

UNIVERSITY OF SOUTH AFRICA

FITOUT BASELINE DOCUMENT

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ACRONYMS

ABBREVIATION	FULL NAME
AIA	Approved Inspection Authority (approved by the Chief Inspector)
BMS	Building Management System
CARAT	Complete, Accurate, Relevant, Accessible, Timely
CFC	Chlorofluorocarbon Organic Compound
GBCSA	Green Building Council of South Africa
HVAC	Heating and Ventilation Air Conditioner
KPI	Key Performance Indicator
NBR	National Building Regulation
OEM	Original Equipment Manufacturer
OHS Act	Occupational Health and Safety Act of 85 of 1993
PCB	Polychlorinated Biphenyls Compounds
PCC	Project Component Checklist
PFC	Power Factor Correction
PMO	Project Management Office
PPE	Personal Protective Equipment
PPM	Planned Preventative Maintenance
QCP	Quality Control Procedure/Plan
RA	Risk Assessment
RCA	Root Cause Analysis
SABS 0400	South African Bureau of Standards
SANS 10400	South African National Standards
SCM	Supply Chain Management
SOP	Standard Operating Procedure
SOW	Scope of Work
UE	University Estates
UNISA	University of South Africa
UPS	Uninterrupted Power Supply

1. INTRODUCTION

The University of South Africa (UNISA) Fit-Out Baseline Document intends to provide guidelines and direction on the Refurbishment, Fit-Out & New Construction Projects at the University. Furthermore, UNISA recognizes its obligation towards compliance with the provisions of the SANS-10400 & NBR, in terms of compliance and the minimum standards required. UNISA is a comprehensive and open distance learning institution, which is comprised, of 7 Regional Centers across South Africa (SA) as depicted in Figure 1.1 below.

The “Fit-Out Baseline Document” was developed as reference for University Personnel, Associate Architects, Furniture Suppliers, Manufacturers, and Contractor Personnel who are involved in the design, Furnishing, Construction, and/or use of New and Renovated Office areas. It presents guidance for the allocation and design of Office Space at the University.

The guidance was developed through research of office environments in both higher education and other commercial industries.

The need for a comprehensive set of standards for the allocation and design for all University space has become apparent, and the precedent for this has been established.

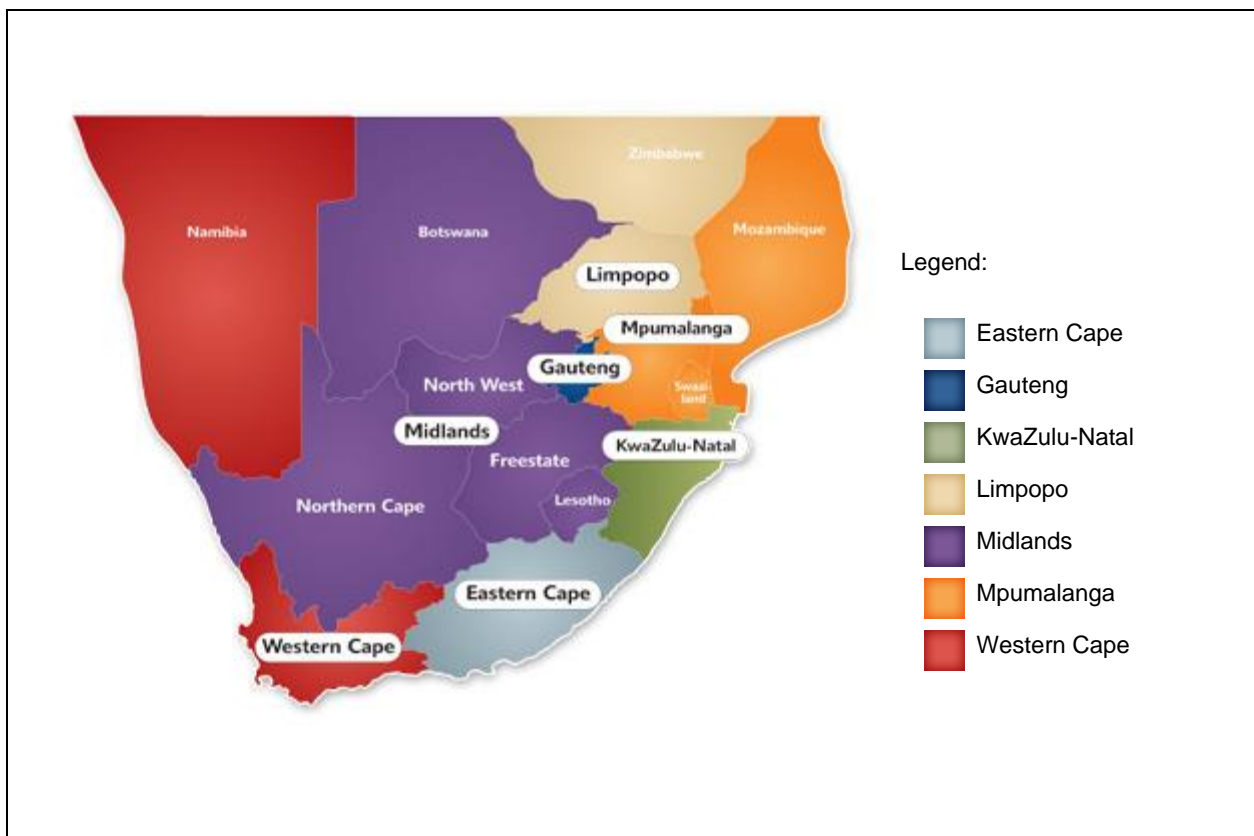


Figure1.1: UNISA Regional Centers

2. GENERAL REQUIREMENTS

A. SUSTAINABLE DESIGN

1. If identified in the Project Component Checklist, provide the design and construction required to obtain the GBCSA Rating required for the project.
2. Building envelope and HVAC systems that establish temperature and humidity comfort ranges in accordance with SANS-10400 XA Energy Code are required. Specifics of insulation materials and installation will not be outlined here but must meet the SANS-10400 XA Energy Code. For existing buildings, the Design and Mechanical Engineering Division will assess the building envelope and HVAC systems.
3. Meet Energy Star® performance criteria and when applicable, provide Energy Star® rated equipment and appliances.
4. Require zero use of CFC-based refrigerants for new systems; complete a comprehensive CFC phase-out conversion when reusing existing systems. Select refrigerants and HVAC systems that minimize emissions.
5. When possible, specify or use products extracted, harvested, recovered or manufactured within a 100 Kilometers of the project site.
6. When possible, specify and or use materials and products that are made of plants that are typically harvested within a ten-year or shorter cycle.
7. Design systems that meet or exceed minimum indoor air quality and ventilation requirements as well as optimizing air change effectiveness in accordance with SANS-10400 XA Energy Code.
8. Design structures to maximize daylight and views to the exterior consistent with the required function of interior building spaces. Daylight harvesting is encouraged but not required.
9. Implement a construction waste management plan to minimize landfilling of construction waste in favor of reuse and recycling.

B. GENERAL BUILDING PLANNING

1. The University premises shall be designed and constructed to meet or exceed the latest Local and National Building Regulations, Fire Regulations, Occupational Health & Safety Regulations and National Barrier Free Regulations.
2. The University premises designs shall be in such a manner as to ensure an economical and efficient use of space, adequate natural light, ventilation, circulation patterns and regulation compliance. Existing facilities that are renovated and/or occupied shall be structurally sound (certified by licensed engineer, if required by the Local Municipality), and meet all minimum design standards of this outline specification. The building in which the Fit-Out space is to be located will be assessed against the requirements of this section by the Architectural Office.
3. If an existing facility or building is used, testing and/or inspection and investigation shall determine if any hazardous materials exist. If it is determined that remediation is required, the facility or building must be rendered free of hazards. This includes but is not limited to asbestos, lead, and PCB's.
4. All existing buildings shall be structurally sound (certified by licensed engineer, if required by the Local Municipality), and meet all minimum design standards of this outline specification. All unsafe conditions are to be corrected prior to UNISA staff occupying the space, including any and all Fire/OHS safety regulation violations. *Leased premises shall meet all the requirements for new construction for the current building regulation with respect to floor load bearing capacity*

5. If an existing facility or building is used, all existing architectural, electrical, plumbing, and HVAC components no longer being used shall be completely removed and not abandoned in place. All openings in existing walls, floors, and shafts shall be properly fire-stopped after the removal of old components and piping.
6. Field verification of existing construction conditions and configurations is compulsory. Do not assume that existing building framing and construction is plumb and square. Structural elements of all existing facilities shall be inspected and verified for size and loading capacity.
7. Pipe and duct chases, including duct chases where floor to floor heights in existing buildings do not allow ductwork above the ceiling, shall not detract from the floor plan layout.
8. Structural bay sizing is to be commensurate with building configuration, architectural expression, structural framing material and cost.
9. If required by the Project Component Checklist, use a raised access floor system for HVAC, electrical and communications systems to facilitate change management in new building construction and where practical at existing buildings.
10. Stack all electrical cabinets, communications/data cabinets and Ablution facilities vertically in buildings with multi floors.
11. Use fixed windows in environmentally controlled buildings. If operable windows are used, they must be lockable, screened, and must be washable on both sides from the building interior. Window framing must be thermally broken.
12. Use double or triple pane glazing according to climate conditions and to meet GBCSA Rating requirements. Reflective glazing is subject to approval by UE Technical committee.
13. Provide positive drainage at exterior window-sills.
14. Demountable drywall partitions are preferred over fixed interior partitions.
15. The total number of passenger Lifts provided is to be coordinated and approved by UE Technical Committee.
16. Do not locate fresh-air intakes adjacent to vehicle drop-off areas, parking areas, truck docks or emergency generators.

C. SECURITY DESIGN

1. Controlled access is required to the entire building and to each individual floor. If required by the PCC, provide conduit and power for a card access management system matching the existing UNISA Access System. The Access System is to be capable of tracking the issuing and revocation of access cards along with generating reports of all access into the building. Provide these readers and locking/operation devices at all building entrances, loading docks and interior doors as defined in the detailed program.
2. Central data base computer is to connect all access locations, equipped for stand-alone operation upon power failure, programmed for automatic locking/unlocking of building doors.
3. If required by the Project Component Checklist, provide conduit and power for security cameras covering all access points.

D. OFFICE AREAS

1. Avoid locating private offices along building perimeter wall and window locations. Dedicate building perimeter to circulation space in order to maximize natural light.
2. Coordinate interior wall partitions with window mullion locations.

3. Doors should swing against a wall whenever possible.
4. In office areas, stagger office/conference room doors so that they are not directly across from each other, especially in a corridor.
5. Coordinate electrical outlet locations with furniture panels in order to allow access.

E. ENTRANCES AND LOBBIES

1. For small buildings and at office suites provide one entrance for staff, visitors, and the public. Where required by the Project Component Checklist, or if required for regulation compliant exiting, provide an additional employee-only entrance.
2. If required by the Project Component Checklist, divide major lobbies into secure/non-secure areas with provisions for card access turnstiles.
3. Provide power operated doors in accordance with the requirements of the UNISA Protection Services Department. Turnstile Card operated doors are preferred to Power operated sliding doors (no mat activation).
4. Provide overhangs at all public and employee entrances to reduce rain damage and protect occupants.
5. Where required by the Project Component Checklist: provide for a security desk at main lobby. Systems furniture may be used as a security desk. Provide adequate power, phone, data and security equipment provisions.
6. Provide directional graphics, directories and department signage.

F. LOADING DOCKS

1. Where required by the Project Component Checklist, provide loading dock(s) separate from main entrance and locate convenient to freight Lifts and to food service area.
2. Provide hydraulic dock leveller, dock bumpers, dock lock, dock seals and edge guards.
3. Loading dock doors are to be insulated overhead coiling type, with push button controls.
4. Provide an adjacent man door to the dock door.
5. Where required by the Project Component Checklist: Provide a separate area for a trash compactor.

G. SUPPORT SPACES

1. Locate Ablution Facilities, Change/Cloak room facilities, Cleaners' storerooms, electrical and telecom cabinets central to the core of the building space.
2. As a minimum, provide X1 Male, X1 Female and X1 disability ablution facility/block per floor in accordance with SANS-10400. If a cafeteria or food service area is part of the program, provide 1 Male, 1 Female and 1 disability Ablution Facility adjacent. These facilities may serve the entire floor, if well located. Some building programs may require separate employee and separate public toilet facilities; this requirement will have to be verified in the PCC.
 - a) The ablution facility design shall incorporate consideration of sight lines that do not compromise privacy, including the placement of mirrors, when the entry door to the restroom is in the open position.
3. Allow for vending areas, break rooms and lunchrooms.

4. **Lactation Room:** provide one per registration building and consistent with NBR. The lactation room shall be private, free from intrusion, sized to contain a table, chair, shall contain a grounded electrical outlet, and is preferred to contain a sink. *A toilet cubicle may not be used as a lactation room.*
5. **Trash and Recycling Areas:** Provide adequate and easily accessible indoor space in the vicinity of any shipping and receiving docks, areas, platforms, or secondary entrances. Provide space for paper, glass and metal recyclable containers in the Trash Area as well as in Break Rooms and Copy Areas. If required in the Project Component Checklist, provide commingled Recycling Areas and service.
6. **Mechanical Equipment Room:** Ceiling height to be a minimum of 3 meters. Control noise transmission to adjacent spaces. *Refer to Mechanical Design Requirements for additional descriptions.*
7. Locate and centralize all mechanical equipment in a machine room as much as possible. Avoid scattering miscellaneous condensing units, exhaust fans and equipment on the roof. Locate equipment behind a screen wall and integrate into the building design. Provide roof walkway pads compatible to the roofing system to roof top equipment with either tie-offs or roof edge protection for workers.
8. Locate vertical shafts adjacent to core areas with no offsets allowing for maintenance accessibility and additions for future utilities.
9. Switchgear and electrical rooms located in basement areas must have provisions for removing water with a back-up emergency electrical power source.

H. SITE PLANNING/DESIGN

1. A site survey, environmental and geotechnical investigations must be provided for review by the UE Technical Committee.
2. Minimize site disturbances when determining building, parking, site circulation and utility locations.
3. Where setback requirements allow, sites shall be attractively landscaped. Maximize the use of native plantings, drought resistant plantings and low maintenance plantings. Irrigation is to be provided in select areas only. Retention ponds on the property shall be secured from trespass.
4. Provide a designated smoking area located outside of the Office facility at a sufficient distance from windows and ventilation systems to ensure that smoke does not enter the premises; a sufficient number of receptacles specifically designed for smoking related trash to accommodate all smokers who work and conduct business in the premises; and disposal of smoking related trash. If the University facility includes both enclosed and unenclosed space, the smoking area must be located outside any enclosed space at a sufficient distance from windows and ventilation systems to ensure that smoke does not enter the enclosed space.

I. SITE CIRCULATION

1. The public and employee entrances to the building shall comply with the SANS-10400 and NBR requirements.
2. Provide enough concrete sidewalks from parking areas for easy access to building. Sidewalks shall be sized so that if vehicles overhang sidewalks there is sufficient passage width per the SAN- 10400 Part S.
3. The parking lot shall be striped and signed to designate "No Parking" areas and to accommodate the minimum number of motor vehicle parking spaces required on the premises.

4. Provide the following as a minimum at parking lots: stall size 2.5m x 5m; use 90° parking where possible; at least 10 percent of parking lot area is to be dedicated for plant islands; provide curbs around perimeter of parking lot and lot islands. The maximum combined gradient may not exceed 5 percent. If used, pre-cast concrete curbs must be anchored to the paved surface.
5. Provide disability parking and signage as per NBR and SANS-10400 requirements.
6. Paint all lines and stripes using 1 coat yellow or white "*Traffic Paint*" as appropriate & approval of the parking layout provided by the Maintenance Department.
7. Provide guardrails, curb cuts and wheel stops to meet NBR & SANS-10400 requirements.
8. Service drives are to be accessed from site circulation drives, screened as much as possible, separate from parking access and be of one-way design.
9. Provide reinforced concrete slab at dumpster locations, 2 meters long X width of garbage vehicle. Provide screen wall with lockable gate and pipe bollards at dumpster pad per local ordinance requirements. Incinerators are not allowed. Trash dumpsters and receptacles shall be screened.
10. Gradients:
 - a) Turf area gradients shall be between 3:1 and 1 percent (2 percent desirable) steeper than 3:1 requires ground cover or other erosion control. Steeper gradients than 2:1 are not acceptable. Terracing is acceptable if access for lawn equipment is provided.
 - b) Walkway gradients shall be less than or equal to 5 percent with cross slopes less than or equal to 2 percent.
 - c) Parking area or entry plaza gradients shall be between one and five percent. Steps are discouraged.

J. STRUCTURAL COMPONENTS

1. Where required by the Project Component Checklist: provide special floor loading requirements for computer room loads, special equipment loads and storage loads.
2. Design 1 bay per floor for high-density storage systems.
3. Non-structural, rigid partitions shall be adequately supported so as not to become load bearing.
4. Masonry walls are to be isolated from floor above by a gap and restrained by either an intermittent or a continuous steel angle on both sides at top of wall or steel straps extending in the wall grout.
5. Top of stud in full height walls is to be separated from the track. Use deflection tracks.
6. Building expansion is to be carried through crossing partitions.

3. EXISTING BUILDING ENVELOPE COMPONENTS

An existing building envelope being proposed for UNISA shall present a professional and permanent appearance, using durable materials in sound, weathertight, and regulation-compliant condition. Design of the exterior envelope shall not rely on caulking and sealants for moisture exclusion.

- a) Acceptable exterior wall materials include:
 - Brick masonry and brick veneer
 - Split-face, glazed, or honed concrete masonry units. Painted concrete masonry is not acceptable except at the rear or non-public elevations of the building.
 - Insulated architectural metal panels.
 - Stone masonry and stone veneer.
 - Exterior insulating finish systems.

- b) Acceptable roofing materials include:
- Concrete roof structures.
 - Built-up or single-ply membrane roof systems.
 - Metal roof panels.

4. INTERIOR COMPONENTS CONSTRUCTION

A. Gypsum Board and Non-Structural Framing:

Metal framing members: 20 gauge minimum, corrosion resistant steel, 70 - 100mm, channel type at 600mm on center. Verify gauge size with actual span and loading conditions. Provide pre-manufactured deflection track at full height wall construction extending to either a floor or a roof deck.

B. Gypsum board:

1. Minimum 6.4mm thickness attached with 51mm long drywall screws and finished per installation standards below.
2. Provide 15mm cementitious board at ceramic tile finish surfaces susceptible to water contact.
3. Provide 15mm water resistant gypsum board at areas subject to high humidity/moisture exposure or to water damage.
4. Exterior wall insulation is to be covered from floor to roof deck with 15mm gypsum board as noted above. Gypsum board above the acoustic ceiling line may be unfinished.
5. Installation: Gypsum board shall be installed and finished as per manufacturer's instruction.
6. Trim and accessories: Use aluminium trim. Provide fire treated 20-gauge metal wall reinforcement for ablution facility accessories, wall mounted mechanical and electrical equipment, wall mounted cabinets, and other miscellaneous wall supported accessory items.

C. Gypsum Plastering:

Portland cement plaster consisting of 3 coats over metal lath and/or 3 coats over concrete masonry units, float finish.

D. Applied Fireproofing:

High-density cementitious, cement-fiber or mineral fiber formulations. Fireproofing materials and applications shall comply with the South African National Standards and Building Code, local fire marshal directives and UL requirements. Applied fireproofing component materials are to be from a single manufacturer. Surfaces are to be cleaned and prepared per manufacturer's recommendations. Repair and patch fireproofing material at areas subject to damage from pipe hangers, and equipment installation.

E. Fire and Smoke Resistive Joint Systems:

Fire and smoke resistive joint systems including through-penetration firestopping of fire-rated construction. Components are to be from a single manufacturer complying with the National Building Regulations, local fire marshal directives and fire department requirements. The selected system must conform to the construction type, type of material penetrating the surface, and the type of space in which the penetration is located.




F. Joint Sealants:

Provide either silicone or polysulfide elastomeric joint sealants at gaps between dissimilar materials, offsets, areas of expansion movement, and areas of water and air penetration and where visual appearance is critical.

G. Rough Hardware:

Furnish all necessary nails and screws and all items generally classed as "rough hardware" including bolts, washers, anchors, straps, etc. that are required for proper assembly.

DOOR TYPES LEGEND

DESIGNATION	DOOR TYPE DESCRIPTION	
Boardrooms & Conference Centres	2400mm(H) X 1600mm(W) X 40mm thick semi solid double door, <i>Dark Oak Veneer</i> finish with aluminium door frame for glass/drywall partitions & steel frame for masonry walls. Including 6.38mm laminated glazed panel inserts.	
Meeting Rooms	2400mm(H) X 900mm(W) X 40mm thick semi solid door, <i>Dark Oak Veneer</i> finish with aluminium door frame for glass/drywall partitions & steel frame for masonry walls. Including 6.38mm laminated glazed panel inserts.	
Executive Offices	2400mm(H) X 900mm(W) X 40mm thick semi solid door, <i>Dark Oak Veneer</i> finish with aluminium door frame for glass/drywall partitions & steel frame for masonry walls.	
Ablution facilities	2032mm(H) X 900mm(W) X 40mm thick hollow core door, painted finish as per door schedule with aluminium door frame for drywall partitions & steel frame for masonry walls.	
Storerooms	Standard 2032mm(H) X 813mm(W) X 40mm thick hollow core door, painted finish as per door schedule with aluminium door frame for drywall partitions & steel frame for masonry walls.	
Open Plan Office entrance	2400mm(H) X site specific width X 50mm thick aluminium framed 10mm thick laminated glass panel door.	
Boardrooms & Conference Centres	Site Specific (H) X 1600mm(W) X 40mm thick solid double door, <i>Dark Oak Veneer</i> finish with 100mm solid meranti architrave frame stained to match door finish. Including 6.38mm laminated glazed panel inserts. <i>For Existing Masonry wall application only.</i>	
Meeting Rooms	Site Specific (H) X 900mm(W) X 40mm thick solid door, <i>Dark Oak Veneer</i> finish with 100mm solid meranti architrave frame stained to match door finish. Including 6.38mm laminated glazed panel inserts. <i>For Existing Masonry wall application only.</i>	
Executive Offices	Site Specific (H) X 900mm(W) X 40mm thick solid door, <i>Dark Oak Veneer</i> finish with 100mm solid meranti architrave frame stained to match door finish. <i>For Existing Masonry wall application only.</i>	
Note: 6 weeks – 8 weeks manufacturing lead-time applied to all “oak veneer” doors & fire doors.		
DOOR/FRAME TYPES: -Offices, Conference Rooms, Toilet Rooms: Standard Duty* -Mechanical Rooms, Electrical Rooms, Service Rooms: Heavy Duty* -Service Entrance Doors at building exterior: Extra Heavy Duty* -Interior doors at offices, conference rooms, stairwells and other heavily used locations are to have a glass side light as a minimum. -Interior doors shall be furnished with 150mm wide x 600mm high window openings and glazing (wired glazing if required by building code) on the storage room, break room and all pass-through doors.		
HARDWARE LEGEND		
DESIGNATION	HARDWARE TYPE DESCRIPTION	SYMBOL
Main Entrance Doors Conference Centres	400mm X 32mm Hollow pull handle back-to-back fixing (stainless steel) door handle with cylinder roller bolt lock, & profile cylinder escutcheons.	
Boardrooms Meeting Rooms Executive Offices Standard Offices	Lever handle on rose with profile cylinder escutcheons (stainless steel) door handle with cylinder sashlock profile.	
Ablution Facilities Storerooms Service Area	200mm X 22mm Straight pull handle on 150mm X 150mm backplate (Stainless steel) with adjustable roller bolt.	

5. OPENINGS - TABLE A1 (ARCHITECTURAL DOOR, ROOM & FINISHES SCHEDULE)

- A. Aluminium Entrances, Storefronts and Curtainwall:** Standard extruded aluminium and glazed systems with a minimum 50 – 100mm member width, equal to systems by WISPECO, Sheerline, or Reusable Walling Systems. Finishes shall be either clear anodized, electronically deposited colour, or fluoropolymer.
1. Doors are to have, at minimum, medium stiles and rails, with a 250mm bottom stile. Framing members are to be configured to accept insulated glazed units. All *exterior* doors shall be weather-stripped, have commercial quality SABS and SANS 10400 XA compliant aluminium threshold.
 2. Automatic door operators are to be SABS and SANS 10400 XA compliant, electronically operated, surface mounted with weather tight aluminium housing. Operator is to be provided with an adjustable time delay. Provide 150mm diameter push plate for activation.
 3. Exterior and Storefront Glazing: 10mm thick, Class A, low “E” glass, tempered or laminated as required by National Building Regulation. Glass shall be laminated and blinds to be installed to reduce glare.
 - a. Standard specification - Blind Design: Roller blind; Sheerweave 4500 “Blue Grey- 5%” UV
 - b. Executive specification - Blind Design: Roller Blind “Salta Pewter”
 - c. Boardroom specification - Blind Design: Roller Blind “Mendoza Pewter” blackout
- B. Insulated Metal Doors:** Other *exterior* doors, not at the main entrance, shall be custom insulated metal construction, heavy-duty commercial quality. Frames shall be prefabricated combination buck, frame, and trim type. Mitered joints shall have locking tabs at frame rabbets and backboards. All *exterior* doors shall be weather-stripped, and have a commercial quality SABS and SANS 10400 XA compliant aluminium threshold.
- C. Overhead Coiling/Roller Doors:** Are to be galvanized steel, with manufacturer’s standard paint finish. At exterior locations, provide insulated polyurethane cores with jamb and sill weather stripping. Lift mechanism shall be torsion spring on cross head shaft with steel lift cables. Doors shall be electronically operated with standard three button open-close-stop type controls. Each door is to have separated controls.
- D. Upward-Acting Sectional Doors (Garage Doors):** Galvanized sheet steel with polyurethane insulation bonded to facing sheets with manufacturer’s standard finish paint. Provide weather stripping. Provide torsion spring lift mechanism on cross head shaft with braided steel cables, Provide a Class 1 electric operated motor, side mounted on cross head shaft, adjustable safety friction clutch, gear driven limit switch, magnetic cross line reversing starter, mounting brackets and hardware. Surface mounted control station is to be a standard three-button open-close-stop type; separate controls for each electric door operator. All upward acting sectional doors shall have an electric eye type safety override.
- E. Existing Building Windows:** Provide window openings around at least two sides of the perimeter of the premises, on each floor at grade level. At least 15% of the wall surface on each level of the three sides shall be glazing to admit natural light. Glazing shall be 10mm thick, Class A, low “E” glass, tempered or laminated as required by regulation. Glass shall be laminated with Vinyl frosting or receive roller blinds installed as per UNISA blinds specification.
- F. Interior Glazing:** Tempered or laminated, or wire glazing as required by regulation.
- G. Bullet Resistant Glass:** at Level 3 per UL 752. Provide at transaction windows.
- H. Observation Windows:** One-way mirror glazing in hollow metal or wood frame.
- I. Caulking:** Acrylic caulking compound for interior use shall be a 1-part, 100% liquid polymer, acrylic base compound, and non-sagging, non-staining, gun consistency.
1. Maximum joint size is 6mm; backer rods are required per manufacturer’s recommendation.
- J. Interior Doors and Openings:** Use 2400mm height and 900mm width doors wherever possible to accommodate outmost ease for wheelchair access. Doors are to swing against a wall whenever possible with a doorstop. Doors and frames shall bear SABS approved labels. Vertical rod panic devices are not permitted. 6 weeks to 8 weeks lead-time for manufacturing of the door may apply.

1. Hollow metal steel doors are to be flush with composite construction Grade II, heavy-duty, 18-gage cold-rolled, 40mm – 90mm thick at interior locations and Grade III, extra-heavy duty, 16 gage galvanized steel 40mm – 90mm thick at exterior locations. Core types shall be as required for the fire rating required by code.
 2. Interior steel frames may be welded or knockdown type, 16-gage steel. Exterior steel frames must be welded type 16 gage-galvanized steel. Doorframes to be anchored with three anchors minimum per jamb. All door frames are to have door silencers and plaster guards.
 3. Either wood doors at interior locations are to be 40 - 90mm premium grade, solid core, hardwood faced, with a field or factory applied finish. Hollow core doors are not acceptable. Face veneer shall be select grade hardwood, of standard commercial thickness not less than 50mm before sanding.
 4. Similar commercial plastic laminate faced or hollow metal may also be provided if approved by the Local Authority.
- K. Access doors:** Are to be fabricated with 16 gage steel frames with 14 gage steel doors, primed with a cylinder lock.
- L. Hardware:** Hardware shall be detailed, handled, supplied and serviced through an architectural hardware consultant. Where required by the Project Component Checklist, provide an electronic access control card operated system. Lessor's existing card operated system may be used if approved by the Tenant Agency.
1. Individual offices, storage rooms, individual restrooms, conference and specialized rooms shall be lockable by a twist button on room side and unlockable by key on corridor side or untwist of room side locking button. All toilet room doors shall be provided with door closers and ball bearing type hinges. Security room door and frame shall be steel with heavy-duty hardware to include interior hinges, or hinges with non-removable pins, and separately keyed with no master key control. Owner/Lessor to supply two (2) keys.
 2. Hardware shall conform to applicable requirements of the SABS, for fire rated doors and frames with appropriate sections of SANS 10400. Hardware shall be made to blueprint template and be furnished to door and frame manufacturer.
 3. For all other conditions comply with the following:
 - a) **Quality level:** Heavy duty commercial - All door handles shall be of heavy-duty SABS compliant lever type, except those on doors to hazardous areas. Brass keys, interchangeable cores, weatherproof if exterior.
 - b) **Exterior:** Weatherproof, heavy-duty cylindrical lockset with pull bar handle type. All exterior locksets shall be DORMA or approved equal and must be designed or protected so any wrenching device cannot grasp them. Knob handles are not acceptable. All entry doors shall be equipped with an electric push button operator for the disabled. Push switch plates shall be 85mm diameter with embossed wheelchair symbol. All double doors at entrances shall be equipped with a tamper-proof astragal and have vertical deadbolts at the top and bottom of each door (verify with local fire marshal requirements).
 - c) **Interior:** Cylindrical lockset with heavy-duty lever handle, DORMA or approved equal. *Knob handles are not acceptable.*
 - d) **Exit devices:** Similar in performance to 'Von Duprin, 990 Series', steel, with finish to match other hardware, SABS approved. Outside trim shall be fastened by means of concealed lugs and through-bolts to the active case. Interior vestibule exit doors shall be equipped with the Latch Paddle or approved equal.
 - e) **Closers:** All exterior doors shall be equipped with high frequency, SABS and SANS 10400 compliant closers. Door closers shall have key valves for back check, speed, and latching. Degree of opening shall be maximum possible without causing interference or damage to door or trim. Exterior closers shall be lockable in the full-open position. Closers



shall be fastened to doors with sex bolts. All door closers shall be by DORMA or approved equal.

- f) **Keying:** Provide and install construction locks in cylinder cores on all exterior doors. The Owner / Lessor shall provide cylinder cores and keys. The Owner/Lessor shall supply two keys per lock, and four master keys.
- g) **Hinges and butts:** Full-mortise type with non-removable pins at exterior doors. Hinges shall be provided with stainless steel pins; oil impregnated bronze bushings, or concealed ball bearing units. Provide 1-1/2 pair of hinges for each door.
- h) Hinged exterior doors, except fire doors, shall require no more than 4kgs of force for operation; hinged interior doors shall require no more than 2.5kgs of force for operation. Fire doors shall have the minimum opening force required by the fire marshal.
- i) **Push/pull units:** Through-bolted type.
- j) **Doorstops:** Floor mounted, with aluminium & rubber blocking.
- k) **Weather-stripping:** At all exterior hollow metal and aluminium doors provide perimeter door seals, door sweeps and barrier free aluminium thresholds.

6. FINISHES - ARCHITECTURAL DOOR, ROOM AND FINISH SCHEDULE

A. Tiles:

1. All toilet facilities wall surfaces are to have 300mm X 600mm glazed porcelain tile, floor to ceiling height with dove grey cement grout. Tile is to be plain faced, as per tile spec below.
2. All toilet facility floors are to have 600mm X 600mm non-slip porcelain tile, thin set with cement grout to match tile colour.
3. All Change/Cloak room facilities wall surfaces are to have 300mm X 600mm glazed ceramic tile, floor to ceiling height with dove grey cement grout. Tile is to be plain faced, as per tile spec below.
4. All Change/Cloak room facilities floors are to have 600mm X 600mm non-slip porcelain tile, thin set with dove grey cement grout. Tile is to be plain faced, as per tile spec below.
5. Other tile finishes may include mosaic, with non-slip surfaces for showers & glass mosaic to decorative purposes. ***This is subject to approval by UE technical committee.***

Location	Manufacturer (or approved similar)	Item	Estimated Unit Cost (Excl. VAT)
Kitchen/ Ablution floors	600mm X 600mm Full bodied porcelain tile. Colour: Murano White Supplier: Union Tiles		<i>R p/m²</i>
Ablution walls	600mm X 600mm Full bodied porcelain tile. Colour: Grey (Polished) Supplier: Union Tiles		<i>R p/m²</i>

Ablution walls (Listello) <i>Applied as per technical documentation</i>	10mm X 10mm Listello between wall tile. Colour: Stainless steel Supplier: Sure Strip		<i>R p/strip</i>
Change/Cloak room shower wall & floor mosaic	300mm X 300mm ceramic mosaic tiles Colour: Grey Mix Supplier: Union Tiles		<i>R /each</i>
Kitchen splash back	100mm X 200mm Bevelled edge ceramic "Subway" Tile Colour: White (Polished) Supplier: Union Tiles		<i>R p/m²</i>

B. Acoustical Panel Ceiling:

1. Minimum ceiling height shall be not less than 2400mm above finished floor, except in small rooms or limited areas, such as mechanical or janitorial rooms, which *may* have ceiling heights of a minimum 2100mm with accordance to the NBR & SANS 10400 regulations.
2. Ceiling panels are to be Saint Gobain: Ecophon Gedina A-TECH (or approved equal) with an exposed profile. Size to be 600 X 1200mm X 15mm thick white 500. Minimum panel size at walls shall be no smaller than 150mm.
3. Ceiling suspension systems are to be equal to Saint Gobain: Gypcroc Donn T38V/T37V grid system (or approved equal). Provide all necessary attachment devices, hold-down clips, wall angle, acoustical sealant and hangers per manufacturer's recommendations. Do not hang suspension system off pipe, conduit or ductwork. Suspend lighting fixtures independently of the ceiling suspension.
4. Ceiling suspension systems are to be equal to Saint Gobain: Gypcroc Donn T38V/T37V grid system, white direct hung heavy-duty double-web exposed tee system (or approved equal). Provide all necessary attachment devices, hold-down clips, wall angle, acoustical sealant and hangers per manufacturer's recommendations. Do not hang suspension system off pipe, conduit or ductwork. Suspend lighting fixtures independently of the ceiling suspension.

C. Gypsum Board Ceilings: Provide painted, 6.4mm gypsum board ceilings in airlock entry vestibules, cleaner's storerooms and secure rooms. Provide 600mm x 600mm steel access door to ceiling systems for maintenance of equipment or repair of system.

D. Resilient Flooring:

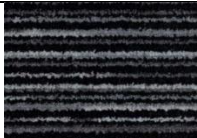

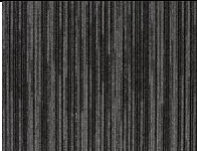



1. Resilient tile flooring to be vinyl composition tile, Composition I, non-asbestos formulated, Class 2, 300mm x 300mm x 3mm thick.
2. Vinyl wall base shall be 100mm in height x 3mm thick. Provide cove base at vinyl composition tile locations, vinyl or rubber treads at all stair treads locations. Provide vinyl edge strips at terminations and transitions.

E. Access Flooring: If required by the Project Component Checklist only: Access flooring panels shall be lightweight concrete filled zinc-coated steel pans with a rigid bolted pedestal understructure secured to the concrete floor.

1. Minimum design load for access flooring system shall be 570kgs minimum with a minimum uniform load of 180kgs/sf facing material shall be carpet in office areas and plastic laminate in data rooms. Provide all ramps, steps, aluminium guardrail accessories.
2. At office areas provide flush electrical/telephone/data outlet boxes with hinged cover and with adjustable air supply dampers. At data room locations, all cut-outs for data cable are to be grommeted with nylon brush closures. Provide perforated tiles for air supply.

F. Carpet: Fire index: SANS 10177 – IV) VOC tested.

1. Chair pads are required for protection of carpet texture. Absent the use of chair pads, maintenance that is more intensive will be required for areas in direct contact with chair caster traffic, and some degree of appearance change is to be expected. See Lease for requirements for carpet replacement.

Location	Manufacturer (or approved similar)	Item	Estimated Unit Cost (Excl. VAT)
Entrance Walk-off Carpet	FloorworX Coral DUO entrance system (site specific sizes) Colour: Silver shadow 3201		<i>R p/m²</i>
Boardrooms & Meeting Rooms & Executive Offices	500mm X 500mm Belgotex: Accelerate "Edit range", Solid colour <i>laid in monolithic pattern</i> (or approved equal)		<i>R p/m²</i>
Standard Enclosed Offices	500mm X 500mm Belgotex: "Fringe range", Bullion colour <i>laid in Tessellated pattern</i> (or approved equal)		<i>R p/m²</i>
Open Plan offices	500mm X 500mm Belgotex: "Fringe range", Pom Pom, Bullion & Layered colour combination <i>laid in a Tessellated pattern</i> (or approved equal)		<i>R p/m²</i>
High Traffic field Carpet (Study areas)	500mm X 500mm Belgotex: Main street "Berber point 920", Beyond & Tactic colour combination <i>laid in a Tessellated pattern</i> (or approved equal)		<i>R p/m²</i>
High Traffic field Carpet (Walkways)	600mm X 600mm Full bodied porcelain tile. Colour: Dove Grey Supplier: Union Tiles		<i>R p/m²</i>

- G. Wall Coverings:** Provide Type II medium duty in offices and areas not subject to high traffic. Provide Type III heavy-duty wall covering in high traffic areas such as corridors, toilet rooms and break rooms. Provide 30mm X 30mm stainless steel corner protectors up to ceiling height for painted wall covering in customer facing areas. Provide clear plastic, vinyl, or poly corner guards up to 1500mm above finish floor on all outside corners to protect vinyl wall covering.
- H. Painting:** Painted surfaces shall receive one coat of primer and two coats of finish. The Contractor shall submit a complete room finish schedule for approval prior to construction. Colours shall be selected and/or approved by UE Technical committee. Use only first-line commercial products for all coating systems.




Exterior	Paint / Coating
Concrete and Stucco	2 coat exterior polyvinyl emulsion
Concrete Masonry Units	1 coat latex block filler. 2 coats exterior acrylic
Ferrous Metal	1 coat synthetic rust-inhibiting primer, 2 coats full-gloss alkyd enamel
Zinc-Coated Metal	1 coat galvanized metal primer, 2 coat full-gloss alkyd enamel
Interior	Paint / Coating
Concrete Walls	2 coats latex interior flat <i>(do not use as a primer)</i>
Concrete Masonry Blocks	1 coat latex block filler, 1 coat interior enamel undercoat, 1 coat interior double velvet
Gypsum Drywall Ceiling	1 coat latex interior primer, 1 coat latex flat
Gypsum Drywall Partition	1 coat latex interior primer, 2 coats interior double velvet odourless
Gypsum Drywall to Receive Wall Covering	1 coat latex interior primer
Woodwork & Hardboard (Painted)	1 coat interior enamel undercoat, 2 coats alkyd gloss enamel
Woodwork & Millwork (Stained)	1 coat synthetic rust-inhibiting primer, 1 coat oilbased interior wood stain, 1 coat shellac, 2 coats oil rubbing varnish
Ferrous Metal	1 coat galvanised metal primer, 1 coat interior enamel undercoat, 1 coat exterior alkyd gloss enamel
Zinc-Coated Metal	1 coat galvanised metal primer, 1 coat interior enamel undercoat, 1 coat exterior alkyd enamel



- All exposed piping, conduit mechanical and electrical components in finish areas are to be either field painted or pre-painted by the manufacturer.
 - Provide odourless paint when painting in areas occupied by personnel regardless if painting operations are conducted during or after business hours.
- I. Interior Window-Sills:** shall be durable water and moisture resistant materials such as High-density Polyethylene (HDPE), finished hardwoods and/or solid surfacing. *Gypsum board or softwood window-sills are not acceptable.*
- J. Plywood Backboards and Wall Blocking:** Plywood backboard will be finished with 2 coats of white enamel paint.







7. SPECIALITIES






- A. Visual Display Surfaces:** Marker boards are to be porcelain enamel faced for liquid-type markers with core material and backing with an aluminium tray.
- B. Directories:** If UNISA is the sole tenant and occupies 100% of the building, provide a building directory at the main entry point. The directory shall be as per UNISA's *Department of Institutional Advancement* guidelines.

- C. Interior Signage:** Interior signage shall meet the per UNISA's *Department of Institutional Advancement* signage design guidelines. The design is available on request.
- D. Exterior Post, Panel and Pylon Signage:** If required by the Project Component Checklist, provide an illuminated exterior sign, mounted on a post or pylon. Design of the sign shall be approved by UNISA's *Department of Institutional Advancement*.
- E. Telephone Specialties:** refer to the Project Component Checklist
- F. Toilet Compartments:** At public or employee use toilet facilities locations, toilet cubicles, urinal screen and privacy panels are to be fabricated from HDPE or other MFD surfacing material.
1. Toilet cubicles are to be floor and wall supported; ceiling hung with security over-ride latching devices. Urinal screens are to be wall hung. Any miscellaneous partitions are to be wall hung or floor supported. All fasteners and hardware are to be tamperproof.
- G. Toilet facilities shelving:** At employee Change/Cloak room facilities, provide a minimum 1 tier steel locker unit per employee, size: 450mm(D) X 380mm(W) X 1850mm(H)
- H. Toilet and Bath Accessories:** All toilet accessories are to be SABS compliant. Use recessed or semi-recessed as required to maintain clear pathway. Coordinate dispenser type with towel and tissue type provided by building maintenance. Combination units provide cost savings in installation.

Sanitary Fittings Schedule			
Item	Manufacturer (or approved similar)	Description	Estimated Unit Cost (Excl. VAT)
WC 	<i>Vaal Sanitary</i>	Vitreous china "orchid" 90° outlet top inlet (code 439100) or back inlet (code 439016) closed rim back-to-wall pan. top inlet can be used with an exposed flushvalve. Product Code: 493550WH Colour: White	R
WC (Paraplegic) 	<i>Plumblink</i>	Lecico Atlas CC "paraplegic Suite" semi-close coupled 90° outlet open rim washdown pan and matching 9 litre cistern complete with lid, fitments, and purpose made c.p Side-flush lever (left or right). Supplied with purpose made thermoset seat and cover plate. The suite is designed to flush effectively on 6 litres. (Excluding Seat & Rails) Product Code: 750202WH Colour: white	R
WHB 	<i>Vaal Sanitary</i>	Vitreous china 575mm x 455mm "Midi weaver" rectangular vanity mounted basin with one taphole. Product Code: 706601WH Colour: White	R

WHB (Paraplegic) 	<i>Vaal Sanitary</i>	Vitreous china 510mm x 405 rounded 'hibiscus' basin with one taphole configuration. integrated overflow and chainstay hole through the centre semi-punched taphole. (Excluding Pedestal) Product Code: 702303BE Colour: White	R
Urinal 	<i>Vaal Sanitary</i>	Vitreous china wall hung 'lavatera' urinal with top inlet (code: 705426). Overall size 600mm x 385mm x 380mm. Top inlet fitting code: 7054z1, include a 38mm c.p. domical grating, a spreader (with a 20mm diameter thread) and two hanger brackets. Product Code: 705400WH Colour: White	R
Urinal Divider 	<i>Vaal Sanitary</i>	Vitreous china 'urinal divider' (code: 705228wh), complete with screw and bracket. Suitable for use when 'lavatera, sweetpea or flatback urinals are installed in range. Colour: White	R
Sink 	Franke	'Projectline' PLN 611 single bowl inset sink, recessed drainage ledge and 38mm diameter waste fittings size: 800mm x 460mm Finish: Stainless Steel	R
Basin Tap (Standard) 	Cobra Sanitaryware	Single lever basin mixer. 1½" bsp female connection inlets Sans 1480 Code: NA-951 NOKA	R
Basin Tap (Approval Required) 	Cobra Sanitaryware	Single lever basin mixer. 1½" bsp female connection inlets Sans 1480 Code: EL-3014	R

Basin Tap (Paraplegic) 	Cobra Sanitaryware	Elbow action pillar tap square type with blue indice. ¼ turn ceramic disc. ½ bsp male connetion inlet. Sans 226 type 2.	R
Sink Tap 	Cobra Sanitaryware	Sink pillar tap with aerated swan neck swivel outlet. ½ bsp male connetion inlet. Sans 226 type 2	R
Shower Head (Change/Cloak room only) 	Cobra Sanitaryware	Prestex single function shower head. 1½" bsp female inlet	R
Shower Arm (Change/Cloak room only) 	Cobra Sanitaryware	Shower arm with wall flange. 1½" bsp male inlet x 1½" bsp male inlet x ±158mm throw.	R
Shower Diverter (Change/Cloak room only) 	Cobra Sanitaryware	Classic 4-way diverter. 2 x ¾" bsp female inlets, 1 x ½" bsp female shower outlet.	R
Basin Waste 	Cobra Sanitaryware	Un-Slotted bath aqua-waste (click-clack waste) 70mm diameter flange, 40mm long shank, 1½" bsp male outlet connection. <i>Finish: Chrome Plate</i>	R

Bottle trap 	Cobra Sanitaryware	Re-seal bottle trap with telescopic basin connection pipe. <i>Finish: Chrome Plate</i>	<i>R</i>
Toilet Flushmaster 	Cobra Sanitaryware	Exposed type, back entry toilet flush valve with control stop and wall flange. With bent flush pipe and pan connector. <i>Sans 1240</i> Horizontal telescopic adjustment (control stop valve body) for easy installation.	<i>R</i>
Urinal Flush-Valve <i>(Approval Required)</i> 	Cobra Sanitaryware	Exposed type, touch-free electronic control valve. Chrome plated	<i>R</i>
Wall Waste Bin 	Volkem Hygiene	27L Steel wall mounted waste bin. Colour: Stainless Steel Code:	<i>R</i>
Sanitary Bin Container 	Volkem Hygiene	12L Pedal operated sanitary bin, smooth, ridge-free design for ease of wipe down. Colour: Satin Silver Dimensions: 463mm(D) X 140mm(W) X 480mm(H) Code:	<i>R</i>
Toilet Roll Dispenser 	Volkem Hygiene	3 Roll toilets dispenser stainless steel T3, with lockable padlock at the top. SABS approved Colour: Stainless steel Dimensions: 145mm(D) X 127mm(W) X 380mm(H) Code:	<i>R</i>

Foam Seat Sanitiser 	Volkem Hygiene	500ml Polypropylene plastic manual/push spray foam toilet seat sanitiser, with lifetime warrantee & hygienically sealed industry leading evacuation-controlled dosing system. SABS approved Colour: Stainless steel Code: WD/06MII	R
Hand Soap Dispenser 	Volkem Hygiene	700ml Classique Touch free soap dispenser. SABS approved Colour: Stainless steel Code	R
Hygiene Bag Dispenser 	Volkem Hygiene	Hygiene bag dispenser for the discreet and safe removal of sanitary waste, installed next to the toilet roll holder. Colour: Stainless steel Dimensions: 250mm(D) X 86mm(W) X 130mm(H) Code:	R
Condom Dispenser 	N/A	230mm(W) X 120mm(D) X 300mm(H) Stainless steel Silverline Duo condom dispenser. Colour: Stainless steel Code:	R
Air Freshener Dispenser 	Volkem Hygiene	Aquarius air care dispenser Colour: White Code: T1818144	R
Urinal & Toilet Sanitizer 	Volkem Hygiene	93mm(D) X 152mm(W) X 224mm(H) Digital urinal & toilet sanitizer, automatically dispensing a cleaning product into once every 15 minutes. Colour: Satin silver Code: AS002	R
Hand Dryers 	Volkem Hygiene	Golden Touch Hand Dryer – Model JXG-250AS Power: 2.3Kw Ingress protection (IP) rating: IPX1 Colour: Stainless steel Code: HD015	R

- I. Operable Partitions:** Where required by the Project Component Checklist, provide an electrically operated, folding panel partition system, ceiling suspended with overhead track. Panels are to be vinyl faced and side stacked with a minimum 50 STC rating (Acoustic rating). Provide all necessary steel support framing. Verify existing structural framing capacity with operable partition loads. Manual operation acceptable for small partitions only.
- J. Fire Extinguishers and Cabinets:** Fire extinguishers are to be provided per the requirements of the NBR & SANS 10400 regulation. Fire extinguishers shall be multipurpose dry chemical type sized and rated for project requirements. Provide flush mounted in recessed wall cabinets in public, office and work areas and provide surfaced mounted on metal brackets at warehouse and storage areas. Cabinets are to be recessed trimless type with aluminum baked enamel finish. Doors are to have glass panels with flush type opening device.
- K. Built-in Projection Screens:** Where required by the Project Component Checklist, provide electrically operated, recessed, ceiling mounted screens. Viewing surface is to be matte white and edge treatment is to be without black masking borders.
- L. Window Treatments:** Provide commercial grade prefinished horizontal aluminium blinds for kitchens, toilet facilities and storerooms. Fabric roller blinds to be provided for office areas, with chain and cord for manual operation.
- M. Shopfitting/Woodwork:**
 1. All shopfitting for break rooms, conference rooms and work areas is to be Melawood board with frameless construction and full overlay doors. Melawood shall comply with SABS Standards Specifications for General Purpose Grade with selection from standard selections, solid colours or wood grains.
 2. Kitchen cabinets shall be complete with hardware, drawers, dividers, and adjustable white melamine shelves. Drawers shall be suspended on steel slides with ball bearing type nylon rollers for ease of operation. Drawer slides shall have a 45kgs Load rating. Provide bar handles compliant with the SABS.
 3. All hardware and fittings shall be equal to Roco fittings products.
- N. Bullet-Resistant Panels:** Fiberglass ballistic panels shall be 12mm thickness with level-2 rating. Face bullet resistant panels with gypsum board to be level-3 rating.
- O. Shelving:** Provide metal shelving in the cleaners' storeroom for storage of cleaning supplies.
- P. Entrance Floor Grilles:** At all public and employee exterior entrances provide recessed entrance floor grilles. Floor grilles and frames are to be extruded aluminium. Floor grilles are to have top-surfaced tread rails with nylon carpet inserts.

8. CONVEYING SYSTEMS

- A. Passenger Lifts:** Compliance with the requirements of the NBR and SANS 10400 regulations will provide the minimum determination for provision of a passenger lifts, unless specified in the Project Component Checklist.
 1. For typical 2-stop application provide a hole-less hydraulic passenger lift system, 1200kgs capacity minimum with a finish clear carb size of not less than 1500mm X 1500mm with a minimum ceiling height of 2100mm. Cab speed shall not be less than 24meter per minute. For facilities requiring more than 2 stops, or depending on building size and use, multiple lifts, larger lift platform sizes, speed and weight capacity will be required. Lift cabs are to have vinyl laminate side walls,

protective bumpers and skid-resistant vinyl composition tile floor surface. Furnish removable protective pads.

B. Goods Lift: A goods lift is required for a building over 2 stories. The need and description for a goods lift in a two-story building is to be noted in the Project Component Checklist.

1. A goods lift, at minimum, shall be Class A, hydraulically operated, with a minimum of 1200kgs loading capacity. The minimum clear cab floor size shall be 1800mm X 2700mm. Goods lift ceiling height should be a minimum of 2400mm to facilitate moving equipment and furnishings. Lift cabs are to have vinyl laminate side walls, protective bumpers and skid-resistant vinyl composition tile floor surface. Furnish removable protective pads.
2. Lift shaft way, electrical, and mechanical, emergency function, and lift components are to be designed, manufactured and installed to comply with the latest edition of the SANS 10400 regulation as well as meet NBR requirements. No building HVAC or plumbing system piping shall be allowed in the lift shaft or machine room. *If HVAC or piping is specifically required for the lift system the design and installation shall be coordinated with the lift manufacture.*

9. FIRE SUPPRESSION

- A.** Fire Protection and Fire Detection/Alarm Systems shall be provided in all Unisa premises. Fire protection systems are to conform to National Building Regulations and local regulations.
- B.** Sprinkler piping shall be schedule 40, schedule 10, or copper
- C.** Concealed type sprinkler heads shall be used in all occupied areas. In existing buildings, sprinkler heads shall be replaced if they have been recalled.

10. MECHANICAL, PLUMBING & HVAC

- A.** Meet or exceed all South African National Standards and Local vicinity code and regulation requirements for the mechanical systems in all Unisa premises and leased, owned, or operated facilities. Some of the requirements of this standard exceed code requirements.
- B.** Coordinate additional amenities and requirements with the building program as defined in the RFP, Project Component Checklist, or project statement.
- C. Existing mechanical and HVAC Conditions:** Existing equipment and components intended for reuse shall be in clean, operable, and efficient condition. All existing piping which is re-used shall be labeled. The existing piping and ductwork, including connections and diffusers, shall be thoroughly inspected for size, condition, and suitability for re-use.
- D. Existing HVAC components:** piping and devices no longer being used shall be completely removed and not abandoned in place. All openings in existing walls, floors, and shafts shall be properly fire-stopped after the removal of old HVAC components and piping.
- E. Gas Service Entrance:** Gas piping entering the building must be protected from accidental damage by vehicles, foundation settlement or vibration. Where practical, the entrance should be above grade and provided with a self-tightening swing joint prior to entering the building.

F. Mechanical/HVAC Design and Planning

1. Energy savings should be a primary component and part of the selection of HVAC equipment. The facility or building design shall comply with both the mandatory and prescriptive provisions of latest ASHRAE standards. The proposed building performance rating compared to baseline building performance rating per ASHRAE standards (without amendments) by building simulation method is to be 14% higher on new buildings and 7% higher on existing buildings.
2. Design systems that require zero use of CFC-based refrigerants for new systems; complete a comprehensive CFC phase-out conversion when reusing existing systems.
3. Design HVAC and refrigeration systems with refrigerants with no or very little ozone depleting potential. Projects shall comply with current LEED guidelines and standards.
4. Establish temperature and humidity comfort ranges and design the HVAC system to maintain the comfort ranges (See Table M1) in accordance with ASHRAE.
5. Require an assessment of tenant space or building thermal comfort within a period of 8 to 12 months after occupancy. Based on the assessment, a corrective action plan is to be developed if Table M1 requirements are not maintained. This plan shall include measurement of relevant environmental variables in problem areas in accordance with ASHRAE.
6. Duct sizing and velocities shall be designed to minimize air noise.
7. Kitchen or other exhaust hoods shall meet NBR regulations and health department requirements.
8. For facilities 1500 square meters and above, provide a building automation system to monitor and control lighting, ventilation, heating and air conditioning systems. The Lessor shall provide the latest technology and technology integration for building automation systems.
9. Fire alarm and security system must function as stand-alone systems with an interface to the building automation system.
10. Vertical zoning: Layer components in the ceiling space with the plumbing and sprinkler piping zone near the underside of the structure, the HVAC duct zone in the middle and the lighting zone immediately above the ceiling system. Sufficient space must be provided to accommodate future lighting relocations and changes without the need for moving HVAC or other components.
11. Valves are to be located in accessible ceiling and wall areas where possible. Provide access panels in gypsum board ceilings and wall locations. Coordinate with furniture plans.
12. Mechanical systems are to be designed with future expansion in mind. Provide valves, controls etc. at locations where future equipment tie-ins would be likely and where systems isolation seems prudent.
13. Allow adequate space for maintenance access to coils, pumps, filters etc.
14. HVAC equipment shall not be placed in ceiling spaces above computer rooms, server rooms, electrical rooms, telephone rooms etc.
15. All mechanical rooms and kitchens shall have floor drains.

G. Plumbing Systems:

1. If a well is required, the well is to be tested and documentation provided for water flow, water quality, chemical content and performance. The test results must be submitted for approval and acceptance. Non-performing wells will be rejected. If water requires treatment, the water treatment system shall be included and provided.
2. Sanitary and Storm system piping shall be separated and discharged per OHS regulation and local authority regulations. Sewage ejectors or sump pumps are only to be used where gravity drainage is not possible.
3. Booster pumps for domestic water service are to be provided when required to maintain system design pressures.
4. Recirculation piping is to be provided for all domestic hot water systems.
5. Avoid water-filled plumbing on outside walls, above ornamental ceilings or in unheated areas.
6. Plumbing fixtures:
 - a) Commercial grade and based upon SABS and/or Cobra Plumbing.
 - b) Low-flow water closets, urinals, taps for sinks and toilets are required for all locations. Do not use waterless urinals without approval by the UE Technical Committee during the schematic design phase of a project.
 - c) Fixtures designated for use by the disabled must comply with the requirements of SANS 10400 and NBR.
 - d) At sink locations with exposed piping provide SABS compliant labelled prefabricated piping insulation. Color to be chosen by the UE Technical committee.
7. Drinking fountains are to supply 15°C water, from standard packaged electric water coolers. Provide bottle filler type with drinking cup dispenser.
8. Dishwashers: If required by the Project Component Checklist, dishwashers shall have dedicated booster heat units that meet all standard requirements.
9. Valves and Shut-offs
 - a) Provide isolation valves at all pieces of equipment and at each ablution fixture for both hot and cold water. Each ablution facility is to have separate water shut-off.
 - b) Locate valves where they can be reached for service in hallways and public spaces where possible.
 - c) Label all valves in plumbing systems. Provide a listing of the labels at project close out.
10. Pumping Systems:
 - a) Primary/secondary systems are recommended. If minimum flows are required, use separate, constant flow primary water pumps and variable flow secondary systems.
 - b) Pumps used in closed loop hydronic piping are to be designed to operate to the left of the peak efficiency point on their curves (high head, less flow) to compensate for variances in pressure drop between calculated and actual valves without causing pump overloading. Do not use pumps with steep curves due to limiting of system flow rates. Pumps are to operate at no less than 75% efficiency for their performance curve.

- c) Packaged variable flow pumping may be used. However, pumps and their controls are to be supplied by the same manufacturer.

11. Piping Systems:

- a) *Provide cathodic protection or other means of preventing pipe corrosion.*
- b) Isolation valves, shut off valves, by-pass circuits and unions are to be provided as necessary for piping at equipment to facilitate equipment repair and replacement. Equipment requiring isolation includes boilers, chillers, pumps, coils, terminal units and heat exchangers. Valves are to be provided for zones off vertical risers.
- c) Valves and other operable fittings must be tagged. A valve tag schedule shall be provided as part of project closeout documentation. Properly identify all valves and locations.
- d) SABS 460 Class 2 copper piping shall be used on all domestic and hydronic piping systems.

12. HVAC Systems:

- a) HVAC air distribution requires the establishment of minimum Indoor Air Quality (IAQ) performance to enhance indoor air quality in building by complying with minimum requirements of ASHRAE.
- b) Provide properly installed condensate drains to prevent build-up of condensate in air handling unit or other equipment drain pans.
- c) All closed loop heating and cooling systems shall be treated with a corrosion inhibitor.
- d) For HVAC piping systems, provide isolation valves at all pieces of equipment and coils for maintenance and service. Locate the valves where they can be reached for service.
- e) HVAC piping insulation shall be installed on all piping, valves, terminal units and all section.
- f) Do not leave un-insulated gaps between components that can cause condensation.
- g) Location of temperature sensors and thermostats shall be coordinated with furniture, equipment and window locations.
- h) Kitchen extractor design must meet NBR regulations as well as all OHS and health department requirements.
- i) Air filters are to be changed at the time of occupancy.
- j) Provide acoustical sound boots at ceiling return air grilles at offices, meeting rooms and conference rooms if walls do not extend to the roof/floor deck above or if a separate return air duct system is not provided.
- k) Air handlers are to be equipped with variable frequency drives to control fan motor speed.

13. Vibration and Acoustical Isolation:

- a) Isolate all moving equipment in the building under dynamic loading.

- b) Use flexible connections for piping/ductwork terminations.
 - c) All wall/floor openings for ducts and piping are to be sealed except at shafts dedicated to gas piping which must be ventilated.
 - d) Reduce fan vibrations immediately outside of all mechanical room walls by acoustically coating or wrapping the duct.
 - e) Provide spring and rubber isolators for piping 50mm and larger hung below noise sensitive spaces.
14. Layout of Mechanical Spaces: Mechanical rooms are to be laid out with clear aisles and access to all equipment. Lighting is to be laid out so as not to interfere with equipment. Housekeeping pads are to be 150mm wider than the mounted equipment on all sides.
15. Building Mechanical Specialties
- a) Electrical Generators: If required in the Project Component Checklist, fuel systems, capacity and system components being supplied with backup emergency generator shall be clearly defined and specified in the Lease or Specification requirements.
 - b) Computer Data Centers Server Rooms: If required in the Project Component Checklist or the building program, provide special HVAC equipment required for any Computer Data Centers or Server Rooms.

11. ELECTRICAL

- A. Meet or exceed all National Building Regulations and local authority vicinity regulation requirements for the electrical systems in all SOM leased, owned, or operated facilities. Some of the requirements of this standard exceed regulation requirements.
- B. When an existing facility or building is being used, all existing circuits which are re-used shall be labeled. The existing circuits including wiring, connections, and disconnects, shall be thoroughly inspected for size, condition, and suitability for re-use.
 - 1. All existing wiring, conduit, and devices no longer being used shall be completely removed and not abandoned in place. All existing unused power supply wiring or cabling shall be completely removed back to supply distribution panel and circuits breakers relabeled as "Spare" or with the new circuit title.
 - 2. All openings in existing walls, floors, and shafts shall be properly firestopped after the removal of old conduit and wiring.
- C. Electrical Site Design and Planning:
 - 1. Spare conduits shall be provided at all primary, secondary, and panelboard feeders for future use.
 - 2. Electrical metering locations and metering sockets must be acceptable to the local utility company.
 - 3. New transformers shall be free of any hazardous materials (PCB's, asbestos, etc.), and dry type transformers are preferred.
 - 4. Exterior lighting design and layout shall meet the latest requirements of the Green star rating standards established for the project requirements.

5. All underground conduit and duct banks shall be watertight and sloped to manholes or junction boxes with a sump.
6. All underground conduit/wiring shall be buried with a marker/tracing wire and a plastic warning tape approximately 300mm above the conduit/wire.
7. Lightning protection shall be provided for all buildings and associated structures per NBR and any other SANS 10400 regulation requirements.

D. Electrical Building Design/Planning:

1. Circuit Planning: Planning shall include locations of copier, microwaves, coffee machines, and vending machines. Provide as a minimum 20-amp dedicated circuits with isolated grounds to all copy machines. Provide as a minimum a separate 20-amp circuit for each device.
 - a) Provide as a minimum isolated ground 20-amp circuits with surge protected receptacles for all main computer hub network equipment and audio-visual equipment.
 - b) Provide a minimum of a twenty-five (25%) percent spare capacity above maximum demand for future growth of the electrical system.
 - c) Dedicated isolated-grounded circuits are not required for computer receptacles.
 - d) Provide a minimum of one (1) 120-volt duplex receptacle in all building entrance vestibules.
2. General:
 - a) Planning shall take into consideration the Lessee/Tenant Agency's Phone and Data systems, security system components including; cameras, card access systems, door-monitoring systems, and any other components included in the security system.
 - b) If a Fire Alarm system is required place, annunciation panels in a location coordinated with the Lessee/Tenant Agency. If a connection to the local fire department is required, it shall be included.
 - c) All electrical panels, control panels, and disconnect panels shall be lockable and within the building all be keyed alike. *(Pad locks are not acceptable)*
 - d) Provide concrete plinth pads for all floor mounted electrical equipment. Pads are to be a minimum height of 85mm and extend a minimum of 300mm beyond the perimeter of each piece of equipment.
3. Electrical Power Requirements:
 - a) Full Height Offices: Provide 4 standard 120-volt, 20-amp duplex receptacles supplied by a 20-amp general service circuit. One of the four shall be an orange isolated circuit receptacle.
 - b) Conference Rooms: Provide 4, 120-volt, 20-amp duplex receptacles.
 - c) Conference, Lunch, and Break Rooms: Provide 1, 120-volt, 20-amp GFI duplex outlet near the counter/sink.
 - d) Furniture Systems: Provide for each grouping of 4 clusters or less, a wiring assembly consisting of 8 conductors back to the circuit breaker panel, to yield at the systems

furnishings 3 hot, 3 neutral. 1 common ground and 1 isolated ground (either three 15-amp or three 20-amp breakers.) Power may come through the ceiling, floor or wall but may not exceed the ratio stated above.

- e) Connections to systems furniture: The University will supply base feed power conduit (from furniture systems manufacturer) or power poles. Base Feed is preferred. Each group of 4 workstations will require a power pole or a base feed. Provide 90-degree elbows for power and communications at connection to exposed wall and floor boxes. Installation of base feed or power poles is by Lessor. Direct, final and complete connection to the modular furniture system shall be the responsibility of the Lessor, including cutting ceiling tiles to accommodate installation of Lessee supplied power poles. All work shall be coordinated with electrical contractor.
4. Firestopping: provide listed firestopping assemblies for all openings, sleeves through floors, and firewalls. Telephone, data, or other communications cable sleeves shall be firestopped after the respective contractor's work is complete.
 5. Cabling:
 - a) Whenever possible, below grade electrical, telephone, and data cabling are to be installed in concrete encased duct banks. Telephone and data are to be separated from electrical power with independent conduit systems.
 - b) All telecommunications cabling shall be kept in trays and/or conduit separate from primary or secondary power cabling.
 - c) All cabling to be labeled.
 6. Lighting:
 - a) Lighting controls used in public areas are to comply with SABS and ASHRAE regulations.
 - b) Lighting fixtures shall be located where practical, so scaffolding is not required for lamp replacement.
 - c) An automatic sensor will control lighting in all occupied rooms, with exception to Conference centres, Boardrooms and Meeting rooms, which will require light switches and dimmers. Locate sensors practically to avoid nuisance triggering.
 - d) Lighting shall be LED type, with a color range between 3500 and 4000K. Lighting levels shall meet or exceed the recommendations of the IESNA Handbook for the use of each space. Daylight harvesting is encouraged but not required.
 - e) All electrical system components and devices shall be independently supported from the building structural framing members and supported per manufacture's recommendations.
 - f) Provide adequate LED lighting, including emergency lighting, to service all equipment in mechanical rooms. Provide dedicated service outlets for supplemental lighting in mechanical spaces. Provide dedicated outlets within 1.8meters of Control Panels.
 - g) Provide emergency lighting as required by regulation or if required in the Project Component Checklist. Emergency lighting shall be tied to an emergency generator, provided with battery back-up, or dual-feed electrical supply.
 7. Wiring:
 - a) All building electrical systems wiring smaller than AWG # 10 shall be copper.

- b) All electrical home run circuits or main feeders shall be solid tubular (Non-flexible) type conduit.
 - c) All receptacles and switches shall be a minimum of specification grade quality.
 - d) Emergency circuit receptacles, switches, or devices shall have color RED bodies.
 - e) If surface mounted raceway is required and non-exposed conduit is not feasible then a white "PVC pipe conduit" is required.
 - f) All wiring to be labeled.
8. Building Electrical Specialties:
- a) Electrical Generators: If required by the PCC, provide emergency electrical generator with required switching for the capacity and system components determined in the PCC. Alternatively, provide an external portable generator hookup and transfer switch.
 - b) Lifts – meet all regulation requirements, including SABS and NBR requirements. All elevators shall be equipped with a battery backup device that allows for exit of any persons trapped in lift when building or municipal power is lost.

12. EXTERIOR IMPROVEMENT

- A. Paving Design: new paving shall be asphaltic concrete paving or Portland cement concrete. *(Further input required from Technical Committee)*
- B. Existing paving shall be in a "like new" condition. Areas deemed not acceptable by the University will be repaired to be in "like new" condition. Existing paving must meet NBR requirements for slopes, cross-slopes, and condition; deteriorated paving, potholes, and large cracks constitute a walking hazard.
 - 1. Asphaltic Concrete Paving shall consist of:
 - a) Minimum 150mm sand-gravel sub-base
 - b) Bond or tack coat asphalt emulsion
 - c) Bituminous leveling course
 - d) Bituminous top course
 - e) New bituminous pavement and existing bituminous pavement shall be prepared and sealed with a coal tar emulsion sealer. Application of sealant shall be as recommended by the manufacturer and performed upon initial delivery of the leased premises and 2 years after possession.
 - 2. Portland Cement Concrete Paving shall consist of:
 - a) Minimum 150mm sand-gravel sub-base
 - b) Reinforcement: 150mm x 150mm (W1.4) wire mesh
 - c) Minimum compressive strength: 4000 PSI in 28 days.
 - d) Minimum cement content: 6 bags

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|-----------------------------|--------------|
| e) Minimum air-entrainment: | 5% |
| f) Maximum slump: | 100mm |
| g) Minimum thickness: | 125mm depth. |

3. Provide slip resistant finishes at exterior concrete surfaces subject to foot traffic.
4. Parking lot drives shall not be crowned.

C. Site Utilities must comply with regulations and local ordinances.

D. Site Amenities

1. Parking lot lighting, landscape lighting, site amenities and site signage design are to have similar design features to complement each other and the facility.
2. If required in the PCC, provide 10 space bike rack permanently affixed to the pavement, no less than 7.6m from entry and visible from entry. Coordinate location with in-slab storm water or other piping.
3. If required in the PCC, provide a flagpole(s) with simple access.
4. Provide concrete filled pipe bollards at exterior locations subject to damage, i.e. dumpster pads, electrical transformers, mechanical devices.
5. Dumpsters shall be screened from public view.
6. Provide windproof trash containers outside each outside entrance.
7. Exterior building street numbers and signs: Building numbers and letters shall be not less than 300mm high with a minimum 50mm stroke shall be provided and installed, identifying the address, "UNISA" and the name of the office or function. These signs will be visible from two directions on main thoroughfares.
8. Cigarette disposal bin(s) and "No Smoking" signs to be provided at the employee and customer entrance(s).

13. GLOSSARY

The terms “approved”, “required” and “as directed” refer to and indicate the work or materials that may be approved, required, or directed by the PCC and Technical Committee.

The term “NBR” and the term “regulation” refer to regulations of building enforcement agencies having jurisdiction in compliance with SANS 10400.

Construction Documents shall include a complete architectural site plan indicating boundary and/or topographic surveys, demolition, erosion plan, grading, lighting, utilities, building location, sidewalks, parking lot, drives, curbs, fences, signs, landscaping, and other site considerations. Construction Documents are to include all structural, mechanical, electrical and furniture plans and specifications.

Lessor/Lessee: The terms Lessor and Lessee are used in a generic fashion in this document. The Lessor may also represent the Contractor or Construction Management firm that is providing a building facility to the University of South Africa. The term Lessee is used as the generic term for the University of South Africa as the end user and/or Owner. Design Professional is the generic title used in this document to describe the Professional Architect or Engineer that is designing the facility being provided.

The term “product” includes materials, systems and equipment. The term “provide” includes furnishing and installing in a professional manner, a product complete in place, tested and approved. The terms “shown”, “indicated”, “detailed”, “noted”, “scheduled” and terms of similar import refer to requirements contained in these specifications for the building or space being offered for lease.

The term “similar” means in its general sense and not necessarily identical. The term “systems furnishings” means interlocking components of portable and moveable wall panels, writing surfaces, shelves, pinning boards, drawers, power poles, etc. of varying sizes which are assembled to create separate work stations for each employee or each work function, that are owned by the Lessee, and are not normally attached to the Leased premises, except for electrical connection attachment. Systems furnishings shall not include floor-to-ceiling wall partitions.

END OF TENANT FIT-OUT DESIGN AND CONSTRUCTION STANDARDS