

# **State of Michigan**

Department of Technology, Management & Budget

Minimum Design and Construction Standards

## **COLD STORAGE TENANT FITOUT for NEW or EXISTING FACILITIES**

May 1, 2017

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# STATE OF MICHIGAN

## DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET

### INTRODUCTION

These cold storage tenant fitout 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 cold storage 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.

The Lessor and/or the Lessor's design professional must refer to the Request for Proposal (RFP), Project Component Checklist, Programmatic Analysis, 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. 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.
3. Implement a construction waste management plan to minimize landfilling of construction waste in favor of reuse and recycling.

#### 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 standard. 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 standard. 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. Structural bay sizing is to be commensurate with building configuration, architectural expression, seismic zone, structural framing material and cost.

#### C. 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.

#### D. SITE CIRCULATION

1. 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. Provide the following as a minimum at parking lots: stall size 9' x 20'; use 90° parking where possible. The maximum combined gradient may not exceed 5 percent. If used, pre-cast concrete curbs must be anchored to the paved surface.
4. Provide handicapped parking and signage per building code and ADAAG and MBF requirements. A minimum of one of the handicapped spaces shall be "van accessible" per ADAAG and MBF.
5. 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.
6. Provide guardrails, curb cuts and wheel stops to meet ADAAG and MBF requirements.
  - 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.

#### E. STRUCTURAL COMPONENTS

1. Live loads: Floor loading shall provide 100 pounds per square foot (minimum) live loads. Limit floor deflection to L/360 if the floor is an elevated floor.
2. All building structural load design for roofs, walls, and floor loading shall meet all Federal, State, and Local building code requirements.
3. Where required by the Project Component Checklist: provide special floor loading requirements for computer room loads, special equipment loads and storage loads.
4. 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.
5. 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.
6. Top of stud in full height walls is to be separated from the track. Use deflection tracks.
7. Building expansion is to be carried through crossing partitions.
8. Building concrete slab on grade design shall follow all State and Local Code requirements and be designed for the appropriate loading conditions for the normal use of a cold storage building. (i.e. – heavy loads from fork lift trucks, and other large equipment stored in the facility.)
  - a) The RFP will specify what specific special loading conditions may be required. (i.e. – shelving, heavy storage lockers, etc....)

## II. BUILDING ENVELOPE COMPONENTS

- A. An existing or new 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:
    - a) Brick masonry and brick veneer
    - b) 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.
    - c) Insulated architectural metal panels
    - d) Stone masonry and stone veneer
    - e) Exterior insulating finish systems
    - f) Redwood or cedar exterior wood siding and trim
    - g) Painted metal siding may be acceptable with (DTMB RED & DCD) approval.
  2. Acceptable roofing materials include:
    - a) Fiberglass or asphalt dimensional or 3-tab self-sealing shingles
    - b) Built-up or single-ply membrane roof systems
    - c) Metal roofing panels may be acceptable with (DTMB RED & DCD) approval.

## III. INTERIOR COMPONENT CONSTRUCTION

- A. Uninsulated cold storage buildings unless otherwise specified will have as a minimum a prime painted finish on all interior surfaces excluding structural components. Structural components shall be prime painted steel or treated structural lumber. Roof truss construction is allowed to be unfinished unless otherwise specified in the RFP.

## IV. OPENINGS – ARCHITECTURAL DOOR, ROOM AND FINISH SCHEDULE (See TABLE A1)

- A. Insulated Metal Passenger Doors: shall be insulated metal construction, heavy duty commercial quality. Frames shall be prefabricated combination buck, frame, and trim type. Mitered joints shall have locking tabs at frame rabbets and backboards. All *exterior* doors shall be weatherstripped, and have a commercial quality ADAAG and MBF compliant aluminum threshold.
- B. 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 mechanically or electronically operated. Electronically operated doors shall have standard three button open-close-stop type controls, with each overhead door having separate controls.
- C. 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, Electronically controlled doors must 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.

- D. Building Windows: Windows are not required for cold storage facilities unless mandated by State or Local Code requirements, or otherwise specified in the RFP.
- E. 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 if required by the RFP. Lessor's existing card operated system may be used if approved by the Tenant Agency.
1. 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.
  2. 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 latch bolt. 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 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 six 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 -- ARCHITECTURAL DOOR, ROOM AND FINISH SCHEDULE (See TABLE A1)**

A. 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 oil based 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.

## **VI. SPECIALTIES**

- A. 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.

## **VII. CONVEYING SYSTEMS – N/A**

## **VIII. FIRE SUPPRESSION**

- A. Fire Protection and Fire Detection/Alarm Systems shall be provided to conform to NFPA, state and local codes.
- B. Sprinkler piping shall be schedule 40, schedule 10, or copper if a sprinkler system is required by code.

## **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.
  1. Fire alarm and security system must function as stand-alone systems with an interface to the building automation system if one is planned.
  2. Plumbing systems: N/A

## **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 which are re-used shall be labeled. The existing circuits including wiring, connections, and disconnects, shall be thoroughly inspected for size, condition, and suitability for re-use.
  1. All existing wiring, conduit, and devices no longer being used shall be completely removed and not abandoned in place. All existing unused power supply wiring or cabling shall be completely removed back to supply distribution panel and circuits breakers relabeled as "Spare" or with the new circuit title.
  2. All openings in existing walls, floors, and shafts shall be properly firestopped after the removal of old conduit and wiring.

### C. Electrical Site Design and Planning

1. Spare conduits shall be provided at all primary, secondary, and panelboard feeders for future use.
2. Electrical metering locations and metering sockets must be acceptable to the local utility company.
3. New transformers shall be free of any hazardous materials (PCB's, asbestos, etc.), and dry type transformers are preferred.
4. Exterior lighting design and layout shall meet the latest requirements of the 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
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.
  - 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 in all occupied rooms will be controlled by an automatic sensor with a manual wall switch override. Locate sensors to avoid nuisance triggering.
  - c) Lighting shall be LED or fluorescent type, with a color range between 3500 and 4000K.
  - d) Lighting levels shall meet or exceed the current State of Michigan Building Code requirements. 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 Michigan 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 than AWG # 10 shall be copper.
  - b) All electrical home run circuits or main feeders shall be solid tubular (Non-flexible) type conduit.
  - c) All receptacles and switches shall be a minimum of specification grade quality.
  - d) Emergency circuit receptacles, switches, or devices shall have color RED bodies.
  - e) If surface mounted raceway is required and non-exposed conduit is not feasible then 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.

## 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](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
Systemax®	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. 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.

## XII. EXTERIOR IMPROVEMENTS

A. Asphaltic Concrete Paving shall consist of:

1. Minimum 6" sand-gravel sub-base: MDOT 22A
2. Bond or tack coat asphalt emulsion: MDOT SS-1h or MDOT MS-2a.
3. Bituminous leveling course: MDOT Mixture 1100L  
Coarse aggregate: 20A  
Minimum thickness of leveling course: 3" (75mm)
4. Bituminous top course: MDOT Mixture 1300T  
Coarse aggregate: 20-AAA  
Minimum thickness of top course: 1-1/2" (38 mm)
5. 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.

B. Portland Cement Concrete Paving shall consist of:

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

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

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

1. Site Utilities must comply with codes, regulations, and local ordinances.
2. Site Amenities

- E. Dumpsters shall be screened from public view
- F. Provide windproof trash containers outside each outside entrance.
- G. 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.
- H. If required in the RFP, install any specialized signs provided by the Tenant Agency.

### **XIII. GLOSSARY**

- A. The terms "approved", "required" and "as directed" refer to and indicate the work or materials that may be approved, required, or directed by the DTMB-RED, or the DTMB-DCD.
- B. 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).
- C. 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.
- D. 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.
- E. The term "product" includes materials, systems and equipment.
- F. The term "provide" includes furnishing and installing in a professional manner, a product complete in place, tested and approved.
- G. 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.
- H. The term "similar" means in its general sense and not necessarily identical.

END OF TENANT FIT-OUT DESIGN AND CONSTRUCTION STANDARDS