

## **REQUIREMENT SPECIFICATIONS**

### Section A: General Specifications

#### 1 General

- 1.1 The Contractor shall comply with the Specifications and all provisions in the Contract document.
- 1.2 During the progress and upon completion of any Services or Works, the Contractor shall ensure that the site is clean and shall remove expeditiously from the site debris and rubbish generated by the Works and properly dispose of it before handing over to the University.

#### 2 Site Restrictions

- 2.1 The Contractor shall note that the University remains in full operation during the whole of the Contract Period. With the presence of existing dwelling structures, dwellers, students/visitors, physical encumbrances and the site's close proximity to other buildings and roads, the Contractor shall be deemed to have taken into consideration such site constraints and the probable effects on working hours and access.
- 2.2 The Contractor shall ensure that the progress of the Works does not disrupt the flow of activities in the buildings and/or surrounding areas.
- 2.3 The Contractor shall carry out a site survey and submit the site possession checklist. This completed checklist form shall be signed and returned to the University's representative within five (5) working days prior to date of work commencement. The Contractor shall take all necessary precautions not to disturb existing wires, cables, services pipes, equipment in operation, sewers, trees, plants, flowers, etc. Any damage to such during the progress of the Works shall be made good at the Contractor's expense.
- 2.4 The Contractor shall make all necessary arrangement to maintain the existing facilities and have minimum of disturbances to the public and occupants.
- 2.5 The Contractor shall deem to have allowed for all these provisions in the Contract. No claim on for these requirements shall be entertained by the University.
- 2.6 The Contractor shall carry out the Works with due considerations on the existing site constraints at any time and under no circumstances whatsoever shall any of the normal operations of the University and its surrounding area be disrupted by reason of the progress of the Works, unless at the permission from the University.

#### 3 Labour Legislation

The Contractor shall observe and comply with all regulations relating to the labour laws and the Industrial Relations Acts, now and thereafter in force and shall pay all fees, charges, etc, connected with the compliance of the same.

#### 4 Access

- 4.1 The Contractor shall be held solely responsible for maintaining clean, safe, adequate and free pedestrian and vehicular access to the various premises adjacent to the Works. The Contractor shall also maintain clean, safe, adequate and free passageway along routes within the working spaces.
- 4.2 The Contractor shall be required to provide access facilities to the site. Such access must be properly constructed and maintained to afford a safe access to the University.

5 Signages/Sign Boards

- 5.1 The Contractor shall supply, install and maintain approved and easily noticeable warning signages/sign boards when carrying out any Works. The University's staff, students, members of the public, etc. must be suitably informed by the Contractor and kept out of such areas which are likely to pose a danger to them. The Contractor shall be responsible for all costs and claims arising from such accidents due to his negligence.
- 5.2 The Contractor must maintain a sufficient number of the signages/sign boards on site at all times. Sample of the signage/sign board shall be submitted to the University for approval before commencement of work on site.

6 Custody of Materials

The Contractor shall be held responsible for the safe custody of materials delivered to the site himself.

7 Safety , Health and Welfare of Workmen

- 7.1 The Contractors should have **BizSAFE level 3** and shall meet the requirements of the Workplace Safety & Health (Risk Management) Regulations. The Contractor shall ensure that all persons at work are competent in the work to be carried out.
- 7.2 The University's standard Safety and Health Handbook for Contractors, which will form part of the Contract Documents, can be downloaded from the University's website at <http://www.ntu.edu.sg/odfm> under Useful Information → Tender/Contract Documents → "Safety and Health Handbook for Contractors date 17 July 2019". The Contractor shall review this Handbook and take note of the University's requirements for the Contract.

8 Works Requiring 'Standing' Supervision

- 8.1 The Contractor is to take note that the working hours of the University's site supervisors are as follows:-
- Monday to Friday - 8.30 a.m. and 5.00 p.m.  
Saturday - 8.30 a.m. and 1.00 p.m.
- 8.2 Any works which require "standing" supervision e.g. earth backfill, removal of poor earth strata, topsoil collection, concreting, piling, mixing of cement and sand for plastering or screeding, mixing of paints, and any hot works etc. shall be carried out between 8.30 a.m. and 5.00 p.m. on Mondays to Fridays and, between 8.30 a.m. and 1.00 p.m. on Saturdays. A prior written permission of the University will have to be obtained if, in the exigency of the case, such works are required to be carried out outside these hours.
- 8.3 No claim for loss or delay consequent upon the Contractor's failure to comply with this Clause will be entertained.

9 Protection of Works and Properties

- 9.1 During the execution of the Works in this Contract, the Contractor shall protect the buildings, furniture, equipment and such other personal properties belonging to the University and/or occupiers of the buildings from damage or loss as a result of the carelessness, negligence or otherwise of the Contractor's workmen. Any damage or loss that may result to such property shall be made good or replaced by the Contractor at his own expense and to the entire satisfaction of the University and the occupants therein.

- 9.2 The Contractor shall be required to allow for all necessary protective measures during the Contract Period, such as the provision of tarpaulin sheet or plywood plank on the roof waterproofing membrane, etc.
- 9.3 The University reserves the right to deduct any money or monies due to the Contractor if such making good/replacements are not done promptly or properly to the satisfaction of the University or the occupants.

10 Contractor's Employees

- 10.1 For security reasons, the Contractor shall maintain a register on site of the full particulars and identity card (I/C) size photographs of all his employees/workmen engaged in the Contract for inspection by the University when requested. Original valid work permits are to be shown to the University for non-citizen employees/workmen. The Contractor shall ensure that all his employees/workmen and that of his subcontractors carry with them identification tags indicating the name of the company and the name of the employee/workman with his or her I/C size photograph whenever they are in the premises of the University.
- 10.2 The Contractor's employees/workmen must comply strictly with rules and regulations in the University and the instructions given by the University.
- 10.3 The Contractor shall note that non-citizens employed on site shall be in possession of the necessary work permits, etc., in order to allow them to work in this Contract. The Contractor shall ensure that no illegal immigrants shall be employed by him or any subcontractor in the execution of any part of the Works and if any illegal immigrant is found to be employed, the University shall, notwithstanding the provisions of this Contract be entitled to withhold any payment to the Contractor and the University shall not be liable for any loss or damages suffered by the Contractor as a result of any payment being withheld.
- 10.4 The University shall be at liberty to object to and require the Contractor to remove any person employed by the Contractor or his subcontractors, who is in the opinion of the University, has misbehaved himself, or is deemed medically or physically unfit or incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the University to be questionable or undesirable to the University. Any person so removed from the Works shall be replaced by the Contractor with a competent employee approved by the University within a period as instructed by the university.

11 Coordination and Interfacing with Works of Direct Contractors Employed by the University and Other Statutory Bodies

- 11.1 The Contractor shall liaise, coordinate and interface his work in line with the work of other Contractors and tradesman employed by the University and other Authorities. Such coordination and interfacing shall include permitting the Direct Contractor to complete the balance of works under this Contract. In the event of failure by the Contractor to allow for such coordination and interfacing, no claim whatsoever would be entertained by the University for removing and re-installing works to accommodate the installation of equipment and works by Direct Contractors. The Contractor shall be responsible for obtaining the exact work schedules of the Direct Contractors and incorporate them into his programme.
- 11.2 On completion of the works by Direct Contractors, the Contractor shall be required to make good all works so disturbed and to provide adequate security to protect all such equipment and works installed by the Direct Contractors from any damage, vandalism or theft.

## 12 Days and Hours of Working

12.1 The normal working hours for this contract is as follows:-

- a) Monday to Thursday : 8.30 a.m. to 5.45 p.m.
- b) Friday : 8.30 a.m. to 5.15 p.m.
- c) Saturday : 8.30 a.m. to 1.00 p.m.

12.2 The Contractor shall note that no work shall be carried out during the night or on Sundays or public holidays. Where the general scope of Works is required to be done after normal working hours or on Sundays or public holidays, arrangement can be made with the University to do so. The Contractor shall give two (2) days' written notice in advance to carry out works outside the specified time. The University reserves the right to restrict or prohibit these works which in the opinion of the University, may give rise to security problems or may result in disturbance to the surroundings. Any additional costs for such overtime work shall be borne by the Contractor, and shall have been allowed in the Tender Price.

12.3 The Contractor may, from time to time, be requested to halt noisy construction activity. The Contractor shall comply with instructions accordingly from the University. No claim of time and costs arising therefrom shall be entertained.

12.4 The Contractor shall take note of the examination periods by the University as specified in the Academic Calendar which can be found in the University's website at <http://www.ntu.edu.sg/Students/Undergraduate/AcademicServices/AcademicCalendar>. The University reserves the right to change the Academic Calendar without giving reasons to the Contractor. The Contractor shall not carry out any noisy works during the revision and examination periods and he shall take this into his account when planning his works. He shall not be entitled to any extension of time to complete the Works and shall not be entitled to recover from the University any loss and expense arising as a result of any temporary suspension or confined working periods.

## 13 Noise, Dust and Air Pollution

13.1 All noisy and dusty activities such as structural works, demolition, hacking and coring etc. shall be carried out with proper protection to the surrounding environment and kept to the minimum level of pollutions in term of noise, dust and air.

### Noise Level

13.2 All mechanical plants, equipment used for the purpose of the Works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order.

13.3 All compressors shall be "sound reduced" models fitted with properly lined and sealed acoustics covers which shall be kept closed whenever the machines and equipment are in use and all ancillary pneumatic percussive tools shall be fitted with mufflers or silencers of the recommended by the manufacturers.

13.4 The use of barriers (acoustics sheds or sound proof partition) to deflect noise away from areas that require less or minimal noise such as residential areas, lecture theatres, tutorial rooms etc. shall be employed whenever possible.

13.5 Care shall be taken when loading or unloading plant, equipment, dismantling scaffolding or moving materials to reduce impact noise.

- 13.6 Mechanical plant shall be maintained in good and workmanlike condition so that extraneous noises from mechanical vibrations, creaking and squealing is reduced to a minimum.
- 13.7 The maximum noise level shall not exceed, as a result of operations in connection with the works, the following:-

	8 a.m. – 7 p.m.	7 p.m. – 8 a.m.
a) Continuous noise level over a period of 12 hours in dB(A).	60	50
b) Continuous noise level over a 5 minutes period in dB(A).	75	55

- 13.8 Although these noise levels are the maximum to be allowed, the Contractor shall endeavour to achieve lower than the above limits by providing and using items of plant and equipment, which have been specifically designed or modified to reduce the noise of normal operation.
- 13.9 Notwithstanding the compliance of the above noise levels, the University may require the Contractor to suspend works or minimise noisy works or to confine their works to a specific time.

#### Dust Pollution Control

- 13.10 The Contractor shall submit to the University a method statement showing how he intends to minimise the dust generated by his work.

#### Air Pollution Control

- 13.11 Mechanical plant, equipment etc. which emit smoke, fumes or other obnoxious gases will not be allowed to be used on the site.
- 13.12 As and when deems necessary, the University has the absolute discretion to require the Contractor to take necessary precautions, maintain or repair such plant and equipment or order their removal from the site.

### 14 Adequate Site Supervision

- 14.1 The Contractor shall ensure that adequate supervision of his workers be provided on site at all times during the progress of the Works. He shall appoint an experienced and competent Site Supervisor who shall be stationed on Site for efficient supervision and effective execution of the Works during the Contract Period.
- 14.2 The Contractor shall confine his workers strictly within the areas of work involved and work must be carried out with the minimum of noise pollution and no nuisance in any form should be created.
- 14.3 Canteens, hostels and all other institutional buildings are out of bounds to the Contractor's workers except with presentable outfit and clean shoes. No wet clothes are allowed in the canteens.

- 14.4 The Contractor must not allow his workers to rest or lay on all pavement meant for pedestrian, or rest along corridor and bus-stop and they shall not eat in the open areas especially field and pavement areas.
- 14.5 The Contractor shall ensure that his workers do not abuse the University's facilities. Examples of possible abuses are as follows:-
- a) Illegal dumping, e.g. leaving litterbags at common corridors, staircases, lift lobbies, etc.;
  - b) Sleeping or resting along corridors or other circulation space;
  - c) Resting, eating or listening to music along corridors or other circulation space;
  - d) Placing personal belongings at unauthorised spaces;
  - e) Gambling, giving of loans ("loan-sharking"), soliciting of money or operate tontine;
  - f) Misuse of University's resources e.g. failure to turn off water taps, electrical switches, etc.;
  - g) Staying/sleeping overnight on campus; and
  - h) Bathing on site.
- 14.6 The Contractor and his employees shall not smoke in the following smoke-free areas:-
- a) Buses, bus stops and taxi stops, drop-off or pick-up point;
  - b) Cafes (indoor & outdoor);
  - c) Canteens (indoor & outdoor);
  - d) Common Areas, corridors, staircases (indoor & outdoor), pedestrian overhead bridge;
  - e) Faculty & administration buildings;
  - f) Halls of Residence;
  - g) Lecture theatres & tutorial rooms;
  - h) Library/forum area;
  - i) Lifts;
  - j) Sports grounds;
  - k) Toilets; and
  - l) In the queues.

## 15 Site Office

- 15.1 In general, the University does not assign any office/maintenance spaces within the existing buildings in Campus for the proper performance of this Contract.
- 15.2 The Contractor may seek the consent of the University to allocate a vacant plot at a non-prominent location for the contractor to create working spaces in the form of containers at their own cost. The allocation of such space is subject to the approval of the University and shall be used solely for the execution of this Contract. No fabrication yard shall be allowed for the Contractor. All fabrication of materials shall be carried out off-site.
- 15.3 The location and size of the plot shall be at the sole discretion of the University and the University accepts no responsibility whatsoever for any loss, damage or destruction howsoever caused to any of the items stored therein.
- 15.4 The Contractor shall provide all infrastructure and open accounts with the service providers for provision of utilities to the temporary site. The Contractor shall also undertake to maintain and provide security in areas occupied by him. Furnishing of the spaces provided shall be undertaken by the Contractor at his own expenses.
- 15.5 The Contractor shall be fully accountable for and keep the space in good and working condition and shall carry out at his own expenses, all necessary maintenance and repairs arising from its usages of the space and shall meet all Government and Statutory Board requirements. If as a result of any act or neglect on the part of the Contractor which requires the University to carry out any maintenance, repairs or cleaning, the Contractor shall pay the University the cost thereof upon demand or may be deducted by the University from any money due or become due to the Contractor.
- 15.6 The Contractor shall demolish, remove, make good and return the area in its original state to the University on completion of contract or earlier termination of the Contract. In the event of the failure or refusal of the Contractor or his sub-contractors to return the areas in good condition, the University shall be entitled to treat all persons found thereon as trespassers and all items whatsoever found thereon shall be deemed to have been abandoned and the University shall be entitled to dispose or deal with these items in such manner as they deem fit, including the disposal thereof. All cost incurred by the University in disposing the same shall be borne by the Contractor.
- 15.7 The Contractor shall submit plans of the temporary site office to the University for record purpose. They shall not make any additions or alterations to the spaces thereafter without the prior approval of the University.
- 15.8 The University reserves the right to require the Contractor to relocate and/or to provide alternative store/office if the original site is required for other purpose. All costs and expenses relating to the said relocation shall be borne by the Contractor.

## 16 Workers' Accommodation

- 16.1 The Contractor shall note that no workers' accommodation shall be permitted within the site boundary in the University.

## 17 Water and Electricity For the Works

- 17.1 Water and electricity required for proper and efficient execution of the Works on Green-Field and Brown-Field projects shall be borne by the Contractor. Green-Field land shall mean undeveloped land and Brown-Field land shall mean land that had been developed and demolished. The Contractor shall at his own expense provide all necessary water piping, electrical wirings and meters required for recording usage of temporary water and electricity supply for the Works (including works to be executed by any subcontractors) till completion and project handover. All utilities connections shall subject to the approval of the University.
- 17.2 If external parameter lightings (to light up common walkways) is required for site hoardings, the contractor at his own cost shall install a dedicated weaterproof DB with MCB (s) and RCCB. Supply is to be taken from the University OG box or nearby power source as instructed by University. Revenue meter is not required for this purpose.
- 17.3 All water and electrical services works shall be carried out by the respective licensed plumber and licensed electrical contractor. The licensed plumber and electrical contractor shall ensure that all works are carried out in accordance with the statutory requirements and code of practice. The licensed plumber shall conform to PUB's (Public Utilities Board) guidelines and regulations when carrying out such works.

## 18 Fixed Line and Mobile Telephones

- 18.1 The Contractor shall provide and maintain in his office in Singapore telephone services and facsimile machine as well as clerical staff capable of receiving verbal instructions in English and Mandarin.
- 18.2 In addition, the Contractor shall also provide a minimum of one (1) main telephone line and fax machine in his site office/maintenance spaces, if allocated by the University.
- 18.3 The Contractor shall furnish the following telephone numbers to the University:
- a) Main Office and Site Office Telephone Numbers; and
  - b) Site Manager and Supervisor's Mobile Numbers.
- 18.4 The cost incurred through the purchase/rental of such telephones, mobile phones, and facsimile machine shall be borne by the Contractor.

## 19 Materials and Workmanship

- 19.1 All materials and workmanship shall so far as procurable be of the respective standards described in the Contract Documents and the Contractor shall upon the request of the University furnish it with vouchers/documents to prove that the materials comply therewith. The Contractor shall perform the Works with due care and skill. All materials supplied by the Contractor pursuant to the Contract shall be merchantable quality and fit for use. Cost of transportation for any equipment or material testing shall be borne by the Contractor.
- 19.2 All materials to be used or incorporated into the work may be inspected, tested and accepted by the University before incorporation into the work. Any work in which untested materials are used without approved or written permission from the University shall be performed at the Contractor's own risk and may be considered unacceptable and unauthorised and may not be paid. When called for in the Technical Specifications, the Contractor shall furnish certificates of compliance stating that the material used in the



work conforms to these specifications. For any test to be conducted, the costs of testing shall be borne by the Contractor.

19.3 The Contractor shall furnish samples required by the University without charges and provide means and assist in the verification of all scales, measures and other devices, which the Contractor operates.

19.4 If submission is returned to the Contractor for correction or sample is not approved or to the satisfaction of the University, the Contractor shall resubmit the sample according to specification in same quantity, as specified for the original submitted, within ten (10) calendar days after receipt by him of the disapproved materials.

## 20 University's Regulation

20.1 The Contractor shall comply with the regulations of the University when carrying out works in particular to the following:-

- a) Entries into occupied areas; tenant's quarters or student hostels shall be accompanied by a staff from the University; and
- b) Any regulations, which the University may impose.

## 21 Care and Protection

21.1 The Contractor shall provide everything necessary for the proper protection to materials and completed work, and must also protect all existing work and property including roads, drains, fencing, etc. from damage when carrying out. Precautions to be taken during works shall include the provision of signboards, warning signs, etc. as directed by the University. Any damage done to such existing work and property by the Contractor's vehicles, equipment, machinery or workmen, or by operations under the Contract shall be made good at the Contractor's expense to the satisfaction of the University.

## 22 Protection of Public Utility Mains, Cables, Pipe, Etc.

22.1 The Contractor shall maintain and protect all public drains, sewers, gas mains, water mains, electric cables, telephone cables and the like in connection with the works and shall make good all damage occasion thereto during execution of the work and indemnify the Government against any claims arising therefrom.

22.2 Cable detectors shall be used to confirm the presence/absence of underground live cables before grubbing up trunks and roots of trees with girth greater than 1.0m measured 1.0m above ground level. Trial holes shall be dug if cables, pipes, etc. are detected beneath the tree base, and the University shall be shown the site prior to grubbing. The Contractor shall only use cable detecting devices approved by the relevant regulatory Authority.

22.3 The Contractor shall strictly comply with the following list of DO's and DON'T's. DO's & DON'T's FOR CONTRACTORS CARRYING OUT EXCAVATION WORKS.

### DO

- a) Use cable detecting devices for location of underground live cables.
- b) Carefully dig a sufficient number of trial holes before carrying out full-scale excavation, piling or leveling work in order to determine the exact location of cables or mains.

- c) Contact immediately the University and the relevant regulatory Authority concerned for assistance if in the course of making trial holes and/or excavation, cables or mains are exposed.
- d) Contact the University and the relevant regulatory Authority concerned for assistance immediately when identification markers (e.g. cables slabs and joint markers of the Electricity. Department) are exposed.
- e) Exercise extreme vigilance when working in the vicinity of service mains especially where cables slabs have been exposed.
- f) Report immediately to the University and the relevant regulatory Authority concerned in the event of damage to any electricity cable, water or gas main.

#### DON'T

- a) Use a mechanical excavator when working in the vicinity of service mains especially after identification markers such as cable slabs have been exposed.
- b) Remove or throw away any identification markers or cable slabs.
- c) Attempt to lift up or divert cables or mains.
- d) Hide or cover up any damage to cables or mains.
- e) Carry out makeshift repairs on any damaged portion of cable or main.

### 23 Meeting and Submission of Report

- 23.1 The Contractor or his authorised representatives shall attend regular meetings at the Office of Development & Facilities Management as scheduled by the University for the purpose of receiving instructions, explanations and discussions.
- 23.2 The Contractor shall submit status report of all works issued to them including expenditure on a monthly basis. In addition, a spreadsheet must also be provided capturing all works order for purpose of tracking of value of works that have been issued to-date.

### 24 Parking

- 24.1 The Contractor is not allowed to park his vehicles in the University's Car Parks: namely, Car Park A, B, SBS, and RTP. He may make deliveries and alight workers at these Car Parks when necessary. All car park lots shall not be obstructed at any time by the Contractor's equipment or materials. Other Car Parks are available within the University and the Contractor may use them.

### 25 Shortcomings in Performance

- 25.1 Penalty charges or a sum/s imposed by the University shall be deducted for any shortcomings in contractual performance of the Contractor, in accordance to the penalty charges as stated herein:-

<b>Item</b>	<b>Shortcomings in Performance</b>	<b>Unit</b>	<b>Penalty Charge (\$)</b>
1.	Breach of general safety requirements and/or cause public inconveniences/hazards to users.	occasion	(500.00)
2.	Breach of general safety requirements that resulted in injury or damages to properties.	occasion	(2,000.00)
3.	Misuse of University property, equipment, facilities, etc.	occasion	(300.00)
4.	Failure to attend meeting at mutually agreed time.	occasion	(100.00)
5.	Failure to adhere to the University's Anti-smoking regulation.	person/occasion	(100.00)
6.	Failure to comply with the University's Rules and Regulations (House rules, traffic and parking regulations, e.g. speed limit on campus).	offence	(500.00)
7.	Misbehavior of the workers, such as sleeping along corridor, sleeping in common area, drinking of alcohol, gambling, discourteous, causing nuisance, harassment, vulgarities, etc.	person/occasion	(300.00)
8.	Worker failed to dress in proper uniform or carry his / her identification tag during course of work execution in the University's premises.	person/occasion	(100.00)
9.	Execute works with non-compliance to Codes/Regulations/Practice.	Incident	(100.00)
10.	Use of non-approved articles/materials etc.	occasion	(100.00)
11.	Failure to provide good housekeeping at site at University's standard level.	occasion	(100.00)
12.	Caused electrical trip at DB arising from negligent act.	occasion	(500.00)
13.	Caused electrical trip at MDB or upper stream arising from negligent act.	occasion	(1,000.00)
14.	Interruption of other services.	occasion	(200.00)

25.2 In the event of any dispute as to the imposition of penalty arising from any breach of the terms in the contract, the Contractor shall prove in writing to the satisfaction of the University within seven (7) days that its cause was not due to default on any part of the Contractor in compliance.

25.3 If the Contractor fails to notify the University in writing with good justifications, within seven (7) days, the penalty charges shall be effective and deducted from the Contractor's payment due or to be due to the Contractor.

## 26 Personal Data

- 26.1 The Contractor shall collect, use, disclose and process personal data of individuals only for the purposes of this Contract and in full compliance with the Personal Data Protection Act 2012 of Singapore and with any directions issued by the University relating thereto. In this respect, the Contractor agrees to
- a) Use personal data only after notifying or obtaining the consent of the individual to whom the personal data relates except where the Contractor has received written confirmation from the University that the University has notified and obtained the consent of the individual to whom the personal data relates;
  - b) Institute reasonable security arrangements to protect the personal data;
  - c) Securely destroy the personal data where it is no longer required, or upon being required by the University; and
  - d) Transfer personal data outside Singapore only as prescribed by Law;
- 26.2 The Contractor shall not be relieved of any of its obligations under this Contract if the University permits the Contractor to subcontract any part of the processing of personal data.
- 26.3 For the purposes of this Contract “personal data” shall mean data, whether true or not, about an individual who can (a) be identified from that data; or (b) from that data and other information to which the University or the Contractor has or is likely to have access.