PART I - OVERVIEW

A. Purpose of Manual

The University of North Dakota doing business as the State Board of Higher Education (hereafter referred to as “UND”) has prepared this manual to assist the design consultants who provide professional services for all new construction, remodeling, rehabilitation and maintenance projects for UND. All of the information contained in this manual is available in electronic format for Consultants use.

Throughout this Manual wherever the term “consultant” is used, the term will be applicable to an Architect, Engineer or other specialized design discipline retained by UND to provide professional services. In addition, wherever the term “Planning Design Construction (PDC)” is used, it refers to the institution department which is responsible for oversight of the design and construction of capital projects. The term “Project Manager” or UND PM refers to the individual representing Planning Design Construction and/or Operations and Maintenance for the project and is an employee of UND.

Part II of this manual provides information on policy, procedures, space utilization, and contracts.

Part III of this manual provides information on structure and content of the bid documents.

Part IV of this manual is the design standards which are to be utilized on all projects. This section includes the minimum building requirements which UND has recognized as necessary on all projects. If deviations from the standards are necessary to satisfy the conditions of certain projects, the Consultant must request and receive approval for such deviation in writing from Facilities Management, Director of Planning Design Construction and/or Director of Operations.

Part V of this manual provides photographs of the visual aesthetic for the campus, which includes masonry styling, signs, lighting fixtures, and other related styling ques for which the design consultant is to include within the project.

B. Administration of Construction Projects

PDC is responsible to UND for managing the design and construction activities for all capital projects, regardless of the source of funding. The primary responsibilities of PDC include the following:

1. Selection of design consultants as per NDCC 54-44.7 and SBHE Policy
2. Oversight of design efforts, including the integration of campus stake-holders with the design team.
3. Coordination of construction activities with UND college/department/units.
4. Oversight and management of the project budgets.

A Project Manager will be designated by PDC for each project. All communications from the Consultant to UND shall be directed to the Project Manager. The Project Manager will provide guidance to the Consultant and responsibility for the project to ensure it meets the established budget, schedule, quality, and users’ requirements.

The following organizational units will provide input in completing the requirements of the projects, and will be involved in the review of the schematic, design, and construction documents:
• Operations will review building operational systems quality, performance, and cost-effective maintenance issues.
• Safety and Risk Management provides advice and consultation in matters relating to the health and safety of faculty, staff, and students.
• Telecommunications departments and/or Information Technology departments review all data cabling, data infrastructure, and information technology equipment.

C. Professional Services

Professional design services for a construction project are required when the estimated cost of construction (which includes design fees) is estimated to exceed $150,000.

The professional services for the project are specified in the Professional Services Agreement. The type of agreement used for each project will depend on the scope of work, budget, and construction delivery method, as defined by the University of North Dakota.

In general, UND selects an architect for most projects regardless of scope of work. The purpose for selecting an architect instead of other design disciplines relates to the architect’s experience in coordination of the multiple design disciplines, administration of the contract as per NDCC 48-01.2 requirements, and the need for a broad understanding of the project needs.

The scope of work for the Architect when designing a major capital project is to be all inclusive of design needs necessary for this work. This includes, but is not limited to, the following services:

1. Architectural design services
2. Mechanical design services
3. Electrical design services
4. Information Technology design services
5. Interior (including FF&E) design services
6. Civil engineering services
7. Haz-Mat abatement design services.
8. Soil testing and other material testing services.
9. Landscape design services.

During contract negotiations with UND, it is paramount for the design professional to fully understand the scope of work prior to proposing a fee. Ascertaining what design services are required to complete the project must be included within the design professional’s basic service. Having a full and complete design service package within one consulting contract is beneficial to UND, who in turn understands that additional costs may be incurred by the design professional for doing so. The additional costs should be enumerated and justified within the fee proposal.

As an example of additional costs, the state-required insurance policy coverage for certain types of design work, such as soil testing and hazardous material abatement, may not be available within the design professional’s insurance policy. If so, the design professional should indicate to the sub-consultants that the commercial general liability insurance as well as the error-omissions insurance they carry must meet the same levels of coverage as that imposed by the State of North Dakota on the architect or engineer. Subsequently, the sub-consultants insurance should name both the primary design professional as well as UND as co-insured in their policy. Any additional costs for the additional insurance coverage obtained by the sub-consultants should be identified and included in the fee proposal.

The design professional is cautioned against preparation of specifications or conditions within the bid documents which contain special protections for the architect by the constructor. The
contract between UND and constructor must contain no third-party conditions which may be contrary to North Dakota statute.

By law, UND is not allowed to retain services (design or construction) from entities barred from doing business in either the State of North Dakota and/or federal government. When retaining sub consultants for project design, the design professional must ascertain that the firms hired are not barred from doing business in North Dakota or the federal government.

UND may undertake projects which are funded by federal programs for a variety of operations that include research, community service, or as block grants. It is important for the design professional to meet with UND representatives who understand the source of funds and are capable of communicating to the design consultant any special terms and conditions imposed by the federal government on the project. (See Section II – Contracts)
PART II – Policy – Space Utilization – Contracts

A. North Dakota University System Policy and Procedure Overview

The following information is provided to assist in communicating to the design professional the regulations and requirements to be followed by all institutions within the North Dakota University System (NDUS). Note that all NDUS institutions are agencies of the State of North Dakota, and are subject to all policies promulgated by the North Dakota State Board of Higher Education, as well as the North Dakota Century Code (NDCC).

Governance

The North Dakota State Board of Higher Education (SBHE) is the constitutionally established governing authority over the eleven public institutions of higher education in the State. The authority of the board extends to the buildings and lands for which this design manual provides guidance in improving or repairing those assets. As a state agency, the SBHE mandates compliance with policy promulgated by the SBHE, as well as the statutes contained within the North Dakota Century Code, and all applicable federal laws, codes, and requirements. This is the limit of authority over the Owner’s buildings and lands, with no other authority having jurisdiction.

Consultant Selection

Design consultants are retained by UND as per statutory requirements. Design consultants are retained by one of two methods only.

- Proposal submission whereby the consultant is competitively hired based on the content of written proposals solicited by UND for a specific project. This procedure is typically used for projects having an estimated cost in excess of $250,000 or where fees are expected to be in excess of $25,000.

- Direct hire by UND based on a limited scope of work whereby consultant fees must not exceed $25,000. This process may be used repeatedly for the same consultant, but only up to a total of $50,000 for any 12 month period

As many projects require the coordination of several design disciplines, the architect is most often selected as the primary design professional. In turn, the architect retains the services of the other needed design disciplines (mechanical engineer, electrical engineer, etc.) under direct contract with the architect. As a result, the architect is the only design professional contracted with UND, and subsequently made responsible for all facets of the design.

This relationship may change depending on the scope of work whereby the primary design is seated in a design discipline other than architecture, and if so the architect (if needed) is retained under direct contract with that discipline

Allowable Methods for Obtaining Construction Services

Construction services may be acquired ONLY by the following methods for projects with budgets exceeding $100,000 (NDCC 48-01.2 Threshold) at the University of North Dakota:

- Design-bid-build process whereby the design consultant prepares bid documents that include all plans and specifications, and subsequently must advertise for bids for three
consecutive weeks. Separate bids are required for each of the General, Mechanical, and Electrical prime contracts. \textit{This is referred to as Multiple Prime Bids.}

1. Exception: If any individual contract of the three Multiple Prime Bids is anticipated to be less than 25\% of the above mentioned threshold, the work of that bid may be combined with either of the remaining prime bids. Note that consideration must be given to which remaining bid is most suitable for the addition, or it may be left as an option for each remaining bid within the bid instructions and bid form. \textit{Note that this differs from third exception in that no bid is solicited for the work, vs. no bid is received.}

2. Exception: If approved by UND, the bid instructions and form may also include the submission of a single bid by a contractor which includes the work of all Multiple Prime Bids, in addition to submission of separate Multiple Prime Bids. \textit{This combination bid is referred to as a Single Prime Bid.}
   - To be awarded, the Single Prime Bid must be less than the sum total of the lowest Multiple Prime Bids. (Single Prime Bid lower than lowest General + lowest Mechanical + lowest Electrical)

3. Exception: If no bid is received for any individual Multiple Prime Bid, UND may obtain the work of that bid through negotiation without rebidding:
   - The work must be negotiated with the individual Multiple Prime Bidder who has the largest contract for the project.
   - The negotiated work may not exceed $150,000.

Construction Manager at Risk, whereby UND solicits proposals for CMaR services. The CMaR subsequently acquires subcontractors or self performs the work. The CMaR provides UND with a guaranteed maximum price for all work.

\textbf{Limitation on Services Provided by the Design Consultant}

- Design consultants may not have any financial interest in the constructor.
- The design consultant cannot manage the construction.
- The design consultant cannot offer design-build services.
- The design consultant may provide construction administration services, but may not provide any service normally provided by the contractor or Construction Manager. Services that may be provided typically include review of contractor submitted information, pay requests, claims, and compliance with specifications and drawings.

\textbf{UND Policy Compliance}

UND is responsible to ensure projects comply with SBHE policy and North Dakota statues regulating construction. Compliance with policy and statute is critical, and the design consultant is expected to assist with compliance to the greatest extent possible. Listed below, in summary form, are important policy and statute requirements:

- Project budgets must include \textbf{ALL} project costs, including
  - Design consultant fees and expenses
  - Land acquisition costs (if required)
- Permits or other special fees required for the project.
- Construction costs
- Movable furniture, fixtures, or equipment costs when included in the budget.

- Projects with budgets exceeding $250,000 require approval by the SBHE prior to starting any construction or retaining construction services. This pertains to awarding multiple prime bids, or accepting a GMP from the CMaR, whereby UND is contractually obligated to proceed with the work and pay the constructor.

- Projects which are funded by gifts, grants or donations and have a budget in excess of $385,000 require both SBHE and legislative approval prior to starting construction or retaining any construction services as indicated above.

- Projects cannot be split into smaller projects as a means to:
  - Avoid the required competitive bidding process for projects having a budget in excess of $100,000.
  - Avoid the requirement for retaining professional design services if the project is estimated to exceed $150,000.
  - Avoid the requirement for authorization by the SBHE and/or legislature for projects having a budget in excess of $250,000.

- Project approval by the SBHE and legislature specifies the following criteria. Any change in criteria previously approved requires UND to seek revised authorization.
  - The total estimated project cost (budget)
  - The scope of work as defined by function, size, and other factors which were included within the request for authorization.
  - The source of funding to be used for construction of the project.

B. Space Utilization Standards

General

Space utilization refers to the relative efficiency of UND’s facilities when applied to room use in occupancy and schedule. Most often applied to classrooms and teaching labs, the information is used to determine if academic / research facilities are being used to capacity. The standards included in this manual apply to all space categories, including offices and conference rooms, and must be followed unless sufficient justification is provided to vary from the standard.

Assignable vs. Unassignable Space

Assigned space is any room which can be assigned to a department or division of UND’s operation. Offices, conference rooms, classrooms, and other rooms which serve some function should be considered assignable. Hallways, restrooms, stairwells, and other areas providing egress are considered unassignable. The ratio of assignable to unassignable space is a measure of efficiency within the facility as it reflects the balance between functional space and egress space.

For all construction undertaken by UND which results in new or renovated space, the minimum amount of space to be designed as assignable is 75% of the total, and subsequently 75% efficient. Note that all assigned and unassigned space must be recorded as such in UND’s space
utilization data base, where use codes and occupancy values are used to describe the function of the room.

**Room Size Standards**

The following room size standards are to be utilized for all construction projects providing new or renovated space. Specialized rooms, such as high-bay heavy-equipment teaching labs, are not included and in turn must be designed to efficiently and safely meet the required use of the space.

**Offices (considered single occupancy unless noted)**

1. Upper level administrator, dean, or department head: 170 SF
2. Middle management, director, associate dean: 140 SF
3. Faculty: 120 SF
4. Supervisor, instructor, lecturers: 100 SF
5. Graduate Student (GTA,GRA): 80 SF
6. Graduate Student (dual occupancy): 120 SF

**Conference Rooms**

1. Occupancy up to 8: 200 SF
2. Occupancy 8 to 16: 400 SF
3. Occupancy over 16: 400 SF + 12 SF per additional

**Classrooms**

1. Single level, no tiered seating: 15 SF per station
2. Lecture (tiered seating): 12 SF per station
3. Collaborative, multipurpose: 20 SF per station

**Teaching Lab**

In general, labs for a specific discipline range between 70 and 120 SF per station.

**Computer Lab – Open**

Computer labs which provide student access to computer equipment for a non-specific instructional discipline range between 30-35 SF per station.

**Teaching Lab Using Computers**

1. 5-15 Occupancy: 50 SF per station
2. Over 15 Occupancy: 40 SF per station
C. Contract Overview

General

Contract between UND and Design Consultant

As per NDCC 54-44.7, the design consultant for a major project is selected using the procedures prescribed by this statute. The procedure requires that, once selected, UND will negotiate a contract with the design professional for a fair and reasonable fee. The negotiation process must include the following considerations and actions:

1. The design professional must ascertain the budget and review it with UND for adequacy to meet the anticipated scope of work. The relative complexity of the project should be determined, and a list of sub-consultants prepared.
2. The design professional must solicit from UND a description of the source of funds for the project, and determine if any restrictions on the funds exist which will impact the project development, scope, or construction costs.
3. Once a full and complete scope of services is determined, and any cost considerations for special requirements based on the source of funds determined, the design professional should propose a fee for services, justifying the costs and providing a reasonable breakdown or summary of those costs.
4. Once the fee is determined and agreed upon, a contract agreement will be prepared for signature by both parties on the appropriate form as amended by UND for specific North Dakota Attorney General requirements.

Contract agreements between the design consultant and UND, and all contract agreements between the constructor and UND, including terms and conditions of the contract documents, general conditions, are modified to meet UND requirements as well as the contracting requirements of the North Dakota Attorney General.

All contract agreements, including those previously approved as templates, must be reviewed by legal counsel prior to signature by UND. If the contract has been previously reviewed as a UND template, the time required to review is typically quite short, and the agreement is usually returned approved for signature within a few days. UND will prepare the signature-ready documents and process the forms for legal review.

As noted in the specification section of this design standard, contract documents must be included in the solicitation of bids. The form of agreements included in the bid documents should be as executed with all UND and ND Attorney General modifications included. The purpose of including the documents as executed (or as close as possible to executed form) prevents potential conflicts with the bid bond, whereby the constructor agrees to enter into a contract. If the contract within the bid documents is substantively changed for execution, the constructor may have cause to void its bid, and the bid bond surety may have no obligation to compensate UND for such refusal.

Liquidated Damages

Liquidated damages are damages sustained by UND as a result of a breach in the contract by the Constructor, most often a breach caused by a delay or failure to meet a completion date. Including a liquidated damages clause within the contract agreement requires careful consideration by the design consultant. As all claims arising from the contract agreement to
construct are first considered by the architect/engineer, understanding the implications of liquidated damages as a contract term with UND is very important. The following should be used as a guide for establishing liquidated damages:

1. The parties of the contract must agree to liquidate (resolve or pay for) the damages by specifying an amount certain over a period of time. This is accomplished with language within the contract for which both parties eventually sign. Consideration must be given to the amount stipulated as it has bearing on items (2) and (3).

2. The anticipated damages to be liquidated must be difficult to define, or difficult to prove. Note that damages which are well defined and simple to prove are recoverable by either party to the contract with, or without, a liquidated damages clause.

3. The amount of damages must be reasonable. The design consultant must review with UND the scope of undefined or difficult to prove damages that will result from a failure to complete the project on time, and subsequently include an appropriate value. If the amount included reflects a punitive effort by UND, it will have little effect on expediting the work if the Constructor assumes the costs are unreasonable and therefore unenforceable. In addition, including liquidated damages may establish an adversarial environment within the project immediately, and subsequently give rise to other problems that may offset any benefit from including liquidated damages.

Performance and Payment Bonds

Bonds for performance by the constructor and payment of vendor, payroll, and other related costs incurred by the constructor for completing the project are required by statute. The bonds add considerably to the project costs, and the benefit of the bonds must be pursued by UND if conditions so require.

Timely payments by the constructor to vendors and employees working on UND’s projects are important in maintaining schedule and quality. It is assumed that the constructor will pay all vendors and subcontractors based on work completed less the contractual retainage. In the event the design consultant is made aware of reports that the constructor is not making timely payments, UND must be notified immediately and appropriate steps taken to rectify the problem if reports are found to be accurate. This includes notification of the surety.

It is assumed that the design consultant will review all applications for payment and subsequently confirm all work by the constructor(s) has been completed as per the contract documents. Substandard work must be identified as soon as possible, and if left uncorrected, UND must contact the surety for remediation immediately. It is considered a part of the design consultant’s fiduciary interest in UND to provide this information as soon as possible, and to assist UND in pursuing any claim against the surety/constructor.

The design consultant is also required to review and approve the constructor’s schedule which must be submitted prior to initiation of work. The schedule must have sufficient detail so as to inform the design consultant and UND of the status of the work, and if the work is either behind or ahead of schedule. The general conditions of the contract as modified by UND contain terms and conditions which identify the steps necessary to restore the construction schedule. Having clarity within the schedule sufficient to clearly identify the project status is paramount in avoiding any disagreement, and subsequent need for, remedial action by the constructor.

As the terms and condition of the performance bond specify a period of time necessary to allow the constructor to regain the schedule, identifying the delay on the day of scheduled substantial
completion has little, if any, value. It is therefore a requirement of this design standard that UND be notified by the design consultant of schedule status on a monthly basis throughout the duration of the project.
A. Bid Documents Overview – CMaR Projects, Design/Bid/Build Projects

The Bid Documents consist of the following documents:

A. Table of Contents
B. Notice to Bidders
C. Bid Form
   1. General Conditions of the Contract
   2. Instructions to Bidders
   3. Sample Performance and Payment Bond
   4. Sample contract for construction
   5. Definitions
   6. General Conditions
   7. Change Order Procedure and Pricing Guidelines
   8. Technical Specification
   9. Technical Drawings

The design consultant is responsible for completing the portion of the Bid Documents which are modified for each project, Items A, B, and C. Items 1 – 7 are provided by UND and may not be modified without written authorization by UND. Items 8 – 9 are produced by the design consultant specifically for each project.

B. Bid Documents Instructions

Specifications

Construction Specifications shall utilize standard CSI coding. The General Requirement Section must not include or conflict with items that are already covered in the General Conditions.

The design consultant is advised to study the General Conditions before beginning the preparation of specifications, and to refer to them routinely through the preparation of specifications. Attention should be paid to standardized or computerized specifications written by outside firms who are employed to write technical sections, to ascertain nothing contained in those specifications conflicts with provisions in the General Conditions. Complete coordination of all Bid Documents is the responsibility of the design Consultant.

Prohibited Language

The following words and phrases are expressly prohibited in the specifications or on the drawings:

- The phrase “by others” must not be used. Name the specific contractor or agent responsible.
- The words “alternate” or “substitute” must not be used to indicate an “option.” The words alternate and substitute have specific definitions in the front-end contract documents. The word “option” should be used to indicate items for which the contractor may make a decision based on contractor preference.
- The word “mechanical” must not be used when referring to the Plumbing Contract, Fire Protection Contract, or the HVAC Contract, or when referring to any of the contractors for these divisions of work. The applicable trade must be used when making these references.
Construction Drawings (For all projects unless otherwise noted)

Work Limits

1. Identify clearly on the work-limits (S-1) drawing the following:
   a. The limits of the work, including areas of existing buildings which are affected by the work, and subsequently covered by builder’s risk insurance for property damage.
   b. The location of security fences and staging areas.
   c. Sources of utility power if provided for construction.
   d. Gates, construction employee parking, and allowable routes for traffic.

Drawing Identification

1. Cover Sheet: CS-1 (include index on this page)
2. Architectural: A-1, A-2, etc.
3. Heating/Ventilation: M-1, M-2, etc.
4. Electrical: E-1, E-2, etc.
5. Plumbing: P-1, P-2, etc.
6. Site Plans: S-1, S-2, etc.
7. Structural: ST-1, ST-2, etc.
8. Steamline: STM-1, STM-2, etc.
9. Furniture: F-1, F-2, etc.
10. Fire Alarm System: FAS-1, FAS-2, etc.
11. Environmental Health & Safety: EHS-1, EHS-2, etc.
12. Fire Protection: FP-1, FP-2, etc.

As Built Drawings

Indicate in specifications that constructors are responsible to maintain as-built drawings throughout the duration of the project. As-built drawings are to be submitted monthly to the design consultant and collectively at the time of substantial completion. The design consultants will transfer the as-built information to the most recent for-construction drawings and submit to UND as part of the close-out documentation. If requested, design consultants will provide final as-built drawings in electronic format, either PDF or in the file format used to prepare the drawings if compatible with UND software.
PART IV: DESIGN STANDARDS

A. Design Standards Overview

Buildings shall be designed as quality institutional buildings or renovations, and components shall be selected and specified to provide maximum life-cycle usefulness. The Consultant is responsible for providing and recommending cost-effective designs that meet this requirement. In addition, the Consultant shall provide all necessary value engineering to ensure the project is designed effectively, and complies with the original intent of UND.

The Consultant shall perform professional services in accordance with federal and local statutes, ordinances, rules, regulations, and building codes. UND has recognized minimum building requirements and has summarized these requirements in the Design Standards.

UND is dedicated to the principle of conserving energy. UND personnel will review the proposed design for means of reducing not only initial cost of energy consuming equipment, but also long-range operational costs.

Certain design standards will be guidelines for the Consultant to develop specifications. Other standards are specifications that must be incorporated verbatim by the Consultant.

The Consultant is responsible for ensuring these standards are met, not only during the design process, but also during construction. The Consultant is also responsible for verifying that the Standards being used are current.

B. Design Standards

The Design Standards are organized in Construction Specifications Institute (CSI) format, Divisions 1 through 33. Standards dealing with aesthetics and appearance have been placed in Appendix A. Landscaping and Horticultural standards have been placed in Appendix B.

NARRATIVES OF MAJOR UNIVERSITY COMPONENTS

GENERAL DESIGN

A sound, functional plan is the single most important factor in obtaining an acceptable solution to the Building Program. This can best be achieved through a careful study of the spatial relationships and thorough understanding of the needs of the users as expressed in the Building Program and in subsequent meetings and discussions held between the Architect and the Building Committee.

It must also be recognized that changing curricula and modifications of space are frequent occurrences in University operation. Flexibility shall be a consideration in any plan to accommodate anticipated as well as unanticipated changes and future growth.

Exterior design of the building is expected to be compatible with neighboring buildings and with the campus as a whole. Exterior materials as well as the building form will be examined very carefully at every step of the design process to ensure compliance with the requirements of the project and UND standards. This will be reviewed and approved by the Director of Planning Design Construction for compliance to the Campus Master Plan and Design Guidelines.

It is neither the policy nor the intent of UND to limit the creative individuality of the Architect/Engineer in design or selection of materials. The guidelines and requirements presented in the Design Guidelines are based upon UND experience with materials and construction methods and details that have resulted in the fewest problems in operation and maintenance, and in the best service of life of materials and equipment. Uniformity in the use
of materials and equipment throughout the campus limits the range of cleaning and maintenance products and reduces the variety of parts and materials which must be stocked for repairs and replacements as well as providing a continuity of aesthetic and functional user-experience.

New materials and products and new methods of construction, when proven sound, may justify changes from these standards. Special consideration shall be given to technology and careful analysis to accommodate future advancement. Design with building sustainability concepts shall be discussed, considered and integrated into the Project. Planning for technological flexibility within budgetary constraints is a primary task.

A majority of UND’s core campus is also in the Historic District. The consultants shall conform to the guidelines and review the design and its implications with the District’s strategic initiatives in coordination with the Director of PDC.

SAFETY CONSIDERATIONS

General: – All University buildings shall be designed with full consideration for the safety of the occupants and maintainers. In occupied buildings, safety and minimizing the disruption of the Professors and Students is of primary concern and may involve tightly phased and scheduled planning for both the Consultants and Contractor. On renovation projects, the University will provide the contractor with a hazardous materials assessment report based on the identified project scope. UND’s project manager will contact the Contractor and organize the work to be preformed by the Abatement sub-contractor as to not adversely impact the construction schedule.

Corridors – Corridors, means of access and egress, shall be of an appropriate width and configuration to provide safe exiting from the building. Doors swinging into Corridors shall be recessed when possible to avoid interference with the flow of pedestrian traffic. Movable furniture and equipment shall be placed, and secured, as not to obstruct the required width or travel path.

Stairs – All enclosed stairways shall have engineered smoke evacuation or mechanical pressurization for smoke control as required by code. All stairs shall have non-slip tread nosings, and shall be built of materials appropriate for the location and installation.

Floors – Floor construction shall be designed to a vibration criteria appropriate to the use. In critical installations, vibration analysis may be appropriate. Where mechanical equipment is located special consideration shall be given to transmission of vibrations into the building: a proper vibration isolation and structural system to be provided. Flooring in Laboratories and chemical storage rooms shall be constructed with chemical resistance liquid-tight flooring materials, including raised sill not less than 4” in height at all points, including in front and behind cabinets, but excluding doorways. Flooring of commercial kitchens shall be constructed of a slip resistant, easily maintained acceptable to the Health Department. Floors in toilet rooms, showers, greenhouses, and other special use spaces shall have flooring appropriate for the use and as approved by UND.

Doors – Where utilized, electro-magnetic holders for rated doors shall be connected to the building smoke detection and alarm system. Doors to all laboratory spaces shall swing toward the corridor and shall have a vision panel when allowed by Code. All exterior doors are monitored and/or controlled through the campus wide communication system. Refer to Division 8.
Asbestos Removal – Most University buildings and utility tunnels constructed before 1970 contain asbestos materials in some form or another. The most typical use is mechanical insulation, floor tile and mastic. Generally, it is the policy of UND to remove and dispose of these materials, whenever a construction project is undertaken, to remodel a building or part of the project. Based on the scope of work established through testing conducting and through the A/E documents, UND will provide the contractor a written report from an inspector identifying the areas of concern. The actual removal and disposal will be accomplished by an Abatement subcontractor to the Prime or CMAR contractor, prior to the start of the remodeling project or when appropriate to the construction sequence of the Project.

ARCHITECTURAL

IMPACT ON SURROUNDING ENVIRONMENT

Review and Approval: Each new construction, building modification, grounds improvement or demolition project must be reviewed with regard to its impact upon its surrounding environment. All projects are to be reviewed by PDC and Operations. Approval is required prior to detailed planning and construction. Typical areas of concern and recommendations are addressed below.

Aesthetics: Consideration should be given, not only to the appearance of a project itself, but also to the impact it will have on the overall appearance of the surrounding areas. This applies to modifications to existing facilities as well as to new facilities.

- The appearance of new facilities should be appropriate for the immediate and campus-wide architectural context (see General Design Guidelines for Campus Architecture).
- The finish color of elements added to the exterior of existing facilities should blend with the existing color palette. The elimination and creation of openings in the façade of a building need to take into consideration the rhythm and balance set up by the existing windows and doors.
- Projects involving additions to or projections from existing facilities should be contextual with the existing and surrounding facilities.
- The installation of window air conditioning units, while undesirable, should be installed so as to minimize their projection from the exterior face of the facility, and must be approved by Facility Management.
- The placement of exterior conduit and piping, while undesirable, is sometimes unavoidable and should be placed so as to take advantage of other vertical and/or horizontal elements.
- Outdoor equipment (e.g. air conditioning units, emergency generators, transformers, etc.) installed at ground level should be located in remote / less traveled areas. When installing equipment at roof level, careful consideration should be given to site lines from the ground level (especially primary traffic routes) as well as upper levels of facilities. The installation of screening (e.g. walls, fencing or landscaping) may be necessary, either at ground level or at roof level, depending on the site lines of the installation.
- The installation of unsightly outdoor structures/objects (e.g. loading docks, storage areas, sheds, tanks, trash / recycling containers, etc.) should be placed so as to take advantage of adjacent building and landscape screening features where available (i.e. within a remote alcove). Installation of additional screening may also be required.

Acoustics: Consideration should also be given to the impact a project will have on the acoustic properties of the surrounding area.

- Exterior: The operation of noisy exterior mechanical/electrical equipment (e.g. air conditioning units, high velocity exhaust air discharges, emergency generators, etc.) can be
very disruptive to adjacent building occupants and/or research functions.

- Equipment should be selected so as to minimize the transmission of noise to these areas. It may be necessary to locate such equipment, as appropriate, at the roof level rather than at the ground level, or to locate it within an appropriately designed acoustical enclosure.
- Noise-producing service areas (i.e. loading dock / receiving areas, trash / recycling areas, laboratory bulk tank areas, etc.) can also be disruptive. They should be located so as to minimize noise transmission to occupied areas, especially those that are more sensitive to noise.

Plantings: Consideration should be given to the impact a project will have on adjacent trees and shrubs.

- Structures/objects should be installed so as to minimize the negative impact on significant plantings (e.g. by shading, root damage, root compaction, etc.).
- Equipment installed at ground level should be located relative to adjacent trees and shrubs such that significant plantings will not be damaged as a result of the long-term operation of this equipment (e.g. due to increased airflow at elevated temperatures).

Maintainability: When exterior equipment is installed at either the ground level or the roof level, consideration should be given to its impact on the maintenance of the surrounding area.

- Ground-Level:
  - All ground-level structures, objects, and equipment should be installed so as to facilitate lawn mowing and other grounds maintenance functions.
  - All ground-level equipment should be located on poured concrete pads. Each piece of equipment that is located adjacent to a facility should be installed on a pad of sufficient size to eliminate small areas that would otherwise require mowing and/or refuse collection.
  - No structure, object or piece of equipment should be located so close to the exterior of a building so as to greatly hinder exterior maintenance functions. Similar consideration should be given to the location of significant plantings.

- Roof-Level:
  - Each piece of roof-level equipment should either be located on an enclosed box type curb or should be supported above the roof surface a minimum distance of 3 ft to allow sufficient access for roof maintenance/potential snow accumulation.

- Interior and Exterior Equipment Access:
  - The necessary clearances should be maintained to access areaways and other access openings that are required for the future replacement of existing mechanical and electrical equipment and/or the future installation of additional equipment.

Traffic/Access: Consideration should be given to the impact a project will have on traffic patterns and vehicular access to area facilities including pedestrian and bicycle traffic. Special consideration should be given to maintaining adequate emergency vehicle access.

Stormwater Water Quality: UND will strive to meet the new regulations in 2016 for Storm water management introduced through the Department of Health to include post-construction Low Impact Development (LID) and Best Management Practices (BMPs) to provide for water quality control to the maximum extent feasible of runoff from the site.

ACCESSIBILITY

Accessibility Code: All remodeling and new construction on the UND campus shall conform to the
Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) and building code of North Dakota.

**Universal Design:** The standards given above are to be recognized as being minimal standards required by law for designing facilities that are readily usable by persons with disabilities. UND strives to provide facilities that are universally usable by persons with diverse physiologic and sensory abilities. The design of campus facilities shall provide for full and independent use of the facility by persons with disabilities. Following are examples of universal design standards adopted by UND that exceed minimum code requirements:

- A power-operated entry door having both arm-height (42 in. high) and foot-plate-height (6 in. high) push plate type actuator switches or a continuous vertical pushplate shall be provided at no less than one entrance, preferably the main entrance, at each new or remodeled building.
- A standard 5’ x 5’ accessible toilet stall is required to accommodate side transferring. Alternative stalls (Dims) described in the codes are not acceptable. End of row accessible stall configurations are preferred.
- All elements within a facility should be planned to minimize architectural barriers to physically challenged individuals.
- Large facilities with public spaces such as classrooms shall be constructed with multiple elevators to ensure continuity of accessibility when elevators are out of service due to repairs.

**ATRIUM**

**Atrium Evaluation Criteria:** While providing gathering spaces which are attractive to many users, atriums come at a high cost to the building. Before deciding to incorporate an atrium, the users and AE team need to evaluate some basic criteria:

- A net to gross analysis.
- Energy consumption evaluation for the increased volume.
- Maintenance of high areas and equipment.
- Natural lighting.
- Smoke evacuation.

**Net to Gross Evaluation:** Atriums add significant cost to a building by dramatically increasing the gross square footage without providing net assignable area.

**Energy Consumption:** Increased energy use for the space must be included in the energy model.

**Maintenance:** When atriums and other areas with high ceilings are incorporated, light fixtures and other devices requiring periodic maintenance shall be installed at lower elevations (e.g. by wall mounting) so as to be easily maintainable. If wall mounting is not feasible, then lighting may be accessed by the use of winches to lower the fixtures to a workable location. High ceilings and walls shall be as maintenance-free and as accessible for maintenance as possible. If there is any equipment or fixture that cannot be accessed by the above described means, then the project shall pay for a lift. An appropriate storage location shall also be provided for the lift.

**Natural Lighting:** Use of skylights shall be avoided or minimized due to their propensity to leak. The sill of the glazed opening shall be located high enough above the adjacent roof membrane that the flashing complies with the roofing and flashing requirements listed in these Standards. Curtain walls are a weak link in the thermal envelope of the building. Consistent with the Design Guidelines, the use of curtain walls should be avoided. Where used, the interior thermal transmission performance of a large glazed opening shall be incorporated into the energy model.
Glass and glazing systems shall comply with the glass and glazing requirements listed in these Standards in all regards, including but not limited to:

- All mullions shall feature pressure plates with snap on mullion covers. No structural sealant or exposed sealant is permitted.
- Size of the individual units of glass is limited by the size of glass that can be handled by a two person crew. See Section 08 81 00 – Glass Glazing in these Standards for specific information.
- Glass shall be a standard color readily and reasonably available from a variety of manufacturers. While the cost of specialty colors may seem insignificant in the overall cost of a large project, replacement costs can be burdensome.

**Fire/Smoke Protection:** Consideration shall be given to limiting the height of the space to avoid special or additional requirements for fire and smoke protection systems. Atrium smoke control systems shall be designed in accordance with the most current adopted editions of the NFPA Life Safety Code and the International Building Code.

**“CLEANABILITY” OF INTERIOR SURFACES**

**Cleanability:** Building construction and finish details are important to cleaning operations since specific designs and finishes lend themselves very well to a productive, efficient, well-managed and successful cleaning effort while others have the opposite impact. As a result, the following comments are offered to promote “cleanability” within new and remodeled buildings. The following types of surfaces often serve as dust catchers and are extremely hard to clean.

- **Rough - Textured Surfaces:** Exposed rough-textured surfaces, such as exposed brick, within buildings should be minimized.
- **Wood Trim:** Wood trim and chair rail shall be installed in moderation and only where needed.
- **Exposed Pipes and Raceways:** Exposed pipes, raceways, etc. (especially horizontal ones), as well as visible, but inaccessible, horizontal flat surfaces should be avoided.
- **Filler Panels:** Filler panels shall be provided at the ends of base cabinets and wall cabinets to close off narrow inaccessible spaces between them and adjacent walls.

**CUSTODIAL FACILITIES**

**Application:** Every new building, addition, and/or remodeling of an existing building should include custodial facilities of the size and type described in this narrative. Such facilities must be specifically considered in the Program Statement phase or other planning processes which define the scope of the project.

**Space Allocations:** Space for custodial work rooms, custodial equipment and storage rooms, trash storage rooms, and trash recycling storage rooms should be allocated in accordance with Table 1 at the end of this narrative.

**Existing Custodial Facilities:** The requirements given in Table 1 may be waived in the case of additions to existing buildings and for interior alterations to the extent that the existing custodial facilities of the type described which are in reasonable proximity to such construction meet the area requirements of these guidelines and are otherwise in reasonable conformance with these guidelines.

**Use Restrictions:** Custodial work rooms, custodial storage rooms, recycling storage rooms and waste management rooms should not be used as a passageway to other rooms nor should they share space with fire reporting equipment, plumbing systems/equipment, alarm systems, electrical panel boards, telephone or data transmission equipment, or any other systems not directly related to custodial services. Custodial work rooms facilities should not be locations for ladders or access doors to mechanical spaces, attics or roof areas.
Custodial Work Rooms:
- Area: Custodial work rooms should have a floor area of not less than 60 sq. ft. The minimum interior dimension for any custodial work room should be 5'-6". In multi-floor buildings with small (less than 10,000 sq. ft.) floors, the area of the custodial work rooms can be reduced to 48 sq. ft. each.
- Ceiling Height: The minimum ceiling height should be 8'-0".
- Doors: 3'-0" wide by 7'-0" high, swinging outward, equipped with storeroom function lock, closer, and 36" high armor plate on inside face. Storeroom function lock should be keyed to custodial day key and custodial grand master.
- Service Sink: Floor level service sink, 24" square, comparable to Fiat* MSB 2424, with hot and cold water mixing faucet with vacuum breaker, American Standard* 8344.111, and hose and bracket, Fiat* Model No. 832-AA.
- Mop Hanger: Model Geerpres* #5047, mounted above service sink and not on same wall as faucet.
- Ventilation: Mechanical ventilation in room should provide not less than six air changes per hour.
- Walls: Concrete masonry or gypsum drywall construction, finished with semi-gloss enamel paint. Walls adjacent to and extending one foot beyond the edge of the service sink should be finished with an impervious waterproof material such as glazed ceramic tile, frp panel to a height of 4 ft. The waterproof material should extend out at last one foot past the edge of the sink.
- Floor: Sealed concrete.
- Ceiling: Open to structure above or gypsum board if fire rating is needed
- Location: Custodial work rooms should be centrally located so that no area in a building is more than 150 ft. walking distance from such a room. Preferred locations of rooms are close to elevators, close to main pedestrian areas, and close to toilet rooms. Custodial work rooms should open to a public corridor or other primary circulation area.
- Electrical: Custodial work rooms and storage rooms should have a light level of 50 fc. Lighting fixtures should be recessed flush with the ceiling or surface-mounted supplied with a safety shield. Work rooms should have a minimum of two electrical outlet receptacles. Room shape and size may require more than two outlets. Outlets combined with light switches are not practical and are not permitted. Electrical outlets should not be located by the door and service sink.

Custodial Equipment / Supply Storage Rooms:
- General: Custodial equipment/supply storage rooms are used for the storage of major items of custodial equipment shared by several custodians. Multiple large pieces of battery/electrical operated equipment are stored in this space. They are also used for the storage of bulk custodial supplies.
- Location: Storage rooms should be located in reasonable proximity to the building delivery entrance.
- Room Finishes: Provide similar room finishes as those described for Custodial Work Rooms.
- Electrical Requirements: Provide similar requirements as those described for Custodial Work Rooms. In addition, provide a minimum of three (3) electrical outlets.

Waste Management / Recycling Storage Rooms:
- General: Waste management rooms are intended for the inside accumulation of generally dry trash, generated by custodial activities, prior to its removal to exterior dumpster units.
Recycling bins, for the collection of recyclable waste, will be located in these rooms. Waste management rooms are not intended for waste resulting from food service operations or hazardous waste.

- **Location:** Waste management rooms should be located adjacent to the building loading dock and/or the receiving room and dumpster location.
- **Walls:** Concrete masonry or comparable abuse-resistant system to withstand the impact of cart traffic and providing two-hour fire separation from remainder of building.
- **Floor:** Sealed concrete.
- **Ceiling:** A minimum one hour fire rated; exposed structure
- **Ventilation:** Mechanical ventilation in room should provide not less than six air changes per hour

<table>
<thead>
<tr>
<th>Building Area</th>
<th>Up to 20K sf</th>
<th>20K – 150K sf</th>
<th>Over 150K sf</th>
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<tbody>
<tr>
<td>Custodial Work Rooms</td>
<td>1 @ 60 sf</td>
<td>60 sf per 15,000 sf of bldg. See Note 2</td>
<td>60 sf per 15,000 sf of bldg. See Note 2</td>
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<tr>
<td>Custodial Equipment and Storage Rooms</td>
<td>Included in Custodial Work Room</td>
<td>1 @ 100 sf</td>
<td>2 @ 150 sf</td>
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<td>Waste Management Rooms</td>
<td>1 @ 80 sf</td>
<td>1 @ 100 sf</td>
<td>1 @ 170 sf</td>
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<tr>
<td>Recycling Storage Rooms</td>
<td>1 @ 100 sf</td>
<td>1 @ 200 sf</td>
<td>1 @ 250 sf</td>
</tr>
</tbody>
</table>

**Table 1: Custodial Space Allocation Table**

Table Notes:

Note 1: If building has more than one story, provide an additional Custodial Work Room with floor sink with a floor area of not less than 48 sq. ft. on each of the other levels.

Note 2: Distribute area in 60 sq. ft. increments on each floor level.