NEW OFFICE BUILDING CONSTRUCTION

STATE OF MICHIGAN

Department of Technology, Management and Budget

NEW OFFICE BUILDING CONSTRUCTION

DESIGN AND CONSTRUCTION STANDARDS

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Table of Contents

Introduction 2
Acronyms 3
I General Requirements 4
II Building Envelope Components 11
III Interior Component Construction 13
IV Openings 16
V Finishes 20
VI Specialties 23
VII Conveying Systems 25
VIII Fire Suppression 26
IX Mechanical, Plumbing and HVAC 26
X Electrical 31
XI Communications 34
XII Site Utilities 38
XIII Exterior Improvements 39
XIV Glossary 40

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET

INTRODUCTION

These new office building design and construction standards establish a minimum level of quality for building systems design and material selection for State of Michigan leased or state-owned office facilities. These design standards intend to provide durable professional facilities for the State of Michigan with maximum utility and energy efficiency, requiring a minimum of maintenance and operational expense for the long term.

These standards set minimal design direction for typical office building construction components and systems and do not address every possible building component and system that could be encountered. Conversely, these standards contain direction and requirements for systems which may not be included or required for the particular RFP's program, such as an elevator, raised flooring, or specialized material.

The Lessor and/or the Lessor's design professional must refer to the Request for Proposal (RFP), Project Component Checklist, Program, State Agency Supplementary Standards, and other attachments for unique products or systems set forth by the requesting State Agency. The Project Component Checklist will identify those components, specialties, or design requirements specific to the project at hand. State Agency Supplementary Standards describe the needs of a particular room or space in the facility.

Adherence to these standards is mandatory. However, any equal or improved concepts, methods, or products are encouraged and will be given full consideration. Written approval by the Department of Technology, Management and Budget Design and Construction Division (DTMB-DCD) is required for any deviations or exceptions from these standards. Approval is required prior to the final release of construction documents for bids or construction.

For leased facilities only, these Design Standards and the Lease agreement take precedence over the Construction Documents.

ACRONYMS USED IN THIS DOCUMENT

ADA	Americans with Disabilities Act
ADAAG:	Americans with Disabilities Act Architectural Guidelines
ANSI:	American National Standards Institute
ASHRAE:	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
CFC:	Chlorofluorocarbon
DTMB-DCD:	Department of Technology, Management and Budget Design and Construction Division
DTMB:	Department of Technology, Management and Budget
DTMB-RED:	Department of Technology, Management and Budget Real Estate Division
FEMA:	Federal Emergency Management Agency
HDPE:	High Density Polyethylene
HVAC:	Heating, Ventilating and Air Conditioning
LEED:	Leadership in Energy Efficient Design
MBF:	Michigan Barrier Free Design (Act 1 of 1966)
MDOT:	Michigan Department of Transportation
MIOSHA:	Michigan Industrial and Occupational Safety Administration
NEMA:	National Electrical Manufacturer's Association
NFPA:	National Fire Protection Association
RFP:	Request for Proposal
PCB:	Polychlorinated Biphenyl
SMACNA:	Sheet Metal and Air Conditioning Contractor's Association
SOM:	State of Michigan
UL:	Underwriter's Laboratory

I. GENERAL REQUIREMENTS

A. SUSTAINABLE DESIGN

1. If identified in the Project Component Checklist, provide the design and construction required to obtain the LEED Rating required for the project.
2. Building envelope and HVAC systems that establish temperature and humidity comfort ranges in accordance with ASHRAE/Michigan Energy Code are required. Specifics of insulation materials and installation will not be outlined here but must meet the ASHRAE/Michigan Energy Code. For existing buildings the building envelope and HVAC systems will be assessed by the Design and Construction Division.
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 that are extracted, harvested, recovered or manufactured within 500 miles of the project site. A list of Michigan-manufactured building products can be found at:

   http://www.michigan.gov/dtmb/0,5552,7-150-9141_60101-209976--,00.html
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 ASHRAE/Michigan 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.
10. If the leased or office premises is accessed directly from the outdoors (uncontrolled air environment), the main entry to the leased or office premises shall be provided with a heated airlock vestibule.

B. GENERAL BUILDING PLANNING

1. The leased premises shall be designed and constructed to meet or exceed the latest local and state building codes, fire codes, and state and national barrier free regulations.
2. The Leased premises shall be designed in such a manner as to ensure an economical and efficient use of space, adequate natural light, ventilation, circulation patterns and code compliance. Existing facilities that are renovated and/or occupied shall be structurally sound (certified by licensed engineer, if required by DTMB-RED), and meet all minimum design standards of this outline specification. Any concept drawing attached to the Lease is only one acceptable schematic design solution. The building in which the tenant space is to be located will be assessed against the requirements of this section.

3. The Leased premises square footage shall be all adjacent, with no other tenants interspersed or separating the Lessee/Tenant Agency's space.
4. 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.
5. All existing buildings shall be structurally sound (certified by licensed engineer, if required by the State), and meet all minimum design standards of this outline specification. All unsafe conditions are to be corrected prior to State of Michigan staff occupying the space, including any and all fire/life safety code violations. The Leased premises shall meet all the requirements for new construction for the current building code with respect to floor load bearing capacity.
6. 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 firestopped after the removal of old components and piping.
7. Field verify existing construction conditions and configurations. 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.
8. 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.
9. Structural bay sizing is to be commensurate with building configuration, architectural expression, seismic zone, structural framing material and cost.
10. If required by the RFP, 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.
11. Stack all electrical closets, communications/data closets and toilets vertically.
12. 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.
13. Use double or triple pane glazing according to climate conditions and to meet LEED requirements. Reflective glazing may be used if glare is not at issue.
14. Provide positive drainage at exterior window sills.
15. Roofs shall be sloped to prohibit snow and ice slide off onto entry doors. Use cold roof design in heavy snow areas to prevent snow and ice build-up. Flat roofs shall have overflow scuppers or overflow roof drains.
16. Provide fall protection as required by MIOSHA. Integrate all protection into the design of the facility.
17. Drywall interior partitions are preferred over demountable partitions.
18. The total number of passenger elevators provided is to be coordinated and approved by the Lessee/Tenant Agency.

19. Do not locate fresh-air intakes adjacent to vehicle drop-off areas, parking areas, truck docks or emergency generators.

20. Incinerators are not allowed.

C. SECURITY DESIGN

1. Controlled access is required to the entire building and to each individual floor. If required by the Project Component Checklist, provide conduit and power for a card access management system matching the existing State of Michigan 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.

4. Transaction windows shall have pre-manufactured transaction window(s) with a speaker ports, pass through opening and counter. Glass shall be bullet resistant. Walls adjacent and below transaction windows shall have bullet resistant construction.

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, VESTIBULES 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 code compliant exiting, provide an additional employee-only entrance with doorbell.

2. If required by the Project Component Checklist, divide major lobbies into secure/non-secure areas with provisions for card access turnstiles.

3. Provide a heated vestibule with recessed floor mat at main entry. Provide 10 feet of walk-off carpet immediately inside entrances and vestibules.

4. Provide power operated doors in accordance with the requirements of the ADAAG. Power operated sliding doors are preferred to power operated swing doors. Provide push plate and motion sensors (no mat activation).

5. Provide overhangs at all public and employee entrances to reduce snow accumulation and protect occupants.

6. 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.

7. Provide directional graphics, directories and agency emblems.

F. LOADING DOCKS

1. Where required by the Project Component Checklist, provide loading dock(s) separate from main entrance and locate convenient to freight elevator and to food service area.

2. Provide hydraulic dock leveler, 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 toilet rooms, janitor closets, electrical and telecom closets central to the building or tenant space.

2. As a minimum provide one men's and one women's toilet room per floor. If a cafeteria or food service area is part of the program, provide one men's and one women's toilet room adjacent. These rooms may serve the entire floor, if well-located. Some building programs may require separate employee and separate public toilet rooms.

   a) The toilet room 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.
   b) Toilet rooms intended for the public shall have automatic door operators. Automatic door operators are to be ADAAG and MBF compliant, electronically operated, surface mounted with aluminum housing. Operator is to be provided with an adjustable time delay. Provide 6-inch diameter push plate for activation.

3. Allow for vending areas, break rooms and lunch rooms.

4. Lactation Room: provide one per building and consistent with Federal law. 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 room may not be used as a lactation room.

5. "Safe Room": Where required by the Project Component Checklist, provide an interior "safe room" to meet FEMA 320 Standards. The "safe room" may be a conference, toilet room, or office. Provide signage for the "safe room".

   a) Reference: http://www.fema.gov/media-library-data/1418837471752-920f09bb8187ee15436712a3e82ce709/FEMA_P-320_2014_508.pdf

6. Trash and Recycling Rooms: 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 (6'x 10' minimum) in the trash room as well as in break rooms and copy areas, in accordance with 1994 PA 451, as amended, MCL 324.16501 et seq. If required in the Project Component Checklist, provide

commingled recycling areas and service.

7. Mechanical Equipment Room: Ceiling height to be a minimum 12'. Control noise transmission to adjacent spaces. Refer to Mechanical Design Requirements for additional descriptions.

8. Locate and centralize all mechanical equipment in a penthouse 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.

9. Locate vertical shafts adjacent to core areas with no offsets allowing for maintenance accessibility and additions for future utilities.

10. Switchgear and electrical rooms located in basement areas must have provisions for removing water with a back-up emergency electrical power source.

11. Main telecommunication and telecommunication rooms: Locate, design, and outfit per requirements of http://www.michigan.gov/documents/dtmb/1345.00.02_Network_and_Telecommunications_Infrastructure_Facility_Standard_482663_7.pdf and this document.

H. SITE PLANNING/DESIGN

1. A site survey, environmental and geotechnical investigations must be provided for review by the DTMB-RED and DCD. These items are required and are the responsibility of the Lessor.

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 State facility at a sufficient distance from windows and ventilation systems to ensure that smoke does not enter the Leased premises; a sufficient number of receptacles specifically designed for smoking related trash to accommodate all smokers who work and conduct business in the Leased premises; and disposal of smoking related trash. If the State 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. Public and employee entrances to the building shall comply with the ADAAG and MBF requirements.

2. Provide sufficient concrete sidewalks from parking areas for easy and ADAAG-compliant access to building. Sidewalks shall be sized so that if vehicles overhang sidewalks there is sufficient passage width per the ADAAG.

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 in the Lease.

4. Provide the following as a minimum at parking lots: stall size 9' x 20'; 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 handicapped parking and signage per building code and ADAAG and MBF requirements. A minimum of one of the handicapper spaces shall be "van accessible" per ADAAG and MBF.

6. Paint all lines and stripes using 1 coat yellow or white Sherwin Williams "Pro-Mar Traffic Paint" as appropriate at a rate of 1 gallon for every 350 lineal feet of 4" wide stripe following the DTMB-RED or DTMB-DCD's approval of the parking layout provided by the Owner/Lessor.

7. Provide guardrails, curb cuts and wheel stops to meet ADAAG and MBF 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, 15-foot 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. Live loads: Entire office floor loading shall provide 100 pounds per square foot (minimum) live loads. Limit floor deflection to L/360. Do not reduce live load for horizontal framing members/columns or load bearing walls supporting top floor or roof.

2. Where required by the Project Component Checklist: provide special floor loading requirements for computer room loads, special equipment loads and storage loads.

3. Design 1 bay per floor for high density storage systems.

4. Non-structural, rigid partitions shall be adequately supported so as not to become load bearing.

5. Masonry walls are to be isolated from floor above by a gap and restrained by either an intermittent or continuous steel angle on both sides at top of wall or steel straps extending in the wall grout.

6. Metal stud partitions do not require in-plane lateral isolation from structure if the design

story drift ratio multiplied by 3(R/8) is less than 0.0025.

7. Top of stud in full height walls is to be separated from the track. Use deflection tracks.
8. Building expansion is to be carried through crossing partitions.
9. Design Procedures:

    a) Load Resistance Factor Design (LRFD): Use for small or large building structures.
    b) Allowable Stress Design (ASD): Use for small building structures only.

10. Progressive Collapse:

    a) Building is not to be subject to progressive collapse as defined by the building code.
    b) Beam or slab failure shall not affect system below or in adjacent bays.
    c) Column failure shall affect only the bays supported by that column

11. Drift: Lateral deflection of building under lateral load is to be limited to wind and earthquake requirements. Wind induced motion and sway must also be limited. Design roof massing and roof structure to prevent excessive drift and potential collapse.
12. Transient vibration induced by passing traffic or foot fall is to be minimized.
13. Corrosion Protection: Steel exposed to elements is to have a protective coating. For small isolated steel elements use either hot dipped galvanized zinc coating or coal tar epoxy. For larger exposed steel elements use a 2-coat system:

    a) Coat 1: organic zinc rich urethane or epoxy primer shop applied over blast cleaned surfaces.
    b) Coat 2: field applied finish coat.

14. For concrete in parking structures use corrosion inhibiting additives and cathodic protection or epoxy coated reinforcing bars and surface sealers.
15. Attachment of exterior cladding:

    a) Provide connections and joints that provide movement between stories
    b) Connections to have sufficient ductility and rotation capacity to preclude brittle failure in connection welds or concrete fractures
    c) Concrete inserts are to be attached to or hooked around reinforcing steel
    d) Positively anchor window frames to resist lateral loads
    e) Provide clearance and flexible mountings at window frames to permit thermal movement

16. Attachment of partitions:

    a) Adequately support non-structural, rigid partitions so as to not to become load bearing
    b) Isolate masonry walls from floor above by a gap and restrain by either an intermittent or continuous steel angle on both sides at top of wall or steel straps extending in the wall grout
    c) Metal stud partitions do not require in-plane lateral isolation from structure if the design story drift ratio multiplied by 3(R/8) is less than 0.0025.
    d) Top of stud in full height walls is to be separated from the track. Use deflection tracks.

17. Building expansion is to be carried through crossing partitions.

II. BUILDING ENVELOPE COMPONENTS

A. A building envelope being proposed for a State of Michigan agency as tenant shall present a professional and permanent appearance, using durable materials in sound, weathertight, and code-compliant condition. Design of the exterior envelope shall not rely on caulking and sealants for moisture exclusion.

1. 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
   - Redwood or cedar exterior wood siding and trim

2. Acceptable roofing materials include:

   - Fiberglass or asphalt dimensional or 3-tab self-sealing shingles
   - Built-up or single-ply membrane roof systems
   - Metal roof panels

B. Concrete

1. All foundation walls below grade shall be poured reinforced concrete or concrete block with reinforcing.

2. All concrete shall have a minimum compressive strength of 3,000 PSI in 28 days.

3. Concrete slabs on grade shall be four (4) inches thick with wire mesh reinforcing. Pour slab on four (4) inch sand bed, firmly tamped by mechanical means to insure a solid base with no voids or hollows.

C. Masonry

1. Face Brick: grade “SW”, severe weather type, special shapes as required by building configuration.

2. Concrete Masonry Units: Hollow load-bearing concrete masonry units, normal weight.

3. Masonry Accessories: horizontal and vertical joint reinforcement, ties, straps and weeps to meet design parameters.

D. Metals

1. ASTM grade for structural steel shapes, plates and bars as determined to meet project conditions and design parameters.

2. Miscellaneous metals items shall use the best commercial quality for the purpose of items specified, free of defects impairing strength, durability, finish or appearance. Materials shall be formed truly and uniformly to required shape, size, sharp lines, and smooth surfaces.

3. Separate dissimilar materials with caulking, bituminous paint or gasket as approved.

4. Shop prime all exposed steel surfaces except where fire proofing is provided.

5. All steel decking must be galvanized or be provided with a rust prohibitive coating, shop applied.

E. Wood

1. Wall Sills: Foundation grade pressure-treated southern pine or Douglas fir.
2. Dimensional lumber for light framing: Stud, 2 x 4 or 2 x 6, No. 2 or standard grade.
3. Dimensional lumber for structural framing: Southern pine No 1 dense KD 2050 Douglas fir select structural 1900f.
4. Concealed sheathing: Standard exterior grade with exterior glue APA CDX, plywood or OSB.
5. Exterior Wood Siding and Trim: Redwood or cedar, heart grade, rough-sawn.
6. Wood preservative: Ammonical copper arsenite (ACA) for Douglas fir or chromated copper arsenite (CCA) for southern pine.

F. Metal Wall Panels: Factory assembled manufactured wall panel insulated with isocyanurate foam-core, double tongue and groove joinery with factory applied air and vapor sealing with a minimum "R" value of 15. 26-gage minimum face and backer sheet steel with Kynar 500 finishing consisting of 1-color coat and 1-primer coat (both faces).

G. Roof

1. Roof shingles: Fiberglass or asphalt, dimensional or 3-tab self sealing. Must have a minimum manufacturer's warranty of 25 years standard pro-rated, U.L. class "A" and wind resistant. Provide roof felts of 15#, non-perforated or better, ice and water dams at all valleys and eaves (3' minimum width), metal or aluminum drip edges.
2. Built-up and Single-Ply Roof Systems: Provide either a 4-ply built-up hot applied or single ply membrane roof system depending upon design parameters. The selected roof system must have a 20-year full system warranty which is to include insulation, fasteners, flashings, and roof systems accessories. Roof system manufacturer is to provide a roof inspection and roof report, with copies, to both the Lessor and Lessee at project completion. Single-ply roof membrane may be either reinforced or non-reinforced and have the equivalent in performance of a 60-mil non-reinforced membrane. A white reflective membrane system is preferred. Roof insulation is to comply with the Michigan Energy Code and be installed in 2 layers, joints staggered.
3. Metal roof panels: Manufactured roof panels comprised of polyisocyanurate insulations sandwiched between 24-gage aluminum coated sheet steel with a Kynar 500 finish. Provide continuous snow fencing to prohibit snow slide-off on all sloped metal roof applications. Manufacturer is to provide a 20-year full systems warranty.
4. Roof specialties: Provide factory assembled/fabricated roof components compatible to roof systems manufacturer's warranty. Field fabricated roof specialties are not permitted.
5. Manufacturer's roof systems and accessories submittals are to be reviewed and approved by DTMB prior to product procurement.

H. Caulking, Sealants

1. Design of the exterior envelope shall not rely on caulking and sealants for moisture exclusion. Select caulking materials per manufacturer's recommendation. Preferred

material for exterior use is butyl rubber or single-component polysulfide base compound. Butyl rubber caulking compound for exterior use shall be 1-part polymerized rubber compound, gun consistency, conforming to federal specification TT-C 598 grade one.

2. Polysulfide base compound for exterior use shall be a 1-component sealing compound complying with the requirements of USIA A116.1, Class B (non-sagging) and federal specification TT-S227B, Types I and II.

3. Acrylic caulking compound for interior use shall be a 1-part, 100% liquid polymer, acrylic base compound, and non-sagging, non-staining, gun consistency.

4. Maximum joint size is ¼-inch; backer rods are required per manufacturer's recommendation.

III. INTERIOR COMPONENT CONSTRUCTION

A. Gypsum Board and Non-Structural Framing

1. Metal framing members: 20 gauge minimum, corrosion resistant steel, 3-5/8", channel type at 16" on center; 24" on center is not acceptable. 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 roof deck.

2. Wood framing members: nominal, grade 1 and 2, 2" x 4" at 16-inches on center.

B. Gypsum board: Minimum 5/8-inch typical thickness attached with 1-1/4" long drywall screws and finished per installation standards below. Provide 5/8-inch cementitious board at ceramic tile finish surfaces susceptible to water contact. Provide 5/8- inch water resistant gypsum board at areas subject to high humidity/moisture exposure or to water damage. Exterior wall insulation is to be covered from floor to roof deck with 5/8" gypsum board as noted above. Gypsum board above the acoustic ceiling line may be unfinished.

1. Installation: Gypsum board shall be installed and finished per United States Gypsum Co. levels of gypsum board finishing as follows:

- Level 1 finish: when above finished ceilings and concealed from view.
- Level 2 finish: as a substrate for tile.
- Level 3 finish: when scheduled to receive a heavy or medium textured finish.
- Level 4 finish: in offices and other areas that receive lower public traffic and visibility.
- Level 5 finish: for all walls and ceilings to receive a painted finish, lightly textured finish and/or wall coverings. Use in corridors and other high public traffic areas.

2. Trim and accessories: Use metal or plastic trim. Provide fire treated wood or 20-gage metal wall reinforcement for toilet room 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 Michigan 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 Michigan Building Code, local fire marshal directives and U.L. 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, areas of water and air penetration, and where visual appearance is critical. Acrylic caulking compound for interior use shall be a 1-part, 100% liquid polymer, acrylic base compound, and non-sagging, non-staining, gun consistency. Maximum joint size is ¼-inch.

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.

TABLE A1 ARCHITECTURAL DOOR, ROOM AND FINISH SCHEDULE

Architectural Door, Hardware, and Finish Standards Schedule									
	Tenant Separation Walls	Toilet Rooms	Enclosed Office, Conference Room, Storage	Open Office	Break Room	Perimeter Wall	Electrical, Mechanical, Service Room	Janitor Closet	Computer and Communications Room
Door Type	D-1 or D-3	D-3	D-4	D-3	D-4	D-1 or D-2	D-2	D-2	D-2
Door Hardware	H-1 or H-2	H-6	H-4	H-3	H-3	H-5	H-3	H-3	H-3
Wall Type	W-1	W-2	W-4	W-5	W-4	W-6	W-3	W-3	W-3
Wall Finish Type	WF-1	WF-	WF-1	WF-1	WF-1	WF-1	WF-3	WF-3	WF-3
Floor Type	F-1	F-3	F-1/F-2	F-1	F3	-	F-5	F-3	F-3
Ceiling Type	C-1	C-2	C-1	C-1	C-1	-	C-3	C-2	C-1

Door Types Legend	
Designation	Door Type Description
D-1	Aluminum storefront medium stile with side light
D-2	Hollow metal frame and hollow metal door
D-3	Hollow metal frame and hollow metal door/ side light or narrow light glazing
D-3	Hollow metal frame and solid wood door
D-4	Hollow metal frame and wood door/ side light or narrow light glazing

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**
*** Refer to Steel Door Institute criteria for description.*

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 6" wide x 24" 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	Door Type Description
H-1	Panic bars, closer, lock, hinges, weatherstrip
H-2	Aluminum push/pulls, closer, hinges, floor bumpers
H-3	Mortise passage set, hinges, wall bumper
H-4	Mortise lock set, hinges, wall bumper, coat hook in offices
H-5	Mortise lock set, hinges, closer, wall bumper
H-6	Push /pulls, closer, hinges, wall bumper

Wall Types Legend

Designation	Wall Construction Description
W-1	3-5/8" metal studs at 16" o.c. with 5/8" gyp bd each face with 3" acoustical insulation. Extend from finish floor to underside of floor or roof deck. Provide deflection track and seal tight to deck above.
W-2	3-5/8" metal studs at 16" o.c. with 3" acoustical insulation, 5/8" gyp bd on one face with 5/8" moisture resistant gyp bd and ceramic tile to 4' a.f.f opposite face. Extend wall to roof or floor deck above. Provide deflection track above.
W-3	3-5/8" metal studs at 16" o.c. with 5/8" gyp bd on one face with 5/8" gyp bd each face with 3" acoustical insulation. Extend to roof or floor deck above. Provide deflection track above.
W-4	3-5/8" metal studs at 16" o.c. with 5/8" gyp bd each face with 3" acoustical insulation. Clip to ceiling grid and provide 2' acoustical insulation at both sides of partition.
W-5	3-5/8" metal studs at 16" o.c. with 5/8" gyp bd each face. Clip to underside of ceiling.
W-6	1-5/8" metal furring with 5/8" gyp bd with rigid insulation. Extend 1' above ceiling.
Wall Finish Legend	
WF-1	Type II medium-duty vinyl wallcovering, paint if concrete block wall construction
WF-2	Type III heavy-duty vinyl wallcovering, chair rail at waiting and conference rooms, paint if concrete block wall construction
WF-3	Paint
Floor Legend	
Designation	Floor Type Description
F-1	State standard carpet with base
F-2	State upgrade carpet with base
F-3	Vinyl composition tile with base
F-3	Ceramic floor tile with sanitary coved base
F-5	No floor finish, anti-dusting sealer only
Ceiling Legend	
Designation	Ceiling Type Description
C-1	15/16" metal exposed tee suspension system with 2' x 2' x ¾" acoustical reveal edge lay-in ceiling tile
C-2	½" gypsum board on metal suspension system, painted
C-3	Open, no ceiling, no paint

IV. OPENINGS – see TABLE A1 ARCHITECTURAL DOOR, ROOM AND FINISH SCHEDULE

A. Aluminum Entrances, Storefronts and Curtainwall: Standard extruded aluminum and glazed systems with a minimum 1-3/4" member width, equal to systems by Kawneer, Tubelite, or Wausau. Finishes shall be either clear anodized, electronically deposited color, or fluoropolymer.

1. Doors are to have, at minimum, medium stiles and rails, with a 10" bottom stile meeting

ADAAG requirements. Framing members are to be configured to accept insulated glazed units. All *exterior* doors shall be weather-stripped, have commercial quality ADAAG and MBF compliant aluminum threshold.

2. Automatic door operators are to be ADAAG and MBF compliant, electronically operated, surface mounted with weather tight aluminum housing. Operator is to be provided with an adjustable time delay. Provide 6-inch diameter push plate for activation.

3. Exterior and Storefront Glazing: 1-inch thick, Class A, low "E" glass, tempered or laminated as required by code. Glass shall be tinted to reduce glare.

B. Glazed Aluminum Curtain Walls: Glazed aluminum curtain wall systems components include extruded aluminum framing, thermally broken with internal reinforcement, insulated spandrel panels, trim, filler units and gaskets. Glass units are to be low "E" insulated either tinted or reflective. Anchor clips and accessories are to be aluminum, nonmagnetic stainless steel or galvanized steel.

1. Curtainwall finish shall be either clear anodized, electronically deposited color, or fluoropolymer. Fluoropolymer shall be Kynar 500, 2-coat for exterior applications and fluropolymer, Kynar 500, 2-coat or baked enamel for interior applications.

2. Exterior and Storefront Glazing: 1-inch thick, Class A, low "E" glass, tempered or laminated as required by code. Glass shall be tinted to reduce glare.

C. Structural Sealant Glazed Curtain Walls: Structural sealant glazed curtain wall systems components include extruded aluminum framing, thermally broken, with internal reinforcement, insulated spandrel panels, trim, filler units and gaskets. Glass units are to be low "E" insulated either tinted or reflective. Anchor clips and accessories are to be aluminum, nonmagnetic stainless steel or galvanized steel. Structural sealant must meet systems manufacturer's specifications.

1. Curtainwall finish shall be either clear anodized, electronically deposited color, or fluoropolymer. Fluoropolymer shall be Kynar 500, 2-coat for exterior applications and fluropolymer, Kynar 500, 2-coat or baked enamel for interior applications.

2. Exterior and Storefront Glazing: 1-inch thick, Class A, low "E" glass, tempered or laminated as required by code. Glass shall be tinted to reduce glare.

D. Exterior Doors and Frames:

1. Insulated Metal Doors: Other *exterior* doors, not at the main entrance, shall be custom insulated metal construction, heavy duty commercial quality. Door face sheets shall be commercial quality, roller leveled, cold rolled, 16 gauge steel with 18 gauge stiffeners at 6" on center and polystyrene or urethane insulation core filler.

2. Frames shall be prefabricated combination buck, frame, and trim type. Mitered joints shall have locking tabs at frame rabbets and backboards.

3. All *exterior* doors shall be weather-stripped and have a commercial quality ADAAG and MBF compliant aluminum threshold. All exposed steel surfaces shall be cleaned, bonded and coated with a baked on zinc chromate based prime paint.

E. Overhead coiling 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.

F. 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 NEMA Type 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.

G. 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 3 sides shall be glazing to admit natural light. Glazing shall be 1-inch thick, Class A, low "E" glass, tempered or laminated as required by code. Glass shall be tinted to reduce glare.

H. Interior Glazing: Tempered or laminated, or wire glazing as required by code.

I. Bullet Resistant Glass: at Level 3 per UL 752. Provide at transaction windows.

J. Observation Windows: One-way mirror glazing in hollow metal or wood frame.

K. Interior Doors and Openings: Use standard height and width doors where ever possible to avoid custom fabrication. Doors are to swing against a wall whenever possible. Doors and frames shall bear UL labels as required by code. Vertical rod panic devices are not permitted.

1. Hollow metal steel doors are to be flush with composite construction Grade II, heavy-duty, 18 gage cold-rolled, 1-3/4-inches thick at interior locations and Grade III, extra-heavy duty, 16 gage galvanized steel 1-3/4-inches 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 knock-down type, 16 gage steel. Exterior steel frames must be welded type 16 gage galvanized steel. Door frames shall be anchored with three anchors minimum per jamb. All door frames are to have door silencers and plaster guards.

3. Wood doors at interior locations are to be 1-3/4" premium grade, solid core, hardwood faced, with either 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 1/28" before sanding.

4. Similar commercial plastic laminate faced or hollow metal may also be provided if approved by the State.

L. Access doors are to be fabricated with 16 gage steel frames with 14 gage steel doors, primed with a cylinder lock.

M. 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 hearings 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 be separately keyed with no master key control. Owner/Lessor to supply two (2) keys.

2. Hardware shall conform to applicable requirements of the building code, and for fire rated doors and frames, with appropriate sections of Chapter 5 of ANSI/NFPA 101. Hardware shall be made to blueprint template and be furnished to door and frame manufacturer.

3. For buildings owned or operated by the State of Michigan furnish and install door hardware to comply with the latest edition of the State of Michigan Security and Emergency Management Standards. State of Michigan will provide these specifications upon request.

4. For all other conditions comply with the following:

   a) Quality level: Heavy duty commercial. All door handles shall be of heavy duty ADAAG-compliant lever type, except those on doors to hazardous areas. Brass keys, interchangeable cores, weatherproof if exterior.
   b) Exterior: Weatherproof, heavy-duty cylindrical lockset type with a minimum 2-3/4" back set and 9/16" throw latchbolt. All exterior locksets shall be Schlage, EXT D53PD RHO 626, or approved equal, and must be designed or protected so they cannot be grasped by any wrenching device. Knob handles are not acceptable. All entry doors shall be equipped with Gyro Tech System 500 electric push button operators for the handicapped. Operator push switch plates shall be of 6-1/4" 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, Schlage AL Series, Stanley/Best 14 & D or approved equal. Knob handles are not acceptable.
   d) Exit devices: Similar in performance to IR-VonDuprin, 990 Series, steel, with finish to match other hardware, UL 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 Adams Rite door locking hardware: #4590 or # 4591 Latch Paddle or approved equal.
   e) Closers: All exterior doors shall be equipped with high frequency, ADAAG and MBF compliant 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.
   f) Keying: Provide and install construction locks in cylinder cores on all exterior doors. Convert to cores for State use within 1 day after building control has been turned over to the State. A keying plan for interior door locks will be furnished by the State with the systems furnishings block plan. Cylinder cores and keys shall be provided by the Owner/ Lessor. The Owner/Lessor shall supply 2 keys per lock, and 4 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 8.5 lbs of force for operation; hinged interior doors shall require no more than 5 lbs 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) Door stops: Wall mounted, with wood blocking.

k) Weatherstripping: At all exterior hollow metal and aluminum doors provide perimeter door seals, door sweeps and barrier free aluminum thresholds.

V. FINISHES -- see TABLE A1 ARCHITECTURAL DOOR, ROOM AND FINISH SCHEDULE

A. Tile:

1. All toilet room wall surfaces are to have glazed ceramic tile extending a minimum of 6'-0" above finish floor, thinset with colored latex-cement grout. Tile is to be plain faced with cushion edges, ¼-inch thickness.

2. All toilet room floors are to have unglazed ceramic tile with integral coved base, thin-set with colored latex-cement gout and 2-coats of sealer. Tile to be porcelain, flat, with abrasive admixture, ¼-inch thickness with patterned face and cushion edges, with all special shapes required for one-piece inside and outside corners.

3. Other tile finishes may include porcelain, quarry, or glazed ceramic, with non-slip surfaces.

B. Acoustical Panel Ceilings:

1. Minimum ceiling height shall be not less than 9'-0" above finished floor, except in small rooms or limited areas, such as mechanical or janitorial rooms, which may have ceiling heights of 8'-0".

2. Ceiling panels are to be mineral base panels, wet formed, standard fissured, white, with reveal edge profile. Size to be 2' x 2' x ¾-inch, unless approved by DTMB-RED or DTMB-DCD. Minimum panel size at walls shall be no smaller than 6-inches.

3. Ceiling suspension systems are to be equal to Armstrong Contract Interiors Prelude XL, 15/16-inch, 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 of pipe, conduit or ductwork. Suspend lighting fixtures independently of the ceiling suspension.

4. Provide unfaced sound attenuation blankets over ceiling systems to meet room to room sound transmission requirements.

C. Gypsum Board Ceilings: Provide painted, 5/8" gypsum board ceilings in airlock entry vestibules, janitor's closets and secure rooms. Provide means of access 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, 12-inch x 12-inch x 1/8-inch thick.

2. Vinyl wall base shall be 4-inches in height x 1/8-inch thick. Provide cove base at vinyl composition tile locations and straight base at carpet locations. Provide vinyl or rubber treads at all stair treads locations. Provide vinyl edge strips at terminations and transitions.

E. Access Flooring – If required in 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 1250 lbs. minimum with a minimum uniform load of 400 lbs./s.f. Facing material shall be carpet in office areas and plastic laminate in data rooms. Provide all ramps, steps, aluminum guard rail 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 cutouts for data cable are to be grommeted with nylon brush closures. Provide perforated tiles for air supply.

F. Carpet: The State of Michigan has a statewide contract for the supply and installation of the specified carpet with a single manufacturer and installer. This contract also applies to SOM leased spaces. Any upgraded carpeting noted on the finish schedule and or the building program statement is not included as part of this predetermined bidding process. All costs for the supply and installation of carpeting is to be included as part of the contract.

1. Carpet Materials Manufacturer/Subcontractor:

   Carpet Manufacturer: Tandus, C & A
   Primary Contact: Elyse Bertling, Account Executive
   Tandus US, LLC 3272 West Haverford Franklin, MI 48025
   Email: ebertling@tandus.com
   Cell: 248-346-8733 Fax: 866-708-9375
   Voice Mail: 800-241-4902, Ext 1461

2. Installation & Secondary Contact:

   Chris Ruehle, State Contract Coordinator & Project Manager

   Lansing Tile & Mosiac, Inc. 2210 Appolo Drive Lansing MI 48906
   Email: Chris.Ruehle@lansingtile.com
   Tel: 517-321-5307 Fax: 517-321-5461

Office Standard Field Carpet	"Runaway II", #03164; 24" x 24" "Color Spectrum, #03343; 24" x 24"
Office Substitute Carpet	"Field Day", #03377; 24" x 24"
Office Solid Carpet	"Plexus Accents II" #05112, 24" x 24"
High Traffic Field Carpet	"Sheffield", #01932, 24" x 24"
Walk-Off Carpet	"Abrasive Action", #02578
Refer to Resilient Flooring and Accessories Items, for wall base and transitions description.	

3. Chair pads are required for protection of carpet texture. Absent the use of chair pads, more intensive maintenance 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.

G. Wall Covering: Provide Type II medium duty in offices and areas not subject to high abuse. Provide Type III heavy-duty wall covering in high abuse areas such as corridors, toilet rooms and break rooms. Provide clear plastic, vinyl, or poly corner guards up to 60" above finish floor on all outside corners to protect vinyl wall covering.

H. Painting: Painted surfaces shall receive 1 coat of primer and 2 coats of finish. A complete room

finish schedule shall be submitted for approval by the Lessee/Tenant Agency prior to construction. Colors shall be selected and/or approved by the State Agency. Use only first-line commercial products for all coating systems similar to Sherwin-Williams, Benjamin-Moore, Pratt & Lambert or PPG.

EXTERIOR	PAINT/COATINGS
Concrete and Stucco	2 coats 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 coats full-gloss alkyd enamel
INTERIOR	
Concrete Walls	2 coats latex interior flat
Concrete Masonry Units	1 coat latex block filler, 1 coat interior enamel undercoat, 1 coat interior semi-gloss
Gypsum Drywall Ceiling	1 coat latex interior primer, 1 coat latex flat
Gypsum Drywall Wall	1 coat latex interior primer, 2 coats interior semi-gloss odorless alkyd enamel
Gypsum Drywall to Receive Wall Covering	1 coat latex interior primer
Woodwork and Hardboard (Painted)	1 coat interior enamel undercoat, 2 coats alkyd gloss enamel
Woodwork, and Millwork (Stained)	1 application wood filler, 1 coat oilbased interior wood stain, 1 coat shellac, 2 coats oil rubbing varnish
Ferrous Metal	1 coat synthetic rust-inhibiting primer, 1 coat interior enamel undercoat, 1 coat exterior alkyd gloss enamel
Zinc-Coated Metal	1 coat galvanized metal primer, 1 coat interior enamel undercoat, 1 coat exterior alkyd enamel

1. All exposed piping, conduit mechanical and electrical components in finish areas are to be either field painted or pre-painted by the manufacturer.
2. Provide odorless paint when painting in areas occupied by personnel regardless if painting operations are conducted during or after business hours.

I. Chair Rail: Provide 1” x 4” HDPE, solid-surface, bamboo, or hardwood chair rail routed at top and bottom edge for a finished appearance, mounted 32” above finished floor in the lobby, break room, offices, and all public spaces at minimum. HDPE is preferred in lobbies and waiting rooms. Softwood chair rail is not acceptable. Additional areas will be identified by the State on preliminary drawings provided by the Owner/Lessor.

J. Interior window sills shall be durable water and moisture resistant materials such as HDPE, finished hardwoods, solid surfacing, natural stone, or artificial stone. Gypsum board or softwood window sills are not acceptable. Provide 1” x 6” interior window sills at all interior sliding windows.

K. Plywood Backboards and Wall Blocking: Provide one 4’ x 8’ x ¾” telephone equipment backboard mounted to wall in the telephone closet. Plywood backboard will be finished with 2 coats of white enamel paint.

L. Wood blocking: Provide 2” x 10” wood blocking in wall cavities where door swing motion could cause door lever hardware to pierce gypsum drywall board, for the installation of wall-mounted door stops. Provide 2” x 6” wood blocking in wall cavities to support handrails in accessible restroom stalls.

VI. SPECIALTIES

A. Visual Display Surfaces: Marker boards are to be porcelain enamel faced for liquid-type markers with core material and backing with an aluminum tray.

B. Directories: If the State is the sole tenant and occupies 100% of the building, provide a building directory at the main entry point. The directory shall be metal or wood framed consistent with the décor of the building, glass enclosed and lockable, sized not less than 36” high x 24” wide. If the Lessee/Tenant Agency is part of a multi-tenant building, provide space within the existing building directory of not less than 3 lines.

C. Interior Signage: Interior signage shall meet the DTMB standard interior signage design. The design is available on request. Locate signs as required by ADA and building code requirements, and on rooms and spaces intended for public use such as conference, meeting, and hearing rooms.

D. Exterior Post, Panel and Pylon Signage: If required by the RFP, provide an illuminated exterior sign, mounted on a post or pylon. Design of the sign shall be approved by the State Agency.

E. Telephone Specialties: If required by the RFP, provide a public telephone with enclosure.

F. Toilet Compartments: At public or employee use toilet room locations, toilet compartments, urinal screen and privacy panels are to be fabricated from HDPE or other solid surfacing material.

1. Toilet compartments are to be 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 Room Shelving: At employee toilet rooms provide a minimum 12” x 36” parcel shelf adjacent to entry door.

H. Toilet and Bath Accessories: All toilet accessories are to be ADAAG and MBF 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.

Item	Manufacturer, Model (or approved equal)	Notes
Combination Toilet Tissue and Waste	Bradley 5952, Gamco TSC-7	Stainless steel, dual roll, integral waste receptacle
Combination Toilet Compartment Unit	Bradley 5911, Gamco TSC-5PH,	One per public toilet compartment.
Toilet Tissue Dispenser (without integrated waste)	Bradley 5402, 5412, Gamco TTD-5, TTD-6, TTD-7	Stainless steel, dual stacking roll, partition mounted, one per stall, if not practical to use combination unit

Stall Waste Container	Bradley 4721-15, 4722-1015, 4722-15, 4731-15, Gamco ND-3	Stainless steel, partition mounted, one per stall, if not practical to use combination unit
Toilet Seat Cover Dispenser	Bradley 5831, Gamco TSC-1	One per stall, if not practical to use combination unit
Combination towel dispenser/waste receptacle	Bradley 2037, Gamco TW 9, TW-9-4	Stainless steel, fully recessed, large capacity
Feminine Product Dispenser	Bradley 401, 407; Gamco 352-25, NV-2-4	One per women's toilet room, coin or free operation
Accessory Hook	Bobrick B-212	
Grab Bars	Size and configuration required to meet ADA and Michigan Barrier Free requirements.	1-1/2" round stainless steel
Soap Dispensers	Bobrick B-824, B-828 (foam)	Hardwired touchless (no battery), one per lavatory fixture, refillable.
Hand dryers	World Dryer SMARTdri, AirMax, or SLIMdri	Hardwired touchless, energy efficient
Faucets	Delta, Moen, American Standard	Hardwired (no battery) touchless
Changing Tables	Koala Care, Bradex	One per each public restroom
Mirrors and frames	Full width mirrors with ¼" thick mirrored glass and polished steel frames	
Drinking fountain cup dispensers	Locate at each drinking water fountain	
Mop and Broom Holders	Two per janitor's closet	

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. 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 Michigan Building Code. 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 aluminum blinds or shade fabric roller blinds at all exterior windows. Slats are to be a minimum 1 inch wide and white or off-white in color, with chain and cord for manual operation. Shade fabric roller blinds shall use a minimum 6 oz/yd fabric in a color selected or approved by the State Agency, with

chain and cord for manual operation.

M. Millwork/Casework:

1. All casework for break rooms, conference rooms and work areas is to be plastic laminate on particle board with frameless construction and full overlay doors. Laminated plastic shall be high pressure plastic laminate complying with NEMA Standards Specifications for General Purpose Grade (HGS/Grade-10 .050") with selection from standard selections, solid colors or wood grains.

2. Cabinets shall be complete with hardware, drawers, dividers, and adjustable shelves. Drawers shall be suspended on steel slides with ball bearing type nylon rollers for ease of operation. Drawer slides shall have a 100 lb. Load rating. Provide wire pulls or simple knobs compliant with the ADAAG.

3. All millwork and installation shall conform to the performance standards of the Architectural Millwork Institute. Finish wood materials to receive stain or transparent finish shall be "Custom" grade. Casework hardware shall be equal to Knape & Vogt Manufacturing Company products.

4. At all areas other than toilet rooms, countertops are to be plastic laminate on particle board substrate with rolled front profile and square edge backsplash.

5. At public use and employee toilet rooms all counter and lavatory surfaces are to be fabricated from HDPE.

N. Bullet-Resistant Panels: Fiberglass ballistic panels shall be 5/16-inch thickness with UL-200, level-2 rating. Face bullet resistant panels with gypsum board.

O. Shelving: Provide solid wood or metal shelving in the janitor closet for storage of cleaning and paper 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 aluminum. Floor grilles are to have top-surfaced tread rails with nylon carpet inserts.

VII. CONVEYING SYSTEMS

A. Passenger Elevators: Compliance with the requirements of the ADAAG and Michigan Building Code will provide the minimum determination for provision of a passenger elevator, unless specified in the Project Component Checklist.

1. For typical 2-stop application provide a hole-less hydraulic passenger elevator system, 2,500 pound capacity minimum with a finish clear cab size of not less than 6'-8" x 4'-3" with a minimum ceiling height of 7'-11". Cab speed shall not be less than 80 feet per minute. For facilities requiring more than 2 stops, or depending on building size and use, multiple elevators, larger elevator platform size, speed and weight capacity will be required. Elevator cabs are to have plastic laminate side walls, protective bumpers and skid-resistant vinyl composition tile floor surface. Furnish removable protective pads.

B. Freight Elevators: A freight elevator is required for a building over 2 stories. The need and description for a freight elevator in a two-story building is to be noted in the Project Component Checklist.

1. A freight elevator, at minimum, shall be Class A, hydraulically operated, with a minimum of

2500 pound loading capacity. The minimum clear cab floor size shall be 5'-4" x 7'-0". Freight elevator ceiling height should be a minimum of 12'-0" to facilitate moving equipment and furnishings. Elevator cabs are to have plastic laminate side walls, protective bumpers and skid-resistant vinyl composition tile floor surface. Furnish removable protective pads.

2. Elevator shaft way, electrical, and mechanical, emergency function, and elevator components are to be designed, manufactured and installed to comply with the latest edition of the State of Michigan Elevator Code as well as meet ADA requirements. No building HVAC or plumbing system piping shall be allowed in the elevator shaft or machine. If HVAC or piping is specifically required for the elevator system the design and installation shall be coordinated with the elevator manufacture.

VIII. FIRE SUPPRESSION

A. Fire Protection and Fire Detection/Alarm Systems shall be provided in all State of Michigan facilities. Fire protection systems are to conform to NFPA, state and local codes.

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.

IX. MECHANICAL, PLUMBING & HVAC

A. Meet or exceed all State of Michigan and Local vicinity code and regulation requirements for the mechanical systems in all State of Michigan leased, owned, or operated facilities. Some of the requirements of this standard exceed code requirements.

B. Review latest editions of State of Michigan Governor's energy directives, American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) standards 15, 55, 62. Follow the more stringent requirements.

C. Coordinate additional amenities and requirements with the building program as defined in the RFP or project statement.

D. Existing mechanical and HVAC 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.

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 guide lines 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 NFPA regulations and local health department requirements.
8. For facilities 15,000 square feet 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. Catwalks with access ladders are to be provided for all equipment that cannot be maintained at floor level.
14. Documentation of all the building systems is to be provided for the guidance of the building engineering staff. Documentation is to indicate actual elements that have been installed, how they performed during testing and how they operate as a system in the completed facility.
15. The building staff is to be provided with the following: 3 copies of prints identifying HVAC zones, record drawings and specifications (both hard copy and on CD), operating manuals with schematic diagrams, sequence of operation and system operational criteria for each system installed and maintenance manuals with complete information of all major components in the facility.
16. Provide posted operation instructions for manually operated mechanical systems. They

are to consist of simplified instructions and diagrams for equipment, controls and operations of the systems , including boilers, refrigeration equipment, HVAC controls, hot and chilled water distribution and hot and cold water domestic water. Instructions are to be framed and posted adjacent to the major piece of equipment of the system. The amount of instruction time provided is to be commensurate with the complexity of each system.

17. Allow adequate space for maintenance access to coils, pumps, filters etc.
18. HVAC equipment shall not be placed in ceiling spaces above computer rooms, server rooms, electrical rooms, telephone rooms etc.
19. 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 code and local regulations. Sewage ejectors 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 American Standard or Kohler.
    b) Low-flow water closets, urinals, faucets for sinks and lavatories are required for all locations. Do not use waterless urinals without approval by the Design and Construction Division during the schematic design phase of a project.
    c) Fixtures designated for use by the handicapped must comply with the requirements of Federal Standard 795; Uniform Federal Accessibility Standards and the requirements of the Title III Standards for the ADA.
    d) At sink locations with exposed piping provide ADA compliant jacketed prefabricated piping insulation. Color to be chosen by the State Agency.

7. Drinking fountains are to supply 55°F water, from standard packaged electric water coolers. Provide bottle filler type with drinking cup dispenser.
8. Dishwashers: If required by the RFP, dishwashers shall have dedicated booster heat units that meet all code requirements.
9. Valves and Shut-offs

    a) Provide isolation valves at all pieces of equipment and at each restroom fixture for both hot and cold water. Each restroom 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) 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.

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.
    d) All closed loop heating and cooling systems shall be treated with a corrosion inhibitor.

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) All pipe is to be labeled and color-coded according to ANSI Z535.1-1991 Safety Color Code and ANSI A13.1-1981 Scheme for Identification of piping Systems. Pipe markings must effectively communicate the contents of the pipes and give additional information if special hazards (such as extreme temperatures or pressures) exist, i.e. "Steam 110PSIG". Arrows shall indicate direction of flow. Label placement shall insure that labels can be easily read based upon label elevation and viewing angle of individual. Labels, at a minimum, shall be placed within six feet of valves, where change in direction occurs, on entry/re-entry points thru wall and floors and on straight segments with spacing between labels that allows for easy identification.
    d) 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.
    e) Copper piping shall be used on all domestic and hydronic piping systems.
    f) All closed loop heating and cooling systems shall be treated with a corrosion inhibitor.

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 hood design must meet NFPA regulations as well as all local 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 2-inches 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 3-inches wider than the mounted equipment on all sides.

15. Building Mechanical Specialties

    a) Electrical Generators: If required in the RFP, 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 RFP or the building program, provide special HVAC equipment required for any Computer Data Centers or Server Rooms.

TABLE M1 – General Office Mechanical Space requirements

Mechanical Minimum Design Requirements for General Office Space	
Code Reference	HVAC Systems –Michigan Uniform Energy Code, latest edition Michigan Mechanical Code, latest edition Ductwork – SMACNA, latest edition Plumbing -- Michigan Plumbing Code, latest edition
Temperature	73°F ± 4°F
Humidity	30-50%

Ventilation	Office Space: 20 cfm per person or 0.2 cfm / sq. ft. (whichever is greater) Break Room: 30 cfm per person Waiting Area: 15 cfm per person Kitchen/Toilet/Janitor's Closest: 10 air changes per hour and 100% exhaust
Air Conditioning	Equipment: 3 watts / sq. ft. Lighting: 2 watts / sq. ft.
Ductwork	Supply and Return air shall be ducted (except at raised floor systems). Return air plenums are not acceptable. Duct insulation shall be external wrap only; no internally lined duct will be accepted. Flex duct allowed within 10 of ceiling diffusers.
Miscellaneous	Provide a minimum of 1 electric water cooler and drinking fountain combination unit. Locate adjacent to restrooms.

Standard Piping Material	Use	Comments
ASTM Schedule 40	Chilled water up to 12-inch diameter. Condenser water up to 12-inch diameter.	150 psi fittings. Standard weight pipe over 12-inch diameter. 150% of working pressure
	Hot water	Test to 300 psig.
	Natural gas	Weld and test to 300 psig
ASTM schedule 80	Steam over 15 psig	Test to 500 psig, 150% of working pressure
Copper tubing	Chilled water, Condenser water	Builder option. Use type K below ground and type L above ground.
	Domestic water	Lead free solder connections
	Refrigeration	Type ACR
Cast Iron	Sanitary, waste and vent	
PVC	Storm	Below grade only

X. ELECTRICAL

A. Meet or exceed all State of Michigan and local vicinity code and regulation requirements for the electrical systems in all SOM leased, owned, or operated facilities. Some of the requirements of this standard exceed code requirements.

B. When an existing facility or building is being used, all existing circuits (including wiring, connections, and disconnects), proposed for reuse shall be thoroughly inspected for size, condition, and suitability for re-use, and labeled. 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.

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 LEED standards established for the project and conform to Dark Skies requirements.
5. All underground conduit and duct banks shall be water tight 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 one foot above the conduit/wire.
7. Lightning protection shall be provided for all buildings and associated structures per NFPA and any other code 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. (Lock hasps are acceptable).
    d) Provide concrete housekeeping pads for all floor mounted electrical equipment. Pads are to be a minimum height of 3 ½ inches and extend a minimum of 6 inches 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 cubicles 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 State 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 U.L. listed firestopping assemblies for all openings and 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. See requirements of http://www.michigan.gov/documents/dtmb/1345.00.02_Network_and_Telecommunications_Infrastructure_Facility_Standard_482663_7.pdf for cabling, tray, conduit, and building entry requirements.
c) All cabling to be labeled.

6. Lighting

a) Lighting controls used in public areas are to comply with ANSI/ASHRAE/IESNA regulations.
b) Lighting fixtures shall be located where practical, so scaffolding is not required for lamp replacement.
c) Lighting in all occupied rooms will be controlled by an automatic sensor with a manual wall switch override. Locate sensors to avoid nuisance triggering.
d) Lighting shall be LED or fluorescent 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 GFI service outlets for supplemental lighting in mechanical spaces. Provide GFI outlets within six (6) feet of Control Panels.
g) Provide emergency lighting as required by code 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 that 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 painted "Wiremold" is required.
   f) All wiring to be labeled.

8. Building Electrical Specialties

   a) Electrical Generators: If required by the RFP, provide emergency electrical generator with required switching for the capacity and system components determined in the RFP. Alternatively, provide an external portable generator hookup and transfer switch.
   b) Elevators – meet all code requirements, including ADA requirements. All elevators shall be equipped a battery backup device that allows for exit of any persons trapped in elevator when building or local power is lost.

XI. COMMUNICATIONS

Follow the requirements of the DTMB Network and Telecommunication Infrastructure Facility Standard 1345.00.02 (included below) for the design of building entrances, main telecommunication rooms, telecommunication rooms, pathways, backbones, cabling, and other communications systems. Wiring will be performed by the DTMB or their contractor; however, all conduit, electrical service, and infrastructure shall be part of the building's design and construction contract. http://www.michigan.gov/documents/dtmb/1345.00.02_Network_and_Telecommunications_Infrastructure_Facility_Standard_482663_7.pdf

Acronyms and Glossary Specific to Communications

ANSI/TIA Standards	Standards compiled by the American National Standards Institute and the Telecommunications Industry Association for voice and data design and planning.
BICSI	Building Industry Consulting Services International – Helps develop standards and guidelines for networking. Its certifications are de-facto standards for cable installers.
BTUH	British Thermal Unit per Hour
CAT 3	Category 3 – An unshielded twisted pair cable designed to carry voice and data up to 10 megabits per second (Mbs) and with transmission frequency of up to 16 Mhz.
CAT 5	Category 5 – An unshielded twisted pair cable that can support data speeds of 100 Mb or more. It provides performance up to 100 Mhz.
CAT 5e	Enhanced Category 5 – An unshielded twisted pair cable that can support 1000 Mb, i.e., gigabit speed.
CMS	Cable Management System
DMARC	Demarcation Point – the physical location where the public network of a telecommunications organization such as a phone or cable company ends and the private network of the customer begins. This is usually where the cable physically enters a building.

fc	Footcandles; lumens per square foot
MTR	Main Telecommunications Room
Systimax®	Network infrastructure product family in use in State of Michigan facilities
TR	Telecommunications room
Office Area	The measured area of the area where a tenant normally houses personnel and/or furniture. This area does not include building common space such as mechanical rooms, lobbies, and vending areas.

Conform to ANSI/TIA 569-C and BICSI standards at minimum, unless reviewed and coordinated with DTMB FBSA and Telecommunications Division. Coordinate and confirm layout and design of the telecommunications system rooms, conduits, pathways and systems with the DTMB Telecommunications Division.

A. Building Entrance

1. DMARC:
    a. Each building or suite will require a DMARC or Demarcation Point, a physical location where the public network of a telecommunications organization such as a phone or cable company ends and the private network of the customer begins. This is usually where the cable physically enters a building.
2. CONDUIT:
    a. Three (3) conduits of 4” diameter rigid steel, placed a minimum of 24” below finished grade, and painted with corrosion inhibiting paint, shall be placed from the property line to an outside hand-hole. All ends of conduit shall have an insulated bushing at each end to seal out debris and water. Location and placement of conduit shall be coordinated with the DTMB Telecommunications Division.
    b. Three (3) conduits at the building entrance from an outside hand-hole to the DMARC, of 4” diameter rigid steel, placed a minimum of 24” below finished grade and painted with corrosion inhibiting paint. All ends of conduit shall have an insulated bushing at each end to seal out debris and water. Location and placement of conduit shall be coordinated with the DTMB Telecommunications Division.
    c. Conduit within the building shall be reamed and have an insulated bushing at each end, and shall be bonded and grounded.
3. BENDS:
    a. All bends shall be made with a sweeping radius; no sharp 90 degree bends are allowed.
    b. If bends in the total length of conduit from the property line to the hand-hole exceed one hundred eighty (180) degrees, a 3’-0” x 3’-0” accessible junction box shall be placed at each point where adding another bend would exceed the one hundred eighty (180) degree limit.
4. HAND-HOLES:
    a. Hand-hole shall be placed within 30’-0” of the entrance wall.
    b. Hand-hole shall be a minimum of 3’-0” x 3’-0” and 1’-6” deep.

B. Main Telecommunication Room (MTR)

1. LOCATION AND SIZE (MTR):
    a. Each building shall have a Main Telecommunication Room (MTR). Depending on the building size and configuration, additional Telecommunication Rooms (TRs) may be required. Each floor in a multistory building, except the floor containing the MTR, shall have at least one TR.
    b. Size of MTR is to be: .75 SF per 100 square feet of Office Area or less, unless otherwise negotiated with DTMB Telecommunications.

c. In multi-story buildings, the MTR shall be placed in line with the stacked TR's located on each floor. Center the MTR within the building vertically and horizontally. The MTR and TRs shall be located central to the building or suite floor plan, but so that the maximum length of the station cable terminating in the TR does not exceed two hundred ninety (290) linear feet.

C. Telecommunications Rooms (TR)

1. SIZE AND LOCATION:
   a. Each TR shall house, at a minimum, information outlet terminations, cable terminations for the riser system, and at least one cabinet.
   b. TRs shall be located central to the building or suite floor plan, but so that the maximum length of the station cable terminating in the TR does not exceed two hundred ninety (290) linear feet.
   c. TRs shall be stacked in multistory buildings.
   d. Size of TR in Offices:

Floor Size	Closet Size
10,000 Office Area SF	10' x 11'
8,000 Office Area SF	10' x 9'
5,000 Office Area SF	10' x 7'
Uses under 5,000 Office Area SF	3'x 7' minimum, with double doors providing access

D. Design and Construction Requirements for Main Telecommunications Room (MTR) and Telecommunications Rooms (TR):

1. ARCHITECTURAL REQUIREMENTS:
   a. Ensure simple unloading and equipment movement to and into the MTR and TRs.
   b. Hazardous elements such as water, fire suppression, drainage, steam, gas piping, or explosive or corrosive atmospheres shall be excluded from the MTR or TRs. There shall be no electrical cabinets or transformers in the MTR or TRs.
   c. Dry or gaseous fire suppression equipment is recommended.
   d. Walls shall extend to deck above.
   e. Ceiling height shall be 8'-6" minimum.
   f. Walls shall be constructed of masonry, concrete block, or stud and drywall construction with the fire rating required by code.
   g. Glass in doors or walls shall be security glass with the fire rating required by code.
   h. Floor shall be antistatic floor tile or sealed concrete. Carpet is not allowed.
   i. Two adjacent walls (termination field walls) shall be covered with ¾" clear grade fire-retardant plywood from 1'-6" above finished floor to 8'-0" above finished floor.
   j. A minimum of two (2) 4" diameter conduit sleeves placed between stacked TR Closets as risers, extending a minimum of 1" above the finished floor, placed adjacent to the plywood-covered termination field wall. Some systems may require additional risers. In all cases, one extra empty sleeve shall be installed. All metal conduits and metal sleeves shall be reamed and bushed at both ends. All conduit sleeves shall be firestopped.
   k. Provide a fire extinguisher at each MTR and TR.
2. DOOR AND HARDWARE:
   a. Door shall be 36" x 80", out-swinging.
   b. Door hinge pins shall be non-removable or installed on room interior.
   c. Locksets shall be:
      i. High-security pin-tumbler double cylinder locks with key-operated mortise or

rim-mounted dead-bolt
    ii. Dead-bolt throw shall be one inch or longer.
    iii. Cylinders shall have five or more pin tumblers
    iv. Card key or sequenced button activated locks with electric strikes, are authorized on a limited basis.

3. HVAC:
    a. MTR shall be environmentally controlled 24/7. Environmental equipment shall be provided with emergency power.
        i. Temperature range: 65 – 85 degrees Fahrenheit
        ii. Humidity range: 20 – 60 % dry-bulb Relative Humidity
        iii. Heat load requiring dissipation: 750-10,000 BTU/H per cabinet (assume three cabinets per room).
4. ELECTRICAL:
    a. The MTR shall contain the main telephone ground bar; each TR shall contain a telephone ground bar. All telephone ground bars shall be a two-hole configuration that accommodates two-hole ground lugs. The telephone ground bars shall meet ANSI/TIA standards.
    b. MTR electrical distribution:
        i. One 110/208V 200A power panel connected to emergency power, equipped with transient voltage surge suppression
        ii. Convenience Power: One 15A 110V circuit distributed on duplex wall plugs on each wall.
        iii. Equipment Operation Power: Three (3) emergency powered 20A 110V circuits distributed on six (6) duplex wall outlets located on walls with plywood. Outlets shall be orange in color.
        iv. All AC electrical power shall be on dedicated branch circuits.
    c. TR electrical distribution:
        i. One 110/208V 200A power panel connected to emergency power, equipped with transient voltage surge suppression
        ii. Convenience Power: One 15A 110V circuit distributed on duplex wall plugs on each wall.
        iii. Equipment Operation Power: Two (2) emergency powered 20A 110V circuits distributed on four (4) duplex wall outlets located on the walls with plywood. Outlets shall be orange in color.
        iv. All AC electrical power shall be on dedicated branch circuits.
    d. Lighting requirements (MTR and TR):
        i. Rooms shall have emergency lighting or lighting supplied with emergency power
        ii. Lighting level shall be 30 fc, measured at floor level.
        iii. Lighting shall be on a separate circuit from the equipment or convenience power.
5. CABLES AND TERMINATIONS:
    a. TR voice terminations will be made on the wall with plywood.
    b. The voice wall field will consist of 110A-type connecting blocks
    c. TR data cables shall terminate in equipment rack-mounted patch panels that must support the applicable Category certified data rate.
    d. Horizontal cable shall be plenum or non-plenum rated depending on the application required by the applicable codes such as the National Electrical Code.
    e. The TR wall field shall incorporate a CMS (see Horizontal Pathways, below).
    f. CAT 3 voice jacks shall be ivory in color.

6. EQUIPMENT RACKS:
    a. Equipment racks in a TR shall be equipped with a CMS (see Horizontal Pathways, below).
    b. Equipment racks shall be provided with clearances as prescribed in BICSI standards.

E. Vertical Backbone Cabling Pathways

Continuous vertical communication backbone cabling pathways between the MTR and TRs in multistory buildings shall have firestopped conduit sleeves as described in D.1.j above. Follow the recommendations of the "Building Automation System Cabling Standard Intelligent Building systems Cabling Standard" for planning pathways. Should the MTR and TRs not be stacked vertically, provide 4" diameter conduit runs with no more than two 90 degree bends between pull points. Do not locate backbone cabling pathways in elevator shafts.

F. Horizontal Pathways

Each floor of the building shall have a cable management system (CMS). The CMS may consist of cable trays, J-hooks and/or conduit. The CMS will carry voice, data, and video cable from the MTR or TR to the work station. The CMS shall have no sharp edges. Metallic cable trays and conduits must be bonded and grounded.

G. Telecommunications Systems

The State of Michigan has standardized procurement on the Systimax® family of products for structured cable systems (SCS) throughout state buildings. The data portion of the Systimax® SCS will be certified to operate at the maximum bandwidth of the category classification of the cable and hardware. The voice portion will be certified to operate at EIA/TIA Category 3 levels. The cable system shall have a minimum twenty year warranty to cover both labor and materials, provided by the equipment manufacturer and not the installing contractor. CommScope shall provide Systimax® test records to the SOM.

H. Horizontal Cable Systems

The horizontal cabling system shall meet, but not be limited to, ANSI/TIA and BICSI standards. Voice cable shall be CAT 3 or above and data cable shall be CAT 5e or above. Cable shall be run within the CMS as described in "Horizontal Pathways" above. All data cables will be certified to operate at the maximum bandwidth of the Category classification of the cable.

XII. SITE UTILITIES

A. Lessor or Lessor's A/E Design Professional is to contact local utility companies to determine system capacities and obtain utility service, easements, etc. Site utilities must comply with codes, regulations, and local ordinances.

B. Locate all utility lines behind curbs and in unpaved areas if possible. Do not locate water lines under foundations, streets, drives, parking areas or other inaccessible areas.

C. Fire hydrants are to be placed less than 300 feet from all points of the building façade, within 5 feet of fire truck access road and within 100 feet of the building siamese connection.

D. Locate sanitary sewer lines in unpaved areas, at least 10 feet from potable water lines.

E. Provide manholes at all intersections, changes in pipe size and changes in gradient.

F. Manhole spacing: pipe < 18": 300 feet and pipe ≥ 18": 400 feet.

G. Provide cleanouts at service lines 5 feet from building and at all bends where manholes are not used.

H. Provide separate storm system even if connected to a dual service main.

I. Use a minimum 10 year storm frequency for design of parking lots. Use piped gravity flow system (no open ditches). Permeable paving is allowed , however, Lessor must maintain and clear the paving pores.

XIII. EXTERIOR IMPROVEMENTS

A. Paving Design: new paving shall be asphaltic concrete paving or Portland cement concrete in accordance with referenced portions of the 2012 Edition of the "MDOT Standard Specifications for Construction". http://mdotcf.state.mi.us/public/specbook/2012/

B. Existing paving shall be in a "like new" condition. Areas deemed not acceptable by the State will be repaired to be in "like new" condition. Existing paving must meet ADAAG requirements for slopes, cross-slopes, and condition; deteriorated paving, potholes, and large cracks constitute a walking hazard.

Asphaltic Concrete Paving shall consist of:

Minimum 6" sand-gravel sub-base: MDOT 22A
Bond or tack coat asphalt emulsion: MDOT SS-1h or MDOT MS-2a.
Bituminous leveling course: MDOT Mixture 1100L
Coarse aggregate: 20A
Minimum thickness of leveling course: 3" (75mm)
Bituminous top course: MDOT Mixture 1300T
Coarse aggregate: 20-AAA
Minimum thickness of top course: 1-1/2" (38 mm)
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.

Portland Cement Concrete Paving shall consist of:

Minimum 6" sand-gravel sub-base: MDOT22A
Reinforcement: 6" x 6" (W1.4) wire mesh
Minimum compressive strength: 4000 PSI in 28 days.
Minimum cement content: 6 bags
Minimum air-entrainment: 5%
Maximum slump: 4"
Minimum thickness: 5" depth.

Provide slip resistant finishes at exterior concrete surfaces subject to foot traffic.

Parking lot drives shall not be crowned. Provide areas for piling of snow.

C. Site Amenities

1. Parking lot lighting, landscape lighting, site amenities and site signage design are to have similar design features to compliment each other and the facility.

2. If required in the RFP, provide 10 space bike rack permanently affixed to the pavement, no less than 25' from entry and visible from entry. Coordinate location with in-slab snowmelt or other piping.

3. If required in the RFP, provide a flag pole(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 12" high with a minimum 2" stroke shall be provided and installed, identifying the address, "State of Michigan" 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).
9. If required in the RFP, install any specialized signs provided by the Tenant Agency.

XIV. 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 Michigan Department of Management and Budget, Real Estate Division, the DMB, Office of Design and Construction or the Michigan Department of State.

The term "building code" and the term "code" refer to regulations of building code enforcement agencies having jurisdiction in compliance with Act Number 230 of the Public Acts of 1972, as amended, being M.C.L. §125.1501 et seq. (State Construction Code Act of 1972).

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.

The term "DTMB" shall refer to the Michigan Department of Technology, Management and Budget's Design and Construction Division and Real Estate Division, which acts as agent on behalf of the Lessee/Tenant Agency.

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 State of Michigan. The term Lessee is used as the generic term for the State of Michigan 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, tackboards, 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 NEW OFFICE BUILDING DESIGN AND CONSTRUCTION STANDARDS