shall be possible to create a programmable database of the subscriber name associated with an extension, so that the visual call identification does not merely display the caller's extension number but also his name.</i>
<i>The system shall be able to display identification numbers of the incoming external caller</i>
MUSIC ON HOLD:
<i>It shall be possible to connect external music to be played when the incoming call is put on Hold.</i>
OUTGOING CALLS:
<i>It shall be possible to make an outgoing call by ZERO dialing for making outgoing calls.</i>
TONES TYPES:
<i>Tones and announcements to be provided with the exchange shall be generated in both digital and analog mode. The following types of tones shall be provided:</i>
<ul style="list-style-type: none"> a. Dial Tone b. Busy tone c. Immediate Ringing Tone d. Fire / Security brea e. P&T Trunk Connected tone f. Lock out tone g. minimum 4 additional programmable tones ch Alarm Tone
ASSIGNMENT AND RESTRICTION OF SERVICES
<i>It shall be possible to assign or restrict certain class of services to certain extensions.</i>

POWER SUPPLY UNIT:

Description
<i>The supply at single outlet point with 230 ± 20% VAC, 50 ±3Hz will be provided by the Bank.</i>

Description
<i>The Power supply unit should be in provided hot standby redundancy.</i>
<i>The tenderer shall provide each power supply unit complete with float cum boost charger, voltmeter, ammeter protection fuses, contactor, required protective gears, Without SMF Batteries, Earthing Systems, Bus Bars and Power Cables etc.</i>
<i>A Float cum Boost charger (FCBC) of suitable rating shall be supplied, to provide the required DC voltage to the EPABX. The FCBC should be sufficient to charge the batteries.</i>
<i>The system shall be provided with sealed maintenance free batteries, which can give a backup for a minimum of 4 hours of operation of the system at maximum rated power consumption. The calculation of battery capacity should be submitted along with Part-I of the tender. Full load test shall be demonstrated after commissioning.</i>
Protection
<i>The system shall have necessary arrangement for protection in respect of the following:</i>
<ol style="list-style-type: none"> 1. Surge 2. Interference 3. Power Fluctuation 4. over current, 5. over-voltage 6. Reversal of polarity 7. Current leakage 8. Any other protection required for safe and sound operations of the system.
<i>The system shall be provided with supervisory alarms for the mains failure.</i>
<i>The system shall be equipped with isolation and self-restoring protection devices for protection of exchange from High Voltage/Current.</i>

TELEPHONE INSTRUMENTS: All instruments provided shall be compatible with the DOT / TEC Network and shall comply with the latest standards.

ANALOG TELEPHONE:

Description
<i>These instruments shall be wall hung type with full featured hands-free alpha-numeric telephone instruments. These instruments shall have the following minimum facilities:</i>
<ol style="list-style-type: none"> a. On hook dialing, b. Internal memory of at least 10 numbers, c. Speed dialing and last number re-dialing d. 16 characters with number of rows as per details in price bid LCD Display for showing caller's name and number both for internal and external, and date, time, called number and other system messages.

SUBHEAD VIII**BOOM BARRIER AT MAIN ENTRY / EXIT****Boom Barrier**

S.N.	Description
1.	Boom Barrier - 6 meter boom length
2.	Product Description: Automatic vehicle boom barriers provide positive, dependable access control for all vehicle entry/exit scenarios. The boom pole will be lifted in response to any legitimate input signal. The barrier can be operated by means of coded cards, tokens, remote push button, keys, ticket machines, computer or loop detector.
3.	Timing: 3 to 6 Sec for up to 6 Meter
4.	Drive: Torque Motor suitable for 600 Nm torque
5.	Materials Housing: Mild Steel Powder Coated Boom pole Aluminum and taped with red reflective tape
6.	Technical Features Engineered for long term reliability, fast on-site maintenance and durability Fully recessed removable access door Removable Lid for easy access to motor and linkage assembly
7.	Power Failure In the event of an emergency or isolation of power supply, the Barrier will remain in the locked position
8.	Interface Boom barrier is controlled by means of a control panel with following features: 1 One (0V) Input for opening/closing signal (pulse N/O) 2 One (0V) Dry Input for Remote Latching Open/close 3 One (220V) Output for Motor 4 One (0V) Input for beam 5 One (0V) Barrier PVC Loop
9.	Technical Data Power Supply: 220 V DC Power Rating; 220/250V 50Hz 400W for 3 meter & 300 W for 6 Meter Logic Voltage: 220 V Operating Temperature: 0 - 55°C
10.	IP rating: IP54.
11.	Per Day Cycle: intensive use for 6 meter fast operation

LIST OF APPROVED MAKES

S. No.	Item	Name of Manufacturers
1.	FRLS PVC insulated copper conductor single core cable for wiring. (ISI marked)	R.R Kabel/ Havells / Finolex / Polycab / KEI / L&T / Grandlay
2.	Telephone Cables Co-exail TV cables	Delton / Finolex / RR Kable / Havells / L&T
3.	XLPE insulated PVC sheathed aluminium cable upto 1.1 KV Gd	Finolex/RRkable/Havells/Pymen/Universal/KEI/CCI/ L&T/Grandlay
4.	CAT-6 Cables for LAN wiring & Internet Cable	Amp /Avaya/Belden/Legrand/Molex
5.	MS Conduit i/c accessories (ISI marked) with heavy duty accessories	AKG/BEC/NIC
6.	HDPE Pipe	Supreme / Keshav Kripa
7.	Modular switch, socket/ Telephone socket/cable TV socket/ Data outlet Socket/Fan Regulator/Metal Boxes/ Occupancy sensor	Legrand-(Arteor) / M.K.(Element)/ Anchor(Wood) / Havells (Murano) / Schneider(Zencelo) / L&T(Oris)
8.	GI Pipe	Tata/Jindal (Hissar)/Prakash Surya
9.	Paints	ICI/Asian/Berger
10.	Terminal Blocks and connectors	Elmex/Essen/Connect Well.
12.	MCB	Legrand(Lexic), ABB (SH200M), Schneider(Acti-9), Seimens, L&T
13.	MCCB, RCBO, RCCB	Schneider Electric/Legrand/L&T / Siemens /ABB
14.	MCB DB	Legrand (Ekinoxe), ABB(Elegance), Schneider (Acti-9), Seimens, L&T
15.	Timer	Schneider Electric/ Siemens/Larsen & Toubro/ Legrand/L&T Multiline/ABB
16.	Ammeter/Voltmeter	AE/IMP/Rishabh/HPL (only digital type to be used)
17.	Selector Switch/CT's	Kayee/Siemens/L&T
18.	Auto Transfer Switch	HPL/H-Elcon/Standard/L&T/Siemens
19.	Indicating Lamps	Teknic/Siemens/L&T/Vaishnov

20.	LT Panel / Meter Board / Distribution Panel/Feeder Pillar	Khokhar Electric Pvt. Ltd./ Tricolite Electric Industries (Pvt.) Ltd./ Ambit
21.	Current Transformer	AE / CAPP / Matrix / ECS / Pragati
22.	Protective Relay	L&T / Schneider / Siemens / ABB
23.	Energy Meter/ Multifunction/Intelligent Energy Meter.	HPL/L&T/Hensel/Anchor/Siemens.
24.	Ceiling fan/wall mounted fan/Fresh Air fan (energy efficient fans).	Orient/ Usha /Crompton greaves/ Havells/ Khaitan
25.	Exhaust fan	Almonard/Crompton/Havells/Usha
26.	Geyser	Racold/Crompton/Jaquar/Havells
27.	PVC conduit i/c accessories	Precision/Asian/AKG/ BEC/Kalinga
28.	Surface mounted square /Circular Mirror Light/Down lighter / Decorative Bracket Light / Chandelier LED fitting	Philips /Trilux/Jaquar/Lighting Technologies
29.	Inverter	Luminous / Microtek / Sukam
30.	Battery Bank	Exide / Amarraja

ACCEPTABLE MAKES OF Sub-Station

Sl.No.	Item	Acceptable Makes
1	Transformer	Kirloskar/Crompton/ ABB/Voltamp/Schneider
2	HT Cable 11KV XLPE insulated	Finolex /RR kable /Havells/Pymen/ Universal/ KEI/CCI
3	ACB/MCCB	Schneider Electric/Legrand/L&T / Siemens/ ABB/ C&S
4.	Capacitor and relay	LEGRAND / EPCOS / SCHNEIDER/L&T

ACCEPTABLE MAKES OF EPBAX

Sl.No.	Item	Acceptable Makes
1-	EPBAX exchange	Alcatel/Avaya/Coral/ Mitel / Siemens
2-	Tag block	krone

ACCEPTABLE MAKES OF LIFT

1-	Kone / Schindler / Mitsubishi / OTIS / Johnson Lifts
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ACCEPTABLE MAKES OF DG SET

Engine (Full Range)	Cummins/ Sterling Generator / Kirloskar
Alternator	Stamford/NGEF/Kirloskar Electric/ Leory Somer/Crompton/
Sound proof Enclosure	Designed & manufactured by DG set OEM.
Battery.	As per manufacturer's standard

LIST OF APPROVED MAKES FOR CONVENTIONAL FIRE ALARM SYSTEM

1.	Smoke Detector	:	Agni / Daksh / System Sensor
2.	Fire Alarm Panel	:	Agni / Daksh / System Sensor
3.	Hotter / Bell Push / Response Indicator	:	Agni / Daksh / System Sensor

ACCEPTABLE MAKES OF BOOM BARRIER

1-	Neptune Automatic (FAAC) / RAVEL / GODREJ / VANTAGE
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SECTION XI

SCHEDULE OF QUANTITIES – MINOR COMPONENT

S. No.	Item Description	Amount (in Rs.)
I.	INTERNAL ELECTRICIFACTION, LIGHT/ FANS, INTERNAL DB'S & TV/ TELEPHONE WIRING	4,16,02,643
II.	LIFTS	3,66,04,240
III.	EXTERNAL ELECTRIFICATION, EARTHING AND EXTERNAL LIGHTING	3,52,23,683
IV.	DG SET	28,96,418
V.	FIRE DETECTION AND ALARM SYSTEM	4,88,623
VI.	SOLAR PHOTO VOLTAIC POWER GENERATION SYSTEM	17,70,740
VII.	EPABX	12,75,452
VIII	BOOM BARRIER AT MAIN ENTRY / EXIT	10,13,356
	GRAND TOTAL	12,08,75,155

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
3.0	Supply, Wiring, Testing & Commissioning for switch board controlled Chandelier Light points with 1.5 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 1.5 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of modular 6A switch, ceiling rose, as specified complete with modular plate with GI boxes of suitable size as complete as required as per electrical layout drawings. The circuit wire with 1.5 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 1.5 sq. mm. FRLS PVC insulated multistrand flexible copper wire including heavy duty 20/25 mm dia PVC Conduit with tee/saddles/fixing material/connector and drawing of circuit wires therein from Distribution Board / Switch Board to Switch Board as per electrical layout drawings shall be included in the item.	86	9	95	Point	2,844	2,70,180
4.0	Supply, Wiring, Testing & Commissioning for Call Bell points with 1.5 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 1.5 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of modular bell push, ceiling rose, GI box as specified complete with modular plate with GI boxes of suitable size as complete as required as per electrical layout drawings. The circuit wire with 1.5 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 1.5 sq. mm. FRLS PVC insulated multistrand flexible copper wire including heavy duty 20/25 mm dia PVC Conduit with tee/saddles/fixing material/connector and drawing of circuit wires therein from Distribution Board / Switch Board to Switch Board as per electrical layout drawings shall be included in the item.	103	14	117	Point	2,853	3,33,801
5.0	Supply, Wiring, Testing & Commissioning for Ceiling Fan points with 1.5 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 1.5 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of modular 6A switches, ceiling rose, Step Fan Regulator (2 Module) as specified complete with modular plate with GI boxes of suitable size, Fan Hook Box as complete as required as per electrical layout drawings. The circuit wire with 1.5 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 1.5 sq. mm. FRLS PVC insulated multistrand flexible copper wire including heavy duty 20/25 mm dia PVC Conduit with tee/saddles/fixing material/connector and drawing of circuit wires therein from Distribution Board / Switch Board to Switch Board	512	72	584	Point	3,214	18,76,976

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
	as per electrical layout drawings shall be included in the item.						
6.0	Supply, Wiring, Testing & Commissioning for Exhaust Fan points with 1.5 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 1.5 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of modular 6A switches, ceiling rose as specified complete with modular plate with GI boxes of suitable size as complete as required as per electrical layout drawings. The circuit wire with 1.5 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 1.5 sq. mm. FRLS PVC insulated multistrand flexible copper wire including heavy duty 20/25 mm dia PVC Conduit with tee/saddles/fixing material/connector and drawing of circuit wires therein from Distribution Board / Switch Board to Switch Board as per electrical layout drawings shall be included in the item.	321	50	371	Point	2,795	10,36,945
7.0	Supply, Wiring, Testing & Commissioning for 6A modular shutterd switched socket outlet point wiring with 4 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 4 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of 6 Amps modular switch, socket complete with modular plate with suitable size of GI box as per electrical layout drawings. Point wiring shall be considered from Distribution Board to concern Switch/Socket Point (Circuit Point) or from another Socket Point to the concern Switch/Socket Point (Loop Point).	1358	186	1544	Point	2,819	43,52,536
8.0	Supply, Wiring, Testing & Commissioning for 2x6A modular shutterd switched socket outlet point wiring with 4 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 4 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of 2x6 Amps modular switch, socket complete with modular plate with suitable size of GI box as per electrical layout drawings. Point wiring shall be considered from Distribution Board to concern Switch/Socket Point (Circuit Point) or from another Socket Point to the concern Switch/Socket Point (Loop Point). (For TV & Bed side)	519	78	597	Point	4,256	25,40,832

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
9.0	Supply, Wiring, Testing & Commissioning for 2x6A modular shutterd switched socket outlet point wiring with 4 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 4 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of 2x6 Amps modular switch, socket complete with modular plate with suitable size of GI box as per electrical layout drawings. Point wiring shall be considered from Distribution Board to concern Switch/Socket Point (Circuit Point) or from another Socket Point to the concern Switch/Socket Point (Loop Point). The 2x6A socket located at near the FTTH box and switches located the height of 1200mm from FLL as per electrical layout drawings. (For FTTH Box)	99	12	111	Point	2,283	2,53,413
10.0	Supply, Wiring, Testing & Commissioning for 6/16A modular shutterd switched socket outlet point wiring with 4 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 4 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of 16 Amps modular switch, socket complete with modular plate with suitable size of GI box as per electrical layout drawings. Point wiring shall be considered from Distribution Board to concern Switch/Socket Point (Circuit Point) or from another Socket Point to the concern Switch/Socket Point. (Loop Point).	654	115	769	Point	3,935	30,26,015
11.0	Supply, Wiring, Testing & Commissioning for 6/16A modular shutterd switched socket outlet point wiring with 4 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 4 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of 16 Amps modular switch, socket complete with modular plate with suitable size of GI box as per electrical layout drawings. Point wiring shall be considered from Distribution Board to concern Switch/Socket Point (Circuit Point) or from another Socket Point to the concern Switch/Socket Point (Loop Point). (Lift Shaft)	101	7	108	Point	2,498	2,69,784

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
12.0	Supply, Wiring, Testing & Commissioning for 16/20A Industrial socket outlet point wiring with 4 sq. mm FRLS PVC insulated multistrand flexible copper wire and earthing with 4 sq. mm. FRLS PVC insulated multistrand flexible copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of 20 A, 240V, SPN Industrial type socket outlet with 2 pole and earth, metal enclosed plug top alongwith 20 A "C" curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket complete as per electrical layout drawings. Point wiring shall be considered from Distribution Board to concern Switch/Socket Point (Circuit Point) or from another Socket Point to the concern Switch/Socket Point (Loop Point). (Car Charging Points)	24	4	28	Point	5,131	1,43,668
13.0	Supply, Wiring, Testing & Commissioning for 6/16A modular shutterd switched socket outlet point wiring with 4 sq. mm FRLS PVC insulated multistrand copper wire and earthing with 4 sq. mm. FRLS PVC insulated multistrand copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of 16 Amps modular switch, socket complete with modular plate with suitable size of GI box as per electrical layout drawings. Point wiring shall be considered from Distribution Board to concern Switch/Socket Point (Circuit Point) or from another Socket Point to the concern Switch/Socket Point (Loop Point). The socket shall be located at near the Geyser and switch shall be located at near the switch board as per electrical layout drawings. (Geyser Point)	318	47	365	Point	7,716	28,16,340
14.0	Supply, Wiring, Testing & Commissioning for 25A modular shutterd switched socket outlet point wiring with 4 sq. mm FRLS PVC insulated multistrand copper wire and earthing with 4 sq. mm. FRLS PVC insulated multistrand copper wire including providing and fixing of heavy duty 20/25 mm dia PVC Conduit, tee, saddles, conduit fixing material, PVC Connector in concealed manner or surface and drawing the above wires therein, including providing & fixing of 25 Amps modular switch, socket complete with modular plate with suitable size of GI box as per electrical layout drawings. The Point wiring shall be considered from Distribution Board to concern Switch/Socket Point. Point wiring shall be considered from Distribution Board to concern Switch/Socket Point (Circuit Point) or from another Socket Point to the concern Switch/Socket Point (Loop Point). (AC Point)	343	59	402	Point	4,835	19,43,670
15.0	Supplying, fixing, testing & Commissioning of call bell/buzzer suitable for single phase, 230 volts, complete as required.	103	20	123	Nos.	99	12,177

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
3.0	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.						
a	Telephone socket outlet (Intercom + Telephone)	316	44	360	Nos.	148	53,280
4.0	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed Steel/ PVC conduit as required.						
a	1 run of cable	5375	1345	6720	Met er	57	3,83,040
5.0	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc. as required.						
5.1	1 or 2 Module (75mmX75mm)	938	99	1037	Nos.	298	3,09,026
6.0	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.						
a	2 Pair	2950	175	3125	Met er	38	1,18,750
7.0	Supply , Installation , Testing and Commissioning of CAT6 Shielded information outlet (I/O) for Data etc as per technical specification.	314	45	359	Nos.	331	1,18,829
TOTAL SH-I-B CARRIED OVER TO SUMMARY							13,37,579
I-C. LIGHT FITTING & FANS							
1.0	Supply, installation, Testing & Commissioning of 18-20 Watt LED batten Light (1200mm), 6500K, having minimum system lumen output of 100 Lumen / watt complete as required. (Jaguar Model No. JQM-WHT-LGLZ01X020XC or equivalent)	602	92	694	Nos.	720	4,99,680
2.0	Supply, installation, Testing & Commissioning of 10 Watt Surface mounted LED Down Light , 6500K, having minimum system lumen output of 100 Lumen / watt complete as required. (Tisva (Usha) Model No. DLP122623M or equivalent)	1375	181	1556	Nos.	1,056	16,43,136
3.0	Supply, installation, Testing & Commissioning of 7-10 Watt Bulkhead LED Light , 6500K, having minimum system lumen output of 100 Lumen / watt complete as required. (Philips Model No. WT140W LED7S CW PSU S1 PC or equivalent)	136	19	155	Nos.	1,064	1,64,920
4.0	Supply, installation, Testing & Commissioning of 10 Watt LED batten Light (600mm), 6500K, having minimum system lumen output of 100 Lumen / watt complete as required. (Mirror Light / Kitchen Ceiling Light) (Tisva (Usha) Model No. FL1062T5D or equivalent)	420	60	480	Nos.	471	2,26,080

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
5.0	Supply, fixing of Decorative Wall Bracket Light fitting, Canopy / Arm / Chrome Lamp cup, Lamp shade - white, E27 Lamp holder, lamp not higher than 14W LED bulb complete as required. (Philips Model No. 37712/06 or equivalent)	510	92	602	Nos.	2,603	15,67,006
6.0	Supply, installation, Testing & Commissioning of 36-40 Watt LED batten Light (1200mm), 6500K, having minimum system lumen output of 100 Lumen / watt complete as required. (Jaguar Model No. JCL-WHT-LGLZ01X040XC or equivalent)	33	15	48	Nos.	1,388	66,624
7.0	Supply, Installation, Testing and Commissioning of 1200 mm sweep, BEE 5 star rated, ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, Power Factor not less than 0.9, Service Value (CMM/W) minimum 6.85, Air delivery minimum 215 CMM, 350 RPM (tolerance as per IS : 374-2019), THD less than 10%, remote or electronic regulator unit for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Supply, earthing etc. complete as required.	415	60	475	Nos.	2,730	12,96,750
8.0	Supplying and fixing of 250 mm sweep decorative Fresh air fan with all accessories suitable for operation single phase 230 volt 50 cycle per second per sec. AC supply etc. as required. in the existing opening, including making the hole to suit the size of the above fan, making good the damage, connection, testing, commissioning earthing etc. as required. (Usha Model No. CRISP AIR or equivalent)	321	50	371	Nos.	1,841	6,83,011
9.0	Supply, Installation, Testing & Commissioning of following sizes of ceiling fan complete with double ball bearing, motor, blades, downrod, canopy, capacitor etc. suitable for operation on 230 volt, 50 Hz, A.C. supply complete as required. (Usha Model No. Swift or equivalent)						
9.1	600 mm.	97	12	109	Nos.	1,831	1,99,579
TOTAL SH-I-C CARRIED OVER TO SUMMARY							63,46,786
I-D. DISTRIBUTION BOARDS							
1.0	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
a	8 way, Double door	11	4	15	Nos.	2,573	38,595
b	12 way, Double door	20	5	25	Nos.	2,315	57,875
c	16 way, Double door	11	2	13	Nos.	3,141	40,833
2.0	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)						
a	6 way (4 + 18), Double door		1	1	Nos.	4,974	4,974
b	8 Way (4+24), Double Door	92	2	94	Nos.	5,967	5,60,898
c	12 way (4 + 36), Double door		8	8	Nos.	6,546	52,368
3.0	Supplying and fixing Cable End Box (Loose Wire Box) suitable for triple pole and neutral, sheet steel, Vertical MCB distribution board, 415 Volts, on surface/ recess, complete with testing and commissioning etc. as required.	92	8	100	Nos.	1,170	1,17,000
4.0	Supplying and fixing Cable End Box (Loose Wire Box) suitable for following single pole and neutral, sheet steel, MCB distribution board, 240 Volts, on surface/ recess, complete with testing and commissioning etc. as required.						
a	For 6 way, Double door SPN MCBDB	11	0	11	Nos.	752	8,272
b	For 8 way, Double door SPN MCBDB	20	4	24	Nos.	832	19,968
c	For 14 way, Double door SPN MCBDB	11	7	18	Nos.	902	16,236
5.0	Supplying and fixing 5 amps to 32 amps rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.						
a	Single pole	1992	368	2360	Nos.	256	6,04,160
b	Double pole	11	0	11	Nos.	656	7,216
c	Triple pole	1	0	1	Nos.	1,007	1,007
6.0	Supplying and fixing following rating, double pole, 240 volts, MCB complete with connections, testing and commissioning etc. as required.						
6.1	40 Amp	19	10	29	Nos.	1,150	33,350
6.2	63 Amp	12	1	13	Nos.	1,150	14,950
7.0	Supplying and fixing of following rating, 240/415 volts, "C" curve, four pole miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
7.1	40 Amp FP MCB		5	5	Nos.	2,261	11,305
7.2	63 Amp FP MCB	92	6	98	Nos.	2,261	2,21,578
8.0	Supplying and fixing of following rating double pole (Single phase and neutral) 240 volts, residual current circuit breaker (RCCB), having a current sensivity current 30 miliampere in the existing MCB DB complete with connections, testing & commissioning etc. as required.						
a	25 Amps	11	0	11	Eac h	2,028	22,308
b	40 Amp	19	25	44	Eac h	2,642	1,16,248
c	63 Amp	288	19	307	Eac h	2,722	8,35,654
9.0	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	100	55	155	Nos.	13	2,015
	TOTAL SH-I-D CARRIED OVER TO SUMMARY						27,86,810

SUBHEAD II - LIFTS

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
1.0	PASSENGER LIFT FOR BLOCK-1 TO BLOCK-8						
	Supplying, Installation, Testing & Commissioning of 6 Passenger (408 Kg) Lifts (Gearless), without Machine Room(MRL) having contract speed of 1.0 MPS serving different floors in the lift shaft as per detailed specifications enclosed and as under:-						
a)	Speed --> 1.0 MPS						
b)	Floors --> G+5						
c)	Travel --> 19.80Mtrs Approx.						
d)	Stops & door opening - --> 6/800 mm WideX 2000mm High						
e)	Controller/ Motor: A.C. variable voltage & variable frequency drive with PMSM motor with regenerative braking						
f)	Automatic rescue device complete with dry maintenance free batteries as required.						
g)	Operation: Microprocessor based single automatic push button / Duplex selective collective with / without attendant.						
h)	Power-415 V, 3 phase, 50 Hz, 4 wires system						
i)	Type of doors						
	(i) Car Power operated, Two Speed Stainless Steel hair line finish. (SS 304 Grade)						
	(ii) Landing doors : Stainless Steel hair line finish. (SS 304 Grade)						
j)	Hand rail not less than 600mm long at 900mm above floor level to be fixed on all the three sides adjacent to control panel in the lift car.						
k)	The Lift shall be provided with Brail System.						
l)	Ceiling as per manufacturer's standards with Fan & LED Lights.						
m)	On each Landing outside the lift, a steel plate with illumination sign shall be provided with written on it:- DO NOT USE LIFT IN CASE OF FIRE. Fire man switch at ground floor to be provided. Interlocking provision with Fire detection system shall be provided.						
n)	2 Hour Fire rated door. Manufacturer shall be submit the certificate alongwith supply of material from NABL approved Lab.						
o)	Voice announcement system in the car to announce the position of the elevator in the hoistway as the car passes or stops at a floor served by the elevator.						
p)	3 way Intercom system						
q)	All the doors shall have the Full height infra-red curtain for safety.						
r)	Emergency Alarm shall be provided.						
s)	Over load warning shall be provided						
t)	Auto Light/Fan Cutoff shall be provided						
u)	Door open/ Door Close shall be provided						
v)	ARD operation indication in car shall be provided						
w)	Emergency Alarm Button shall be provided						
x)	Out of Service Mode shall be provided						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
y)	Attendant Operation shall be provided						
z)	Anti nuisance feature shall be provided.						
aa)	Fire Man Control shall be provided.						
bb)	Over Load detection Device shall be provided						
cc)	Lift Car Flooring - 20mm recess shall be required for flooring.						
dd)	As per norms barrier free provision of lifts						
ee)	Direction & position indicator : large display LED car position indicator in top of the lift door: i) Digital floor position indicator in the car and at all landings LED type. ii) Detailed Travel direction indicator in the car and at all landings (to be provided above the car /landing Doors) iii) Gongs with visual indication on all landing for the arrival of the car iv) Lift in use /lift out of order sign: lift out of order indication shall be in-built with floor position indicator.						
ff)	Leveling accuracy : + 5 mm at all load conditions. Speed variation : + 1 % of rated speed.						
gg)	Emergency supply i) Inverter backup with trickle/boost charges arrangement for at least 30 minutes with maintenance free batteries for emergency light, alarm bell and inter-com system						
hh)	Counter weight : Cast iron fillers fitted in steel channel frame of size and numbers as per manufacturers standard Car and counter weight guide rails : Machined guide rails of suitable size and fish plates.						
ii)	Standard features: Anti- nuisance car call protection, independent service, overload device, Nudging, Emergency firemen's service , Emergency car light unit, infrared curtain door protection, door time protection, emergency alarm button, extra door time of lobby and parking, door open/close button, manual rescue operation, auto fan cut off shall be Provided.						
	Lift described as above	16	0	16	Set	19,52,752	3,12,44,032
2.0	PASSENGER LIFT FOR BLOCK-9						
	Supplying, Installation, Testing & Commissioning of 6 Passenger (408 Kg) Lifts (Gearless), without Machine Room(MRL) having contract speed of 1.0 MPS serving different floors in the lift shaft as per detailed specifications enclosed and as under:-						
a)	Speed --> 1.0 MPS						
b)	Floors --> G+4						
c)	Travel --> 16.0Mtrs Approx.						
d)	Stops & door opening - --> 5/800 mm WideX 2000mm High						
e)	Controller/ Motor: A.C. variable voltage & variable frequency drive with PMSM motor with regenerative braking						
f)	Automatic rescue device complete with dry maintenance free batteries as required.						
g)	Operation: Microprocessor based single automatic push button / Simplex selective collective with / without attendant.						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
h)	Power-415 V, 3 phase, 50 Hz, 4 wires system						
i)	Type of doors						
	(i) Car Power operated, Two Speed Stainless Steel hair line finish. (SS 304 Grade)						
	(ii) Landing doors : Stainless Steel hair line finish. (SS 304 Grade)						
j)	Hand rail not less than 600mm long at 900mm above floor level to be fixed on all the three sides adjacent to control panel in the lift car.						
k)	The Lift shall be provided with Brail System.						
l)	Ceiling as per manufacturer's standards with Fan & LED Lights.						
m)	On each Landing outside the lift, a steel plate with illumination sign shall be provided with written on it:- DO NOT USE LIFT IN CASE OF FIRE. Fire man switch at ground floor to be provided. Interlocking provision with Fire detection system shall be provided.						
n)	Voice announcement system in the car to announce the position of the elevator in the hoistway as the car passes or stops at a floor served by the elevator.						
o)	3 way Intercom system						
p)	2 Hour Fire rated door. Manufacturer shall be submit the certificate alongwith supply of material from NABL approved Lab.						
q)	All the doors shall have the Full height infra-red curtain for safety.						
r)	Emergency Alarm shall be provided.						
s)	Over load warning shall be provided						
t)	Auto Light/Fan Cutoff shall be provided						
u)	Door open/ Door Close shall be provided						
v)	ARD operation indication in car shall be provided						
w)	Emergency Alarm Button shall be provided						
x)	Out of Service Mode shall be provided						
y)	Attendant Operation shall be provided						
z)	Anti nuisance feature shall be provided.						
aa)	Fire Man Control shall be provided.						
bb)	Over Load detection Device shall be provided						
cc)	Lift Car Flooring - 20mm recess shall be required for flooring.						
dd)	As per norms barrier free provision of lifts						
ee)	Direction & position indicator : large display LED car position indicator in top of the lift door: i) Digital floor position indicator in the car and at all landings LED type. ii) Detailed Travel direction indicator in the car and at all landings (to be provided above the car /landing Doors) iii) Gongs with visual indication on all landing for the arrival of the car iv) Lift in use /lift out of order sign: lift out of order indication shall be in-built with floor position indicator.						
ff)	Leveling accuracy : + 5 mm at all load conditions. Speed variation : + 1 % of rated speed.						
gg)	Emergency supply i) Inverter backup with trickle/boost charges arrangement for at least 30 minutes with maintenance						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
	free batteries for emergency light, alarm bell and inter-com system						
hh)	Counter weight : Cast iron fillers fitted in steel channel frame of size and numbers as per manufacturers standard Car and counter weight guide rails : Machined guide rails of suitable size and fish plates.						
ii)	Standard features: Anti- nuisance car call protection, independent service, overload device, Nudging, Emergency firemen's service , Emergency car light unit, infrared curtain door protection, door time protection, emergency alarm button, extra door time of lobby and parking, door open/close button, manual rescue operation, auto fan cut off shall be Provided.						
	Lift described as above	1	0	1	Set	18,69,744	18,69,744
3	PASSENGER LIFT FOR BLOCK-A						
	Supplying, Installation, Testing & Commissioning of 6 Passenger (408 Kg) Lifts (Gearless), without Machine Room(MRL) having contract speed of 1.0 MPS serving different floors in the lift shaft as per detailed specifications enclosed and as under:-						
a)	Speed --> 1.0 MPS						
b)	Floors --> G+3						
c)	Travel --> 12.40Mtrs Approx.						
d)	Stops & door opening - --> 4/800 mm WideX 2000mm High						
e)	Controller/ Motor: A.C. variable voltage & variable frequency drive with PMSM motor with regenerative braking.						
f)	Automatic rescue device complete with dry maintenance free batteries as required.						
g)	Operation: Microprocessor based single automatic push button / Simplex selective collective with / without attendant.						
h)	Power-415 V, 3 phase, 50 Hz, 4 wires system						
i)	Type of doors						
	(i) Car Power operated, Two Speed Stainless Steel hair line finish. (SS 304 Grade)						
	(ii) Landing doors : Stainless Steel hair line finish. (SS 304 Grade)						
j)	Hand rail not less than 600mm long at 900mm above floor level to be fixed on all the three sides adjacent to control panel in the lift car.						
k)	The Lift shall be provided with Brail System.						
l)	Ceiling as per manufacturer's standards with Fan & LED Lights.						
m)	On each Landing outside the lift, a steel plate with illumination sign shall be provided with written on it:- DO NOT USE LIFT IN CASE OF FIRE. Fire man switch at ground floor to be provided. Interlocking provision with Fire detection system shall be provided.						
n)	Voice announcement system in the car to announce the position of the elevator in the hoistway as the car passes or stops at a floor served by the elevator.						
o)	3way intercom system						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
p)	2 Hour Fire rated door. Manufacturer shall be submit the certificate alongwith supply of material from NABL approved Lab.						
q)	All the doors shall have the Full height infra-red curtain for safety.						
r)	Emergency Alarm shall be provided.						
s)	Over load warning shall be provided						
t)	Auto Light/Fan Cutoff shall be provided						
u)	Door open/ Door Close shall be provided						
v)	ARD operation indication in car shall be provided						
w)	Emergency Alarm Button shall be provided						
x)	Out of Service Mode shall be provided						
y)	Attendant Operation shall be provided						
z)	Anti nuisance feature shall be provided.						
aa)	Fire Man Control shall be provided.						
bb)	Over Load detection Device shall be provided						
cc)	Lift Car Flooring - 20mm recess shall be required for flooring.						
dd)	As per norms barrier free provision of lifts						
ee)	Direction & position indicator : large display LED car position indicator in top of the lift door: i) Digital floor position indicator in the car and at all landings LED type. ii) Detailed Travel direction indicator in the car and at all landings (to be provided above the car /landing Doors) iii) Gongs with visual indication on all landing for the arrival of the car iv) Lift in use /lift out of order sign: lift out of order indication shall be in-built with floor position indicator.						
ff)	Leveling accuracy : + 5 mm at all load conditions. Speed variation : + 1 % of rated speed.						
gg)	Emergency supply i) Inverter backup with trickle/boost charges arrangement for at least 30 minutes with maintenance free batteries for emergency light, alarm bell and inter-com system						
hh)	Counter weight : Cast iron fillers fitted in steel channel frame of size and numbers as per manufacturers standard Car and counter weight guide rails : Machined guide rails of suitable size and fish plates.						
ii)	Standard features: Anti- nuisance car call protection, independent service, overload device, Nudging, Emergency firemen's service , Emergency car light unit, infrared curtain door protection, door time protection, emergency alarm button, extra door time of lobby and parking, door open/close button, manual rescue operation, auto fan cut off shall be Provided.						
	Lift described as above	0	1	1	Set	17,86,736	17,86,736
4	PASSENGER LIFT FOR VOF BLOCK						
	Supplying, Installation, Testing & Commissioning of 6 Passenger (408 Kg) Lifts (Gearless), without Machine Room(MRL) having contract speed of 1.0 MPS serving different floors in the lift shaft as per detailed specifications enclosed and as under:-						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
a)	Speed --> 1.0 MPS						
b)	Floors --> G+2						
c)	Travel --> 9.0Mtrs Approx.						
d)	Stops & door opening - --> 3/800 mm WideX 2000mm High						
e)	Controller/ Motor: A.C. variable voltage & variable frequency drive with PMSM motor with regenerative braking						
f)	Automatic rescue device complete with dry maintenance free batteries as required.						
g)	Operation: Microprocessor based single automatic push button / Simplex selective collective with / without attendant.						
h)	Power-415 V, 3 phase, 50 Hz, 4 wires system						
i)	Type of doors						
	(i) Car Power operated, Two Speed Stainless Steel hair line finish. (SS 304 Grade)						
	(ii) Landing doors : Stainless Steel hair line finish. (SS 304 Grade)						
j)	Hand rail not less than 600mm long at 900mm above floor level to be fixed on all the three sides adjacent to control panel in the lift car.						
k)	The Lift shall be provided with Brail System.						
l)	Ceiling as per manufacturer's standards with Fan & LED Lights.						
m)	On each Landing outside the lift, a steel plate with illumination sign shall be provided with written on it:- DO NOT USE LIFT IN CASE OF FIRE. Fire man switch at ground floor to be provided. Interlocking provision with Fire detection system shall be provided.						
n)	Voice announcement system in the car to announce the position of the elevator in the hoistway as the car passes or stops at a floor served by the elevator.						
o)	3 way intercom system						
p)	2 Hour Fire rated door. Manufacturer shall be submit the certificate alongwith supply of material from NABL approved Lab.						
q)	All the doors shall have the Full height infra-red curtain for safety.						
r)	Emergency Alarm shall be provided.						
s)	Over load warning shall be provided						
t)	Auto Light/Fan Cutoff shall be provided						
u)	Door open/ Door Close shall be provided						
v)	ARD operation indication in car shall be provided						
w)	Emergency Alarm Button shall be provided						
x)	Out of Service Mode shall be provided						
y)	Attendant Operation shall be provided						
z)	Anti nuisance feature shall be provided.						
aa)	Fire Man Control shall be provided.						
bb)	Over Load detection Device shall be provided						
cc)	Lift Car Flooring - 20mm recess shall be required for flooring.						
dd)	As per norms barrier free provision of lifts						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
ee)	Direction & position indicator : large display LED car position indicator in top of the lift door: i) Digital floor position indicator in the car and at all landings LED type. ii) Detailed Travel direction indicator in the car and at all landings (to be provided above the car /landing Doors) iii) Gongs with visual indication on all landing for the arrival of the car iv) Lift in use /lift out of order sign: lift out of order indication shall be in-built with floor position indicator.						
ff)	Leveling accuracy : + 5 mm at all load conditions. Speed variation : + 1 % of rated speed.						
gg)	Emergency supply i) Inverter backup with trickle/boost charges arrangement for at least 30 minutes with maintenance free batteries for emergency light, alarm bell and inter-com system						
hh)	Counter weight : Cast iron fillers fitted in steel channel frame of size and numbers as per manufacturers standard Car and counter weight guide rails : Machined guide rails of suitable size and fish plates.						
ii)	Standard features: Anti- nuisance car call protection, independent service, overload device, Nudging, Emergency firemen's service , Emergency car light unit, infrared curtain door protection, door time protection, emergency alarm button, extra door time of lobby and parking, door open/close button, manual rescue operation, auto fan cut off shall be Provided.						
	Lift described as above	0	1	1	Set	17,03,728	17,03,728
	TOTAL SH-II CARRIED OVER TO SUMMARY						3,66,04,240

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
1.8	Supply, Installation, Testing and Commissioning of MS Channel.	1000	500	1500	KG	108	1,62,000
2.0	11KV/415V OIL TYPE TRANSFORMER						
2.1	Design, manufacture, supply, installation, testing and commissioning of 500 KVA, 11 KV /0.415 KV, 3 phase, 50 Hz delta/star-11 connected, OUTDOOR TYPE , copper wound transformer, oil immersed ONAN cooled, complete with all fittings such as oil conservator, silica gel breather, thermometer, explosion vent with off Load Tap changing (OCTC) arrangement on HV side with Tapping for variations of high voltage from (+) 5% to (-) 5% in steps of 2.5% each, bi-directional roller, diagrams & rating plate, Oil temperature indicator, & Winding temperature indicator, Buchholz relay, weather proof Marshalling Box, lifting lugs, first filling of oil, weather proof H.T.cable box & L.T cable connection arrangement etc. complete as per specification. All relays, contacts & CT terminals to be wired upto marshalling box. Transformer Losses shall be as per energy efficiency Level-1 of IS:1180.	2		2	Set	14,48,209	28,96,418
2.2	Design, manufacture, supply, installation, testing and commissioning of 160 KVA, 11 KV /0.415 KV, 3 phase, 50 Hz delta/star-11 connected, OUTDOOR TYPE , copper wound transformer, oil immersed ONAN cooled, complete with all fittings such as oil conservator, silica gel breather, thermometer, explosion vent with off Load Tap changing arrangement on HV side with Tapping for variations of high voltage from (+) 5% to (-)5% in steps of 2.5% each, bi-directional roller, diagrams & rating plate, Oil level indicator, lifting lugs, first filling of oil, weather proof H.T.cable Bushing & L.T cable box arrangement etc. complete as required. Transformer shall be as per latest IS 1180 - 2014, Star-1.		1	1	Set	6,66,850	6,66,850
3.0	SAFETY EQUIPMENT						
3.1	First aid box as approved by St.John Ambulance Brigade /Indian Red Cross society conforming to IS : 2217 - 1963.	1		1	Eac h	2,379	2,379
3.2	Shock treatment chart duly mounted on a wooden frame with glass on, as required in 2 languages (Hindi & English).	1		1	Eac h	846	846
3.3	Rubber mat 1000 mm. Wide to withstand 1.1 KV dielectric strength as per latest IS 15652-2006.	30		30	Met er	3,172	95,160

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sector-1A	Total Qty.			
3.4	Supplying and installing at approved location approved make fire buckets (6 No.) of 24 gauge galvanized steel sheet conforming to IS: 2546, standard 9.5 litre capacity and of round bottom shape, painted white inside and red outside and black on the bottom, inscribed with letters "FIRE" in black and gold. Cost shall be inclusive of providing MS stand duly painted over a coat of primer.	2	1	3	Each	2,181	6,543
4.0	Supply & Laying of following sizes of 1.1KV grade multicore copper conductor PVC insulated and PVC sheathed armoured control cable conforming to IS:7098 (Part-I) 1988, including end termination with brass compression gland and copper lugs.						
4.1	2 core, 6.0 sq.mm	50	0	50	Met er	300	15,000
4.2	4 core, 1.5 sq.mm	50	50	100	Met er	185	18,500
4.3	8 core, 1.5 sq.mm	100	0	100	Met er	321	32,100
4.4	12 core, 1.5 sq.mm	100	0	100	Met er	430	43,000
	TOTAL SH III-A CARRIED OVER TO SUMMARY						41,80,942
III-B.	LT PANEL						
1.0	Design, Manufacturing, Supply, Installation, Testing & Commissioning of cubicle type totally enclosed free standing / Wall mounted type moisture, dust and vermin proof compartmentalized Floor Distribution Panel made out of 2.0 mm thick of Main members & front cover 1.6 mm thick CRCA sheet complete with internal wiring with suitable size wires / cable, interconnection, painting complete as per specification & drawing. All the Multi Function Meter / KWH Meter shall be with RS 485 port / SCADA or BMS Connectivity.						
	The MCCB rating up to 250A shall have thermal magnetic based adjustable over current, short circuit protection and above 250A MCCB shall have microprocessor based adjustable over current, short circuit, earth fault protection.						
1.1	COMMON AREA PANEL - BLOCK-A						
	INCOMING						
	1 No. 100 Amp FP Moulded Case Circuit Breaker.						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital MFM with CT's.						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	<u>BUSBAR</u>						
	150 Amp TPN aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	2 Nos. 63 Amp TP+N Moulded Case Circuit Breaker.						
	2 Nos. 25 Amp DP Miniature Circuit Breaker						
	1 Nos. 25 Amp FP Miniature Circuit Breaker.						
	2 Nos. 40 Amp FP Miniature Circuit Breaker						
	1 Nos. 40 Amp FP Miniature Circuit Breaker.						
	Panel described as above		1	1	Nos.	98,302	98,302
1.2	METER BOARD-1 (BLOCK-A)						
	<u>INCOMING</u>						
	1 No. 160 Amp FP Moulded Case Circuit Breaker.						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital MFM with CT's.						
	<u>BUSBAR</u>						
	200 Amp TPN aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	6 Nos. 63 Amp FP Miniature Circuit Breaker with Three phase KWHr Meter (as approved by Jammu Electricity Authority), CT's.						
	2 Nos. 63 Amp FP Miniature Circuit Breaker with Three phase KWHr Meter (as approved by Jammu Electricity Authority), CT's.						
	Meter Board described as above		1	1	Nos.	1,71,528	1,71,528
1.3	METER BOARD (RD Residence Block)						
	<u>INCOMING</u>						
	1 No. 100 Amp FP Moulded Case Circuit Breaker.						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Three phase KWHr Meter (as approved by Jammu Electricity Authority), CT's.						
	<u>BUSBAR</u>						
	150 Amp TPN aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	3 Nos. 63 Amp FP Miniature Circuit Breaker						
	Meter Board described as above		1	1	Nos.	70,636	70,636
1.4	METER BOARD (VOF BLOCK)						
	<u>INCOMING</u>						
	1 No. 100 Amp FP Moulded Case Circuit Breaker.						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital MFM with CT's.						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	<u>BUSBAR</u>						
	150 Amp TPN aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	4 Nos. 40 Amp DP Miniature Circuit Breaker with Single phase KWHr Meter (as approved by Jammu Electricity Authority), CT's.						
	2 Nos. 40 Amp DP Miniature Circuit Breaker with Single phase KWHr Meter (as approved by Jammu Electricity Authority), CT's.						
	Meter Board described as above		1	1	Nos.	1,42,744	1,42,744
1.5	COMMON AREA PANEL - CLUB BLOCK						
	<u>INCOMING</u>						
	1 No. 100 Amp FP Moulded Case Circuit Breaker.						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital MFM with CT's.						
	<u>BUSBAR</u>						
	150 Amp TPN aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	3 Nos. 63 Amp FP Miniature Circuit Breaker.						
	1 Nos. 25 Amp DP Miniature Circuit Breaker						
	1 Nos. 25 Amp DP Miniature Circuit Breaker						
	Panel described as above		1	1	Nos.	64,750	64,750
1.6	COMMON AREA PANEL - VOF BLOCK						
	<u>INCOMING</u>						
	1 No. 100 Amp FP Moulded Case Circuit Breaker.						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital MFM with CT's.						
	<u>BUSBAR</u>						
	150 Amp TPN aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	1 Nos. 63 Amp TP+N Moulded Case Circuit Breaker						
	1 Nos. 63 Amp TP+N Moulded Case Circuit Breaker.						
	1 Nos. 40 Amp FP Miniature Circuit Breaker						
	1 Nos. 40 Amp FP Miniature Circuit Breaker						
	1 Nos. 25 Amp DP Miniature Circuit Breaker						
	1 Nos. 25 Amp DP Miniature Circuit Breaker						
	Panel described as above		1	1	Nos.	95,065	95,065
1.7	LIFT PANEL (BLOCK-A)						
	<u>INCOMING</u>						
	1 No. 63A FP MCB						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	<u>BUSBAR</u>						
	100 Amp FP aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	3 Nos. 63 Amp FP RCBO, 300mA.						
	2 Nos. 25 Amp DP Miniature Circuit Breaker.						
	Panel described as above		2	2	Nos.	1,20,082	2,40,164
2.0	<u>FEEDER PILLAR (OUTDOOR TYPE)-</u>						
	Design, Manufacturing, Supply, Receiving, Unloading, Shifting, installation, testing & commissioning of cubicle type totally enclosed free standing type moisture, dust, vermin & weather proof Floor Distribution Panel made out of 2.0 mm thick & front cover 1.6 mm thick CRCA sheet complete with following equipments, including digital ammeter with inbuilt ammeter selector switch, digital voltmeter with inbuilt voltmeter selector switch, indicating lamps, CT's, internal wiring with suitable size wires / cable, MS Angle stand for installation, RCC foundation, interconnection, painting complete as per specification & drawing.						
	<u>EXTERNAL LIGHTING PANEL-</u>						
	<u>INCOMING</u>						
	1 No. 63 Amp FP MCB, 10 KA breaking capacity						
	1 No. 0 to 500 Volt digital voltmeter with inbuilt selector switch.						
	1 No. 63 Amp digital ammeter with inbuilt selector switch and CT's.						
	1 Set of phase indicating lamps with Single Pole MCB.						
	1 Set of ON / OFF indicating lamps with Single Pole MCB.						
	1 No. 24 Hrs TSQ Timer						
	1 No. 63 Amp, 4P/3P Contactor & A/M switch and Push Button.						
	<u>BUS BARS</u>						
	100 Amp TPN aluminium busbar.						
	<u>OUTGOING</u>						
	10 No. 25 Amp DP MCB, 10 KA breaking capacity.						
	Panel described as above	1	1	2	Each	80,790	1,61,580
3.0	MAIN L.T. PANEL & CAPACITOR PANEL (OUTDOOR TYPE) (Sector-1A)						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	Design, Manufacturing, Supply, Receiving, Unloading, Shifting, Installation, Testing & commissioning of Main LT Panel. The panel will be totally enclosed type with, free standing, floor mounted, indoor duty, dust & vermin proof, , front operated, electrical panel fabricated from 2 mm thick CRCA Sheet as per specifications & drawing laid in this document and will be complete with the main and auxiliary bus bars, interconnection wiring, earth bus and will be powder coated finish with 70 micron or more thickness. All the busbar joint shall be protected by clip on type sleeve. The Main LT Panel shall use all draw out type breakers suitable for 415 V AC, 3 phase, 50 Hz, 3 phase 4 wire supply system. The panel shall have following incoming and outgoing Air Circuit Breakers, MCCB as per the drawing and specification.						
	All the MCCB up to 250 Amp shall have thermal release with adjustable overload, short circuit & earth fault protection and above shall have microprocessor release with adjustable overload, short circuit & earth fault protection. The panel shall be manufactured as per BOQ, tech specification and drawing. Fault level of panel shall be 65 KA.						
	<u>INCOMING</u>						
	01 Nos. 250 Amp FP Moulded Case Circuit Breaker.						
	<u>BUSBARS</u>						
	300 Amp TPN bus bars of aluminium alloy as per SLD.						
	<u>OUTGOING</u>						
	EACH OUTGOING FEEDER SHALL HAVE DIGITAL MULTI FUNCTION METER WITH CT'S & ON/OFF INDICATION LIGHT WITH PROTECTION SP MCB.						
	02 Nos. 160 Amp FP Moulded Case Circuit Breaker.						
	01 Nos. 100 Amp TP Moulded Case Circuit Breaker.						
	01 Nos. 125 Amp FP Moulded Case Circuit Breaker.						
	01 Nos. 100 Amp FP Moulded Case Circuit Breaker.						
	03 Nos. 63 Amp FP Moulded Case Circuit Breaker.						
	<u>INSTRUMENTS</u>						
	1 Nos. digital Multi Function Meter with CT's.						
	1 Sets of phase indicating lights (RYB) with protection fuses (one set for each incoming breaker).						
	1 Sets breaker 'ON' & 'OFF' indicating lamp (one set for each incoming breaker).						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	1 Set of CT's one of 250/ 5Amp ratio for APFC relay.						
	1 Nos. Frequency meter (one for each Incoming Breaker).						
	1 Nos. Under Voltage & Over Voltage Relay						
	1 Nos. Phase Reversal Relay						
	1 Nos. Master Trip Relay.						
	CAPACITOR BANK PANEL (30 KVAR) (CAPACITOR PANEL SHALL BE PART OF MAIN L.T. PANEL) - 01 SET. (EACH CAPACITOR PANEL SHALL HAVE FOLLOWING)-						
	<u>INCOMING</u>						
	1 Nos. 0 to 500 Volt digital voltmeter with Voltmeter Selector Switch & Protective SP MCB (96mm square).						
	1 No. 0 to 100 Amp digital ammeter (96mm square) with CT's.						
	1 Sets of phase indicating lights (RYB) with protection fuses.						
	1 Sets breaker 'ON' & 'OFF' indicating lamp.						
	4 Step Automatic Power Factor Correction relay (APFC relay).						
	<u>BUSBARS</u>						
	150 Amp TPN bus bars of aluminium alloy as per SLD.						
	<u>OUTGOING</u>						
	2 Nos. 32 Amp TP MCCB.						
	2 Nos. 20 Amp TP MCCB.						
	2 Nos. capacitor duty contactor (one for each 10KVAR capacitor unit).						
	2 Nos. capacitor duty contactor (one for each 5KVAR capacitor unit).						
	2 Nos. 10 KVAR Capacitor Bank.						
	2 Nos. 5 KVAR Capacitor Bank.						
	4 sets of push button stations Red and Green for manual operation of capacitor units with auto/manual selector switches.						
	1 No. Indicating lamp for each 10 / 5 KVAR capacitor unit to indicate that the unit is 'ON'.						
	1 No. Toggle switch for changing automatic to manual operation of capacitor units.						
	Power factor meter.						
	Main L.T. Panel Cum Capacitor Panel describe as above		1	1	Set	5,15,056	5,15,056
4.0	DG PANEL (OUTDOOR TYPE) (Sector 1A)						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	Design, Manufacturing, Supply, Receiving, Unloading, Shifting, Installation, Testing & commissioning of Main DG Panel. The panel will be totally enclosed type with, free standing, floor mounted, indoor duty, dust & vermin proof, , front operated, electrical panel fabricated from 2 mm thick CRCA Sheet as per specifications & drawing laid in this document and will be complete with the main and auxiliary bus bars, interconnection wiring, earth bus and will be powder coated finish with 70 micron or more thickness. All the busbar joint shall be protected by clip on type sleeve. The Panel shall use all draw out type breakers suitable for 415 V AC, 3 phase, 50 Hz, 3 phase 4 wire supply system. The panel shall have changeover facility & interlocking and auto operation of incomers. The panel shall have following incoming and outgoing Air Circuit Breakers, MCCB as per the drawing and specification.						
	<u>INCOMING FROM 62.5 KVA DG SET</u>						
	02 Nos. 125 Amp FP Moulded Case Circuit Breaker.						
	02 Nos. of 4P Contractors, 125Amps						
	<u>BUSBARS</u>						
	150 Amp TPN bus bars of aluminium alloy as per SLD.						
	<u>OUTGOING</u>						
	<u>EACH OUTGOING FEEDER SHALL HAVE DIGITAL MULTI FUNCTION METER WITH CT'S AND ON/OFF INDICATION LAMP.</u>						
	05 Nos. 100 Amp FP Moulded Case Circuit Breaker.						
	2 Nos. 63 Amp FP Moulded Case Circuit Breaker.						
	<u>INSTRUMENTS</u>						
	1 No. 0 to 125 Amp digital Multi Function Meter with CT's for DG Set						
	1 Nos. of 3 phase KWH meter duly approved by State Electricity Authority with Net Metering Facility with CTs for LT Mains						
	2 Sets of phase indicating lights (RYB) with protection fuses (one set for each incoming breaker).						
	2 Sets breaker 'ON' & 'OFF' indicating lamp (one set for each incoming breaker).						
	2 Sets trip circuit healthy indicating lamp (one set for each incoming breaker).						
	2 Nos. Frequency meter (one for each Incoming Breaker).						
	2 Nos. master trip relay (one for each Incoming Breaker).						
	Control Module / Instruments for auto-mains failure functioning of DG set.						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	All other accessories / instruments / equipments required to function the above panel as AMF Panel.						
	Main DG Panel describe as above		1	1	Set	2,87,695	2,87,695
5.0	Design, Manufacturing, Supply, Installation, Testing & Commissioning of cubicle type totally enclosed free standing / Wall mounted type moisture, dust and vermin proof compartmentalized Floor Distribution Panel made out of 2.0 mm thick of Main members & front cover 1.6 mm thick CRCA sheet complete with internal wiring with suitable size wires / cable, interconnection, painting complete as per specification & drawing. All the Multi Function Meter / KWH Meter shall be with RS 485 port / SCADA or BMS Connectivity.						
	The MCCB rating up to 250A shall have thermal magnetic based adjustable over current, short circuit protection and above 250A MCCB shall have microprocessor based adjustable over current, short circuit, earth fault protection.						
	All KWHr Meter shall be installed after approval from state electricity board. The Meter Board GA drawing shall also be approved from state electricity board.						
5.1	COMMON AREA PANEL - BLOCK-1 (TYPICAL FOR BLOCK- 3, 4, 5, 6, 7, 8)						
	<u>INCOMING</u>						
	2 No. 100 Amp FP Moulded Case Circuit Breaker.						
	1 No. 100A FP Auto Transfer Switch.						
	2 Set of phase indicating lamps with MCB.						
	2 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital KWHr Meter with CT's duly approved with State Electricity Authority with Net Metering Facility						
	<u>BUSBAR</u>						
	150 Amp FP aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	2 Nos. 63 Amp TP+N Moulded Case Circuit Breaker.						
	1 Nos. 63 Amp FP Miniature Circuit Breaker						
	2 Nos. 40 Amp FP Miniature Circuit Breaker						
	1 No. 40 Amp FP Miniature Circuit Breaker						
	1 Nos. 63 Amp DP Miniature Circuit Breaker						
	1 Nos. 25 Amp DP Miniature Circuit Breaker						
	1 Nos. 25 Amp FP Miniature Circuit Breaker						
	Panel described as above	7		7	Nos.	2,28,537	15,99,759

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
5.2	COMMON AREA PANEL - BLOCK-2						
	<u>INCOMING</u>						
	2 No. 100 Amp FP Moulded Case Circuit Breaker.						
	1 No. 100A FP Auto Transfer Switch.						
	2 Set of phase indicating lamps with MCB.						
	2 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital KWHr Meter with CT's duly approved with State Electricity Authority with Net Metering Facility						
	<u>BUSBAR</u>						
	150 Amp FP aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	2 Nos. 63 Amp TP+N Moulded Case Circuit Breaker.						
	1 Nos. 63 Amp FP Miniature Circuit Breaker						
	2 Nos. 40 Amp FP Miniature Circuit Breaker						
	1 No. 40 Amp FP Miniature Circuit Breaker						
	2 Nos. 25 Amp DP Miniature Circuit Breaker						
	1 Nos. 25 Amp FP Miniature Circuit Breaker						
	Panel described as above	1		1	Nos.	2,27,655	2,27,655
5.3	COMMON AREA PANEL - BLOCK-9						
	<u>INCOMING</u>						
	2 No. 160 Amp FP Moulded Case Circuit Breaker.						
	1 No. 160A FP Auto Transfer Switch.						
	2 Set of phase indicating lamps with MCB.						
	2 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital KWHr Meter with CT's duly approved with State Electricity Authority with Net Metering Facility						
	<u>BUSBAR</u>						
	200 Amp FP aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	2 Nos. 63 Amp TP+N Moulded Case Circuit Breaker.						
	1 Nos. 63 Amp FP Miniature Circuit Breaker						
	4 Nos. 63 Amp FP Miniature Circuit Breaker						
	2 Nos. 40 Amp FP Miniature Circuit Breaker						
	1 Nos. 63 Amp DP Miniature Circuit Breaker						
	2 Nos. 40 Amp DP Miniature Circuit Breaker						
	1 Nos. 25 Amp FP Miniature Circuit Breaker						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	1 Nos. 25 Amp DP Miniature Circuit Breaker						
	Panel described as above	1		1	Nos.	2,92,110	2,92,110
5.4	COMMON AREA PANEL - BLOCK-10						
	<u>INCOMING</u>						
	2 No. 100 Amp FP Moulded Case Circuit Breaker.						
	1 No. 100A FP Auto Transfer Switch.						
	2 Set of phase indicating lamps with MCB.						
	2 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital KWHr Meter with CT's duly approved with State Electricity Authority with Net Metering Facility						
	<u>BUSBAR</u>						
	150 Amp FP aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	1 Nos. 63 Amp FP Miniature Circuit Breaker						
	4 Nos. 63 Amp FP Miniature Circuit Breaker						
	2 Nos. 25 Amp DP Miniature Circuit Breaker						
	1 Nos. 25 Amp FP Miniature Circuit Breaker						
	Panel described as above	1		1	Nos.	2,13,527	2,13,527
5.5	METER BOARD-1 (BLOCK-1) (TYPICAL FOR BLOCK-3, 4, 5)						
	<u>INCOMING</u>						
	1 No. 160 Amp FP Moulded Case Circuit Breaker						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital MFM with CT's.						
	<u>BUSBAR</u>						
	200 Amp FP aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	11 Nos. 63 Amp FP Miniature Circuit Breaker with three phase KWHr Meter, CT's.						
	1 Nos. 63 Amp FP Miniature Circuit Breaker with three phase KWHr Meter, CT's.						
	Meter Board described as above	4		4	Nos.	2,30,112	9,20,448
5.6	METER BOARD-2 (BLOCK-2)						
	<u>INCOMING</u>						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	1 No. 200 Amp FP Moulded Case Circuit Breaker.						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital MFM with CT's.						
	<u>BUSBAR</u>						
	250 Amp FP aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	12 Nos. 63 Amp FP Miniature Circuit Breaker with three phase KWHr Meter, CT's.						
	1 Nos. 63 Amp FP Miniature Circuit Breaker with three phase KWHr Meter, CT's.						
	Meter Board described as above	1		1	Nos.	2,44,696	2,44,696
5.7	METER BOARD-3 (BLOCK-6, 7, 8)						
	<u>INCOMING</u>						
	1 No. 200 Amp FP Moulded Case Circuit Breaker.						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital MFM with CT's.						
	<u>BUSBAR</u>						
	250 Amp TPN aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	10 Nos. 63 Amp FP Miniature Circuit Breaker with Three phase KWHr Meter, CT's.						
	1 Nos. 63 Amp FP Miniature Circuit Breaker with three phase KWHr Meter, CT's.						
	Meter Board described as above	3		3	Nos.	2,32,393	6,97,179
5.8	METER BOARD-4 (BLOCK-9)						
	<u>INCOMING</u>						
	1 No. 100 Amp FP Moulded Case Circuit Breaker.						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	1 No. Digital MFM with CT's.						
	<u>BUSBAR</u>						
	150 Amp TPN aluminium busbar with coloured heat shrinkable sleeve.						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	<u>OUTGOING</u>						
	10 Nos. 40 Amp DP Miniature Circuit Breaker with Single phase KWHr Meter, CT's.						
	1 Nos. 40 Amp DP Miniature Circuit Breaker with single phase KWHr Meter, CT's.						
	Meter Board described as above	1		1	Nos.	2,05,183	2,05,183
5.9	COMMON AREA PANEL EXTERNAL LIGHT, WTP, STP						
	<u>INCOMING</u>						
	2 No. 160 Amp FP Moulded Case Circuit Breaker.						
	1 No. 160A FP Auto Transfer Switch.						
	2 Set of phase indicating lamps with MCB.						
	2 Set of ON/OFF indicating lamps with MCB.						
	1 No. KWHr Meter with CT's.						
	<u>BUSBAR</u>						
	200 Amp FP aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	1 Nos. 100 Amp FP Moulded Case Circuit Breaker with three phase KWHr Meter, CT's.						
	1 Nos. 100 Amp FP Moulded Case Circuit Breaker.						
	2 Nos. 63 Amp FP Moulded Case Circuit Breaker with three phase KWHr Meter, CT's.						
	1 Nos. 63 Amp FP Moulded Case Circuit Breaker.						
	Panel described as above	1		1	Nos.	3,74,946	3,74,946
5.10	LIFT PANEL (TYPICAL)						
	<u>INCOMING</u>						
	1 No. 63A FP MCB						
	1 Set of phase indicating lamps with MCB.						
	1 Set of ON/OFF indicating lamps with MCB.						
	<u>BUSBAR</u>						
	100 Amp FP aluminium busbar with coloured heat shrinkable sleeve.						
	<u>OUTGOING</u>						
	3 Nos. 63 Amp FP RCBO, 300mA.						
	2 Nos. 25 Amp DP Miniature Circuit Breaker.						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	Panel described as above	9		9	Nos.	1,20,082	10,80,738
6.0	MAIN L.T. PANEL & CAPACITOR PANEL (Sector-9)						
	Design, Manufacturing, Supply, Receiving, Unloading, Shifting, Installation, Testing & commissioning of Main LT Panel. The panel will be totally enclosed type with, free standing, floor mounted, indoor duty, dust & vermin proof, , front operated, electrical panel fabricated from 2 mm thick CRCA Sheet as per specifications & drawing laid in this document and will be complete with the main and auxiliary bus bars, interconnection wiring, earth bus and will be powder coated finish with 70 micron or more thickness. All the busbar joint shall be protected by clip on type sleeve. The Main LT Panel shall use all draw out type breakers suitable for 415 V AC, 3 phase, 50 Hz, 3 phase 4 wire supply system. The panel shall have changeover facility & interlocking through, bus coupler switching and having following incoming and outgoing Air Circuit Breakers, MCCB as per the drawing and specification.						
	All the MCCB up to 250 Amp shall have thermal release with adjustable overload, short circuit & earth fault protection and above shall have microprocessor release with adjustable overload, short circuit & earth fault protection. The panel shall be manufactured as per BOQ, tech specification and drawing. Fault level of panel shall be 65 KA.						
	<u>INCOMING</u>						
	2 No. 800 Amp FP Air Circuit Breaker.						
	<u>BUSCOUPLER</u>						
	1 No. 800 Amp FP Air Circuit Breaker.						
	2 Sets of indicating lamps for ON & OFF of bus coupler.						
	<u>BUSBARS</u>						
	1000 Amp TPN bus bars of aluminium alloy as per SLD.						
	<u>OUTGOING</u>						
	EACH OUTGOING FEEDER SHALL HAVE DIGITAL MULTI FUNCTION METER WITH CT'S & ON/OFF INDICATION LIGHT WITH PROTECTION SP MCCB.						
	02 Nos. 200 Amp TP Moulded Case Circuit Breaker.						
	06 Nos. 200 Amp FP Moulded Case Circuit Breaker.						
	08 Nos. 160 Amp FP Moulded Case Circuit Breaker.						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	11 Nos. 100 Amp FP Moulded Case Circuit Breaker.						
	<u>INSTRUMENTS</u>						
	2 Nos. digital Multi Function Meter with CT's.						
	2 Sets of phase indicating lights (RYB) with protection fuses (one set for each incoming breaker).						
	2 Sets breaker 'ON' & 'OFF' indicating lamp (one set for each incoming breaker).						
	2 Set of CT's one of 800/ 5Amp ratio for APFC relay.						
	2 Nos. Frequency meter (one for each Incoming Breaker).						
	2 Nos. Under Voltage & Over Voltage Relay						
	2 Nos. Phase Reversal Relay						
	2 Nos. Master Trip Relay.						
	1 Set of Mechanical interlocking between incomer and bus coupler.						
	CAPACITOR BANK PANEL (100 KVAR) (ALL CAPACITOR PANEL SHALL BE PART OF MAIN L.T. PANEL) - 02 SET. (EACH CAPACITOR PANEL SHALL HAVE FOLLOWING)-						
	<u>INCOMING</u>						
	1 Nos. 0 to 500 Volt digital voltmeter with Voltmeter Selector Switch & Protective SP MCB (96mm square).						
	1 No. 0 to 200 Amp digital ammeter (96mm square) with CT's.						
	1 Sets of phase indicating lights (RYB) with protection fuses.						
	1 Sets breaker 'ON' & 'OFF' indicating lamp.						
	8 Step Automatic Power Factor Correction relay (APFC relay).						
	<u>BUSBARS</u>						
	250 Amp TPN bus bars of aluminium alloy as per SLD.						
	<u>OUTGOING</u>						
	3 Nos. 63 Amp TP MCCB.						
	2 Nos. 32 Amp TP MCCB.						
	1 Nos. 20 Amp TP MCCB.						
	3 Nos. capacitor duty contactor (one for each 25KVAR capacitor unit).						
	2 Nos. capacitor duty contactor (one for each 10KVAR capacitor unit).						
	1 Nos. capacitor duty contactor (one for each 5KVAR capacitor unit).						
	3 Nos. 25 KVAR Capacitor Bank.						
	2 Nos. 10 KVAR Capacitor Bank.						
	1 Nos. 5 KVAR Capacitor Bank.						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	6 sets of push button stations Red and Green for manual operation of capacitor units with auto/manual selector switches.						
	1 No. Indicating lamp for each 25 / 10 / 5 KVAR capacitor unit to indicate that the unit is 'ON'.						
	1 No. Toggle switch for changing automatic to manual operation of capacitor units.						
	Power factor meter.						
	Main L.T. Panel Cum Capacitor Panel describe as above	1		1	Set	32,75,017	32,75,017
7.0	DG PANEL- (Sector-9)						
	Design, Manufacturing, Supply, Receiving, Unloading, Shifting, Installation, Testing & commissioning of Main DG Panel. The panel will be totally enclosed type with, free standing, floor mounted, indoor duty, dust & vermin proof, , front operated, electrical panel fabricated from 2 mm thick CRCA Sheet as per specifications & drawing laid in this document and will be complete with the main and auxiliary bus bars, interconnection wiring, earth bus and will be powder coated finish with 70 micron or more thickness. All the busbar joint shall be protected by clip on type sleeve. The Panel shall use all draw out type breakers suitable for 415 V AC, 3 phase, 50 Hz, 3 phase 4 wire supply system. The panel shall have having following incoming and outgoing Air Circuit Breakers, MCCB as per the drawing and specification.						
	<u>INCOMING FROM 250 KVA DG SET</u>						
	01 Nos. 400 Amp FP Moulded Case Circuit Breaker.						
	<u>BUSBARS</u>						
	500 Amp TPN bus bars of aluminium alloy as per SLD.						
	<u>OUTGOING</u>						
	<u>EACH OUTGOING FEEDER SHALL HAVE DIGITAL MULTI FUNCTION METER WITH CT'S.</u>						
	03 Nos. 160 Amp FP Moulded Case Circuit Breaker.						
	10 Nos. 100 Amp FP Moulded Case Circuit Breaker.						
	<u>INSTRUMENTS</u>						
	1 No. 0 to 400 Amp digital Multi Function Meter with CT's.						
	2 Sets of phase indicating lights (RYB) with protection fuses (one set for each incoming).						
	1 Sets breaker 'ON' & 'OFF' indicating lamp (one set for DG incoming breaker).						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
	1 Sets trip circuit healthy indicating lamp (one set for DG incoming breaker).						
	1 Nos. Frequency meter (one for DG Incoming Breaker).						
	1 Nos. master trip relay (one for DG Incoming Breaker).						
	Control Module / Instruments for auto functioning of DG set on mains failure						
	All other accessories / instruments / equipments required to function the above panel as AMF Panel.						
	Main DG Panel describe as above	1		1	Set	9,09,735	9,09,735
	TOTAL SH-IIIB CARRIED OVER TO SUMMARY						1,18,88,513
III-C.	CABLE & CABLE TRAY						
1	Supplying of 11 KV grade aluminium conductor, cross linked polyethylene (XLPE) insulated individual core screened, flat steel/strip armoured PVC sheathed cable (UE) complete as required.						
a	3 core x 120 sq. mm	135	0	135	Met er	1,675	2,26,125
b	3 core x 50 sq. mm	0	25	25	Met er	775	19,375
2	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.						
a	Upto 120 sq. mm	110	10	120	Met er	525	63,000
3	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.						
a	Upto 120 sq. mm	15	10	25	Met er	77	1,925
4	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing masonry open duct as required.						
a	Upto 120 sq. mm	10	5	15	Met er	63	945
5	supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sector-1A	Total Qty.			
	aluminium conductor cable of 11 KV grade as required :						
a	120 sq. mm	2		2	Each	14,968	29,936
b	50 sq. mm		1	1	Each	12,181	12,181
6	supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required :						
a	120 sq. mm	6		6	Each	20,100	1,20,600
b	50 sq. mm		1	1	Each	18,248	18,248
7	Supplying following 1.1kV grade, heavy duty XLPE insulated PVC Sheathed Aluminum Conductor FRLS type armoured cables suitable for 415V, 50Hz, AC system, with inner and outer PVC sheath, outer sheath provided with FRLS insulation, galvanized steel armouring (round or flat as mentioned) and with all components as mentioned in BOQ, specifications and schedule, complete etc. as required.						
7.1	3.5 core, 300 sq.mm.	855		855	Met er	1,858	15,88,590
7.2	3.5 core, 240 sq.mm.	405	30	435	Met er	1,528	6,64,680
7.3	3.5 core, 185 sq.mm.	685		685	Met er	1,200	8,22,000
7.4	3.5 core, 150 sq.mm.	400		400	Met er	948	3,79,200
7.5	3.5 core, 120 sq.mm.	280		280	Met er	814	2,27,920
7.6	3.5 core, 95 sq.mm.	110	100	210	Met er	654	1,37,340
7.7	3.5 core, 70 sq.mm.	2310		2310	Met er	520	12,01,200
7.8	3.5 core, 50 sq.mm.	520	25	545	Met er	387	2,10,915
7.9	3.5 core, 35 sq.mm.	410	210	620	Met er	299	1,85,380
7.10	4 core, 25 sq.mm.	250	180	430	Met er	258	1,10,940
7.11	4 core, 16 sq.mm.	15	90	105	Met er	193	20,265
7.12	4 core, 6 sq.mm.	340	30	370	Met er	138	51,060

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sector-1A	Total Qty.			
7.13	2 core, 10 sq.mm.	50		50	Met er	126	6,300
7.14	2 core, 6 sq.mm.	1820	850	2670	Met er	104	2,77,680
7.15	4 core, 16 sq. mm. Cu. Fire Survival Cable	270	55	325	Met er	1,316	4,27,700
7.16	4 core, 10 sq. mm. Cu. Fire Survival Cable	495	40	535	Met er	945	5,05,575
7.17	4 core, 6 sq. mm. Cu. Fire Survival Cable	585		585	Met er	647	3,78,495
8	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.						
a	Upto 35 sq. mm	2290.5	1245	3536	Met er	387	13,68,239
b	Above 35 sq. mm and upto 95 sq. mm	2646.0	100	2746	Met er	405	11,12,130
c	Above 95 sq. mm and upto 185 sq. mm	1228.5	0	1229	Met er	422	5,18,427
d	Above 185 sq. mm and upto 400 sq. mm	1134.0	30	1164	Met er	474	5,51,736
9	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.						
a	Upto 35 sq. mm	254.5	135	389.5	Met er	37	14,412
b	Above 35 sq. mm and upto 95 sq. mm	294.0	20	314	Met er	57	17,898
c	Above 95 sq. mm and upto 185 sq. mm	136.5	0	136.5	Met er	77	10,511
d	Above 185 sq. mm and upto 400 sq. mm	126.0	0	126	Met er	134	16,884
10	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required.						
a	Upto 35 sq. mm (clamped with cable tie)	1690.0	95	1785	Met er	45	80,325
11	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required.						
11.1	2 x 6 sq. mm (19mm)		56	56	Eac h	240	13,440
11.1	2 x 10 sq. mm (19mm)			0	Eac h	241	0
11.2	3½ X 35 sq. mm (32mm)	6	6	12	Eac h	369	4,428
11.3	3½ X 50 sq. mm (35mm)	8	2	10	Eac h	413	4,130

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sector-1A	Total Qty.			
11.4	3½ X 70 sq. mm (38mm)	20		20	Eac h	468	9,360
11.5	3½ X 95 sq. mm (45mm)	4	2	6	Eac h	588	3,528
11.6	3½ X 120 sq. mm (45mm)	4		4	Eac h	613	2,452
11.7	3½ X 150 sq. mm (50mm)	4		4	Eac h	697	2,788
11.8	3½ X 185 sq. mm (57mm)	6		6	Eac h	875	5,250
###	3½ X 240 sq. mm (62mm)	6	2	8	Eac h	1,027	8,216
###	3½ X 300 sq. mm (70mm)	18		18	Eac h	1,195	21,510
###	4 X 10 sq. mm (25mm) (The Termination including 4 x 6 sq. mm cable)	212	8	220	Eac h	269	59,180
###	4 X 16 sq. mm (28mm)	20	8	28	Eac h	309	8,652
###	4 X 25 sq. mm (28mm)	10	4	14	Eac h	315	4,410
12	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required.						
a	63 mm dia (OD-63 mm & ID-51 mm nominal)	50	65	115	Met er	247	28,405
b	120 mm dia (OD-120 mm & ID-103 mm nominal)	475	110	585	Met er	368	2,15,280
c	160 mm dia (OD-160 mm & ID-135 mm nominal)	125	50	175	Met er	481	84,175
d	200 mm dia (OD-200 mm & ID-175 mm nominal)	245	0	245	Met er	668	1,63,660
	(Cable Trays)						
13	Supplying and installing following size of perforated Hot Dipped Galvanized Iron cable tray (galvanization thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.						
a	100 mm width x 50 mm depth x 1.6 mm thickness	370	0	370	Met er	669	2,47,530
b	150 mm width x 50 mm depth x 1.6 mm thickness	280	50	330	Met er	716	2,36,280
14	Supplying and installing following size of perforated Hot Dipped Galvanized Iron cable tray "bends" (galvanization not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.						
a	100 mm width x 50 mm depth x 1.6 mm thickness	9	0	9	Nos.	1,159	10,431

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sect or-1A	Total Qty.			
b	150 mm width x 50 mm depth x 1.6 mm thickness	9	0	9	Nos.	1,270	11,430
15	Supplying and installing following size of perforated Hot Dipped Galvanized Iron cable tray "Tee" (galvanization not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.						
a	100 mm width x 50 mm depth x 1.6 mm thickness	9	0	9	Nos.	1,327	11,943
b	150 mm width x 50 mm depth x 1.6 mm thickness	9	0	9	Nos.	1,383	12,447
16	INSPECTION CHAMBER:						
	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 fine sand : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design:						
16	Inside dimensions 455x610 mm and 45 cm deep for single pipe line :						
16.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	65	21	86	Each	6,431	5,53,092
16	Extra for depth beyond 45 cm of brick masonry chamber						
16.2	For 455x610 mm size						
16.2	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	65	21	86	Meter	5,641	4,85,105
	TOTAL SH-III-C - CARRIED OVER TO SUMMARY						1,35,85,257
III-D.	EARTHING AND LIGHTNING PROTECTION						
1	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 Meter long etc. with charcoal/ coke and salt as required.	98	26	124	Each	7,472	9,26,528

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sector-1A	Total Qty.			
2	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 Meter long etc. with charcoal/ coke and salt as required.	16	5	21	Each	13,838	2,90,598
3	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	11	8	19	Each	6,855	1,30,245
4	Supplying and laying 6 SWG G.I. wire at 0.50 Meter below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	1820	1000	2820	Meter	51	1,43,820
5	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	260	80	340	Meter	1,162	3,95,080
6	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	1330	460	1790	Meter	244	4,36,760
7	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, G.I. tube, having single prong at top, with 85 mm dia 6 mm thick G.I. base plate including holes etc. complete as required.	20	4	24	Each	518	12,432
8	Fixing of lightning conductor finial (single prong) with base plate including holes etc. complete as required.	20	4	24	Each	360	8,640
9	Joining copper / G.I. tape (with another copper/ G I tape, base of the finial or any other metallic object) by riveting / nut bolting/ sweating and soldering etc as required.	723	50	773	Each	113	87,349
10	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required.(For horizontal run)	1930	550	2480	Meter	126	3,12,480
11	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required.(For vertical run)	1120	50	1170	Meter	197	2,30,490
13	Providing and fixing testing joint, made of 20 mm X 3 mm thick G.I. strip, 125 mm long, with 4 nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete as required.	102	24	126	Each	121	15,246
14	Providing and laying G.I. tape 32 mm X 6 mm from earth electrode directly in ground as required.	1290	350	1640	Meter	195	3,19,800

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sector-9	Sector-1A	Total Qty.			
15	Providing and fixing earth bus of 50 mm X 5 mm GI strip on surface for connections etc. as required.	40	0	40	Met er	488	19,520
TOTAL SH-III-D CARRIED OVER TO SUMMARY							33,28,988
III-E.	EXTERNAL LIGHTING						
1.0	Supply, Installation, Testing & Commissioning of 7.5 Mtr High hot dip Galvanized Octagonal Pole single arm with bottom 140mm A/F, top 70 mm A/F made up of 3 mm thick HT plate and 220x220x16 mm base plate, fixing arrangement of light complete with 4 Nos 24mm dia x 700 mm long foundation bolts, RCC foundation etc as complete as required.	31	16	47	Eac h	20,014	9,40,658
2.0	Supply, Installation, Testing & Commissioning of LED light fixture 60 watt, 6500 lumen, integral driver, protection IP 66, CLASS I as complete as required.	31	16	47	Eac h	10,713	5,03,511
3.0	Supply, Installation, Testing & Commissioning of LED light fixture 170 watt, 17700 lumen, integral driver, protection IP 66, CLASS I as complete as required.	6	4	10	Eac h	34,087	3,40,870
4.0	Supply, Receiving, Unloading, Shifting, Installation, Testing & commissioning of 45W LED Post Top Light for Gate Light including all fixing accessories as required.	4	4	8	Eac h	19,478	1,55,824
5.0	Supply, Installation, Testing & commissioning of outdoor type (IP 65) Bollard Light 100 mm dia, 800 mm height made out of cast aluminium, 8 up to 10 W LED Light with minimum 340 lumen, 100 lumen / watt, warm white, stainless steel screw, corrosion & UV resistant coat etc as complete as required.	11	8	19	Eac h	12,174	2,31,306
6.0	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required.						
a.	3 x 2.5 sq. mm	325	170	495	Met er	137	67,815
TOTAL SH-III-E CARRIED OVER TO SUMMARY							22,39,984

SUBHEAD IV - DG SET

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
1	Design, Manufacturing, Supply, Receiving, Unloading, Shifting, Storing, Installation, Testing and Commissioning of Radiator Cooled DG sets of following capacity (rating in kVA) compact packaged silent type, with Outdoor type Acoustic Enclosure to reduce the noise level as per requirements of central pollution control board, 415Volts, 3 phase, 50 Hz AC alternator coupled to diesel engine with mechanical governor complete with all accessories, standard specifications tool kits, service manual, self starting device, fly wheel, coupling with guard, V belt, radiator, instrument panel (starting switch with key, Water Temperature indicator gauge, Lube Oil Pressure gauge, Lube oil temperature gauge, Battery Charging Ammeter, indicating lamp, hour counter etc.), residential silencer, common bed plate, anti vibration isolation pads, extended cable termination box, grouting bolts, first charge of engine oil, gear oil, high speed diesel oil, 12 volt maintenance free chargeable battery set with Trickle/Boost Battery charger, interface card for BMS connectivity complete as required of rating 415 Volts, 3 phase, 50 Hz. AC alternator coupled to Diesel Engine complete with all accessories. D.G. Set shall be as per CPCB-II.						
1.1	250 KVA D.G. Set, as per Specification and required length of Exhaust Piping, suitable capacity of day oil fuel Tank.	1		1	Set	21,01,587	21,01,587
1.2	62.5 KVA D.G. Set, as per Specification and required length of Exhaust Piping, suitable capacity of day oil fuel Tank.		1	1	Set	7,94,831	7,94,831
	TOTAL SH - IV CARRIED OVER TO SUMMARY						28,96,418

SUBHEAD VI - SOLAR PHOTO VOLTAIC POWER GENERATION SYSTEM

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
1.0	Supply, Installation, Testing and Commissioning of on grid Solar Photo voltaic Power Plant conforming to MNRE specifications as amended, consisting of Mono / Poly Crystalline silicon solar cells, net metering facility, necessary protections, earthing, mounted on Aluminium / GI structure of suitable strength with following components complete as required:-						
	a) Solar Photovoltaic Module of capacity 330Wp or above, manufactured in India, conforming to IS14286 / IEC61215, IS/IEC61730-Part-1, IS/IEC61730-Part-2. Solar Photovoltaic Module conversion efficiency shall not be less than 16.5%. PV modules used in solar power plants / systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.						
	b) Power Conditioning Unit (PCU) of 350-800V DC Input voltage range and 400V AC, three phase, 4wire, 50Hz +/-2.5Hz, output voltage suitable to generate AC Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 degree C. The PCU shall adjust the voltage and frequency level to suit the Grid Voltage Frequency.						
	c) Data Monitoring System complete with accessories.						
	d) Fixing of Array junction box & Main junction box with IP65 protection and termination arrangement for incoming and outgoing cable alongwith glands, lugs and other accessories etc. as required.						
	e) Lightning and surge voltage protection.						
	f) Connections & Interconnections by supplying & fixing required size XLPE insulated copper conductor 1.1kV grade armoured power and control cables between solar modules, main power cable to grid supply PCU unit along with supplying & fixing of necessary channel / conduit lugs and other accessories etc. as required.						
	The Solar PV described as above	24	5	29	kWp	61,060	17,70,740
	TOTAL SH-VI CARRIED OVER TO SUMMARY						17,70,740

SUBHEAD VII – EPABX

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
1.0	Supply & Installation of following pair Telephone Tag Block with krone connector. The TTB shall be made out of 18 SWG MS sheet with powder coating and lockable cover etc as complete as required.						
1.1	10 Pair	2	5	7	Each	1,446	10,122
1.2	20 Pair	7	1	8	Each	1,989	15,912
1.3	30 Pair	10	0	10	Each	2,953	29,530
1.4	50 Pair	0	1	1	Each	4,279	4,279
1.5	150 Pair	1	0	1	Each	11,451	11,451
2	Supply and wiring of telephone cable 0.5mm dia annealed tinned copper conductor PVC insulated and PVC sheathed unarmoured telephone cable in burried in ground complete as required.						
2.1	10 pair telephone armoured cable.	745	500	1245	Met er	143	1,78,035
2.2	20 pair telephone armoured cable.	785	10	795	Met er	220	1,74,900
2.3	50 pair telephone armoured cable.	20	20	40	Met er	441	17,640
2.4	100 pair telephone armoured cable.	20	0	20	Met er	794	15,880
3	Supply, Installation and Commissioning of EPABX System complete with following specifications as required.						
	Non-Blocking						
	Equipped with:						
	Control section cPCI architecture						
	Based on Real Time 2gIP platform						
	Extension side:						
	150 analogue extensions						
	With CALLER ID ON DIGITAL AND ANALOG PUSH BUTTON TELEPHONES / EXTENSION**Internal & External Both						
	System Features: -						
	Expandable up to 250 ports.						
	Music In Hold - 01 No.						
	The EPABX described as above	1		1	Each	6,06,227	6,06,227
4	Supply, Installation and Commissioning of EPABX System complete with following specifications as required.						
	Non-Blocking						
	Equipped with:						
	Control section cPCI architecture						

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Total Qty.			
	Based on Real Time 2gIP platform						
	Extension side:						
	15 analogue extensions						
	With CALLER ID ON DIGITAL AND ANALOG PUSH BUTTON TELEPHONES / EXTENSION**Internal & External Both						
	System Features: -						
	Expandable up to 50 ports.						
	Music In Hold - 01 No.						
	The EPABX described as above		1	1	Each	83,851	83,851
5	Supply, installation, testing & commissioning of Push Button Telephone Wall hang model with flash, Hold, pause keys etc and voice Mail message indication LED.	118	7	125	Each	1,021	1,27,625
	TOTAL SH-VII CARRIED OVER TO SUMMARY						12,75,452

SUBHEAD VIII - BOOM BARRIER AT MAIN ENTRY / EXIT

S. No.	Item Description	Quantity			Unit	Rate (in Rs.)	Amount (in Rs.)
		Sect or-9	Sect or-1A	Tot al Qty.			
1	Supply, Installation, Testing & Commissioning of Boom Barrier, Electro-mechanical Boom barrier with loop sensor /beam sensor & boom resting post vehicle access barrier & all accessories complete as required as per below specifications.						
a	The Boom Barrier shall be compliance with following :-						
b	Application: Outdoor IP Rating: 54						
c	Barrier Housing Unit: Powder Coated; Boom: Powder Coated White RAL 9010 with Red reflective strips.						
d	Housing Material Of Construction: All Aluminium Housing with Base frame in SS-304 for high protection against corrosion.						
e	Protection: All Housing and internal parts will be rust & corrosion free metals or alloys of high strength with suitable Epoxy coating as applicable.						
f	Boom Specifications: The Booms shall be extruded aluminum with octagonal profile (straight/articulated) 100mm. X 55mm. X 1.6 mm. shall be the structure of the profile/ Alternatively the boom may also be offered as extruded aluminum with round profile of dia 74mm X 1.4 mm.						
g	Intelligence: The barrier shall use a blockable DC High Torque Drive in combination with CAN bus communication standard interfaced Controller. It shall offer LCD Display & Graphic User Interface for easy control setting. Possibility for integration via standard user interfaces.						
h	Digital Inputs: Minimum 8 Digital Outputs: Minimum 4 Relay Outputs: At least 6						
i	Compliance & Safety: Compliance to CE. Adherence to Safety Requirements of the EMC Directive 2004/108/EC, Low Voltage Directive 2006/95/EC and the basic requirements of the Machinery Directive 2006/42/EC						
j	Power Supply: 230+/- 10% VAC, 50 Hz.						
k	Maximum Power Consumption: Not More than 120 watts for Barrier Length up to 6 Meters.						
l	Opening & Closing Time: 4 seconds for Boom Length between 3.5 to 6 Meters						
m	Operating Temperature: 30 Degree Celsius to + 50 Degree Celsius						
n	Safety: Software for Detection of Presence of Vehicle in Loop or in the path of Infrared Safety Sensors available. Loops or sensors to be used to prevent barriers from closing on the vehicle.						
o	Duty Cycle: 100%						
p	Integration: Shall function in integration with Smart cards, proximity reader based access control systems etc.						
q	Performance Requirement: MCBF- 10 Mil Cycles, MTBF- 50,000 Hours, MTTR- 30 Minutes						
r	Certificates Required: TUV For Opening & Closing time, ISO Certificate of the Company from the country of Origin, UL Certification for the product, Certification for Ingress Protection (IP), EMC Test report						
	The Boom Barrier described as above	2	2	4	Each	2,53,339	10,13,356
	TOTAL SH-VIII CARRIED OVER TO SUMMARY						10,13,356

SECTION XII

LIST OF SCHEDULES

(A to I)

Schedule A

NOTES FOR SCHEDULE OF QUANTITIES

1	The Schedule of Quantities shall be read in conjunction with the specifications, Tender drawings and bid documents. Tenderer shall not rely merely on the description given in the Schedule of Quantities.		
2	Quantities of work indicated in the Schedule of Quantities are only approximate and are given to provide a common basis for tendering. No claim shall be entertained from Contractor if the actual quantities or items of work differ from those indicated herein, except where stated otherwise. The Engineer-in-charge reserves the right to modify any aspect of the scope of Tender at any time during the course of work.		
3	The tenderer shall quote his rates in for both major and minor components of work in percentage above or at par or below of the estimated cost in Schedule of Quantity at SECTIONs IX and XI issued by the Employer.		
4	Quote in percentage above or below or at par shall be in words and figures.		
5	Non-compliance of these conditions may render the Bid invalid at the discretion of the Employer.		
6	The quantities of work actually carried out against each item shall be measured and paid at the rates quoted (schedule rate with quoted percentage above or at par or below) where applicable or otherwise at such rates and prices as may be fixed within the terms of the Contract.		
7	Tenderer shall be deemed to have allowed in his rates the provision, maintenance and final removal of all temporary works of whatsoever nature required for the proper execution of the works, except for those temporary works for which specific items have been provided in Schedule of Quantities.		
8	Abbreviations used are as under :		
	i)	No.	Number
	ii)	Cu m	Cubic metre
	iii)	Sq m	Square metre

	iv)	M	Metre
	v)	LS	Lump sum
	vi)	MT	Metric Tonne
	vii)	Kg	Kilogram

Schedule B

MATERIAL TESTING AND QUALITY ASSURANCE

(i) Once, the material (to be used in work) is approved by Engineer-in-Charge as per clause 10 of 'Clauses of Contract' in Section IV, Contractor shall, within 02 working days from the date of such approval, submit his / their material procurement plan for entire work to the Engineer-in-Charge. Contractor shall submit to Engineer-in-Charge the material testing certificate (s) (MTC) provided by Manufacturer for every supply by Manufacturer to Contractor supported by substantiating document (acceptable to Engineer-in-Charge) linking material supplied by Manufacturer to its MTC.

(ii) Testing of materials shall be conforming to the relevant Code (s) as stated in the contract and as per Material Testing and Quality Assurance Plan suggested / approved by the Third Party Quality Auditor engaged by the Employer.

(iii) Whenever material is to be tested in laboratory, material testing shall be done through NABL Accredited laboratory (ies).

Schedule C

SAFETY CODE

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than $\frac{1}{4}$ to 1 ($\frac{1}{4}$ horizontal and 1 vertical.)
2. Scaffolding of staging more than 3.6 m (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends there of with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
3. Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.
4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm. (3ft.)
5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. ($11\frac{1}{2}$ "") for ladder upto and including 3 m. (10 ft.) in length. For longer ladders, this width should be increased at least $\frac{1}{4}$ " for each additional 30 cm. (1 foot) of length. Uniform step spacing of not more than 30 cm shall be kept. Adequate

precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit; action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person.

(a) Excavation and Trenching – All trenches 1.2 m. (4ft.) or more in depth, shall at all times be supplied with at least one ladder for each 30 m. (100 ft.) in length or fraction thereof, Ladder shall extend from bottom of the trench to at least 90 cm. (3ft.) above the surface of the ground. The side of the trenches which are 1.5 m. (5ft.) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 m. (5ft.) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances, undermining or undercutting shall be done. All trenches and excavations shall be provided with necessary fencing and lighting

(b) Safety Measures for digging bore holes:-

(i) If the bore well is successful, it should be safely capped to avoid caving and collapse of the bore well. The failed and the abandoned ones should be completely refilled to avoid caving and collapse;

(ii) During drilling, Sign boards should be erected near the site with the address of the drilling contractor and the Engineer in-charge of the work;

(iii) Suitable fencing should be erected around the well during the drilling and after the installation of the rig on the point of drilling, flags shall be put 50m around the point of drilling to avoid entry of people;

(iv) After drilling the borewell, a cement platform (0.50m x 0.50m x 1.20m) 0.60m above ground level and 0.60m below ground level should be constructed around the well casing;

(v) After the completion of the borewell, the contractor should cap the bore well properly by welding steel plate, cover the bore well with the drilled wet soil and fix thorny shrubs over the soil. This should be done even while repairing the pump;

(vi) After the borewell is drilled the entire site should be brought to the ground level.

6. Demolition – Before any demolition work is commenced and also during the progress of the work,

(i) All roads and open areas adjacent to the work site shall either be closed or suitably protected.

(ii) No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.

(iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

7. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned:- The following safety equipment shall invariably be provided.

(i) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear, rubber hand gloves and protective goggles.

(ii) Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes, shall be provided with protective goggles.

(iii) Those engaged in welding works shall be provided with welder's protective eye shields and gloves.

(iv) Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

(v) When workers are employed in sewers and manholes, which are in active use, the contractors shall ensure that the manhole covers are opened and ventilated at least for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public.

(vi) In addition, the contractor shall ensure that the following safety measures are adhered to :-

(a) Entry for workers into the line shall not be allowed except under supervision of the JE or any other higher officer.

(b) At least 5 to 6 manholes upstream and downstream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manhole for working inside.

(c) Before entry, presence of Toxic gases should be tested by inserting wet lead acetate paper which changes colour in the presence of such gases and gives indication of their presence.

(d) Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with Oxygen kit.

(e) Safety belt with rope should be provided to the workers. While working inside the manholes, such rope should be handled by two men standing outside to enable him to be pulled out during emergency.

(f) The area should be barricaded or cordoned off by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day.

(g) No smoking or open flames shall be allowed near the blocked manhole being cleaned.

(h) The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.

(i) Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer-in-Charge shall decide the time up to which a worker may be allowed to work continuously inside the manhole.

(j) Gas masks with Oxygen Cylinder should be kept at site for use in emergency.

(k) Air-blowers should be used for flow of fresh air through the manholes. Whenever called for, portable air blowers are recommended for ventilating the

manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non sparking gas engines also could be used but they should be placed at least 2 metres away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.

(l) The workers engaged for cleaning the manholes/sewers should be properly trained before allowing to work in the manhole.

(m) The workers shall be provided with Gumboots or non sparking shoes bump helmets and gloves non sparking tools safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing the limbs before working inside the sewer lines.

(n) Workmen descending a manhole shall try each ladder stop or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.

(o) If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.

(p) The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-in-Charge regarding the steps to be taken in this regard in an individual case will be final.

(vii) The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following precaution should be taken:-

(a) No paint containing lead or lead products shall be used except in the form of paste or ready made paint.

(b) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scrapped.

I Overalls shall be supplied by the contractors to the workmen and adequate facilities shall be provided to enable the working painters to wash during and on the cessation of work.

- a. Workmen executing work on scaffolds or other structures above specified height shall be provided with full body harness and fall arresters.

8. No paint containing lead or lead products shall be used except in the form of paste or readymade paint. The Contractor shall not employ women and men below the age of 18 on the work of painting with product containing lead in any form, wherever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use :

- (i) White lead, sulphate of lead or product containing these pigment, shall not be used in painting operation except in the form of pastes or paint ready for use.

- (ii) Measures shall be taken, wherever required in order to prevent danger arising from the application of a paint in the form of spray.

- b. Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping.

- (iv) Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.

- c. Overall, shall be worn by working painters during the whole of working period.

- (vi) Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled¹³ by painting materials.

- d. Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified.

- (vii) Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

- e. When the work is done near any place where there is risk of drowning, all necessary equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.

9. Use of hoisting machines and tackle including their attachments, anchorage and supports shall be in perfect condition and also shall conform to the following standards or conditions :-

(i) (a) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.

(b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.

(ii) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to operator.

(iii) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

(iv) In case of departmental machines, the safe working load shall be notified by the Electrical Engineer-in- Charge. As regards contractor's machines the contractors shall notify the safe working load of the machine to the Engineer-in-Charge whenever he brings any machinery to site of work and get it verified by the Electrical Engineer concerned.

(v) Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be

necessary should be provided. The worker should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

(vi) All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

10. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.

11. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labour Officer or Engineer-in-Charge of the department or their representatives.

16. Notwithstanding the above clauses from (1) to (15), there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

FIRE SAFETY CODE

1. Cutting / drilling machine and other electrically operated equipment used at site shall be plugged into correctly rated electrical outlets.
2. Only ISI marked 3 pin plug and other appliances and equipment shall be used.
3. Electrical power cables/wires used shall not have any joints and shall be properly rated.
4. All electrical appliances i.e. welding, drilling, cutting machine etc. shall be safely and securely earthed to prevent leakage current while in operation.
5. Before commencing the welding work for the first time on any day, fire section shall be informed and only after the site inspection by the Fire officers/Personnel, work shall be started.

6. Two buckets of water and sand shall be kept in an easily accessible area on the site.
7. Fire extinguishers recommended and issued by fire officers shall be kept on the site.
8. Used paint drums shall be stored in specified store only after closing them properly.
9. Personal protective equipment such as safety shoes, hand gloves, welder's mask, ear plug, etc., depending upon the requirement of the work shall be provided by the Contractor to the workmen to prevent occupational health hazards.
10. The safety belt shall be provided by the Contractor and used by the workmen while working from height for more than 10' from Ground level.
11. None of the passages near lift lobby and staircases shall be used for stacking / dumping any kind of materials/waste.
12. None of the fire extinguishers shall be removed/shifted from its designated location.
13. Power supply shall be switched off from the mains when equipment is not in use.
14. Wood-shavings and saw-dust generated from the work shall be collected on daily basis, removed from site and stored at the designated place in proper manner.
15. Any debris generated from the work shall be collected on daily basis, removed from site and stored at the designated place in proper manner.
16. Battery operated emergency light/torches shall be provided by the Contractor to the workmen while working beyond office hours.

Schedule D

LIST OF DOCUMENTS TO BE MAINTAINED AT SITE

S. No.	Description of the Document	Remarks
1	Contract Agreement.	Certified true copies of the contracts
2	Drawings	One set of all drawings issued for the work
3	Work instruction / Site order Book	For issue of instructions by Engineer-in-charge or his representative at site in the course of day to day supervision. This book shall be in the form of Triplicate book with machine numbered pages. After recording the instructions, one copy shall be taken by Engineer-in-Charge or his representative, another by the contractor and the third copy shall remain in the book on which the compliance shall be recorded by Contractor after taking required action.
4	Daily Progress Record	For recording daily activities, information can be utilized for submission of progress reports and planning of work, updation of MSP etc.
5	Hindrance register	For recording the details of hindrances, reasons & its clearance with time period jointly signed by the Site Engineer/ Engineer-in-charge representative an' the contractor's representative
6	Cement Register (Receipts/Consumption/Balance)	
7	Steel Register (Receipts/Consumption/Balance)	

8	Building Materials Register	
9	Concrete Cube Test register/Slump Test Register	
10	Log Book of defects	
11	Test Reports For Building Materials/Materials Of Other Subsidiary trades	
12	Sand bulkage Register	
13	Lead Caulk Register	
14	Daily Labour Register	
15	Variation Order Registers (Separately For Main Work And Other Major Subsidiary Trades)	
16	Pipeline Testing Register	
17	Ponding Test Register	
18	Electrical Wiring System (including Earth Test Results) Testing Register	
19	Equipment Test Certificate Register For Major Equipment In AC Plant, Electrical Sub-station,etc.	
20	Performance Test Register For Lifts, AC plants And Other Electrical And Electromechanical Equipment	

These registers shall be kept in the safe custody of AM(Tech).

Proper records of consumption of cement and other such materials shall be maintained and comparisons may be made about theoretical and actual consumption and that of available stocks in respect of projects at each centre. Such records may be periodically checked by Engineer-in-Charge of the project

Schedule E

GENERAL RULES AND INSTRUCTIONS TO TENDERERS – INFORMATION

Bids in Two Bids System	1	<p>Tender Inviting Authority – Regional Director Reserve Bank of India Estate Department Rail Head Complex, Jammu- 180012 Tel No.: 0191 2472481 Fax No.: Email id: estate@rbi.org.in</p> <hr/> <p>Name of the Work - Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.</p> <p>Estimated cost of work: ₹ 83.19 cr</p>
Earnest Money Deposit (EMD)	14	<p>Earnest Money Deposit (EMD) is to be submitted by all the tenderers through NEFT / RTGS to the following account:</p> <p>Beneficiary: in RBI Jammu, Account No.8714295, IFSC Code: RBIS0JMPA01 (0=Zero) (Intimate / forward the transaction details on estate@rbi.org.in) and Proof of remittance indicating transaction number and other details shall be uploaded on Bank's approved e-tender portal along with other tender documents.</p> <p>OR</p> <p>through Bank Guarantee from a scheduled Bank as per Form -F (validity of BG at least upto validity of bid).</p>

	<p>OR</p> <p>through Demand Draft from a scheduled Bank drawn in favour of Reserve Bank of India</p> <p>EMD in any of the above forms shall be deposited in original at the office of tender inviting authority on or before the due date</p>
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Schedule F

GENERAL CONDITIONS OF THE CONTRACT – INFORMATION

Definitions		
	2.	
		i) Name of the Work – - Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.
		ii) The Sites – Bank's sites at Sector 9 and Sector 1A, Trikuta Nagar, Jammu
		iii) Employer – Reserve Bank of India represented by Regional Director, Reserve Bank of India, Jammu
		xxii) The percentage mentioned to cover all overheads and profits – 15%
Discrepancies and Adjustment of Errors	8.2	The Competent Authority - Regional Director, Reserve Bank of India, Jammu

CLAUSES OF CONTRACT

Performance Bank Guarantee		CLAUSE 1 and item 23 of General Rules and Instructions to Tenderers – Information
		Bank Guarantee from any Scheduled Bank as per proforma at Annex 4 of this tender, for an amount equal to 5% of the Contract Amount
	(i)	Time allowed for submission of Performance Bank Guarantee from the date of award of work – 14 days

	(ii)	Maximum allowable extension of time for submission of Performance Bank Guarantee beyond the period specified in (i) above without penalty – 7 days
	(iii)	Maximum allowable extension of time for submission of Performance Bank Guarantee beyond the period specified in (ii) above with late fee @ 0.1% of the amount of Performance Bank Guarantee per day – 7 days
Recovery of Security Deposit	CLAUSE 1 A	
	Retention percentage – 5% from every bill subject to 5% of the contract price. Total Retention Money – 5% of the contract price	
Compensation for Delay	CLAUSE 2	
	Authority for fixing compensation under clause 2: The Regional Director, Reserve Bank of India, Jammu.	
	<p>Compensation for Delay</p> <p>(i) The work shall throughout the stipulated period of the contract be proceeded with all due diligence and if the Contractor fails to complete the work within the specified period he/they shall be liable to pay compensation for delay at the rate of 0.25% of the estimated cost / tendered cost per week (to be computed on per day basis) subject to a maximum amount of 10% of the tendered cost.</p> <p>(ii) The compensation for delay will be levied in following manner:</p> <p>“If the Contractor fails to maintain the required progress of the works by the completion time stipulated in the Contract or within any extended time under time extension Clause and the employer certifies in writing that in his opinion the same ought reasonably to have been completed, the Contractor shall pay</p>	

the Employer the sum named as “Compensation for Delay” for the period during which the said works shall so remain incomplete and the Employer may deduct such damages from any moneys due to the Contractor.

(iii) In case, the contractor does not achieve a particular milestone, if any, mentioned in the Contract or rescheduled milestone(s) in terms of time extension clause, the amount shown against that milestone shall be withheld to be adjusted against the compensation for delay levied at the time of completion of contract. Withholding of payments on failure to achieve a milestone shall be automatic and without any notice to the Contractor. However, if the Contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make-up for the delay before the subsequent milestone(s), the amount mentioned against each missed milestone shall also be withheld. No interest whatsoever shall be paid by the Bank on such withheld amount/s. The delay period shall be calculated from the stipulated date of occurrence of a milestone until the date when the milestone is actually achieved. The application of compensation for delay shall not effect a change in the milestone or release the Contractor of his obligation to improve the progress of work. The contractor hereby specifically agrees and authorizes the Employer to deduct such compensation for delay, if any, from any instalments of payment becoming due and payable to the contractor in terms of this contract or from the retention money.

(iv) Milestones Chart for this contract:

Mile- stone	Mile-stone Financial	Time for	Amount to be withheld in case of
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	No.	Progress in Rs.	Achieving from the date of commencement stipulated in Schedule F	Non- achievement of the Milestone.
	First	9 crore	10 months	In the event of not maintaining desired pace of progress and not achieving Milestone Financial Progress (as assessed from running payments), an amount of Rs 1.0 crore shall be immediately withheld from the dues of the contractor for failure to achieve (on stipulated date) the first milestone.
	Second	32 crore	20 months	In the event of not maintaining desired pace of progress and not achieving Milestone Financial Progress (as assessed from running payments), an amount of Rs 2.0 crore shall be immediately withheld from the dues

				of the contractor for failure to achieve (on stipulated date) the first milestone.
	Third	65 crore	30 months	In the event of not maintaining desired pace of progress and not achieving Milestone Financial Progress (as assessed from running payments), an amount of Rs 3.1 crore shall be immediately withheld from the dues of the contractor for failure to achieve (on stipulated date) the first milestone.
	Fourth	Full and final value of work done	40 months	LD shall be levied depending upon overall actual extent of delays attributable to the Contractor's actions, at the rate 0.25% of estimated cost / tendered cost per week (to be computed on per day basis) subject to the maximum of 10% of the accepted tender

				amount. If the overall project is delayed by the Contractor, he shall not be entitled to any reduction in the amount of the “ Compensation for Delay” to be recovered from his dues by the Employer notwithstanding his successful attainment of earlier milestone.
Commencement, Time allowed for completion and Extension for Delay	CLAUSE 5			
	Date of commencement: 14 th day from the date of award of work. Time allowed for completion of work: Forty (40) months from the date of commencement. Extension for delays shall be as per clause 5 of ‘Clauses of Contract’ in Section V.			
	i)	Authority for granting Extension of Time: Regional Director, Reserve Bank of India, Jammu		
	ii)	Authority for shifting of milestones: Regional Director, Reserve Bank of India, Jammu		
	iii)	Authority for shifting of date of commencement in case of delay in handing over of site: Engineer-in-charge		
Payment on Interim Certificate to be Regarded as Advances	CLAUSE 7			
		Gross value of work done together with net payment/ adjustment of advances for material collected, if any, since the last such payment eligible for raising Running Account bill (Interim payment): ₹ 2.0 crore		

		Retention percentage for Interim Certificates – 5% from every bill
		Total Retention Money – 5% of the Contract Price (i.e. Retention Money from each bill) plus 5% Performance Bank Guarantee.
		Retention period for the Retention Money – up to successful completion of Defects Liability Period (DLP) of 12 months from the date of virtual completion certified by the Engineer-in-Charge) specifically stipulated at clause 17 of this tender.
		Installment due after Virtual Completion – Performance Bank Guarantee submitted by contractor towards Performance
		Period of honoring interim certificates 1 month from the date of receipt of complete bill along with all the documents as specified in Special Conditions of Contract
	CLAUSE 9	
Payment of Final bill		Period of honoring interim certificates- 6 months from the date of receipt of complete bill along with all the documents as specified in Special Conditions of Contract
	CLAUSE 10B	
Material Testing Lab at site	i)	<p>Laboratory at site:</p> <p>The contractor shall establish a testing lab at site and provide testing equipment and materials for the field tests mentioned in the list of mandatory tests given in CPWD Specifications 2019 Vol. 1 & 2. Nothing extra shall be payable to him on this account. The representatives of the Bank shall be at liberty to inspect</p>

	<p>the testing facilities at site and conduct testing at random in consultation with Engineer in charge. The contractor shall provide all necessary facilities for the purpose. The laboratory shall be equipped, inter alia, with the following equipment:</p> <p><u>a)Balances:</u></p> <p>i)7 kg to 10 kg capacity, semi self-indicating type – Accuracy 10 gm.</p> <p>ii)500 gm capacity, semi self-indicating type Accuracy 1 gm.</p> <p>iii)Pan Balance- 5 kg Capacity- Accuracy 10 gm.</p> <p>b)Ovens- Electrically operated, thermostatically controlled up to 1100C- Sensitivity 10C.</p> <p>c)Sieves: as per IS: 460</p> <p>i)IS Sieves – 450 mm internal dia of sizes 100 mm, 80 mm, 63 mm, 50 mm, 40 mm, 25 mm, 20 mm, 12.5 mm, 10 mm, 6.3 mm, 4.75 mm, complete with lid and pan.</p> <p>ii)IS Sieves – 200 mm internal dia (brass frame) consisting of 2.36 mm, 1.18 mm, 500 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns with lid and pan.</p> <p>d)Sieve shaker capable of 200 mm and 300 mm dia sieves, manually operated with timing switch assembly.</p> <p>e)Equipment for slump test- slump cone, steel plate, taping rod, steel scale, scoop.</p> <p>f)Equipment for concrete testing</p> <p>i)Concrete cube moulds 15x15x15cm: 18Nos.</p> <p>ii)Pruning Rods 2Kg weight length 40cm and ramming face 25mm : 1 No.</p> <p>iii)Extra Bottom plates for 15cm cube mould: 6 Nos.</p>
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	ii)	<p>iv) Standard Vibration table for cubes : 1 No</p> <p>v) Dial gauges 25 mm travel- 0.01 mm/division Least count : 1 No.</p> <p>vi) Compression testing machine of 100 tonne capacity: 1 No.</p> <p>90% tests for material be performed at site lab with above stated equipment's, however at least 10% testing of materials shall be got done from external laboratories. However, for the tests to be carried out by the external laboratories, the contractor shall supply free of charge all the materials required for testing, including transportation. If the tests which were to be conducted in the site laboratory are conducted in other laboratories for any the reasons the cost of such tests shall be borne by the contractor.</p> <p>Other Laboratories: The contractor shall arrange carrying out all tests required under the agreement through the laboratory as approved by the Engineer-in-Charge and shall bear all charges in connection therewith including charges for testing for all materials.</p>
Deviations/ Variations Extent and Pricing	CLAUSE 12	
Deviation – Deviated Quantities and Pricing	Deviation limit beyond which clause 12.2 C shall apply: 25% beyond the tender item (that is increase of more than 25%) quantity specified in the Schedule of Quantity.	
Contractor Liable for Damages, defects during defect liability period	CLAUSE 17	
	f. Defects Liability Period – 12 months from the date of virtual completion certified by the Engineer-in-Charge.	

	(ii) Competent Authority for deciding recovery amount – Regional Director, Reserve Bank of India, Jammu		
Contractor to Supply Material, Machinery, Equipment, Tools & Plants etc.	Clause 23		
	The following list of Machinery, Tools & Plants to be deployed by the contractor at site is indicative. However, the actual requirement shall be decided by the Engineer in Charge and the same shall be binding on the contractor		
	S. No.	Name of Equipment	Numbers (Minimum)
	1	Excavators (various sizes)	1 No.
		Equipment for hoisting & lifting	
	2	Tower Crane or Builder's hoist (Desirable)	2 No.
		Equipment for Concrete work	
	3	Automatic Concrete batching plant of sufficient capacity as per direction of Engineer-in-Charge	1 No.
	4	Concrete pump (Desirable)	2 No.
	5	Concrete transit mixer	2 No.
	6	Concrete mixer with hopper (diesel)	2 No.
	7	Concrete mixer with hopper (electrical)	2 No.
	8	Needle vibrator (electrical)	2 No.
9	Needle vibrator (petrol)	2 No.	
10	Surface vibrator	2 No.	
	Equipment for Building work		
11	Bar bending Machine	2 No.	

12	Bar cutting machine		2 No.
13	Drilling machine		2 No.
14	Welding machine i/c transformer		2 No.
15	Cube testing machines		2 No.
16	M.S. pipes	As directed by Engineer- in-Charge.	1 Set for each site
17	Steel shuttering		
18	Steel scaffolding		
19	Grinding/polishing machines		2 Nos.
	Equipment for transportation		
20	Tippers		2 No.
21	Trucks		2 No.
	Pneumatic equipment		
22	Air compressors (diesel)		1 Nos
	Dewatering equipment		
23	Pump (diesel)		1 No.
24	Pump (electric) (Desirable)		1 No.
	Power equipment		
25	Diesel generator		1 No.

Note:

1. Workshop facilities for fabrication/addition and alterations, and other allied works shall be arranged by the contractor at his own cost.
2. The list of equipment/T&P/machinery as per above is for general guidance. In addition to these, machinery / equipment as required shall be arranged by the contractor in case the requirement at any stage exceeds as per the Program finalized at his own cost and nothing extra whatsoever on this account

	<p>shall be paid. This includes equipment for arrangement of concrete from RMC producing plants also.</p> <p>3. All the equipment, T&P and machinery shall be kept in good working conditions.</p> <p>4. Equipment like batching plant, concrete pump excavators/Transit mixer etc. shall be allowed to be moved away from the site when, the same are no longer required at site of work in the opinion of Engineer-in-charge.</p> <p>5. In addition to above list, contractor is bound to brought at site any test equipment for any item of work, at his own cost, which Engineer-in-Charge may direct him. Nothing extra shall be paid to contractor in this regard. Direction of Engineer-in-Charge in this regard shall be final & binding.</p> <p>6. If contractor fails to comply such directions within time specified by Engineer-in-Charge, the same shall be brought to site by department by any means at cost of contractor itself and nothing shall be paid in this regard.</p>
Settlement of Disputes & Arbitration	<p>CLAUSE 25</p> <p>Competent Authority for referring the dispute – Regional Director, Reserve Bank of India, Jammu</p> <p>Place of Arbitration – Jammu, India</p>
Insurance in respect of damages to Persons and Property	<p>CLAUSE 31</p> <p>Contractor shall take following Insurance Policies:</p> <ol style="list-style-type: none"> 1) Contractor's All Risk Policy for the full Contract Value and available upto completion of the work. 2) Workmen Compensation Policy for all workmen deployed at site. Minimum limit of coverage under the policy shall be Rs 5 lakhs per person for any one accident or occurrence and Rs 10 lakh in respect of damage to property for any one accident or occurrence. Policy shall be available upto the

	<p>completion of Defect Liability Period.</p> <p>3) Policy covering accidents to staff, Engineers, supervisors and others who are not governed by Workmen's Compensation Act.</p>				
Employment of Staff and employees	CLAUSE 32				
	<p>The following list of Technical Representative(s) to be deployed by the Contractor at site is indicative however the actual requirement shall be decided by the Engineer in Charge and the same shall be binding on the contractor.</p>				
	Requirement of Technical Staff		Minimum experience (Years)	Designation of Technical Staff	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36(i)
	Qualification	Number (of Major + Minor Component)			
Graduate Engineer	1	20 (and having experience of one similar nature of work)	Project Manager	₹60,000/- per month	
Graduate Engineer	1+1	12 (and having experience of one similar nature of work)	Deputy Project Manager	₹40,000/- per Month per person	

	Graduate Engineer or Diploma Engineer	1+1	5 or 10 respectively	Project/site Engineer	₹25,000/- per month per person
	Graduate Engineer	1+1	8	Quality Engineer	₹25,000/- per month
	Diploma Engineer	1	8	Surveyor	₹15,000/- per month
	Graduate Engineer	1+1	6	Project Planning/ billing Engineer	₹20,000/- per month per person

Note:

Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers. Diploma holder with minimum 10-years relevant experience with a reputed construction company can be treated at par with Graduate Engineers for the purpose of such deployment subject to that such diploma holders should not exceed 50% of requirement of degree engineers.

Schedule G

INTEGRITY PACT

To,

All Tenderers

Subject: NIT No. For the work: **“Construction of Residential Quarters for Officers At Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal and External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation, etc.”**

Dear Sir,

It is here by declared that the Reserve Bank of India is committed to follow the principle of transparency, equity and competitiveness in public procurement.

The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Tenderer will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer /tenderer will stand disqualified from the tendering process and the bid of the tenderer would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the Reserve Bank of India.

Yours faithfully

Regional Director
Reserve Bank of India
Jammu

To,

Regional Director

Estate department

Reserve Bank of India

Rail Road Complex

Jammu 180012

Subject: NIT No. for the work: “Construction of Residential Quarters for Officers At Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal and External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation, etc.”

Dear Sir,

I/We acknowledge that Reserve Bank of India is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by Reserve Bank of India. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, Reserve Bank of India shall have

unqualified, absolute and unfettered right to disqualify the tenderer/tenderer and reject the tender/bid is accordance with terms and conditions of the tender/bid.

Yours faithfully

(Duly authorized signatory of the Tenderer!)

Seal

**TO BE SIGNED BY THE TENDERER AND SAME SIGNATORY COMPETENT /
AUTHORIZED TO SIGN THE RELEVANT CONTRACT WITH RESERVE BANK OF
INDIA**

INTEGRITY PACT

(On a Non-Judicial Stamp Paper of appropriate value)

This Integrity Agreement is made at on this day
of20.....

BETWEEN

Reserve Bank of India represented through Regional Director, Reserve Bank of India,
Jammu, (Hereinafter referred as the '**Principal/Owner**', which expression shall unless
repugnant to the meaning or context hereof include its successors and permitted
assigns)

AND

..... (Name and Address of the Individual / firm/
Company) Through (Hereinafter referred to
as the (Details of duly authorized signatory) "**Tenderer/Contractor**" and which
expression shall unless repugnant to the meaning or context hereof include its
successors and permitted assigns)

PREAMBLE:

WHEREAS the Principal / Owner has floated the Tender (NIT No.
.....) (hereinafter referred to as "**Tender/Bid**") and intends to award,
under laid down organizational procedure, contract for "**C/o**
.....
....." hereinafte
r referred to as the "**Contract**".

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Tenderer(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as “**Integrity Pact**” or “**Pact**”), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witness as under:

ARTICLE 1: Commitment of the Principal/Owner

- 1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:
 - (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - (b) The Principal/Owner will, during the Tender process, treat all Tenderer(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Tenderer(s) the same information and will not provide to any Tenderers(s) confidential/additional information through which the Tenderer(s) could obtain an advantage in relation to the Tender process or the Contract execution.
- € The Principal/Owner shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- 2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner

will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

ARTICLE 2: Commitment of the Tenderer(s)/Contractor(s)

- 1) It is required that each Tenderer/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Bank all suspected acts of **fraud or corruption or Coercion or Collusion** of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
- 2) The Tenderer(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
 - a) The Tenderer(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.
 - b) The Tenderer(s)/Contractor(s) will not enter with other Tenderer(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
 - c) The Tenderer(s)/Contractor(s) will not commit any offence under relevant IPC/PC Act. Further the Tenderer(s)/Contractor(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details including information contained or transmitted electronically.
 - d) The Tenderer(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly, Tenderer(s)/Contractor(s) of Indian Nationality shall disclose names and address of foreign agents/representatives, if any. Either the India agent on behalf of the

foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participates in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.

- e) The Tenderer(s)/Contractor(s) will, when presenting his bid, disclose (with each tender as per proforma enclosed) any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
- 3) The Tenderer(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 4) The Tenderer(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice **means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to detriment of the Bank interests.**
- 5) The Tenderer(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/her reputation or property to influence their participation in the tendering process).

ARTICLE 3: Consequences of Breach

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Tenderer(s)/Contractor(s) and the Tenderer/Contractor accept and undertakes to respect and uphold the Principal/Owner's absolute right:

- 1) If the Tenderer(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days' notice to the contractor shall have powers to

disqualify the Tenderer(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Tenderer/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. **Such exclusion may be forever or for a limited period as decided by the Principal/Owner.**

- 2) **Forfeiture of EMD/Performance Guarantee/Security Deposit:** If the Principal/Owner has disqualified the Tenderer(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Tenderer/Contractor.
- 3) **Criminal Liability:** If the Principal/Owner obtains knowledge of conduct of a Tenderer or Contractor, or of an employee or a representative or an associate of a Tenderer or Contractor which constitutes corruption within the meaning of Indian Penal code (IPC)/Prevention of Corruption Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

ARTICLE 4: Previous Transgression

- 1) The Tenderer declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.
- 2) If the Tenderer makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/holiday listing of the Tenderer/Contractor as deemed fit by the Principal/Owner.
- 3) If the Tenderer/Contractor can prove that he has resorted/recouped the damage caused by him and has installed a suitable

corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

ARTICLE 5: Equal Treatment of all Tenderers/Contractors/Subcontractors

- 1) The Tenderer(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Tenderer/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Sub-contractors/sub vendors.
- 2) The Principal/Owner will enter into Pacts on identical terms as this one with all Tenderers and Contractors.
- 3) The Principal/Owner will disqualify Tenderers, who do not submit, the duly signed Pact between the Principal/Owner and the tenderer, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

ARTICLE 6. Independent Monitors

- 1) The PRINCIPAL / OWNER has appointed two Independent Exrnal Monitor (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission of India. The contact details of the Monitors (IEMs) are under:

<p>Shri Vishwanath Giriraj, IAS (Retd.) A Wing, Flat 1001, Landmark Towers GD Ambedkar Marg, Opp Wadala Telephone Exchange Naigaon, Dadar East Mumbai -400014 Mobile No.098219 375549 Email- vgiriraj@rediffmail.com</p>	<p>Shri Divya Prakash Sinha, IPS (retd.) 01, Ground Floor, Tower A Amrapali Sapphire Noida – 201 301, Uttar Pradesh Mobile Nos.09810090291, 09868264271 Email- dpsinha.ips@gmail.com</p>
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- 2) The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.
- 3) The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.
- 4) Both the parties accept that the Monitors have the right to access all the

documents relating to the project/procurement, including minutes of meetings.

5) As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the Principal / Owner.

6) The TENDERER / CONTRACTOR(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the OWNER including that provided by the TENDERER. The TENDERER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the TENDERER /Subcontractor(s) with confidentiality.

7) The OWNER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8) The Monitor will submit a written report to the designated Authority of OWNER within 8 to 10 weeks from the date of reference or intimation to him by the OWNER / TENDERER and, should the occasion arise, submit proposals for correcting problematic situations.

ARTICLE 7: Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor, 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other tenderers, till the Contract has been awarded. If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, Reserve Bank of India.

ARTICLE 8: Other Provisions

- 1) This Pact is subject to Indian Law, place of performance and jurisdiction is the **Headquarters** of the Principal/Owner, who has floated the Tender.
- 2) Changes and supplements need to be made in writing. Side agreements have not been made.

- 3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
- 4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 5) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement/Pact, any action taken by the Owner/Principal in accordance with this **Integrity Agreement/Pact or interpretation thereof shall not be subject to arbitration.**

ARTICLE 9: LEGAL AND PRIOR RIGHTS

- 1) All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contract documents with regard any of the provisions covered under this Integrity Pact.
- 2) A person signing IP shall not approach the Courts while representing the matters to IEMs and he/ she will await their decision in the matter.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....
 (For and on behalf of Tenderer/Contractor) (For and on behalf of Principal / Owner)

WITNESSES:

(i) (ii).....
 (Signature, name and address) (Signature, name and address)

Place:
Dated:

Schedule H

TENDERER'S UNDERTAKING ADDRESSED TO THE BANK

I / we hereby undertake that I/we shall comply with the provisions of "The Sexual Harassment of women at work place (Prevention, Prohibition and Redressal) Act,2013".

Signature of Tenderer with seal

Note:

Prevention of Sexual Harassment of women at work place (Prevention, Prohibition and Redressal)

- a) The contractor shall be solely responsible for full compliance with the provisions of "the Sexual Harassment of women at work place (Prevention, Prohibition and Redressal) Act, 2013". In case of any complaint of sexual harassment against its employee within the premises of the Bank, the complaint will be filed before the Internal Complaints Committee constituted by the contractor and the contractor shall ensure appropriate action under the said Act in respect to the complaint.
- b) Any complaint of sexual harassment from any aggrieved employee of the contractor against any employee of the Bank shall be taken cognizance of by the Regional Complaints Committee constituted by the Bank.
- c) The contractor shall be responsible for any monetary Compensation that may need to be paid in case the incident involves the employees of the tenderer, for instance any monetary relief to Bank's employee, if sexual violence by the employee of the tenderer is proved.
- d) The contractor shall be responsible for educating its employees about prevention of sexual harassment at work place and related issues.

- e) The contractor shall provide a complete and updated list of its employees who are deployed within the Bank's residential premises.

Schedule I

MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS EMPLOYED BY CONTRACTORS

1. APPLICATION

These rules shall apply to all buildings and construction works for which workers are ordinarily employed/engaged or are proposed to be employed/engaged in any day during the period during which the contract work is in progress.

2. DEFINITION

Work place means a place in connection with construction work on any day during the period during which the contract work is in progress.

3. FIRST-AID FACILITIES

(i) At every work place, there shall be provided and maintained, so as to be easily accessible during working hours, first-aid boxes at the rate of not less than one box for 150 contract labour or part thereof ordinarily employed.

(ii) The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment:-

(a) For work places in which the number of contract labour employed does not exceed 50- Each first-aid box shall contain the following equipment :-

1. 6 small 686ncomplete dressings.
2. 3 medium size 686ncomplete dressings.
3. 3 large size 686ncomplete dressings.
4. 3 large 686ncomplete burn dressings.
5. 1 (30 ml.) bottle containing a two per cent alcoholic solution of iodine.
6. 1 (30 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
7. 1 snakebite lancet.

8. 1 (30 gms.) bottle of potassium permanganate crystals.

9. 1 pair scissors.

10. 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.

11. 1 bottle containing 100 tablets (each of 5 gms.) of aspirin.

12. Ointment for burns.

13. A bottle of suitable surgical antiseptic solution.

(b) For work places in which the number of contract labour exceed 50.

Each first-aid box shall contain the following equipments.

1. 12 small complete dressings.

2. 6 medium size complete dressings.

3. 6 large size complete dressings. 4. 6 large size complete burn dressings.

5. 6 (15 gms.) packets complete cotton wool.

6. 1 (60 ml.) bottle containing a two per cent alcoholic solution iodine.

7. 1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.

8. 1 roll of adhesive plaster.

9. 1 snake bite lancet.

10. 1 (30 gms.) bottle of potassium permanganate crystals.

11. 1 pair scissors.

12. 1 copy of the first-aid leaflet issued by the Director General Factory Advice Service and Labour Institutes /Government of India.

13. A bottle containing 100 tablets (each of 5 gms.) of aspirin.

14. Ointment for burns.

15. A bottle of suitable surgical antiseptic solution.

(iii) Adequate arrangements shall be made for immediate recoument of the equipment when necessary.

(iv) Nothing except the prescribed contents shall be kept in the First-aid box.

(v) The first-aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the work place.

(vi) A person in charge of the First-aid box shall be a person trained in First-aid treatment in the work places where the number of contract labour employed is 150 or more.

(vii) An injured person shall be taken to a public hospital without loss of time, in cases where the injury necessitates hospitalization.

(viii) In work places where the number of contract labour employed is 500 or more and hospital facilities are not available within easy distance from the works. First-aid posts shall be established and run by a trained compounder. The compounder shall be on duty and shall be available at all hours when the workers are at work.

(ix) Where work places are situated in places which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

4. DRINKING WATER

(i) In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.

(ii) Where drinking water is obtained from an Intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.

- (i) Every water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or other source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for

drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and waterproof.

(iv) A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. WASHING FACILITIES

(i) In every work place adequate and suitable facilities for washing shall be provided and maintained for the use of contract labour employed therein.

(ii) Separate and adequate cleaning facilities shall be provided for the use of male and female workers.

(iii) Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

6. LATRINES AND URINALS

(i) Latrines shall be provided in every work place on the following scale namely :-

(a) Where female are employed, there shall be at least one latrine for every 25 females.

(b) Where males are employed, there shall be at least one latrine for every 25 males.

Provided that, where the number of males or females exceeds 100, it shall be sufficient if there is one latrine for 25 males or females as the case may be upto the first 100, and one for every 50 thereafter.

(ii) Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.

(iii) Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting nonabsorbent materials and shall be cement washed inside and outside at least once a year, Latrines shall not be of a standard lower than borehole system.

(iv) (a) Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men only" or "For Women Only" as the case may be.

(b) The notice shall also bear the figure of a man or of a woman, as the case may be.

(v) There shall be at least one urinal for male workers upto 50 and one for female workers upto fifty employed at a time, provided that where the number of male or female workmen, as the case may be exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females upto the first 500 and one for every 100 or part thereafter.

(vi) (a) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.

(b) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the Public Health Authorities.

(vii) Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.

1. Disposal of excreta :- Unless otherwise arranged for by the local sanitary authority, arrangements for proper disposal of excreta by incineration at the work place shall be made by means of a suitable incinerator. Alternately excreta may be disposed of by putting a layer of night soil at the bottom of a pucca tank prepared for the purpose and covering it with a 15 cm. layer of waste or refuse and then covering it with a layer of earth for a fortnight (when it will turn to manure).
 2. The contractor shall at his own expense, carry out all instructions issued to him by the Engineer-in-Charge to effect proper disposal of night soil and other conservancy work in respect of the contractor's workmen or employees on the site. The contractor shall be responsible for payment of any charges which may be levied by Municipal or Cantonment Authority for execution of such on his behalf.
7. PROVISION OF SHELTER DURING REST

At every place there shall be provided, free of cost, four suitable sheds, two for meals and the other two for rest separately for the use of men and women labour. The height of each shelter shall not be less than 3 metres (10 ft.) from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sq.m. (6 sft) per head. Provided that the Engineer-in-Charge may permit subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

8. CRECHES

(i) At every work place, at which 20 or more women worker are ordinarily employed, there shall be provided two rooms of reasonable dimensions for the use of their children under the age of six years. One room shall be used as a play room for the children and the other as their bedroom. The rooms shall be constructed with specifications as per clause 19H (ii) a,b & c.

(ii) The rooms shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.

(iii) The contractor shall supply adequate number of toys and games in the play room and sufficient number of cots and beddings in the bed room.

(iv) The contractor shall provide one ayaa to look after the children in the creche when the number of women workers does not exceed 50 and two when the number of women workers exceed 50.

(v) The use of the rooms earmarked as creches shall be restricted to children, their attendants and mothers of the children.

9. CANTEENS

(i) In every work place where the work regarding the employment of contract labour is likely to continue for six months and where in contract labour numbering one hundred or more are ordinarily employed, an adequate canteen shall be provided by the contractor for the use of such contract labour.

(ii) The canteen shall be maintained by the contractor in an efficient manner.

(iii) The canteen shall consist of at least a dining hall, kitchen, storeroom, pantry and washing places separately for workers and utensils.

(iv) The canteen shall be sufficiently lighted at all times when any person has access to it.

(v) The floor shall be made of smooth and impervious materials and inside walls shall be lime-washed or colour washed at least once in each year. Provided that the inside walls of the kitchen shall be lime-washed every four months.

(vi) The premises of the canteen shall be maintained in a clean and sanitary condition.

(vii) Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.

(viii) Suitable arrangements shall be made for the collection and disposal of garbage.

(ix) The dining hall shall accommodate at a time 30 per cent of the contract labour working at a time.

(x) The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs shall not be less than one square metre (10 sft) per diner to be accommodated as prescribed in sub-Rule 9.

(xi) (a) A portion of the dining hall and service counter shall be partitioned off and reserved for women workers in proportion to their number.

(b) Washing places for women shall be separate and screened to secure privacy.

(xii) Sufficient tables stools, chair or benches shall be available for the number of diners to be accommodated as prescribed in sub-Rule 9.

(xiii) (a) 1. There shall be provided and maintained sufficient utensils crockery, furniture and any other equipments necessary for the efficient running of the canteen.

2. The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.

(b) 1. Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.

2. A service counter, if provided, shall have top of smooth and impervious material.

3. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment.

(xiv) The food stuffs and other items to be served in the canteen shall be in conformity with the normal habits of the contract labour.

(xv) The charges for food stuffs, beverages and any other items served in the canteen shall be based on 'No profit, No loss' and shall be conspicuously displayed in the canteen.

(xvi) In arriving at the price of foodstuffs, and other article served in the canteen, the following items shall not be taken into consideration as expenditure namely:-

(a) The rent of land and building.

(b) The depreciation and maintenance charges for the building and equipment provided for the canteen.

(c) The cost of purchase, repairs and replacement of equipment including furniture, crockery, cutlery and utensils.

(d) The water charges and other charges incurred for lighting and ventilation.

(e) The interest and amounts spent on the provision and maintenance of equipment provided for the canteen.

(xvii) The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors.

10. ANTI-MALARIAL PRECAUTIONS

The contractor shall at his own expense, conform to all anti-malarial instructions given to him by the Engineer-in-Charge including the filling up of any borrow pits which may have been dug by him.

11. The above rules shall be incorporated in the contracts and in notices inviting tenders and shall form an integral part of the contracts.

12. AMENDMENTS

Government may, from time to time, add to or amend these rules and issue directions – it may consider necessary for the purpose of removing any difficulty which may arise in the administration thereof.

SECTION XIII

ANNEXURES TO VARIOUS SECTIONS AND SCHEDULES

Annex 1

Shortlisting/Eligibility Criteria forms

Format 1**Basic Information (To be read with Item 2 / Section III)**

1(a)	Name of the Tenderer/firm	
2.	Details of registration of the firm : whether Sole Proprietorship/ Partnership firm /Private Limited/ Limited or Co-operative Body etc.	
2(a)	Name of the proprietor or Partners./ directors :	
3(a)	Registered Address:	
3(b)	Address for correspondence	
4(a)	Contact Person	
4(b)	Designation	
4l	Telephone :	
4(d)	Mobile no.	
4l	FAX/Tele-fax:	
4(f)	e-mail id	
5	GST Registration details and no.	
5(a)	Details of registration of labour, ESI, EPF if any	

6	Number of years of experience of Tenderer / Firm of Tenderer in the field.	
7	In case the company is subsidiary, the involvement, if any, of the Parent Company in the Bank's proposed work :	
8	Was the applicant ever required to suspend the eligible works for a period of more than six months continuously after commencement? If yes, then furnish the reasons thereof.	
9	Has the agency or any constituent partner in case of partnership firm, ever abandoned the awarded works before their completion? If so, give name of the project and reasons for abandonment.	
10	Has the agency or any constituent partner in case of partnership firm, ever been debarred /black-listed for competing in any organization at any time? If so, give details	
11	Has the agency or any constituent partner in case of partnership firm, ever been convicted?	
12.	Whether the agency is involved in frequent civil suit /litigations in the contracts/being executed now. If yes please furnish the details in proforma given below.	Yes / No

Sl no	Name of the project and Employer	Nature of work	Work order No and Date	Present stage of work	Value of contract	Brief details of litigation
1.	2.	3.	4.	5.	6.	7.

Signature of Tenderer with seal

Place

Date

Attach supporting documents

Signature of the Tenderer with seal

Format 2A**List of important similar works 'On Hand' (To be read with Item 2 / Section III)**

SI no	Name of the work and location	Nature of work / items of work involved in the contract	Name of the owner and Architect Whether Government or Semi- Government or Private Body with full postal address.	Contract Amount in ₹	Completion Period		Present stage of work with reasons if the work is getting delayed	Any other relevant information
					Stipulated	Expected		
1	2	3	4	5	6(a)	6(b)	7	8

Signature of the Tenderer with seal

Format 3

Works qualifying Eligibility (To be read with Item 2 / Section III)**Details of similar work/s (qualifying) completed during last seven years during the period Nov 01, 2015 to Oct 31, 2022****(The work/s costing equal or above the minimum value specified in minimum eligibility criteria)**

Sl no	Name of similar work and location	Nature of work / items (brief description) of work involved in the contract.	Name of the owner/client and Architect. Also indicate whether Government or Semi-Government or Private Body with full postal address.	Name, e-mail ID, telephone (land line and mobile) nos., Fax no. of the contact executive (the person of Tenderer's client who can be contacted by the Bank in case it is so needed).	Cost of work		Period of completion			Reason for delay, if any	Whether work was left 703ncomplete or contract was terminated from either side?	Litigation/Arbitration, if any with details.	Any other relevant information.
					Contract Amount (₹ lakh)	Actual value of work done (in ₹ lakh)	Date of commencement of work	Scheduled date of completion	Actual date of completion				
1.	2.	3.	4.	5.	6 a	6b	7a	7b	7c	8	9	10	11

Signature of the Tenderer with seal

Format 3A

**CLIENT's CERTIFICATE REGARDING PERFORMANCE OF THEIR
CONTRACTOR (On Client's Letter Head) (To be read with item 2 / Section III)**

Name & address of the Client :

Details of Works executed by Shri /M/s :

1. Name of work with brief particulars of items involved (as per schedule of quantities):

2. Whether the framework (i.e. inner metal skeleton) is designed (in-house or get designed from professional/s) or proprietary for its structural fitment, sturdiness, stability, self-supportiveness and safety of the system by the Contractor as per requirement of system : Yes / No

3. Whether items were fabricated at factory, ready to install components delivered at site and then assembled / installed at site Or fabrication and installation both the operations were done at site:

4. Agreement No. and date :
5. Agreement amount :
6. Date of commencement of work:
7. Stipulated date of completion:
8. Actual date of completion: :
9. Details of compensation levied for delay (indicate amount) if any:
10. Gross amount of the work completed and paid :
11. Name and address of the authority under whom works executed :
12. Whether the contractor employed qualified Supervisor during execution of work:

13. i) Quality of work (indicate grading):

Outstanding/Very Good/ Good/Satisfactory/poor

ii) Amt. of work paid on reduced rates, if any.

14. i) Did the contractor go for arbitration?

ii) If yes, total amount of claim

iii) Total amount awarded

15. Comments on the capabilities of the contractor.

a) Technical proficiency: Outstanding/Very Good/ Good/Satisfactory/poor

b) Financial soundness : Outstanding/Very Good/Good/Satisfactory/poor

c) Mobilization of adequate T&P: Outstanding/Very Good/Good/Satisfactory/poor

d) Mobilization of manpower: Outstanding/Very Good/Good/Satisfactory/poor

e) General behavior: Outstanding/Very Good/Good/Satisfactory/poor

Signature of the Reporting Officer* with Office seal

Note: (i) All columns should be filled in properly

- (ii) * Clients Report/certificate (a) for each of qualifying similar completed works carried out for Government/ public sector companies, the certificate should be signed by the concerned Executive Engineer or an officer in an equivalent or higher rank (b) for each of the qualifying similar completed works carried out for Private companies shall accompany Tax deduction at source, TDS certificate has to be submitted for proving the credentials/contract amount.

Format 4**FINANCIAL STATUS (To be read with item 2 / Section III)**

Sr.no.	Details	Financial Year		
		April 1, 2019 to March 31, 2020 ₹ in lakh	April 1, 2020 to March 31, 2021 ₹ in lakh	April 1, 2021 to March 31, 2022 ₹ in lakh
1	Annual financial turn over certified by Chartered Accountant.			
2	Income Tax returns for the year			

Note:

- i. Statement shall be supported by copies of audited financial statements/ accounts of the business of the Tenderer duly certified by a Chartered Accountant. The Income Tax Clearance Certificates / Income Tax Assessment orders along with the latest final accounts of the business of the Tenderer duly certified by a Chartered Accountant, copied of the Income Tax clearance Certificate/ Income Tax assessment orders along with the latest final accounts of business of the Tenderer duly certified by a Chartered Accountant as a proof creditworthiness.

Signature of the Tenderer with seal

Format 5

**FORM OF BANKERS' CERTIFICATE FROM A SCHEDULED BANK
(On Bankers' Letter Head) (To be read with Item 2 / Section III)**

To
Regional Director
Estate department
Reserve Bank of India
Rail Road Complex
Jammu 180012

This is to certify that to the best of our knowledge and information M/s. /Shri.....
a customer of our bank having marginally noted address, are/is respectable and can
be treated as good for any engagement up to a limit of
₹.....(Rupees
.....). This certificate is issued without any
guarantee or responsibility on the bank or any of its officers.

For the Bank with Name, Designation & Seal

Note:- (i) Bankers' certificates should be on letter head of the Bank
(c) In case of partnership firm, certificate to include names of all partners as
recorded with the Bank.

Format 5A**Details of Tenderer's Banker (To be read with Item 2 / Section III)**

1	Name and full Address of the Banker	
2	Name of contact executives, Email ID, contact numbers (land line and mobile), Fax number etc. (The person can be contacted at the office of their banker by the Bank in case it is needed.)	

Signature of the Tenderer with seal

Format 6

List of your technical personnel , giving details about their technical qualifications and experience including that in your establishment

Sl. No.	Name	Age	Qualifications	Construction experience	Nature of works handled	Name of major projects handled (value atleast 40% of estimated cost put to tender)	Date from which employed in your organisation	Indicate special experience such as Advanced Construction Management techniques like CPM/PERT and indicate projects in which such techniques were employed.

Indicate other points, if any, to show your technical and managerial competency to indicate any important point in your favour.

Signature of the Tenderer with seal

Format 7**List of available plants, available machineries and equipment etc.**

Sl.No.	Name of plant / machinery / equipment and accessories	Total number of units. sq.mt	No.of units / sq.mt. which can be spared for the Bank's work
1	Concrete Mixers with capacity		
2	Vibrators		
	a) Needle type		
	b) Formwork / slab typr		
3	Weigh-batcher with capacity		
4	Concrete cube testing equipment with capacity		
5	Steel tubular scaffolding, also indicate the height to which it can be erected		
6	Slab shuttering area		
	a) Steel		
	b) Timber		
7	Pumps with capacity		
8	Air Compressors		
9	Welding, bar cutting and bending equipment		
10	Hoists with capacity		

Signature of the tenderer with seal

Check list

A. List of Documents duly signed and certified and to be submitted to the Reserve Bank of India on or before last date and time of submito be scanned and uploaded within the period of bid submission:

Sl.No.	Description of Documents	Submitted Yes / No
i	Form of tender	
ii	UTR No. of NEFT Transaction for submission / Bank Guarantee (BG) as per prescribed format for EMD.	
iii	Composition of the firm/organization:	
	(i)Format A (duly signed)	
	(ii) Copy of registration certificate.	
	(iii)Copy of the Articles of Association/ Power of Attorney/other relevant document	
	(iv)copy of Goods and Service Tax registration certificate	
	(v) Details of registration of labour along with EPF and ESI documents.	
iv.	Experience:	
	Proof of past experience of 7 years (Format 2)	
	Format 2A (works on hand)	
	List of eligible similar nature of works completed during the last Seven Years ending December 31, 2022 (last day of month previous to the one which applications /tender are invited) in Format 3	
	(i) Proof of eligible works (value wise – past 7 years)	

	(a) Works executed for Government / Public sector companies: Copies of detailed work order/s for eligible works indicating date of award, contract amount, time given for completing the work, etc. and the corresponding completion certificate(s) indicating actual date of completion and actual value of executed similar work/s issued by the client(s)	
	(b) Work executed for Private Companies: Copies of work order, work completion certificate along with Tax Deducted at Source (TDS) certificate(s) issued by the client(s) and Form 26AS for works executed for private companies.	
	(c) Client's certificate in Form 3A in the letterhead of the client and should be signed by the concerned Executive Engineer or an officer in an equivalent or higher rank.	
v.	Annual Financial Turn Over:	
	Format 4 duly signed by the bidder and certified by Chartered Accountant	
	Income Tax Assessment Orders along with the latest final accounts of the business of the contractor duly certified by a Chartered Accountant	
vi.	Solvency:	
	(a) Format 5 in the letterhead of the bidder's bank	
	(b) Details of Tenderer's bank in Format 5A	
vii.	Format 6	
viii.	Format 7	
ix.	Tenderer's Undertaking Addressed to the Bank at	

	Schedule H	
x.	Certificate of Registration for GST.	
xi.	Any other document as specified in the NIT and tender.	
B.	Original documents in physical form and duly signed to be submitted before scheduled date	
i.	Bank Guarantee / DD for EMD if BG/DD has been provided against EMD.	
ii.	All documents as above	

Annex 2

Draft Articles of Agreement

(On Non Judicial Stamp Paper of appropriate value)

ARTICLES OF AGREEMENT made the _____ day of _____
between the Reserve Bank of India, Rail Head Complex, Jammu 180012 having its
Central Office at Shahid Bhagat Singh Marg , Fort, Mumbai 400001 (hereinafter called
“the Employer”) of the one part and

_____ (hereinafter called “the Contractor”) of the other part.

WHEREAS the Employer is desirous of carrying out the work of Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc. and has caused drawings and specifications describing the works to be done.

AND WHEREAS the said drawings, the Specifications and the Schedule of Quantities have been signed by or on behalf of the parties hereto.

AND WHEREAS the Contractor has agreed to execute upon and subject to the Conditions set forth herein and to the Conditions set forth in the Special Conditions and in the Schedule of Quantities and Conditions of Contract and the clauses of tender (all of which are collectively hereinafter referred to as “the said Conditions”) the works shown upon the said Drawings and/or described in the said Specification and included in the Schedule of Quantities at the Respective rate therein set forth amounting to the sum as therein arrived at or such other sum as shall become payable there under (hereinafter referred to as “the said Contract Amount”).

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In considerations of the said Contract Amount to be paid at the times and in the manner set forth in the said Conditions, the Contractor shall upon and subject to the said Conditions execute and complete the work shown upon the said Drawings and described in the said Specifications and the Schedule of Quantities.
2. The Employer shall pay the Contractor the said Contract Amount or such other sum as shall become payable, at the times and in the manner specified in the said Conditions.
3. The term "Architect" in the said conditions shall mean 'in house Architect' for the purpose of architectural planning etc. of works under this contract.
4. The Reserve Bank of India shall administer and directly arrange for supervision of works, certification of bills, making payments and implementation of various terms, conditions and stipulations of the contract.
5. The said conditions and various schedules shall be read and construed as forming part of this agreement, and the parties hereto shall respectively abide by, submit themselves to the said Conditions and perform the agreements on their part respectively in the said Conditions contained.
6. The agreement and documents mentioned herein shall form the basis of this Contract.
7. This Contract is neither a fixed Lump sum contract nor a Piece Work Contract but is a Contract to carry out the work in respect of Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc. to be paid for according to actual measured quantities at the rate contained in the Schedule of rates and Probable Quantities or as provided in the said Conditions.
8. The Contractor shall afford every reasonable facility for the carrying out of all works relating to civil works, installation of sanitary work and fittings, permanent water supply, electrical installations, fittings, air conditioning and other ancillary works in the manner laid down in the said conditions and shall make good any damages done to walls, floors etc. after the completion of such works.
9. The Employer reserves to itself the right of altering the Drawings and nature of the work by adding to or omitting any items of work or having portions of the same carried out without prejudice to this contract.

10. Time shall be considered as the essence of this Contract and the Contractor hereby agrees to commence the work from 14th day of date of work award letter and to complete the entire work within 40 months subject nevertheless to the provisions for extension of time.
11. All payments by the Employer under this Contract will be made only at Jammu.
12. All disputes arising out of or in any way connected with this agreement shall be deemed to have arisen at Jammu and only Courts in Jammu shall have jurisdiction to determine the same.
13. That the several parts of this Contract have been read by the Contractor and fully understood by the Contractor. The Contractor shall not be entitled for the payment for the quantities beyond the tendered quantities unless ordered for by specific written instructions from the Bank's Engineer-in-Charge.
14. The Contractor shall not disclose directly or indirectly any information, materials and details of the Bank's infrastructure/systems/equipment etc., which may come to the possession or knowledge of the Contractor during the course of discharging its contractual obligations in connection with this agreement, to any third party and shall at all times hold the same in strictest confidence. The Contractor shall treat the details of the contract as private and confidential, except to the extent necessary to carry out the obligations under it or to comply with applicable laws. The Contractor shall not publish, permit to be published, or disclose any particulars of the works in any trade or technical paper or elsewhere without the previous written consent of the Employer. The Contractor shall indemnify the Employer for any loss suffered by the Employer as a result of disclosure of any confidential information. Failure to observe the above shall be treated as breach of contract on the part of the Contractor and the Employer shall be entitled to claim damages and pursue legal remedies.

The Contractor shall take all appropriate actions with respect to its employees to ensure that the obligations of non-disclosure of confidential information under this agreement are fully satisfied.

The Contractor's obligations with respect to non-disclosure and confidentiality will survive the expiry or termination of this agreement for whatever reason.

IN WITNESS WHEREOF the Employer and the Contractor have set their respective hands to these presents the day and year first hereinabove written.

IN WITNESS WHEREOF the Employer has set its hands to these presents through its duly authorized official and the Contractor has caused its common seal to be affixed hereunto and has caused these presents to be executed on its behalf, the day and year first hereinabove written.

Signature Clause

SIGNED AND DELIVERED by the Reserve bank of India by the hand of
Shri

(Name and designation)

In the presence of

(1)

Address

(2)

Address

Witness

SIGNED AND DELIVERED by

In the presence of

(1)

Address

(2)

Address

If the contractor is a partnership or an individual.

If the contractor is a company.

If the party is partnership firm or an individual should be signed by all or on behalf of all the partners.

Witness

THE COMMON SEAL OF

Was hereunto affixed pursuant to the resolutions passed by its Board of Directors at the meeting held on _____ in the presence of

(1)

(2)

Directors who have signed these presents in token thereof in the presence of

(1)

(2)

If the Contractor signs under its common seal, the signature clause should tally with the sealing clause in the Articles of Association.

SIGNED AND DELIVERED BY the Contractor by the hand of Shri _____ and duly constituted attorney.

If the Contractor is signing by hand of power of Attorney, whether a company or individual.

It is one of the terms of invitation of tenders that the Tenderer shall furnish a Bank Guarantee for a sum of Rs. _____ (Rupees _____ only) as Earnest Money Deposit (EMD).

M/s. (Name of the Tenderer) _____, (hereinafter called as "the Tenderer"), who are our Clients/Constituents intend to submit their tender/ Bid for the said work and have requested us to furnish Bank Guarantee to RBI in respect of the said sum of Rs. _____ (Rupees _____ only) in respect of EMD.

NOW THIS GUARANTEE WITNESSETH

1. We _____ (Name of the Bank) do hereby agree with and undertake to RBI, their Successors, Assigns that in the event of the RBI coming to the conclusion that the Tenderer have not performed their obligations under the said conditions of the tender or have committed a breach thereof, which conclusion shall be binding on us as well as the said Tenderer; we shall on demand by the RBI, pay without demur to the RBI, a sum of Rs. _____ (Rupees _____ only) or any lower amount that may be demanded by the RBI. Our guarantee shall be treated as equivalent to the Earnest Money Deposit for the due performance of the obligations of the Tenderer under the said Conditions, provided, however, that our liability against such sum shall not exceed the sum of Rs. _____ (Rupees _____ only).
2. We also agree to undertake to and confirm that the sum not exceeding Rs. _____ (Rupees _____ only) as aforesaid shall be paid by us without any demur or protest, merely on demand from the RBI on receipt of a notice in writing stating that the amount is due to them and we shall not ask for any further proof or evidence and the notice from the RBI shall be conclusive and binding on us and shall not be questioned by us in any respect or manner whatsoever. We undertake to pay the amount claimed by the RBI within a period of one week from the date of receipt of the notice as aforesaid.
3. We confirm that our obligation to the RBI under this guarantee shall be independent of the agreement or agreements or other understandings between the RBI and the Tenderer.

This guarantee shall not be revoked by us without prior consent in writing of the RBI.

We hereby further agree that –

- a) Any forbearance or commission on the part of the RBI in enforcing the conditions of the said agreement or in compliance with any of the terms and conditions stipulated in the said tender and/or hereunder or granting of any time or showing of any indulgence by the RBI to the Tenderer or any other matters in connection therewith shall not discharge us in any way and our obligation under this guarantee. This guarantee shall be discharged only by the performance by the Tenderers of their obligations and in the event of their failure to do so, by payment by us of the sum not exceeding Rs. _____ (Rupees _____ only).
- b) Our liability under these presents shall not exceed the sum of Rs. _____ (Rupees _____ only) .
- c) Our liability under this agreement shall not be affected by any infirmity or irregularity on the part of our said constituents/clients in tendering for the said work or their obligations there under or by dissolution or change in the constitution of our said constituents.
- d) This guarantee shall remain in force up to _____ (four months from the last date of submission of tender) provided that if so desired by the RBI, this guarantee shall be renewed for a further period as may be indicated by them on the same terms and conditions as contained herein.
- e) Our liability under these presents will terminate unless these presents are renewed as provided hereinabove on the _____ or on the day when our said constituents comply with their obligations, as to which a certificate in writing by the RBI alone is the conclusive proof whichever date is later. Unless a claim or suit or action is filed against us within _____ or any extended period, all the rights of the RBI against us under this guarantee shall be forfeited and we shall be released and discharged from all our obligations and liabilities hereunder.

Yours faithfully,

For and on behalf of _____ Bank.

Authorized Official (with seal)

(NB: This guarantee will require stamp duty as applicable in the state, where it is executed and shall be signed by the official whose signature and authority shall be verified).

Annex 4

PROFORMA OF BANK GUARANTEE for PERFORMANCE / RETENTION MONEY

(On Non-Judicial Stamp Paper of appropriate value)

Place: _____

Date: _____

The Regional Director
Estate Department
Reserve Bank of India
Rail Head complex
Jammu-180012

Dear Sir,

Name of Work : Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.

Whereas Reserve Bank of India, Rail Head Complex, Jammu having its Central Office at Shahid Bhagat Singh Road, Mumbai, (hereinafter called "the RBI") has awarded the Contract for the captioned project (hereinafter called the "Contract") to M/s _____ (Name of the Contractor) (hereinafter called " the said Contractor" which expression shall include its successors and assigns).

AND Whereas the Contractor is bound by the said Contract to submit to RBI a Performance Security for a total amount of ₹. _____ (Rupees _____ only) (Amount in figures and words) for the

due fulfilment by the said contractor of the terms and conditions contained in the contract.

We, _____ (Name of the Bank), (hereinafter called "the Bank"), at the request of M/s _____, the contractor, do hereby undertake to pay to the RBI an

amount not exceeding Rs _____ as Performance Bank Guarantee for due fulfilment of the terms and conditions of the contract.

NOW THIS GUARANTEE WITNESSETH

1. We _____ (Name of the Bank) do hereby agree with and undertake to RBI, their Successors, Assigns that in the event of the RBI coming to the conclusion that the Contractor has not performed his obligations under the said conditions of the contract or have committed a breach thereof, which conclusion shall be binding on us as well as the said contractor; we shall on demand by the RBI, pay without demur to the RBI, a sum of Rs. _____ (Rupees _____ only) or any lower amount that may be demanded by the RBI. Our guarantee shall be treated as equivalent to the Performance Bank Guarantee Amount for the due performance of the obligations of the Contractor under the said Contract, provided, however, that our liability against such sum shall not exceed the sum of Rs. _____ (Rupees _____ only).
2. We also agree to undertake to and confirm that the sum not exceeding Rs. _____ (Rupees _____ only) as aforesaid shall be paid by us without any demur or protest, merely on demand from the RBI on receipt of a notice in writing stating that the amount is due to them and we shall not ask for any further proof or evidence and the notice from the RBI shall be conclusive and binding on us and shall not be questioned by us in any respect or manner whatsoever. The Bank shall pay to RBI any money so demanded notwithstanding any dispute/disputes raised by the Contractor in any suit or proceedings pending before any Court, Tribunal or Arbitrator/s relating thereto and the liability under this guarantee shall be absolute and unequivocal. We undertake to pay the amount claimed by the RBI within a period of one week from the date of receipt of the notice as aforesaid.
3. We confirm that our obligation to the RBI under this guarantee shall be independent of the agreement or agreements or other understandings between the RBI and the Contractor.
4. This guarantee shall not be revoked by us without prior consent in writing of the RBI.

We hereby further agree that –

- f) Any forbearance or commission on the part of the RBI in enforcing the conditions of the said agreement or in compliance with any of the terms and conditions stipulated in the said Contract and/or hereunder or granting of any time or showing of any indulgence by the RBI to the Contractor or any other matters in connection therewith shall not discharge us in any way and our obligation under this guarantee. This guarantee shall be discharged only by the performance by the Contractor of their obligations and in the event of their failure to do so, by payment by us of the sum not exceeding Rs. _____ (Rupees _____ only).
- g) Our liability under these presents shall not exceed the sum of Rs. _____ (Rupees _____ only) .
- h) Our liability under this agreement shall not be affected by any infirmity or irregularity on the part of our said constituents/clients or their obligations thereunder or by dissolution or change in the constitution of our said constituents.
- i) This guarantee shall remain in force up to _____ (30 days beyond the work completion period) provided that if so desired by the RBI, this guarantee shall be renewed for a further period as may be indicated by them on the same terms and conditions as contained herein.
- j) Our liability under these presents will terminate unless these presents are renewed as provided hereinabove on the _____ or on the day when our said constituents comply with their obligations, as to which a certificate in writing by the RBI alone is the conclusive proof whichever date is later. Unless a claim or suit or action is filed against us within _____ or any extended period, all the rights of the RBI against us under this guarantee shall be forfeited and we shall be released and discharged from all our obligations and liabilities hereunder.

In witness whereof I/We of the Bank have signed and sealed this guarantee on the -----
-- day of ----- (Month) being herewith duly authorized.

For and on behalf of _____ (Name of the Bank)

Signature of authorized Bank official

Name:

Designation

Stamp/ Seal of the Bank

Signed, sealed and delivered for and on behalf of the Bank by the above named in the presence of :

Witness 1

Witness 2

Signature

Signature

Name

Name

Address

Address

.....

.....

Annex 5

FORMAT FOR POWER OF ATTORNEY FOR AUTHORIZED SIGNATORY

(On Non-Judicial Stamp Paper of appropriate value)

To,

The Regional Director
Estate Department
Reserve Bank of India
Rail Head complex
Jammu-180012

Dear Sir/Madam,

Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.

We.....(Name of the Tenderer and address of their registered office) do hereby constitute, appoint and authorize Mr. / Ms.(Name and residential address of Power of Attorney holder) who is presently employed with us and holding the position of as our attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to our bid for the captioned Project, including signing and submission of all documents and providing information / responses to the Reserve Bank of India (RBI), representing us in all matters before RBI, and generally dealing with RBI in all matters in connection with our proposal for the said Project.

We hereby agree to ratify all acts, deeds and things lawfully done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

Signature/(s) of the Tenderer

Name/(s)

Stamp/Seal of the Tenderer

Note:

Power of Attorney should be properly stamped and notarized

Power of Attorney furnished by Tenderer shall be irrevocable.

Annex 6

Proforma for providing input for NEFT Payment

RTGS/NEFT/ECS – MANDATE AUTHORISATION FORM

1. Contractor’s Name:

--

2. Contractor’s Name as per Bank Records:

--

3A. Contractor’s Code

--

3B. Contractor’s PAN Number: #

--

Quoting PAN No. in all the e-returns has become 100% mandatory w.e.f. 14-02-2008, hence ensure to fill- up this and also send a photocopy of PAN duly self-attested. If there is any difference between the name given in the supplier’s name and name given in the PAN card, then a note to explain the reason for the difference and the correlation between both.

4. Contractor’s Complete Postal Address:

Door No.		Street:	
Location:		District:	
City:		State	PIN

5. Contractor’s E-mail ID:

--

6. Contractor’s Telephone Number & Mobile Phone Number:

--

7. Name of the Bank:

--

8. Bank (Branch) Postal Address:

9. RTGS*/NEFT /MICR- Code of the Branch:**

RTGS:	
NEFT:	
MICR:	

RTGS* - “Real Time Gross Settlement”, NEFT** - “National Electronic Fund Transfer”. MICR-Magnetic Ink Recognition Character These “IFSC” Codes are unique numbers of each Branch – “ Indian Financial Services Code”. For some Branches both the codes are the same and some Banks, may maintain one Code No. for RTGS and another Code No. for NEFT. Hence, please fill-up both the rows, even if it is the same.

10. Nature of the Account: (Tick whichever is applicable & put ‘x’ mark for the balance two accounts)

Saving Bank Account:	Cash Credit Account:	Current Account:
----------------------	----------------------	------------------

11. Bank Account Number of the Contractor: ©

--

© Fill up from the 1st column. For the balance left out blank columns, please mention ‘x’ mark.

We hereby declare that the particulars given above are correct and complete. If the transaction is delayed for reasons of incomplete or incorrect information, we would not hold MDL responsible.

Authorized Signature of the Contractor:

Date:

Contractor's Seal:

Certified that the particulars as per Serial Numbers 2, 7 to 11 are correct as per our records.

Date:

Bank's Stamp

Authorized Signature of the Officer of the Bank.

Annex 7

Proforma for Indemnifying the Employer against Contract labour **Rules/regulations**

(On Non-Judicial Stamp Paper of appropriate value)

To

The Regional Director
Estate Department
Reserve Bank of India
Rail Head complex
Jammu-180012

Dear Sir/Madam

Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.

We, M/s (Name of contractor), hereby undertake that we shall comply with all the statutory rules/ regulations with regard to the employment of contract labour and their payment.

We also hereby fully indemnify and keep indemnified the Employer, i.e. Reserve Bank of India, against payments to be made to the contract labour and for the observance of the laws in this regard without prejudice to our right to claim indemnity from our sub-contractors.

Yours faithfully,

For _____

Authorised signatory

Annex 8

Proforma for Indemnifying the Employer against Patent Rights

(On Non-Judicial Stamp Paper of appropriate value)

To,

The Regional Director
Estate Department
Reserve Bank of India
Rail Head complex
Jammu-180012

Dear Sir/Madam

Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.

We, M/s _____ (Name of Contractor) hereby undertake to fully indemnify and keep indemnified the Employer i.e. Reserve Bank of India against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall ourselves pay any royalties, licence fees etc. which may be payable in respect of any article or part thereof included in the contract or damages, cost and charges of all and every sort that may be legally incurred in respect thereof.

In the event of any claims made under or action brought against Employer in respect of any such matters as aforesaid, we shall, on being notified thereof, at our own expense, settle any dispute or conduct any litigation that may arise therefrom, provided that we shall not be liable to indemnify the Employer if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

Yours faithfully,

For _____

Authorised signatory

NAME AND ADDRESS OF THE CONTRACTOR:

SIGN & SEAL OF THE CONTRACTOR:

Date:

Place:

Annex 9

Undertaking in connection with
Payment of advance on materials consumed in ready to install parts delivered
by the Contractor at the site

(On Non-Judicial Stamp Paper of appropriate value)

To,
The Regional Director
Estate Department
Reserve Bank of India
Rail Head complex
Jammu-180012

Dear Sir/Madam

Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.

This undertaking made this _____ day of _____ by M/s _____ (Name of the Contractor) hereinafter referred as Contractor.

The Employer and the Contractor have entered into an Agreement dated _____ hereinafter called as the said Agreement and in terms of Clause No.07 in the General Conditions of Contract, the Employer has agreed at his discretion on the request of Contractor that the Contractor will be paid an advance of up to 75% of the cost of materials consumed in ready to install parts delivered by the Contractor to the site (hereinafter called as Material) for installation in the works.

The Contractors have applied to the Employer that they be allowed advances on the security of materials absolutely belonging to him and brought by him to the site of work. The Employer has agreed to do so on the terms and conditions hereinafter set out.

Now this letter of Undertaking witnesses that in consideration of the said Agreement, and in consideration of the amount paid/payable to the Contractors by the Employer and of any further advances as may be made to the Contractor as aforesaid, the Contractor hereby agrees with the Employer and undertake as under:

1. The amount advanced by the Employer to the Contractor as aforesaid and all or any further sum or sums advanced shall be employed by the Contractor in or towards expending the execution of the said Works and for no other purpose whatsoever.
2. That the materials which have been offered to and accepted by the Employer as security are absolutely the Contractor's own property and free from encumbrances of any kind and the Contractor will not make any application for or receive a further advance on the security of materials which are not absolutely his own property and not free from encumbrances of any kind and the Contractors indemnifies the Employer against all claims in respect of which an advance has been made to them as aforesaid.
3. That the materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereinafter called the said Materials) shall be used by the Contractors solely in the execution of the said Works in accordance with the directions of the Bank's Engineer and in the terms of the said Agreement.
4. That the Contractor shall make at his own cost all necessary and adequate arrangement for the proper watch, safe custody and protection against all risk of the said Materials and that until used in installation as aforesaid, the said Materials shall remain at the site of the said Works in the Contractor's custody and on their own responsibility and shall at all times be open to inspection by the Bank's Engineers or any officer authorized by the Engineer-in-Charge.

In the event of the said Materials or any part thereof being stolen, destroyed or damaged, the Contractor will forthwith replace the same with other materials of like quality or repair and make good the same complete in all respect conforming to the specifications of Contract.

5. That the said materials shall not on any account be removed from the site of the said Works except with the written permission of the Engineer-in-Charge.

6. That the advances shall be repayable in full when or before the Contractors received payment from the Employer of the price payable to them for the said Works under the terms and the provisions of the said Agreement provided that if any intermediate payments are made to the Contractors on account of work done, then on the occasion of each such payment the Employer will be at liberty to make a recovery from the Contractor's bill for such payment by deducting therefrom the value of the said Materials the actually used in the construction and in respect of which recovery has not been made previously the value for this purpose being determined in respect of each description of materials at the rates at which the amounts of the advances made under these presents were calculated.

7. That if Contractor shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said Agreement or of the presents, the total amount of the advance or advances that may still be owing to the Employer shall immediately on the happening of such default be repayable by the Contractor to the Employer together with interest thereon at twelve percent per annum from the date or respective dates of such advance or advances to the date of repayment and with all costs, charges, damages and expenses incurred by the Employer in or for the recovery thereof or the enforcement of this security or otherwise by reason of the default of the Contractor and the Contractor hereby covenants and agree with the Employer to repay and pay the same respectively to him accordingly.

8. That the Contractor hereby charges all the said Materials with the repayment to the Employer of the sum or sums, advances as aforesaid and all cost, charges, damages and expenses payable under these presents PROVIDED ALWAYS and it is hereby

agreed and declared that notwithstanding anything in the said Agreement and without prejudice to the powers contained therein if and whenever the covenant for payment and repayment hereinbefore contained shall become enforceable and the money owing shall not be paid in accordance therewith, the Employer may at anytime thereafter adopt all or any of the following courses as he may deem best.

(a) Seize and utilize the said materials or any part thereof in the completion of the said Works on behalf of the Contractor in accordance with the provisions in that behalf contained in the said Agreement, debiting the Contractor with the actual cost of effecting such completion and the amount due in respect of advances under these presents and crediting the Contractor with the value of work done as if he had carried it out in accordance with the said Agreement and at the rates thereby provided. If the balance is against the Contractor, he is to pay same to the Employer on demand.

(b) Remove and sell by public auction the seized materials or any part thereof and out of the moneys arising from sale retain all the sums aforesaid repayable or payable to the Employer under these presents and pay over the surplus (if any) to the Contractor.

(c) Deduct all or any part of the money owing out of the security deposits or any sum due to the Contractor under the said Agreement.

9. That except in the event of such default on the part of the Contractor as aforesaid interest on the said Advance shall be payable.

10. That in the event on any conflict between the provisions of these presents and the said Agreement the provisions of these presents shall prevail and in the event of any dispute or difference arising over the construction of effect of these presents the settlement of which has not been hereinbefore expressly provided for, the same shall be referred to the Employer whose decision shall be final and no appeal shall lie against his decision before any court, arbitrator or authority.

11. The provision of this undertaking shall be deemed to be supplemental to the said Agreement.

IN WITNESS WHEREOF the Contractor have set their hands to these presents the day and year first hereinabove written.

SIGNED, SEALED AND DELIVERED

BY THE CONTRACTOR

IN THE PRESENCE OF

Witness One

Witness Two

Signature

Signature

Name

Name

Address

Address

Annex 10

Undertaking regarding declaration of debarment by public institution(s)

(To be submitted by the tenderer on their letterhead)

Name of Work: Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.

1. I/We (Name of the bidder) declares that
 - a) I/we or any of our allied firm* is/ are not debarred / suspended / blacklisted by any public institution / entity in India or any other country as on(last date of submission of bid).
 - b) I/ We or any of our allied firm* have not made any transgression in respect of the code of integrity (as mentioned in the tender) with any public institution / entity in India or any other country in last three years as on(last date of submission of bid).
 - c) we will inform the Bank in writing, in case, I/we or any of our allied firm* is/are debarred / suspended / blacklisted by any public institution / entity in India or any other country on or before award of work for the captioned work.
2. I/We(Name of the bidder) declare that I/we or our allied firm*(Name of the allied firm(s)) is/ are debarred / suspended / blacklisted by(Name and address of public institution in India or any other country) and the same effective upto(date).
A copy of such letter is attached for your information and record.

(seal and signature of the bidder)

Date

Place

(Note: strike out one of the above two declarations which is not applicable)

*Allied firm: A firm would be termed as “allied firm” if the management is common, or substantial or majority shares are owned by the banned/ suspended firm and by virtue of this it has a controlling voice. Further all successor firms will also be considered as allied firms.

Annex 11

Proforma for Undertaking / Declaration / Certificate by the Bidder regarding country sharing land border with India

To

The Regional Director
Estate Department
Reserve Bank of India
Rail Head complex
Jammu-180012

Name of Work: Construction of Residential Quarters for Officers at Sector-1A and Sector-9, Trikuta Nagar, Jammu including Civil, Electrical, Plumbing, Fire Fighting, Water Supply, Internal & External Development Work, Sanitary Installation, Sewerage System, Lifts, Substation etc.

I / We (Name and address, including Country of location of bidder) have read and understood the contents of the Office Memorandum (OM) F. No. 6/18/2019-PPD dated July 23, 2020 and its subsequent orders / revision issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India regarding the restrictions on procurement from a bidder of a country which shares a land border with India.

2. I / We certify that (Name of the bidder)

- i. is not from a country sharing land border with India, or
- ii. is from a country sharing land border with India and has been registered with the Competent Authority, the certificate of which is enclosed, or
- iii. is from a country sharing land border with India where Government of India has extended lines of credit, or
- iv. is from a country sharing land border with India where Government of India is engaged in development projects.

(Strikeout whichever of the above is not applicable).

3. I /We further certify that (Name of bidder) fulfils all requirements in this regard and is eligible to be considered under the provision of the above referred Office Memorandum and its subsequent orders / revision. I/We also undertake that even in case of contracts where we are permitted by the Bank/RBI to sub- contract I/we (Name of bidder) will not sub-contract any work to a contractor from country(ies) sharing land border with India, unless such contractor fulfils all the requirements contained in the above referred office memorandum / order.

4. I/We know and understand that, if this Undertaking / Declaration / Certificate submitted by us is found to be false, the Bank shall be free to reject / terminate our tender / Work Order and that the Bank shall also be free to initiate any legal action in accordance with law including forfeiting of Earnest Money Deposit / Performance Bank Guarantee / Security Deposit and / or debarring us from participating in tenders invited by the Bank in future.

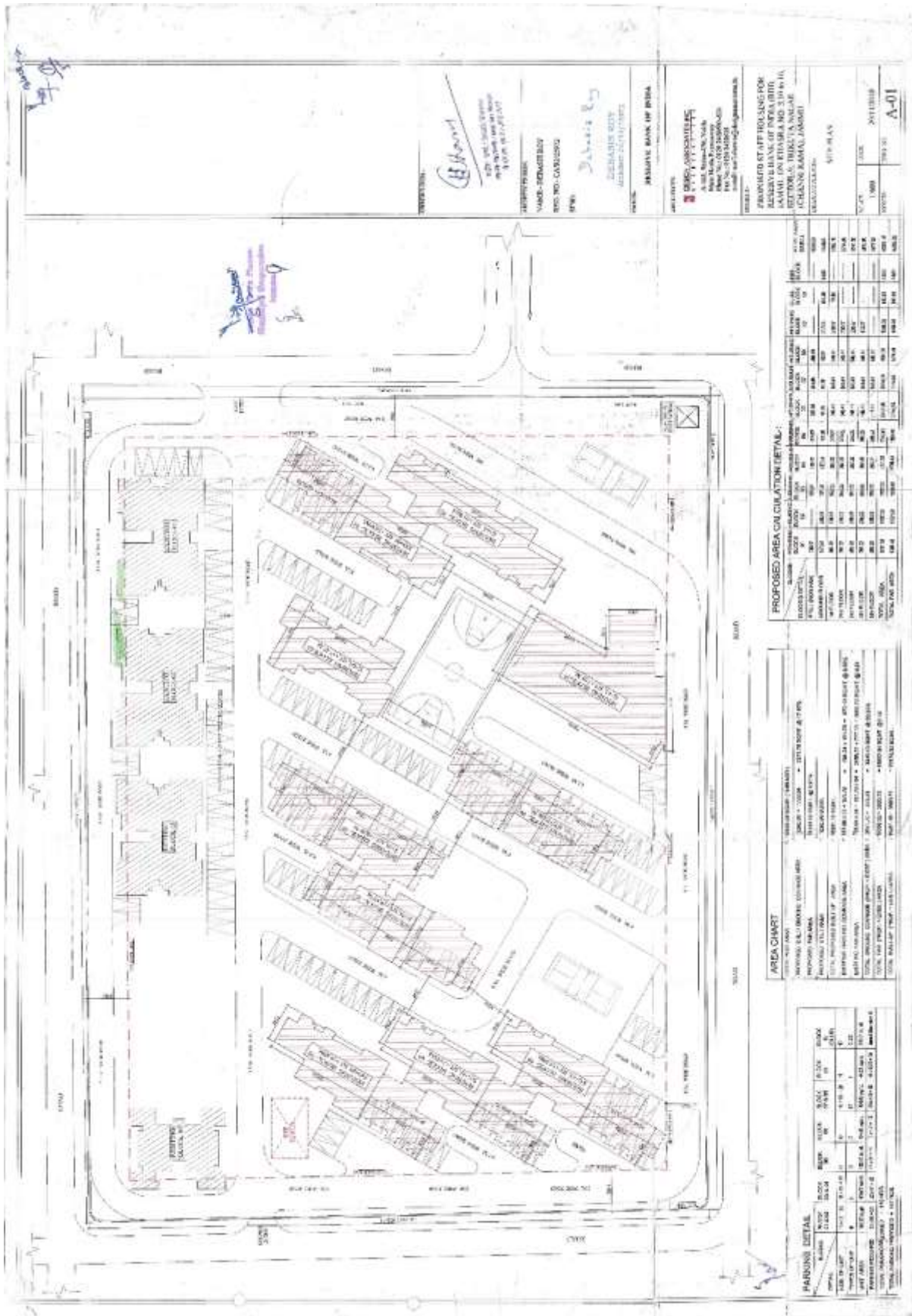
Signature and name of the authorized signatory of the Bidder with Stamp

Date:

Place:

SECTION-XIV

DRAWINGS



PROPOSED SITE DEVELOPMENT FOR
 ASHLEY BANK OF INDIAN (BIO)
 10000 N. KENNESAW RD. 319 W. 111
 BENTONVILLE, ARKANSAS 72715
 (CHANGING NAME)
 5/19/2014

PROPOSED AREA CALCULATION DETAIL:

DESCRIPTION	AREA (SQ. FT.)	AREA (ACRES)	PERCENTAGE OF TOTAL
TOTAL SITE AREA	1,000,000	23.0	100%
IMPERVIOUS SURFACE	400,000	9.1	40%
PERVIOUS SURFACE	600,000	13.9	60%
PAVING	100,000	2.3	10%
ASPHALT	50,000	1.1	5%
CONCRETE	50,000	1.1	5%
LANDSCAPING	100,000	2.3	10%
GRASS	500,000	11.6	50%
TOTAL IMPERVIOUS SURFACE	400,000	9.1	40%
TOTAL PERVIOUS SURFACE	600,000	13.9	60%

AREA CHART

AREA	AREA (SQ. FT.)	AREA (ACRES)	PERCENTAGE OF TOTAL
OFFICE BUILDING	100,000	2.3	10%
RETAIL BUILDING	100,000	2.3	10%
MULTI-FAMILY RESIDENTIAL	100,000	2.3	10%
PARKING	100,000	2.3	10%
LANDSCAPING	100,000	2.3	10%
GRASS	500,000	11.6	50%
TOTAL	1,000,000	23.0	100%

PERMISSION DETAIL

PERMISSION	AREA (SQ. FT.)	AREA (ACRES)	PERCENTAGE OF TOTAL
OFFICE BUILDING	100,000	2.3	10%
RETAIL BUILDING	100,000	2.3	10%
MULTI-FAMILY RESIDENTIAL	100,000	2.3	10%
PARKING	100,000	2.3	10%
LANDSCAPING	100,000	2.3	10%
GRASS	500,000	11.6	50%
TOTAL	1,000,000	23.0	100%

DESIGN ASSOCIATES
 1000 N. KENNESAW RD.
 BENTONVILLE, ARKANSAS 72715
 (781) 435-1234

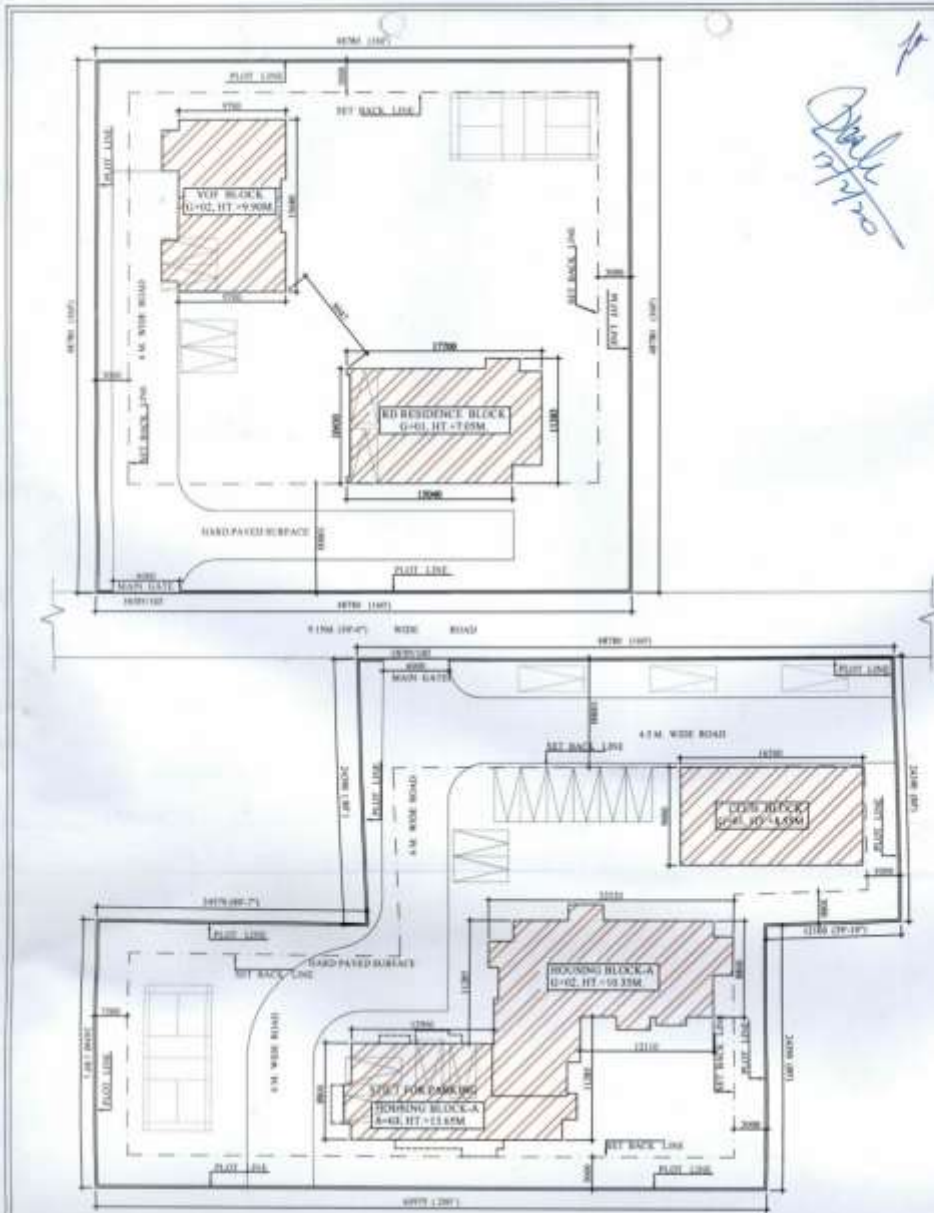
PREPARED BY:
 J. HARRIS

DATE:
 5/19/2014

SCALE:
 1" = 40'

PROJECT NO.:
 1000

SHEET NO.:
 A-01



Handwritten signature and date: 17/2/20

Handwritten signature and name: Mr. Debasis Roy

AREA CHART

TOTAL PLOT AREA	= 5056.75 SQMT. (1.28 ACR.)
PROPOSED GROUND COVERAGE AREA	= 812.22 SQMT. @ 16.25%
PROPOSED FAR AREA	= 2216.82 SQMT. @ 0.43
PROPOSED STLT. AREA	= 146.42 SQMT.
TOTAL BUILT-UP PROPOSED AREA	= 2363.24 SQMT.

AREA CALCULATION DETAIL-

FLOOR/DETAIL	HOUSING BLOCK - A	CLUB BLOCK	RD RESIDENCE BLOCK	VOF BLOCK	TOTAL AREA (SQM.)
STLT (NON FAR)	146.42				146.42
GROUND FLOOR	173.8	141.9	98.8	139.8	554.3
1st FLOOR	36.52	35.5	38.19	179.8	290.01
2nd FLOOR	36.52			179.8	290.01
3rd FLOOR	25.28				25.28
TOTAL FAR AREA	174.8	177.4	136.99	499.4	2363.24

PARKING DETAIL

DETAIL	HOUSING BLOCK - A	CLUB BLOCK	RD RESIDENCE BLOCK	VOF BLOCK
NOS. OF UNIT	08	01	01	06
TYPES OF UNIT	IV	QUB	RESIDENCE	VOF
UNIT AREA	188.01 sq.m.	238.20 sq.m.	274.81 sq.m.	96.36 sq.m.
PARKING REQUIRED	08 x 1.5 = 12	01 x 10 = 10	01 x 20 = 20	06 x 10 = 60
TOTAL PARKING REQUIRED	= 17 NOS.			
TOTAL PARKING PROPOSED	= 21 NOS.			



NAME: DEBASIS ROY
REG. NO. CA-93/15972
DEBASIS ROY
 Architect CA-93/15972

CLIENT: RESERVE BANK OF INDIA

ARCHITECTS: DEBASI ASSOCIATES INC.
 A-145, Sector-14A, Noida
 Main Trade Enquiry
 Phone No. - 0120-242668-629
 Fax No. - 0120-2426628
 e-mail: aad@debasiassociates.com

PROJECT: PROPOSED STAFF HOUSING FOR RESERVE BANK OF INDIA (RBI), JAMMU ON PLOT NO. 240 to 242, 244 to 247, 270, 274 to 277 & 281 to 283, SECTOR-14A, TRIKUTA NAGAR, JAMMU.

SITE PLAN

SCALE: 1:400 DATE: 27/12/2019
 SHEET: 01 OF 02 **A-01**

1. All relevant drawings can be obtained from the Bank's websites www.rbi.org.in/Scripts/BS_ViewTenders.aspx.

1	Block 1,2,7,8,9 C
2	Block 1-2 P
3	Block 7-8 P
4	Block 9-10 P
5	Block-A C
6	Club, RD, VOF C
7	Sector-1A P
8	Sector-1A
9	Sector-9 C Block-10
10	Sector-9 Elec
11	Sector-9 P