STATE OF MICHIGAN

GRETCHEN WHITMER
GOVERNOR

DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET
LANSING

MICHELLE LANGE
DIRECTOR

December 1, 2023

MEMORANDUM

TO: Members of the House and Senate Appropriations Committee
Members of the Joint Capital Outlay Subcommittee

FROM: Maria Tyszkiewicz, DTMB Budget Director

SUBJECT: Consolidated, Comprehensive, State-of-the-art Laboratory Progress Report

This memorandum is in response to Capital Outlay Sec. 226 as included within Public Act No. 9 of 2022 which requests for a new comprehensive state public health and environmental science laboratory to be investigated and appropriated $10,000,000.00 for this initial effort. Additionally, as part of Public Act No. 166 of 2022, $250,000,000.00 was appropriated under Capital Outlay Sec. 102 (3) and as part of Enrolled House Bill 4292, $66,000,000.00 was appropriated under Capital Outlay Sec. 302 to follow through with the design and construction of the new facility.

Public Act No. 9 of 2022, subsection 226 of the public act requires the following:

The department shall submit all the following to the house and senate appropriations committees and the joint capital outlay subcommittee:

(a) Program statements and schematic planning documents, including a comparative assessment of building new laboratories, expanding existing laboratories, renovating existing laboratories, or repurposing another state-owned building.

(b) A summary of bid results.

(c) A progress report no later than June 1, 2022, and every 6 months thereafter.

In response each subsection, the Department of Technology, Management & Budget (DTMB) / State Facilities Administration (SFA) / Design & Construction Division (DCD) provides the following:

(a) The initial report ‘State of Michigan Preliminary Concept, Cost, and Risk Assessment for the Consolidated Laboratory Project’ was provided which detailed and summarized the program, provided schematic plans, compared

new versus renovation, and provided additional preliminary findings and was included as part of the June 1, 2022, response. The final program statements and schematic planning documents are attached to this memorandum.

(b) The summary of bid results was provided as part of the December 1, 2022, response.

(c) This report is the fourth of an assumed ten semi-annual reports through the projected completion of the Consolidated State Laboratory in calendar year 2026.

The project design meetings continue to move forward. The contracted Architect/Engineer vendor continues to meet with the subject matter experts of the lab leadership from the Department of Health and Human Services, Department of Labor and Economic Opportunity and the Department Environment, Great Lakes and Energy to finalize the design development documents by December 2023.

The Construction Manager continues to evaluate the budget based on the programming requirements to aid in decision making during the design development phase. Construction of the new building is expected to begin in spring 2024.

Total encumbered to date is $249,036,431.75. of the appropriated total amount of $326,000,000.00.

Please feel free to reach out to me to discuss if you have any questions and/or concerns.

Cc:

Lisa Shoemaker, State Budget Office
Ryan Fink, State Budget Office
Brian Kennedy, State Budget Office
Neil DeSouza, DTMB Legislative Liaison
Phillip Jeffery, DTMB Chief Financial Officer
Michael Turnquist, DTMB State Facilities Administration
Adam Lach, Director, DTMB Design and Construction
Brigitte Pricco, DTMB Financial Services

Schematic Design Narrative

State of Michigan
New Public Health + Environmental Sciences Lab

H+B Project No. 22-320
June 16, 2023

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Part 1 - PROJECT SUMMARY

A. Project Description: .

B. Program and Performance Goals
   1. Sustainable Design Framework
      a. The project will be designed to LEED Silver standards. A preliminary LEED scorecard is attached. The scorecard indicates a minimum selection of credits to earn 50 points as well as optional buffer credits; the final selection will be refined during subsequent design phases.
      b. The project will pursue applicable energy utility incentives.
   2. Energy Performance
      a. The following assembly performance values are recommended.

Assembly	Target U-Value	Target SHGC	Code U-Value	Code SHGC
Roof (Insulation Above Deck)	0.032 (R-32)	-	.032 (R-30)	-
Metal-Framed Wall	0.055 (R-19)	-	0.064 (R-13+R7.5ci)	-
Mass Wall	0.09	-	0.09	-
Spandrel Area	< 0.200 (R-5 min)	-	< 0.200 (R-5 min)	-
Vision Fenestration (N/S)	0.32	0.38	0.38	0.4
Vision Fenestration (E/W)	0.32	0.35	0.38	0.4

      b. The following passive energy design strategies will be reviewed in further detail for life cycle carbon and cost impact:
         1. Window/wall ratio of 40-50%
         2. Reduced solar heat gain coefficient of west facing glazing.
         3. Reduced U-value of glazing.
         4. Addition of exterior shading devices on south glazing.
         5. Window design for increased daylighting.

C. Code Analysis

   1. Use Group Classification: B with subset S.

   2. Construction Classification: Type 5-B (MBC 2021)

   3. Allowable Height & Area:

      a. Allowable Height in Feet for B, Type 5B: 60 Feet above Grade (504.3)

b. Allowable Stories for B, Type 5B, Sprinklered: 3 Stories (504.4)
c. Allowable Area: Unlimited for Two-story B occupancy (507.5)

4. Fire-Resistive Ratings:

    a. Type 5-B: No fire rating required for structure per Construction Classification. Some may be required per other separations. (601)

5. Separations:

    a. Occupancy Separation: 1-hour fire barrier between…
    b. Incidental Use separations to be provided per MBC Table 509.
    c. Boiler Room: 1-hour separation
    d. Stair Enclosure: 1-hour separation
    e. Corridors: No rating requirements

6. Means of Egress:

    a. Dead ends, 50 feet or 2 1/2 times width.
    b. Number of exit access points from each space, 2 where greater than 49 occupants or where Common Path of Travel is greater than 100 feet.
    c. Remoteness of exit access points, one-third the diagonal of the space or floor.
    d. Travel distance to an exit, 300 feet.
    e. Aisle width, not less than 36 inches.
    f. Corridor width, not less than 44 inches; 36 inches if occupancy less than 50.
    g. Stairways will be 48 inches wide, 44 inch is code minimum.

7. Accessibility:

    a. Required of all spaces, except mechanical and electrical equipment spaces.
    b. A minimum of two percent of the parking spaces shall be accessible. For every six accessible spaces, one shall be a van-accessible space.
    c. Building entrances shall be accessible.
    d. A minimum of two accessible Means of Egress are required.

Part 2 - SITE

A. Site Location

1. The site is located at the north end of Crowner Drive north of Lansing Road, east of I-69, south of Davis Highway, and west of the State Game area in Windsor Township, Eaton County, Michigan.

B. Zoning and Land Use

1. The site is zoned INST on the Windsor Township zoning map however the Township does not regulate the zoning on the State owned property. The State of Michigan regulates all zoning. It is proposed to develop the site in accordance with the standards set forth within the existing Complex.
2. The site is currently vacant.
3. The site will be served by an extension of the existing privately owned public water and sewer systems located at the north end of Crowner Drive.
4. Storm sewer will discharge to the existing roadside ditch along the south side of Crowner Drive. This is a private drain.

C. Physical Characteristics

1. The site is located within parcels Numbers 19 and 22 of the Secondary Governmental Complex Plats. The site is 116.3 acres in size and has gentle slopes with the central area being higher and sloping down in each direction. It is located at the north end of Crowner Drive. There are several wetlands located on the site which are shown on the site survey. The two of the wetlands have been determined to be regulated by the Department of Environment, Great Lakes, and Energy (EGLE). These wetlands will be avoided so as not to impact them and to avoid permitting. The remaining wetlands will also be avoided where possible, but there is some impact in them.

D. Site Design Summary

1. The design will closely follow the programming presented in the RFP while meeting all state site development guidelines.

E. Agency Approvals

1. The project will need site related approvals from the following agencies:
    a. Michigan Department Technology, Management & Budget (DTMB).

b. Eaton County Road Commission – Intersection of Crowner Drive and Davis Highway.
c. DTMB - Drainage and Soil Erosion and Sedimentation Control permits.
d. EGLE for privately owned public sanitary sewer permit.
e. EGLE for privately owned public water permit.

F. Site Layout

1. The proposed site layout utilizes the existing topography and avoidance of wetland to develop the two-story Lab facility. The access points provide distinct entry point for staff, visitors and service vehicles. The visitor and staff parking areas are separated, and security control fencing and gates will be used to control access. The service / mechanical areas will be located on the rear side of the building and are located away from public entrances.

2. Crowner Drive will be extended to Davis Hwy. to provide access for both employee and visitor access and for emergency vehicle access also. Trucks will be prohibited from accessing the site to and from Davis Hwy. Crowner Drive is planned to have a rural road cross section with roadside ditches similar to the north end of Crowner Dr. and Davis Hwy.

3. A 6’ wide sidewalk will be connected to the existing sidewalk at the Michigan Department of Transportation (MDOT) Horatio S. Earle Learning Center. This walk extends throughout the Secondary Complex.

4. Parking count and sizes will meet the Owner’s requirements. It is proposed to utilize 9 feet wide x 18 feet long spaces acceptable to the State. The parking lot, service drives, and islands will use standard curb and gutter.

G. Water Distribution

1. The State Secondary Complex operates its own privately owned public water supply distribution system. Water is purchased from Delta Charter Township. Delta Township meters the flow at the service point near the intersection of Davis Hwy. and Canal Rd. The proposed line will be primarily 12” diameter with some 8” diameter. The new line will be connected to the end of the existing system at the north end of Crowner Dr. and extended to the site.

2. The static pressure used to estimate fire flow is a residual pressure of 20 psi. A hydrant flow test will be performed to verify the available water capacity at this psi. A booster pump may be necessary if water pressures and flows are not adequate.

3. The plan proposes to provide fire protection and domestic serviced as follows:

    a. Fire protection will be provided by an 8”-inch water line for the building’s fire suppression / sprinkler system. This line will be extended from the site’s 12” main that is looped around the building with fire hydrants located along it to provide fire protection.

    b. Domestic service will be connected to the 8” building fire service line within the building.

H. Sanitary Sewer

1. The State Secondary Complex operates its own privately owned public wastewater collection system which serves the entire complex. The system discharges to the Delta Township sanitary collection and treatment system.

2. The existing 12” diameter sewer at the north end of Crowner Dr. is planned to be extended to the building. An 8” diameter service to each wing of the new building should be anticipated.

3. The existing 12” sewer flows to a lift station that is part of the State’s collection system. The lift station has two 500 gallon per minute (gpm) grinder pumps which provide a firm capacity of 500 gpm with the largest pump out of service. The pump run times of the lift station were monitored during the months of April and May 2023. A peak flow was estimated using the 10 State Standards, assuming a conservative 10 hour flow period and the 500 gpm pumps. The average daily flows ranged from an estimated 22,350 gallons per day (gpd) to 55,050 gpd and peak flows ranged from 149 gpm to 367 gpm. There is approximately 133 gpm of additional capacity in the lift station.

4. The topographic survey shows that the invert elevation of the existing 12” sewer at the north end of Crowner Dr. is 872.98. It is anticipated the depth is sufficient to serve the building with a proposed FF elevation of 889.0.

5. The capacity of a 12-inch sewer line at 0.22% (min) grade is roughly 750 gpm (1,079,604 gpd) with a full-flow velocity of 2.13 feet per second. The anticipated peak wastewater flow from the building has not been calculated but is estimated to be between 60 and 100 gpm.

6. It is believed there is downstream capacity within the collection and treatment systems.

I. Drainage

1. The existing site grades slope toward the property boundaries in all directions. Drainage from the developed site and roof will be collected and transported via enclosed storm sewers and open swales to a stormwater treatment and detention area at the north end of the site. The system will be designed to capture and treat the first flush, bank full, and 100 year storms. The stormwater will discharge to the existing privately owned ditch on the south side of Davis Hwy. The ditch is located within the State's property and discharges to the ponds in the State game area to the east.

2. Grades are expected to have user friendly slopes of no greater than 3.5%. Slopes over 2% are not allowed within barrier-free parking areas and access aisles.

3. The storm sewers will be sized to handle the anticipated runoff from a 10-year storm. This is a regional and local standard for sizing pipes.

J. Landscaping

1. The developed site will be designed to meet LEED certification. Landscape design will play an important role in achieving the desired score. Attention to drought tolerant plants material and heat island reduction will be important.

2. An irrigation system will be required for plantings under canopies. It will be determined if irrigation is required for the other portions of the site.

Part 3 - STRUCTURAL

A. Structural Systems

1. Applicable Codes and Standards
   a. 2021 Michigan building Code,
   b. Minimum Design Loads for Buildings and Other Structures, ASCE 7-10/SEI.
   c. Building Code Requirements for Structural Concrete, ACI-318-14.
   d. Steel Construction Manual, AISC-360-10.
   e. AISI North American Specification for Design of Cold Formed Steel Structural Members, S100-12.
   f. Welding Handbook, AWS.
   g. Building Code Requirements and Specifications for Masonry Structures, TMS/ACI 530-13.
   h. National Concrete Masonry Association, NCMA.
   i. American Society of Testing Materials, ASTM.
   j. Wire Reinforcement Institute Inc. WRI.
   k. 2015 International Fire Code, NFPA 13D (2013) National Fire Protection Association.

2. Foundations
   a. Preliminary geotechnical report by SME project number 075051.00 dated November 07, 2016. The ten boring presented in the report are located outside the current location and footprint of the building. As a result, new additional soil borings will be drilled to substantiate the initial soil investigation and study the underlying soil condition. Based on the preliminary soil report, the soil conditions at typical foundation bearing levels are suitable for conventional spread footing type foundations under columns and continuous strip footings under perimeter grade beam/frost wall foundations. The net allowable bearing capacity is anticipated to range between 2,000psf to 4,000psf.
   b. Footing sizes will vary, however typical interior footings based on 3,000 psf (assumed) net allowable soil pressure could be as follows:
      1.Interior footing where conventional metal roof: 10’-0’’x10’-0’’x3’-0’’
      2.Interior footing where concrete roof: 11’-0’’x11’-0’’x3’-0’’
      3.Interior footing where concrete roof with mech. load: 12’-6’’x12’-6’’x3’-0’’.
      4.Interior footing where Penthouse exists: 13’-6’’x13’-6’’x3’-6’’.
      *Note that foundations under braced frame/moment frame will be slightly larger than foundation sizes indicated above.
   c. Perimeter trench wall foundation supporting exterior CLT wood panel and composite metal panel wall finishes will be approximately 2’-10” inches thick x2’-0’’ bearing 3’-6’’ minimum from finished grade.
   d. All perimeter and exterior wall and column footings will bear a minimum of 3’-6” below finished grades.

e. Loading dock ramp wall/retaining walls: ramp walls will be +/-12'' thick cast-in-place concrete walls supported on continuous wall footings. 4,000psi concrete will be used for footings and ramp walls.
f. Special foundation requirements:
    1. Dewatering may be required, depending on the soils report recommendations.
    2. Geotechnical testing and inspection will be required during construction to verify the actual on-site soil conditions prior to concrete placement.
    3. The foundation drain system will be designed as drained system.

3. Concrete Slabs

a. Slab-On-Grade Construction
    1. Typically, 5''slab-on-grade reinforced with 6x6-W2.1xW2.1 WWF on vapor retarder on min. 4'' granular fill on prepared sub-grade. Heavily loaded lab and office slab areas could be 6'' slab-on-grade reinforced with 6x6-W2.1xW2.1 WWF. Slab on grade in a humidity-controlled rooms shall be placed on vapor retarder on 6'' engineered fill on free drained granular fill on prepared subgrade typical.
    2. Nonbearing cmu walls will be on isolated continuous footing.
    3. Slab-on-grade in the warehouse and loading dock area will be 8'' thick slab-on-grade reinforced with #3@12'' o.c. top and bottom each way or two layers of 6x6-W2.9XW2.9 WWF.
    4. Use concrete with a minimum 28-day compressive strength of 4,000psi.
    5. A 15-mil polyethylene vapor retarder will be provided below slab on grade.
    6. Control joints in slabs will be typically spaced at 12'-0''. Saw cut joints within 24 hours of concrete placement. Backer rod and sealant shall be per project specification.
    7. Slab on grade construction joints shall be furnished with a full-length keyway centered on members. Alternatively, Provide smooth dowel bars or diamond shape load plates at construction joints.
    8. MEP Pad: MEP pads on grade will be typically 8'' to 12'' thick equipment pads reinforced with #4@12'' o.c. Top and bottom each way.
    9. MEP Pits: pit walls shall be 8'' to 12'' thick concrete walls reinforced with #5@12''o.c. vertical and #4@12''o.c. horizontal. Coordinate location, depth and size of pit with MEP drawings
    10. Slab Depression: step slab for the required slab depression dimensions. Refer to architectural drawing for location and extent of slab depressions.
    11. Trench drains:

a. Provide thickened slab around trench drain.
b. Provide L2x2x1/4'' with 3/8''x4'' long headed stud embed angle at edge of trench. Cover the trench with galvanized bar grating welded to L2x2 embed angle. Note: embed angle and grating cover is not required for prefab trench drains.

12. Warehouse loading dock leveler.
    a. Construct new +/-12'' thick wall and foundation reinforced with #5@12''o.c. vertical and horizontal to create depressed dock approaches.
    b. Step slab to create depressed slab for the dock-leveler. Coordinate slab depression height with selected dock-leveler.
    c. Provide 12'' slab on grade reinforced with #4@12''o.c. each way top and bottom.
13. Walk-in freezer: slab-on-grade under walk-in freezer shall be 8'' to 10'' thick reinforced with #4@12'' o.c. each way top and bottom. Provide 1'' to 2'' isolation joint. Insulation shall be provided at the isolation joint and under the slab.

4. Framing system

a. The typical concrete floor at level 02, Mezzanine, penthouse, and concrete roofs will be 4 ½'' normal weight concrete on 3''-18-gauge wide rib galvanized composite steel floor deck (total thickness 7 ½'').
b. The composite floors will be reinforced with 6x6-W2.1xW2.1 WWF placed at mid-depth of the slab. #4@12''o.c. L-bars with (3) #4 continuous support bars will be provided at typical floor and opening slab edges. Provide #4@12'' o.c x 4'-0'' long bars above girder beams typical. Where polished concrete finishes exist, the floor slab will be reinforced with #4@12''o.c. each way with 90-degree bend at slab edges.
c. The floor beams will be designed as composite beams with a ¾'' diameter nelson shear studs. A minimum of one stud per foot will be provided.
d. The typical supported composite floor/roof steel weight is estimated to be in the range of +/-14psf.
e. Typical roof construction will be 3''-20-gauge wide rib roof deck supported on an open web steel joist or wide flange roof beams.Spacing of roof framing will be approximately +11'-0''. Alternatively, the spacing could be reduced to +/-8'-0'' should there be significant hanged items that require misc. steel to bridge between the joist/roof beams.
f. Roof and floor steel decks shall be continuous over three spans in the direction indicated. Single and double spans, if required shall satisfy load and deflection requirements.
g. Steel deck shall have galvanized coating conforming to ASTM A653, coating designation G90 for roof deck and G60 for floor deck typical.
h. Steel decking will be welded to supporting member at a maximum spacing of 12'' o.c. with 5/8'' puddle weld. Weld roof decks at perimeter, braced frame,

moment frames at a maximum spacing of 6'' o.c. Side laps shall be fastened at a maximum 3'-0'' on center with minimum one fastener per span.

i. Typical columns will be wide flange or steel tube columns.
j. MEP/housekeeping pads on supported floors will be 4'' thick min reinforced with #4@12'' o.c. doweled to the composite floor slabs.
k. Building expansion Joints: two building expansion joints as shown in sheet SK-204 will be provided to accommodate the movement and expansion of the building materials caused by temperature fluctuations, seismic activity, settlement, or other factors.
l. Pour strip/Temporary Construction Joint: temporary separation of concrete placements and steel erection will be provided at two locations. The purpose of the pour strip/temporary construction joint is to allow for a controlled separation of movement between two adjacent steel structures and concrete placements. This helps to prevent cracking and damaged caused by thermal expansion and shrinkage of the concrete.

5. Lateral system
   a. The lateral resistance and stability of the building against lateral loads (wind and seismic) will be provided by a combination of moment frames and braced frames. Refer to sheet SK-4 for the proposed bracing and moment frame locations.
   b. Steel frames and beams that are part of the moment frame will be heavier/deeper than a typical bay girder/or floor beams.
   c. Braced frames located on the exterior wall of the building could be chevron or X-brace.

6. Wall systems
   a. The typical exterior building wall construction will be a composite metal panel applied on a visual grade 5 ply CLT wall panel. The CLT wall panels will be panelized for ease of installation. Two CLT angle brackets per CLT wall panel will be provided to support the wall on floor slabs. Lateral connections will be provided at the top of the wall panel. Tension straps for cross laminated timber applications will be utilized at typical floor to floor panel wall connection.
   b. Exterior cladding in the warehouse building will be insulated metal panel siding spanning between C or Z girts.

7. Roof Mechanical and Screen Wall
   a. Galvanized steel columns and horizontal members with kickers, in plane bracings and corner bracings will be provided to serve as a backup for typical screen walls. Thermal break will be provided to isolate the exposed screen wall steel framing form the supporting roof members.

8. Canopies
   a. The canopy construction will be a 1 ½" wide rib, steel roof deck supported on wide flange steel beam, girder, and column construction. Galvanize all

roof deck to G90 requirements. Lateral resistance will be provided through attachment to the main structure.

9. Stair Framing
   a. Metal stairs systems consisting of steel channel or tube stringers and concrete filled metal pans. Hangers or post will be provided as required to support the stair stringers and landing.

10. Elevator and elevator shafts.
    a. Elevator shaft walls will be rated light gauge or CLT wall type construction. Elevator support framing will be designed to meet the requirements of ASME/A17.1-13, safety code for elevators and escalators.

B. Design Loads

1. General: The structure will be designed to resist wind, seismic, snow, and live loads as prescribed by the requirements of the 2015 Michigan Building Code and ASCE 7-10.

   Building Risk Category IV

   a. Live Loads
      Roof: 25 psf snow load + drift or 30 psf minimum

      Floors:

Office/Exam:	100 psf (unreducible) (Includes 15 psf for partitions)
Stairs /corridors:	100 psf (unreducible) or same as occupancy served.
Conf./Lobby/Public areas:	100 psf (unreducible)
Mezz. Floor	150 psf (unreducible)
Mechanical rooms:	150 psf (unreducible)
Loading/unloading	250 psf (unreducible)
Wearhouse	250 psf (unreducible)

   b. Dead loads

Roof, insulation:	5 psf
Deck, beams:	Actual Weight
Ceiling/ducts/sprinklers/lighting:	10 psf/ 15psf at PH
Equipment:	TBD

   c. Snow Loads

Ground snow load, Pg	30psf
Snow Exposure Factor, Ce	1.0
Snow Importance Factor,Is	1.2
Thermal Factor, Ct	1.0

d. Wind Loads
Basic wind speed of 120 mph and Exposure B, importance factor 1.0

e. Seismic Loads

Seismic Importance Factor:	1.50
Ss:	0.083g
S1:	0.046g
Sds:	0.089g
Site Classification:	D
Seismic force-resisting system	Moment frame and Ordinary Braced Frames
Seismic Design Category	C
Seismic Analysis Method:	Equivalent Lateral Force Method

2. Testing: A thorough package of construction inspection services will be planned to include soil bearing pressures, soil compaction, concrete testing, structural steel shop fabrication, structural steel field erection, and light gage metal framing and installation.

C. Material Properties

1. Concrete

Footings	f'c=4000 psi, normal weight
Frost Walls	f'c=4000 psi, normal weight
Ramp Walls	f'c=4000 psi, normal weight
Slab-on-Grade	f'c=4000 psi, normal weight
Slab on Steel Deck	f'c=4000 psi, normal weight
All Other Concrete	f'c=4000 psi, normal weight

2. Reinforcing

Typical Bars	ASTM A615, Grade 60
Welded Wire Fabric	ASTM A185
Blended fibers	ASTM 1609
Welded Bars	ASTM A706, Grade 60

3. Structural Steel

Wide Flange Shapes, WT's	ASTM A992
Channels & Angles	ASTM A36
Pipe	ASTM A53, Grade B
Hollow Structural Sections (Rectangular & Round)	ASTM A500, Grade C
Base Plates	ASTM A572, Grade 36

All Other Steel Members	ASTM A36
High Strength Bolts,	ASTM A325 or A490
Nuts and Washers	(min ¾" Diameter)
Anchor Bolts	ASTM F1554, Grade 55
Welding Electrodes	E70XX
Steel Deck Welding Electrode	E60XX min.

D. Deflection Criteria

1. Roof and floor members:
   Maximum live load deflection = L/360 or 1'' max.
   Maximum total load deflection = L/360

E. Vibration Requirements

1. Typically, vibration of MEP unit will be isolated by using isolation springs. Floor vibration will be evaluated per AISC recommendations for office use, which has an acceleration limit due to walking excitation of 0.5%.

Part 4 - ARCHITECTURAL

A. General Description

1. Concept: This project has one central tenet: the health and longevity of Michigan's communities and environments. The core work of the departments to be housed in this building focus on the rapid and expansive testing of water, air, soil, disease, health, screening, and more. Drawing on these commitments, the design of the new laboratory building is reflective of the people and nature of Michigan. At this building's core, is an engine of people and samples that need to be routed efficiently and with care. This high-volume circulation system defines the basic programmatic layout of the building. The spine of the layout is defined by the Linear Equipment Room, where all labs can be serviced safely and efficiently by providing separate circulation and access for samples and other lab service functions. Toward the exterior are people-centric workspaces, meeting rooms, and offices. The flows from these spaces converge in the center around shared facilities, break rooms, and the main entry. These flows are further emphasized by the overall massing of the building, penthouses, and wings as they visually intertwine on what is otherwise a very rectangular and efficient floor plate.

2. Orientation: The northern face of the building accommodates the main entry, staff, and visitor parking. The southern face of the building includes the main dock, and sample drop-off loops for the departments. Upon arrival at security, staff and visitors are greeted with a view of the interior courtyard. This space provides daylight into the deep center of the building while giving building users an opportunity to enjoy outdoor space without leaving the building.

3. Façade: The exterior façade is marked by a simple grid of aluminum composite metal panels. The panels are biased slightly to reinforce the movement and flow of the people and samples within. These patterns themselves, derived from the natural movement of dunes and forests found throughout the state. The Additional accents are made through phenolic wood rain screen material, and window wall glazing systems at main points of interaction such as the main entry, courtyard, and breakrooms. The east and west facades include solar shading fins to cut down on glare and heat gain at the larger expanses of glazing. The remainder of the more typical fenestration is kept very tall to allow for daylight penetration toward the interior labs. The windows include a 6" mullion extension at the jambs, sill, and head to create a frame around the unit. The entire façade and glazing systems are kept on module with the laboratory environment (10'-8") and broken into constituent (5'-4" wide) parts.

B. Lab Planning

1. Purpose: The current lab plans represent the design team's understanding of the lab user's specific needs and desires. The central purpose of this facility is to provide laboratories that serve the public health of the State of Michigan. The scope of the labs is diverse and complex; ranging from the testing of domestic swimming pool water to the identification of specific 'select' agents like anthrax, tests related to newborn screening and the analysis of soil and air samples. It is anticipated that the diversity and scope of lab testing will only increase over time, as new health concerns emerge, and new scientific processes evolve.

2. Design Focus: The primary purpose of a laboratory is to provide for the safety of the laboratory staff and building users to perform scientific activities that are potentially hazardous. The focus of the lab design and planning effort was to make standardized flexible labs that could be adapted to all of the specific and specialized current needs, while being able to evolve as needs change in the future, while efficiently using space and managing costs. Central to this goal was a focus not just on the lab testing processes, but on the laboratory staff who work so hard in challenging situations to serve the public health. The goal was to allow for effective scientific work in quality environments that support staff wellbeing and productivity.

3. Process: The design and planning process was centered around extensive engagement with the lab stakeholders themselves. Multiple in-person and virtual meetings reviewed every aspect of each lab with representatives from every group. Multiple options were studied, and a regular back and forth of sketches and ideas between the lab planning team and the lab stakeholders led to broad lab design concepts as well as specific layouts for each agency and each group as documented in the SD plans. The effort started with the scope defined by the legacy program brief previously prepared. During the process one agency dropped out of the project, another agency discovered that the program had missed a couple key groups, which were added back into the project. During the process it was agreed that HHS Infectious Disease would combine their various BSL3 biocontainment labs into a larger, integrated suite, and the specific program brief of rooms for the BSL3 suite changed significantly. Throughout the planning engagement process, changes in various program spaces occurred, which is natural given the speed of change for the science and the age of the original program brief. These changes have all been incorporated into the current SD plans.

4. Planning Organization: The laboratory wings are planned around a 10 ft 8 in planning module, generally in both directions. This module has proven to be efficient and functional and adds up to a nominal 32 ft structural module. The laboratories generally occur in the 2 wings east and west of the central core. The lab wings are organized around a layered spatial concept. On the outside

is an open office landscape zone directly adjacent to the south and north facing exterior walls. Inboard of the office landscape zone is the open lab zone. The open lab zone is separated from the office zone with an interior wall plane that has a high percentage of glass. This allows the open lab zone to get natural light and views 'borrowed' through the office zone. Inboard the open lab zone is the support lab zone, which is made up of smaller, enclosed labs that require special separations or controlled atmospheric conditions. At the center is the Linear Equipment Room, a multifunctional space that houses lab equipment (particularly noisy and heat generating equipment like compressors) and gas cylinders, and miscellaneous support spaces, while also acting as a service corridor for moving samples, equipment, and waste remote from the open office landscape. With the goals of maximizing flexibility and minimizing costs, open labs are used as the general rule for this design, with enclosed specialty labs as exceptions. Open labs are generally less expensive to build than enclosed specialty labs due to the higher concentration of engineering systems and utilities necessary to support enclosed specialty labs.

5. Modular Planning Concept: Given the specialized nature of the laboratories, and the critical flows between different spaces needed for the testing procedures, there are many cases where the open laboratories migrate into the support laboratory zone, and vice versa. This demonstrates the overall flexibility of the modular lab planning concepts.

6. Lab Benching: Benching will be a mix of movable and fixed systems. This is a proven approach that balances long-term flexibility with affordability. Over time the movable benches can be reconfigured or replaced with floor mounted equipment as needs change. Sinks are typically located at fixed benching along walls. The open lab concept, combined with movable benches, will accommodate a high degree of change without needing significant renovation.

7. Lab Services: Specialized air, water, vacuum, lab gases, power and data will all be delivered within the ceiling plane fed from the LER and dropped down to the lab benches using overhead carriers/panels. This keeps hard piping out of the benches which supports reconfiguration.

C. Exterior Closure

1. Exterior Wall
   A) Foundation: Cast-in-place concrete wall, modified bituminous sheet waterproofing, insulation, coated concrete masonry unit.

   B) Typical Exterior Wall: Composite metal panel, z-girt and air space, fiberglass thermal girt, 6" unfaced mineral wool board, self-adhering sheet air barrier, sheathing, 5-ply CLT panels. See A-300.

   C) Accent Walls: Wood panel, J/Hat aluminum profiles and air space,

fiberglass thermal girt, 6” unfaced mineral wool board, self-adhering sheet air barrier, sheathing, 5-ply CLT panels. See A-300.
BOD: *Parklex Prodema*.

D) HSS Warehouse: 6” Insulated metal panel.
BOD: *Kingspan Quadcore KS Series*.

2. Exterior Windows (Curtain Wall & Punched openings)
A) Glazed aluminum curtain wall system, thermally broken, unitized.
BOD: *6” Kawneer 1600 Curtain Wall,*
*Structural glazing at main entry and wing ends.
* Windows in all punched openings shall include frame extensions (jambs/head/sill), re A-211.
*Glazing: 1" insulated tempered glass unit, low-iron vision glazing with low-e coating, argon filled.
South windows: U-0.32 and SHGC-0.38
East/West windows: SHGC-0.35 max

3. Exterior Doors
A) Full glass at curtain wall systems.
B) Aluminum frame glass doors at composite metal walls for Vestibules, Corridors, Ante Rooms.
C) Hollow metal at composite metal wall systems for Service/MEP rooms.
D) Overhead doors: Insulated sectional steel doors.
BOD: *Overhead Doors Thermacore AP Door Model 850*.

4. Roofing
A) Flat roofs: TPO/PVC membrane, cover board, rigid insulation, vapor retarder, sheathing. See A-150 & A-300.
B) Sloped roofs: Standing seam metal, cover board, rigid insulation, vapor retarder, sheathing. See A-150 & A-300.

5. Others
A) Slab-on-grade, foundation and elevator pit waterproofing:
Modified Bituminous Sheet Minimum 60-mil nominal thickness. BOD: *CARLISLE CCW MiraDRI 860/861, HENRY Blueskin WP 100/200.*

B) Expansion Joint Covers
L2 Floor BOD: *Construction Specialties DGTP Series*
L1 & L2 Walls & Ceilings BOD: *Construction Specialties ASM Series*
Exterior Walls BOD: *Emseal, Seismic Colorseal*
Curtain Walls BOD: *Emseal, Seismic Colorseal DS*
Roof BOD: *Emseal, Roofjoint*

D. Interior Construction

1. Interior Partitions
   a. CMU Walls
      1. CMU walls will be reinforced, typically fire-rated, laterally braced at top of wall with steel angles and fire-stopping provided. Add gypsum furring partition when facing corridors or other rooms.
         Locations: Stairs and elevators.
   b. Gypsum Board Walls
      1. Standard construction shall use non-combustible components throughout the partition assembly, inclusive of strapping for wall-hung equipment.
      2. Steel studs will be 6" typically.
      3. Full height studs shall be fastened to the floor only – a deflection track shall be provided at the deck above.
      4. Sound attenuation blankets shall be 3 ½" (minimum) mineral wool, or as needed to meet STC requirements for specific conditions.
         Locations: Conference Rooms, Training Classroom, Sound Lab, Machine Shop, Wind Tunnel Lab (NC45), Restrooms.
      5. Cement Board will be used at areas of tile installation in wet environments.
      6. Mold and moisture resistant gypsum board will be used at toilet rooms and housekeeping rooms. Mold-resistant gypsum board will be used at inside face of exterior walls as needed.
   c. Non-rated partitions
      1. Non-rated partitions shall be constructed of 5/8" Type X gypsum wall board over steel studs and shall be continuous from the floor to the deck above, unless otherwise noted in the drawings.
   d. Fire Rated Partitions
      1. Fire rated partitions shall be constructed of 5/8" Type X gypsum wall board over steel studs.
      2. Fire rated partitions shall be continuous from the floor to the deck above.
      3. Fire rated unit partitions shall be sealed in accordance with specified penetration firestop and fire resistive joint systems.
      4. All smoke and/or fire rated partitions shall be identified above finished ceilings with permanent, non-removable labels that identify the smoke or fire rating of the partition. Such labels shall be applied on both sides of walls and visible on every plane of the wall if it changes direction in plan. Labels shall be provided no less than 8 feet on center.
   e. Lead-lined Partitions
      1. Sheet lead will be applied to steel studs behind gypsum board in 'Unknown BSL-3' rooms. Lead thickness to be determined by physicist.
   f. Furring Walls

1. Furring walls shall be constructed of 5/8” gypsum board applied over steel studs, hat channels or z-furring channels
2. Unless required for fire rating, gypsum wall board shall be permitted to stop at 6” above the finished ceiling or soffit

g. Gypsum Board Soffits
1. Soffits shall be constructed from gypsum wall board over steel studs unless noted otherwise
2. Unless required for fire rating, gypsum wall board shall be permitted to stop at 6” above the finished ceiling

2. Interior Windows and Doors
A) Interior All-Glass Window Wall System & Entrances: Concealed Channel Set w/ 1/2" Laminated Glazing. Basis of Design Product*: CRL Glazing* by *C.R. Laurence Co*, Inc. or a comparable product by: *DORMA USA, Inc*., *Vistawall Architectural Products* or *Oldcastle Building Envelope*.
B) All doors into laboratory spaces shall include vision panel.

3. Wall Finishes
Level 4 drywall finish throughout.
Refer to sheet I-100 and Space Type Criteria Appendix for information on wall finishes.

4. Floor Finishes
Refer to sheet I-100 and Space Type Criteria Appendix for information on floor finishes.

5. Ceiling Finishes
Refer to sheet I-100 and Space Type Criteria Appendix for information on ceiling finishes.

6. Interior Specialties
A) Glass guardrails: Laminated tempered clear glass with clear interlayer. Basis of Design: *Glass Rail System (GRS)* by *C.R. Laurence Co*., Inc. Locations: L1 Monumental Stair & L2 Atrium.

E. Elevators
1. Two (2) Gearless MRL Passenger elevators serving Level 01 and Level 02.
Capacity: 3500#
Speed: 200fpm
Stops: Pass. Elevator #1: 2 front; Pass. Elevator #2: 2 front.
Minimum Clear Inside Car: 6’-8”" Wide X 5'-10" Deep
Minimum Clear ceiling: 10’-0” High
Entrance Size: 3'-6" Wide X 8'-0" High
Entrance Type: Center-Opening
2. Three (3) Gearless MRL Service elevators: Two (2) serving Level 01, Level 02 & PH Level and One (1) serving Level 01 & Level 02.

Capacity: 5000#
Speed: 200fpm
Stops: Service Elevator #3: 3 front; Service Elevator #4: 2 front, 2 rear; Service Elevator #5: 2 front.
Minimum Clear Inside Car: 5'-8" Wide X 8'-9" Deep
Minimum Clear ceiling: 10’-0” High
Entrance Size: 4'-0" Wide X 8'-0" High
Entrance Type: Side-Opening

Control Rooms to be located in the Penthouse Level.

F. Fixtures / Furniture / Equipment
Refer to Space Type Criteria Appendix.

Part 5 - FIRE PROTECTION

A. Design Criteria
    1. Hazard Classification: Hazard classifications throughout the building will be assigned in accordance with NFPA 13. Office space and general circulation space will be classified as Light Hazard occupancies. Lab areas and mechanical/electrical support spaces will be classified as Ordinary Hazard, Group 1 occupancies.
    2. Neither manual nor automatic wet standpipes are an anticipated requirement for this facility based on the proposed building height.

B. Incoming Service: A dedicated 6” fire protection service will be provided to the building with a double check detector assembly style backflow protector located inside the building. No water pressure or flow information are available currently, but it is assumed that no fire pump is required. If inadequate water pressure is discovered via a flow test, a NFPA 20 compliant fire pump system will be provided.

C. Piping
    1. Wet piping 2” and smaller will be Schedule 40 black steel with threaded or flanged joints.
    2. Wet piping 2-1/2” and over will be Schedule 10 black steel with mechanically coupled grooved joints.
    3. Dry piping 2” and smaller will be Schedule 40 galvanized steel with threaded or flanged joints.
    4. Dry piping 2-1/2” and larger will be Schedule 10 galvanized steel with flanged or mechanically coupled grooved joints.

D. Sprinkler Types: Typical sprinklers throughout areas with suspended ceilings will be flat-plate concealed heads. Areas with no ceilings or exposed structure will typically be provided with upright heads. Dry pendent sprinklers (flat-late concealed or exposed, depending on ceiling type) will be provided in vestibules all walk-in coolers/freezers. Gasketed sprinkler heads will be provided throughout clean rooms and BSL-3 spaces. Sprinkler heads throughout the facility will be quick response type.

E. Fire Pump: No water pressure or flow information are available currently, but it is assumed that no fire pump is required. If inadequate water pressure is discovered via a flow test, a NFPA 20 compliant fire pump system will be provided in a dedicated fire pump room located on the southeast wall of the ground floor mechanical room.

F. Specialty Systems Required:
    1. A flush mounted fire department connection will be provided near the water/sprinkler room and will be located within 75 feet of a fire hydrant.
    2. Any exterior projections (canopies) greater than 4 feet, but less than 16 feet, in depth will be protected with dry sidewall sprinklers connected to the wet

automatic sprinkler system. Any exterior projections greater than 16 feet in depth will be protected with a dry automatic sprinkler system. A nitrogen flooded dry fire protection system with steel piping will be investigated from a cost efficiency perspective in lieu of the standard compressed air flooded galvanized steel dry automatic sprinkler system.

Part 6 - PLUMBING

A. Water Service
    1. A dedicated domestic water service (approximately 6”) will be provided from the site water main. This service will be routed to the First Floor Mechanial Room. A reduced pressure principle backflow preventer will be provided on the domestic water service and will be located in the mechanical room.

B. Pressure Booster Pumps
    1. The available water pressure is not known at this time. A pressure test will be performed to determine the available pressure. If necessary, a duplex pressure booster system will be provided to increase the pressure of the domestic water service.

C. Domestic Water Distribution
    1. Cold water, hot water, and hot water recirculation piping will be routed from the mechanical room throughout the building to all fixtures requiring domestic water.
    2. The pipe material shall be Type L copper tubing with wrought copper fittings and soldered joints. The pipe joints will be formed with 95-5 tin-antimony solder and flux having a chemical composition equal to or less than 0.2% lead.
    3. Piping 2” and smaller will be joined with fittings utilizing a copper crimping system such as the Rigid/Viega ProPress System. Piping larger than 2” will be soldered. The piping will be insulated with fiberglass pipe insulation having an all service jacket and self-sealing lap.

D. Water Softeners
    1. A water sample will be analyzed during the Design Development phase to determine the quality the water service. If the water sample tests deem it necessary, a water softener system will be provided.

E. Water Heaters
    1. Two (N+1 redundant) natural gas water heater(s) with integral storage tanks will be installed. The water will be heated to and distributed at 140°F. The 140°F water will be distributed to the mop basins. The 140°F hot water will be mixed locally at all other locations down to 110°F water prior to discharging from the fixtures requiring hot water.

F. Hot Water Recirculation
    1. Hot water circulation distribution piping will be routed to within a minimum of 3’ from each fixture. A hot water circulation pump will be located adjacent to the hot water heaters. The hot water circulation pump will be controlled by the Buidling Automation System.

G. Sanitary Waste and Vent System

1. The sanitary and vent piping system will be divided into standard and acid waste piping systems. The acid waste piping systems will remain independent of the standard sanitary and vent piping system until after it is neutralized. Three neutralization systems will be provided to neutralize the acid sanitary waste piping serving the lab fixtures of each wing.
2. Standard Sanitary/Vent Piping:
    - The sanitary drainage and vent piping will be cast iron, hub and spigot below grade, and cast iron, no-hub above grade. Horizontal collection into the building drain occurs below the slab and exit by gravity to the site sanitary sewer.
3. Acid Waste/Vent Piping:
    - All laboratory suite fixtures and mechanical room drains will be collected below the slab and drain by gravity to acid neutralization tanks. There will be one acid neutralization tank located at each exit point. All building acid waste drainage and vent piping below the slab and within walls/chases shall be Schedule 40 polypropylene and will be joined with butt fusion joints. All acid waste drainage and vent piping within the return air plenum shall be Schedule 40 PVDF and will be joined with butt fusion joints.

H. Storm Water System
1. Sizing of the drains and collection piping will be based on using a rainfall rate of four inches per hour for a storm of one hour duration and 100-year flood for the primary roof drainage system. Emergency overflow drains and piping will be provided and sized like the standard storm system. The piping will be routed vertically from the drains to below the slab. Horizontal collection into the building drain will occur below the slab and exit by gravity to the site storm sewer. The secondary piping will discharge approximately 18” above grade.
2. Storm Piping:
    - The storm piping will be cast iron, hub and spigot below grade, and cast iron, no-hub above grade. Horizontal collection into the building drain occurs below the slab and exit by gravity to the site storm sewer.

I. General Plumbing Description:
1. Plumbing fixtures (lavatories, water closets, urinals) will be porcelain type. Fixture colors will be selected by the Architect. Sensor-operated flush valves and sensor-operated faucets will be provided for restrooms.

2. Water closets will utilize 1.28 gallons per flush (gpf), and urinals will utilize 0.5 gpf. Lavatories will have a flow rate of 0.5 gallons per minute.
3. Sinks in break rooms will be stainless steel.
4. Sinks will use 2.2 gallons of water per minute and the trim for each sink will be coordinated with the user. The sink will utilize a manual faucet.
5. Hose bibs will be provided in all Mechanical Equipment Rooms. Hose bibbs will be provided around the perimeter of the building at 200' intervals. Three roof-mounted hose bibbs will be provided.
6. An emergency eyewash/shower will be provided in all Labs.

J. Laboratory Utilities
   1. Pure Water System:
      - Two packaged pure water systems will be located in the Mechanical Room and will provide the lab spaces with pure water. One system will be dedicated to the EGLE/LEO wing and the other will be dedicated to the HHS wing. Each pure water system will take a domestic cold water feed and produce Clinical Laboratory Reagent Water. Each system will be designed to accommodate 300 gallons of use per day. Each pure water system will include the following:
         1. Water softeners
         2. RO membrane
         3. Stainless steel storage tank (approx. 600 gallons)
         4. Stainless steel distribution pumps
         5. Cathode/anode/mixed bed polishing tanks
         6. 5.0-micron filter
         7. 0.2-micron filter
         8. UV light
      - All pure water piping within the mechanical room and throughout the building shall be orbitally welded, stainless steel piping.
      - An alternate price shall be established to compare the orbitally welded, stainless steel piping to plastic piping. The plastic piping shall be electrically fused, polypropylene in non-plenum return areas and Polyvinylidene Fluoride (PVDF) in plenum return areas.
   2. Bulk Liquid Nitrogen
      - Two large liquid nitrogen tanks will be installed outside of the builiding. The tank will be provided by the gas supplier. Liquid nitrogen piping will be piped from the tank to the equipment. One tank will be located near the EGLE/LEO wing and will serve

the Air Volatiles Lab. The other tank will be located near the HHS wing and will serve the Chemistry VOC Lab.
- The liquid nitrogen piping will be fully welded, stainless steel, super insulated vacuum jacketed piping (VJP). Contact ACME Cryogenics (800.422.2790) or Cryofab (800.426.2186) for more information.

3. Bulk Gaseous Nitrogen
    - The two large liquid nitrogen tanks mentioned above will be utilized for gaseous nitrogen. The gaseous nitrogen will be routed from each tank to the fume hoods in the following locations:
        1. EGLE/LEO: All prep labs, Organic VOC Labs, and Inorganic VOC Labs
        2. HHS: Organic Instrument Labs, Organic Processing Labs, and all VOC Labs
    - All gaseous nitrogen piping shall be stainless steel with compression fittings similar to that produced by Swagelok.
    - An alternate price shall be established to include an outdoor nitrogen generator that serves all of the spaces mentioned above.
4. Bulk Gaseous Argon
    - The gaseous argon will be routed from each tank to the following locations:
        1. EGLE/LEO: All Metals Labs and PFAS Labs
        2. HHS: All Inorganic Labs and Main Instrument Rooms
    - All gaseous argon piping shall be stainless steel with compression fittings similar to that produced by Swagelok.
5. Compressed Air
    - A packaged duplex air compressor will be located in the Mechanical Room and will provide the compressed air needs. The compressed air system will deliver clean, dry air (e.g. oil free, -40°F dew point). All compressed air piping will be Type L hard drawn seamless copper tube with soldered fittings. The size and capacity of the air compressor will be determined during design development.
    - Compress air piping will be routed from the mechanical room to all of the fume hoods and work benches in the EGLE/LEO wing.
6. Vacuum
    - A packaged duplex vacuum pump will be located in the Mechanical Room and will provide the vacuum needs. The

discharge from the vacuum pump will either connect to the building exhaust system or discharge to the outdoors. The exact approach will be determined during design development. All vacuum piping will be Type L hard drawn seamless copper tube with soldered fittings. The requirement and location of liquid separators and filters will be determined during design development.

- Vacuum piping will be routed from the mechanical room to the following locations:
    1. EGLE/LEO Wing: All Labs
    2. PFAS Extraction Lab
    3. DW Extraction Lab
    4. Environmental Water Extraction Lab
        a. Regulators are to be provided locally to this lab
    5. HHS: All chemistry sample prep benches
    6. HHS: Biosafety cabinets in Micro Labs, Viro Labs, and BSL3 Labs

7. Gas Cylinder Closets - Manifold Gas Systems
    - Each cylinder closet shall contain a gas manifold to which all cylinders connect. The manifold will automatically switch to the next cylinder once the previous cylinder has been used.
    - All helium, hydrogen, and nitrogen piping shall be stainless steel with compression fittings similar to that produced by Swagelok.
    - All compressed air and CO2 piping shall be Type L hard drawn seamless copper tube with soldered fittings.
    - Helium Cylinder Closets are needed for the following labs:
        1. EGLE Semi-Volatiles and Volatiles Labs
        2. HHS: Main Instrument Areas, VOC Labs, and Metals Labs
    - Hydrogen Cylinder Closets are needed for the following labs:
        1. EGLE Semi-Volatiles Instrument Labs, Volatiles Labs, and Air Volatiles Labs
        2. HHS: Space will be allocated for a future manifold. No cylinders or manifolds are included in the current design.
    - Nitrogen Cylinder Closets are needed for the following labs:
        1. EGLE Volatiles Orgain Labs and Air Organic Labs
    - Compressed Air Cylinder Closets are needed for the following labs:
        1. HHS: PFAS nitrogen generator
    - CO2 Cylinder Closets are needed for the following labs:
        1. HHS: Incubators in the Virology Labs

K. Natural Gas

1. Service Connection and Pressure
   a. The natural gas service shall be extended from the site main to the building mechanical room. The gas meter and pressure regulator shall be provided by the local utility and shall be located on grade outside of the mechanical room. Gas piping shall be extended from the meter to all equipment needing gas. Natural gas piping shall be standard weight black steel threaded joints on piping 2’ and smaller, and butt welded and flanged joints on pipes 2-1/2” and larger.

Part 7 - MECHANICAL

A. Design Criteria
1. Design Conditions
- Outdoor Design Conditions:
1. Heating: -10°F Dry Bulb, 10.9 mph wind (westward)
1. Cooling: 95.0°F Dry Bulb, 78.0°F Wet Bulb
1. Dehumidification: 74.9°F Dew Point, 84.1°F Dry Bulb
- Design Safety Factors:
1. Heating: 30%
1. Cooling: 15%
- Indoor Design Conditions:
1. Occupied Spaces (Labs, Offices, Conference Rooms, etc)
a. Temperature: 72°F, ±2°F for Occupied Spaces
b. Humidity: 30% - 60% Relative Humidity
1. Equipment Spaces
a. Temperature: 60 - 78°F, ±2°F
b. Humidity: 30% - 60% Relative Humidity
1. Technology/IT Spaces
a. Temperature: 75°F, ±2°F
b. Humidity: 30% - 60% Relative Humidity
- Outside Air Quantity:
1. The outside air quantity will be in accordance with ASHRAE Standard 62.1-2019 for the various space types and/or as required for fume exhaust/lab exhaust make-up.
- Laboratory Air Changes Per Hour (ACH); There are three governing factors for overall airflow within laboratory spaces:
1. Cooling Load
1. Fume Exhaust Make-Up
1. Minimum ACH required for safe laboratory operation as agreed to by the Owner.
a. The design is currently based on the following information. This will be further refined and developed as the design progresses.

Space Type	ACH	Watts per Sq Ft
EGLE Labs	8	7
LEO Labs	8	7
HHS Labs	8	7
BSL Spaces	15	7

b. The ventilation rate is a large contributor to the overall energy use of the building. The design team would like for the project to carry an alternate

to include an Aircuity system. The Aircuity system will monitor the Lab Spaces by sampling the air at predetermined intervals (approximately 15 minutes). If the sampling indicates that the air quality is acceptable, it will communicate with the lab control system and reduce the ACH to that Lab. If at any time Aircuity's sampling indicates an air quality that is unacceptable, the system will communicate with the lab control system and increase the ACH to that Lab to purge the Lab. The minimum and maximum (purge) ACH values will be determined through conversations with the Owner's Environmental Health and Safety Group as the design progresses. The Aircuity system consists of:

i. Sensor suite.
ii. Sensors.
iii. Information management server.
iv. Tubing.
v. Room/duct sensors.
vi. Air/data routers.
i. Vacuum pump.

B. Ventilation Systems
1. There are two penthouses that will house ventilation equipment for the project. One penthouse is on the west side of the building and will serve the EGLE & LEO spaces, and the other penthouse is on the east side of the building and will serve the HHS and BSL spaces.
2. The basis of design for all air handing units will be Trane Custom.
3. EGLE, LEO, & Center Area
    - The ventilation system shall consist of three large custom air handling units (AHUs) each approximately 45,000 CFM. The total airflow for this system is approximately 135,000 CFM. Each AHU will be sized such that the total airflow can be accommodated in the event that one AHU is offline. The AHUs will be designed to have a maximum of 350-400 feet per minute through the coils and filters during normal operation (ie with all three AHUs operating). The velocity through the AHUs will be allowed to exceed this range during the times when only two AHUs are operating. The custom AHUs will consist of a supply fan array, chilled water coil, MERV 8 and MERV 15 filters, an energy recovery coil, steam dispersion manifold, return fan array,

and access sections. Each fan will have a variable frequency drive (VFD).

- Supply ductwork will extend from the penthouse down to air terminal devices. Air terminal devices for laboratory spaces will be high precision air valves. All laboratories will have dedicated supply and general exhaust air valves. All fume hoods will have dedicated fume exhaust air valves. Separate duct-mounted hydronic reheat coils are provided for temperature control downstream of the supply air valves. The supply air to the laboratories is sized to accommodate the minimum Air Change per Hour requirement (ACH), provide adequate cooling, and provide the makeup air for all of the exhaust requirements.
- Air terminal devices for non-lab spaces will be standard terminal air boxes (TAB) with integral reheat coils.
- Supply air to non-lab spaces is used for make-up air to the lab spaces. Supply air not needed for make-up air is routed back to a central return air duct riser via transfer ducts and the building plenum. The return ductwork is routed in the vertical duct chases up to the penthouse. Once back in the penthouse, the return air is ducted directly back to each air handler.
- The outside air will have two separate paths to the AHUs as described below. Path 1 will be used during economizer and during the cooling season. Path #1 and Path #2 will be used during the heating season.
    3. Path #1: This path will be through a louver (approx. 900 sq ft) located on the northeast facing wall. An 8’ deep outside air intake plenum will be located behind the louver. The louver will have an access door and floor drains. The plenum walls will be pre-fabricated, insulated plenum walls, doors, and ceilings. Outside air ductwork will extend from this plenum and connect to a mixing box on each of the AHUs.
    3. Path #2: This path will be through a solar wall. The solar wall will cover the entire south/south east facing wall of the penthouse. The solar wall will be external to the penthouse and will extend from the floor of the penthouse to the top of the parapet. A horizontal air duct will be located behind the parapet and above the roof that will connect to the top portion of the solar wall. Outside air ductwork will extend from the bottom of the horizontal duct to a mixing box on each of the AHUs.

4. HHS Spaces
    - The ventilation system shall consist of three large custom air handling units (AHUs) each approximately 40,000 CFM. The total airflow for this system is approximately 120,000 CFM. Each AHU will be sized such that the total airflow can be accommodated in the event that one AHU is offline. The AHUs will be designed to have a maximum of 350-400 feet per minute through the coils and filters during normal operation (ie with all three AHUs operating). The velocity through the AHUs will be allowed to exceed this range during the times when only two AHUs are operating. The custom AHUs will consist of a supply fan array, chilled water coil, MERV 8 and MERV 15 filters, an energy recovery coil, steam dispersion manifold, return fan array, and access sections. Each fan will have a variable frequency drive (VFD).
    - Supply ductwork will extend from the penthouse down to air terminal devices. Air terminal devices for laboratory spaces will be high precision air valves. All laboratories will have dedicated supply and general exhaust air valves. All fume hoods will have dedicated fume exhaust air valves. Separate duct-mounted hydronic reheat coils are provided for temperature control downstream of the supply air valves. The supply air to the laboratories is sized to accommodate the minimum Air Change per Hour requirement (ACH), provide adequate cooling, and provide the makeup air for all of the exhaust requirements.
    - Air terminal devices for non-lab spaces will be standard terminal air boxes (TAB) with integral reheat coils.
    - Supply air to non-lab spaces is used for make-up air to the lab spaces. Supply air not needed for make-up air is routed back to a central return air duct riser via transfer ducts and the building plenum. The return ductwork is routed in the vertical duct chases up to the penthouse. Once back in the penthouse, the return air is ducted directly back to each air handler.
    - The outside air will have two separate paths to the AHUs as described below. Path 1 will be used during economizer and during the cooling season. Path #1 and Path #2 will be used during the heating season.
        4. Path #1: This path will be through a louver (approx. 1015 sq ft) located on the east facing wall. An 8’ deep outside air intake plenum will be located behind the louver. The louver will have an access door and floor drains. The plenum walls will be pre-fabricated, insulated plenum

walls, doors, and ceilings. Outside air ductwork will extend from this plenum and connect to a mixing box on each of the AHUs.

4. Path #2: This path will be through a solar wall. The solar wall will cover the entire south/south east facing wall of the penthouse. The solar wall will be external to the penthouse and will extend from the floor of the penthouse to the top of the parapet. A horizontal air duct will be located behind the parapet and above the roof that will connect to the top portion of the solar wall. Outside air ductwork will extend from the bottom of the horizontal duct to a mixing box on each of the AHUs.

5. Clean Room Spaces
    - The clean room spaces are located on the first level. These spaces will each have a supply air valve and associated reheat coil to maintain temperature and maintain pressurization. Each space will have a general exhaust air valve, and all fume hoods will have a dedicated fume exhaust air valve. These supply and exhaust air valves will be connected to the HHS ventilation equipment described above.
    - The supply air will be delivered to the sealed plenum space above each of the clean rooms. Each clean room will have fan filter units (FFU) located in the ceiling. The FFUs will have HEPA filters, and all FFUs for a clean room will be connected to a FFU controller. The controller will be connected to the building automation system. The FFU will have filters that are room-side replaceable. The FFUs will cover approximately 50% of the ceiling area.
    - Each clean room space will have return air devices mounted low on opposing walls. The FFUs will pull plenum air through their HEPA filters and deliver to the clean room. The FFU will pull return air back from the low return air devices and up through plenum walls and back to the ceiling plenum. Once the return air is in the ceiling plenum, it will mix with the air from the supply air valve for temperature control.
6. BSL Spaces
    - The ventilation system shall consist of two large custom air handling units (AHUs) each approximately 32,000 CFM. The total airflow for this system is approximately 32,000 CFM. Each AHU will be sized for 100% of the BSL needs providing N+1 redundancy. The custom AHUs will consist of a supply fan array, chilled water coil, MERV 8 and MERV 15 filters, an energy

recovery coil, steam dispersion manifold, return fan array, and access sections. Each fan will have a variable frequency drive (VFD).

- All spaces within the BSL suite will be served by high precision air valves. All BSL air valves will be located in the penthouse. All laboratories will have dedicated supply and general exhaust air valves. All hoods (fume hoods, bio-safety cabinets, etc) will have dedicated exhaust air valves. Separate duct-mounted hydronic reheat coils will be provided for temperature control downstream of the supply air valves. The supply air to the laboratories is sized to accommodate the minimum Air Change per Hour requirement (ACH), provide adequate cooling, and provide the makeup air for all of the exhaust requirements. Bubble-tight dampers will be provided in the supply and exhaust ductwork at the penthouse floor penetration.
- The outside air for the BSL AHUs will connect to the outside air paths described in the HHS section.

7. Warehouse
    - The ventilation system shall consist of one modular air handling unit (AHU) approximately 20,000 CFM. The AHU will consist of a supply fan array, chilled water coil, MERV 8 and MERV 15 filters, an energy recovery coil, steam dispersion manifold, return fan array, and access sections. Each fan will have a variable frequency drive (VFD). The AHU will be located on a mezzanine/platform within the Warehouse space.
    - Supply ductwork will extend from the AHU to air terminal devices. Air terminal devices for laboratory spaces will be high precision air valves. All laboratories will have dedicated supply and general exhaust air valves. All fume hoods will have dedicated fume exhaust air valves. Separate duct-mounted hydronic reheat coils are provided for temperature control downstream of the supply air valves. The supply air to the laboratories is sized to accommodate the minimum Air Change per Hour requirement (ACH), provide adequate cooling, and provide the makeup air for all of the exhaust requirements.
    - Air terminal devices for non-lab spaces will be standard terminal air boxes (TAB) with integral reheat coils.
    - Supply air to non-lab spaces is used for make-up air to the lab spaces. Supply air not needed for make-up air is routed back to a central return air duct via transfer ducts and the building plenum. The return ductwork is routed directly back to the air handler.

- Outside air will be ducted from a louver located on the south wall of the warehouse to the AHU. Relief air will be ducted from the AHU to a roof mounted relief hood.

C. Exhaust Systems

1. General exhaust is defined as air that is exhausted from laboratories, but does not originate in a fume hood, point exhaust, etc. While this air is not considered for recirculation, it is also not considered as hazardous as fume exhaust air.
2. Fume exhaust is defined as exhaust air that serves all fume hoods, point exhausts, chemical storage cabinets, and other similar functions. Fume hood exhaust will be designed to maintain the required face velocity for containment. This is typically 80 Feet Per Minute (FPM). Fume hood's will be designed to maintain the required face velocity when the fume hood sash is less than or equal to 18" open (i.e. when the sash is open more than 18", the required face velocity for containment will not be maintained). This is because fume hood sashes are typically only opened beyond 18" for set-up.
3. The basis of design for all exhaust fan systems will be Strobic Air.
4. EGLE, LEO, & Center Area
    - The laboratory exhaust systems will consist of a combined exhaust system serving both general exhaust and a fume exhaust. The general exhaust system will serve both laboratory and toilet exhaust. The general exhaust serving laboratories will utilize high precision air valves and will modulate in response to the supply air valve and fume exhaust air valve serving the laboratory to maintain negative pressurization relative to adjacent spaces. The general exhaust serving non-laboratory spaces will utilize terminal air boxes to control the exhaust air rate. All ductwork associated with general exhaust will be galvanized steel.
    - The fume exhaust will utilize high precision air valves that will modulate in order to maintain proper exhaust airflow rates. The fume exhaust ductwork will manifold with the general exhaust system into one ducted system within the service corridor. All fume exhaust ductwork will be stainless steel from the equipment to the manifolded main in the corridor. The manifolded main will be galvanized. The combined exhaust will connect to a common exhaust riser utilizing a subduct assembly as described in NFPA 45. This subduct assembly takes the place of fire dampers. Once the combined exhaust duct reaches the penthouse, the combined exhaust travels through the exhaust energy recovery

unit that contains a run-around coil. This energy recovery coil is part of a run-around loop that consists of coils in the exhaust air stream and outside air stream. Pumps will pump a glycol mixture between the two coils. The run-around system will transfer energy between the exhaust air stream and the outside air stream reducing the overall heating and cooling demand of the building. The combined exhaust system will have a bypass around the energy recovery unit that bypasses the unit during economizer or when it is down for maintenance/service. Roof-mounted, mixed flow, high-dilution exhaust fans will serve the combined exhaust system. There will be four fume exhaust fans providing N+1 redundancy (each approx. 25,000 CFM). The fume exhaust fans will discharge a minimum of 10'-0" above the adjacent rooflines and a minimum of 3,000 Feet Per Minute (FPM) in compliance with ANSI/AIHA Z9.5 Standard for Laboratory Ventilation.

- The energy recovery unit will be located in the west penthouse, and the exhaust fans will be located on the roof in the area to the west of the west penthouse.

5. HHS Spaces
    - The laboratory exhaust systems will consist of a combined exhaust system serving both general exhaust and a fume exhaust. The general exhaust system will serve both laboratory and toilet exhaust. The general exhaust serving laboratories will utilize high precision air valves and will modulate in response to the supply air valve and fume exhaust air valve serving the laboratory to maintain negative pressurization relative to adjacent spaces. The general exhaust serving non-laboratory spaces will utilize terminal air boxes to control the exhaust air rate. All ductwork associated with general exhaust will be galvanized steel.
    - The fume exhaust will utilize high precision air valves that will modulate in order to maintain proper exhaust airflow rates. The fume exhaust ductwork will manifold with the general exhaust system into one ducted system within the service corridor. All fume exhaust ductwork will be stainless steel from the equipment to the manifolded main in the corridor. The manifolded main will be galvanized. The combined exhaust will connect to a common exhaust riser utilizing a subduct assembly as described in NFPA 45. This subduct assembly takes the place of fire dampers. Once the combined exhaust duct reaches the roof, the combined

exhaust travels through the exhaust energy recovery unit that contains a run-around coil. This energy recovery coil is part of a run-around loop that consists of coils in the exhaust air stream and outside air stream. Pumps will pump a glycol mixture between the two coils. The run-around system will transfer energy between the exhaust air stream and the outside air stream reducing the overall heating and cooling demand of the building. The combined exhaust system will have a bypass around the energy recovery unit that bypasses the unit during economizer or when it is down for maintenance/service. Roof-mounted, mixed flow, high-dilution exhaust fans will serve the combined exhaust system. There will be four fume exhaust fans providing N+1 redundancy (each approx. 30,000 CFM). The fume exhaust fans will discharge a minimum of 10'-0" above the adjacent rooflines and a minimum of 3,000 Feet Per Minute (FPM) in compliance with ANSI/AIHA Z9.5 Standard for Laboratory Ventilation.

- The energy recovery unit and exhaust fans will be located on the roof in the area to the west of the east penthouse.

6. BSL Spaces
    - The BSL exhaust system will consist of a combined exhaust system serving both general exhaust and a fume exhaust. The general exhaust serving laboratories will utilize high precision air valves and will modulate in response to the supply air valve and fume exhaust air valve serving the laboratory to maintain negative pressurization relative to adjacent spaces. All ductwork associated with general exhaust will be fully-welded stainless steel up to the HEPA units. The general exhaust ductwork will be routed from the space it serves to the penthouse. There will be a bubble-tight damper located in the penthouse floor penetration. The general exhaust air valve will be located vertically in the penthouse. Downstream of the air valve, the general exhaust will manifold with all the other exhaust airstreams into a manifolded exhaust main.
    - The fume exhaust will utilize high precision air valves that will modulate in order to maintain proper exhaust airflow rates. All fume exhaust ductwork will be fully-welded stainless steel. The fume exhaust ductwork will be routed from the device it serves to the penthouse. There will be a bubble-tight damper located in the penthouse floor penetration. The fume exhaust air valve will be located vertically in the penthouse. Downstream of the air

valve, the fume exhaust will manifold with all the other exhaust airstreams into a manifolded exhaust main.

- Two bag-in-bag-out HEPA units will be located in the penthouse. Each HEPA unit will be sized for 18,000 CFM, and it will contain multiple filter banks. The HEPA unit will be sized such that one filter bank can be isolated for replacement and all other filter ranks can remain active. The manifolded exhaust main will be fully-welded stainless steel up to the HEPA units. The exhaust downstream of the HEPA units will be flanged stainless steel. Once the manifolded exhaust exits the HEPA unit it will travel through the exhaust energy recovery unit that contains a run-around coil. This energy recovery coil is part of a run-around loop that consists of coils in the exhaust air stream and outside air stream. Pumps will pump a glycol mixture between the two coils. The run-around system will transfer energy between the exhaust air stream and the outside air stream reducing the overall heating and cooling demand of the building. The combined exhaust system will have a bypass around the energy recovery unit that bypasses the unit during economizer or when it is down for maintenance/service. Roof-mounted, mixed flow, high-dilution exhaust fans will serve the combined exhaust system. There will be three fume exhaust fans providing N+1 redundancy (each approx. 18,000 CFM). The fume exhaust fans will discharge a minimum of 10’-0” above the adjacent rooflines and a minimum of 3,000 Feet Per Minute (FPM) in compliance with ANSI/AIHA Z9.5 Standard for Laboratory Ventilation.
- The energy recovery unit will be located in the east penthouse, and the exhaust fans will be located on the roof in the area to the west of the east penthouse.

7. Warehouse
    - The laboratory exhaust systems will consist of a combined exhaust system serving both general exhaust and a fume exhaust. The general exhaust serving laboratories will utilize high precision air valves and will modulate in response to the supply air valve and fume exhaust air valve serving the laboratory to maintain negative pressurization relative to adjacent spaces. The general exhaust serving non-laboratory spaces will utilize terminal air boxes to control the exhaust air rate. All ductwork associated with general exhaust will be galvanized steel.

- The fume exhaust will utilize high precision air valves that will modulate in order to maintain proper exhaust airflow rates. The fume exhaust ductwork will manifold with the general exhaust system into one ducted system within the warehouse. All fume exhaust ductwork will be stainless steel from the equipment to the manifolded main. The manifolded main will be galvanized. The combined exhaust will travel through a run-around coil located in the exhaust fan plenum. This run-around loop consists of coils in the exhaust air stream and outside air stream. Pumps will pump a glycol mixture between the two coils. The run-around system will transfer energy between the exhaust air stream and the outside air stream reducing the overall heating and cooling demand of the building. The combined exhaust system will bypass around the run-around coil during economizer or when it is down for maintenance/service. Roof-mounted, mixed flow, high-dilution exhaust fans will serve the combined exhaust system. There will be three fume exhaust fans providing N+1 redundancy (each approx. 8,000 CFM). The fume exhaust fans will discharge a minimum of 10'-0" above the adjacent rooflines and a minimum of 3,000 Feet Per Minute (FPM) in compliance with ANSI/AIHA Z9.5 Standard for Laboratory Ventilation.
- The exhaust fans will be located on the roof in the area to the west of the east penthouse.

D. Heating & Cooling Plant
    1. The heating and cooling will be provided by chillers that are capable of producing chilled water and heating water simultaneously. The plant will consist of the following:
        - Chillers
        - Ice Storage
        - Boiler
        - Geothermal Bores
    2. Chillers:
        - Four, screw chillers will be provided (approx. 1,000 nominal tons each). Three chillers are needed to accommodate peak loads providing N+1 redundancy. The basis of design chiller will be Trane CTV.
        - Heating: The peak heating load is approximately 28,000 MBH. The heating system will be a primary secondary system. Two primary pumps (approx. 950 GPM each) will be provided for

each chiller. Three secondary pumps (approx. 1,400 GPM each) will be provided. The secondary pumps will distribute heating water to all of the heating devices (e.g. AHUs, reheat coils, unit heaters, etc).

- Cooling: The peak cooling load is approximately 1,645 Tons. The chilled water system will be a primary secondary system. Two primary pumps (approx. 2000 GPM each) will be provided for each chiller. Three secondary pumps (approx. 1,645 GPM each) will be provided. The secondary pumps will distribute chilled water to all of the cooling devices (e.g. AHUs, heat exchangers, etc).
- Pumps and Piping Systems
    2. Pumps will be base-mounted end suction.
    2. Variable frequency drives will be used to minimize pumping energy.
- Heating and Chilled Water piping 2” and smaller will be copper with soldered joints and fittings. Shutoff valves will be ball type, and check valves will be swing type. Piping 2-1/2” and larger will be Schedule 40 black steel, with butt-welded, mechanically coupled, or flanged joints. Shutoff valves will be butterfly type, and check valves will be double-door type.

3. Ice Storage:
    - The ice storage will consist of approximately 131 tanks similar to those manufactured by Calmac (model 1190-C). These tanks will be located outside near the mechanical room. They will occupy approximately 9,250 square feet. They will be piped in a reverse return manner.
4. Boiler:
    - A new natural gas fired, high-efficiency condensing boiler (approx. 1,000 MBH) will be provided. The boiler will only be needed during extreme conditions when the cold weather is near design temperatures for many consecutive days. The boiler will add heat to the geothermal loop. The basis of design boiler will be Fultan Vantage.
    - This small heating water loop will utilize a variable/primary pumping scheme. Two pumps (approx. 100 GPM each) will be provided and will provide N+1 redundancy. These pumps will circulate heating water between the boiler and the heat exchanger on the geothermal loop.

- Heating Water piping 2” and smaller will be copper with soldered joints and fittings. Shutoff valves will be ball type, and check valves will be swing type. Piping 2-1/2” and larger will be Schedule 40 black steel, with butt-welded, mechanically coupled, or flanged joints. Shutoff valves will be butterfly type, and check valves will be double-door type.
- Condensate piping for condensing type boilers will be neutralized before entering the sanitary waste system.

5. Geothermal Bores
    - A geothermal field providing approximately 1,050 tons of capacity will be provided. This field is sized for approximately 45% of the peak heating load. A bore field with approximately 350 bores, 500-feet deep taking up approximately 35,000 square feet will be provided. The bore field will be piped in multiple loops. Each loop will be routed from the bore field to the mechanical room. Once in the mechanical room the loops will manifold together. A plate-and-frame heat exchanger will be provided in the geothermal piping to add heat to this loop using the boiler mentioned above.
    - Heat Exchanger: The heat exchangers will be plate and frame and ASME stamped for 125 psi water service. The heat exchangers will be free standing with multiple plates, designed to allow for opening and cleaning in place.
    - Geothermal Water piping inside the building: 2” and smaller will be copper with soldered joints and fittings. Shutoff valves will be ball type, and check valves will be swing type. Piping 2-1/2” and larger will be Schedule 40 black steel, with butt-welded, mechanically coupled, or flanged joints. Shutoff valves will be butterfly type, and check valves will be double-door type.
    - Geothermal Water piping below grade: Pipe shall be Chevron Phillips Driscoplex 5300 DR 11 or approved equal. The u-bend assembly shall be manufactured from a polyethylene extrusion grade material having a minimum cell classification of PE345434C per ASTM D-3350 and shall full comply with the International Ground Source Heat Pump Association (IGSHPA) standard 1C “Ground Heat Exchanger Materials”.

E. Energy Recovery System
    1. The energy recovery systems will consist of the following:
        - Energy Recovery Unit (ERU)
            1. Coil

1. Filter
1. Access Doors

- Two Pumps providing N+1 Redundancy
- Coil in the associated AHUs
- Interconnecting Piping
- Expansion Tank
- Air Separator
- Glycol Feed Station
- Heating Water Plate-and-Frame Heat Exchanger
    1. One side is the Energy Recovery Water
    1. One side is the building Hot Water
    1. This heat exchanger will be used to add heat to the energy recovery loop at times when the energy recovered can not accommodate the heat needed within the associated AHU.
- Chilled Water Plate-and-Frame Heat Exchanger
    1. One side is the Energy Recovery Water
    1. One side is the building Chilled Water
    1. This heat exchanger will be used to reject “waste” chilled water. There will be times when the chillers are operating in 100% heat mode, and there is not chilled water demand. We will use the “waste” chilled water to make ice, but there may be times when we’ll need to send that “waste” chilled water to the exhaust air stream.

2. There are four of these systems as mentioned in the Ventilation section above. There will be one for the EGLE/LEO system, one for the HHS system, one for the BSL system, and one for the Warehouse.
3. Pumps and Pipe Distribution
    - The energy recovery system will be a variable/primary system.
    - Energy recovery water pumps will be base-mounted end suction type.
    - Variable frequency drives will be provided to minimize pumping energy.
3. Energy recovery water piping 2” and smaller will be copper with soldered joints and fittings. Shutoff valves will be ball type, and check valves will be swing type. Piping 2-1/2” and larger will be Schedule 40 black steel with butt-welded, mechanically coupled, or flanged joints. Shutoff valves will be butterfly type, and check valves will be double-door type.

4. The heat exchangers will be plate and frame and ASME stamped for 125 psi water service. The heat exchangers will be free standing with multiple plates, designed to allow for opening and cleaning in place.

F. Humidification
1. Two gas-fired steam boilers will be provided in each penthouse along with the associated boiler feed systems and blowdown equipment (approx. 3,150 #/hr each). Each boiler will be sized for the humidification load of the air handlers within the same penthouse. Stainless steel steam piping will be routed from the steam boilers to the steam dispersion manifold in each AHU. The condensate from each dispersion manifold will be collected in a condensate return station and returned to the boiler feed system.

G. Controls
1. The Building will be provided with a new Building Automation System (BAS) to control systems and equipment and to monitor functions. The required BAS functions will include, but are not limited to: mechanical and electrical equipment start/stop, status monitoring, operational scheduling, setpoint adjustment, primary airflow, space temperature, discharge air temperature for each control zone and lighting control. A personal computer will be provided for user interface along with the software and programming for a web-based system for remote access.
2. Each area that requires pressure control will be provided with a lab control system similar to Phoenix Controls to maintain proper ventilation levels, fume hood face velocities, and pressure relationships throughout the project space. Two methods of containment will be utilized for these spaces. The first protects space (lab) occupants from the hazards within the fume hoods, if applicable; the second protects the Corridor from the hazards within the Lab Space. The fume hood sashes will be equipped with sash sensors (potentiometers) that will constantly measure the face opening of the hood and control the air valve to maintain face velocity through the opening. The laboratory control system will utilize volumetric offsets to maintain pressure differentials between Corridors or other General Use Type Spaces and Labs. This is accomplished by providing an offset between the supply air into the space and the total (fume and general) exhaust out of the space. The dedicated Lab Control System (LCS) will be utilized to control and monitor air valves and fume hood velocities. The BAS and the LCS shall be provided with an interface between the two systems to allow monitoring, read, and write capabilities to the lab control system from the operator workstation.
3. A chilled water plant control optimization package shall be included in the design similar to Trane's Tracer system. The optimization packaged

will be used to provide the most efficient operation of the chilled water plant.

H. General Mechanical Description
    1. Hot water cabinet heaters will be provided at all entrances/exits from the building.
    2. Hot water unit heaters will be provided in all utilitarian spaces.
    3. Chilled water fan coil units will be provided for all IT spaces and electrical rooms.
    4. Hot water perimeter radiation (Runtal panel radiation) will be provided along all exposures with large amounts of glass.

Part 8 - ELECTRICAL

A. Electrical Design Requirements
   1. Lighting Systems
      a. System Narrative
         1. Lighting design for this project will meet current Illuminating Engineering Society recommended illuminance targets.
         2. Additional mandatory controls for lighting that include manual switching, automatic controls to reduce lighting levels, and day lighting controls will be installed.
         3. All luminaires will have a Correlated Color Temperature (CCT) of 4000°K in lab spaces and 3500°K in public spaces with a minimum Color Rendering Index (CRI) of 90.
      b. Average Illumination Levels: The average maintained illuminance levels are indicated in the table below.
      c. Lighting System Components
         1. Interior Luminaires
            a. LED luminaires will be used for general lighting.
            b. LED luminaires will be provided with dimmable drivers and will have a minimum rated life of 50,000 hours (LED board and driver).
            c. All conductors serving luminaries will be in conduit.
         2. Exterior Luminaires
            a. LED luminaires with low temperature drivers will be located in exterior applications at exit doors, parking lots, and along walkways and drives.
            b. Egress doors will be provided with light luminaires with two LED boards and drivers to provide code-required egress lighting.
            c. Exterior lighting will use full cutoff type luminaires to minimize light trespass. Outdoor lighting will also be designed to satisfy the requirements of the LEED Light Pollution Reduction credit.
         3. Lighting Controls
            a. Lighting controls will comply with the applicable energy code.
            b. Automatic shutoff will be achieved using a combination of BAS/timeclock controlled lighting contactors, vacancy sensors, and occupancy sensors. A vacancy sensor controlling lighting will come on automatically to 50% and manually to 100%. Lighting controls will be installed in areas listed in the table below.
            c. Required manual override switches will be installed in each individual room. Momentary contact switches will be provided to interface with the vacancy sensors in most rooms. Refer to the table below for areas requiring dimming and multi-level switching.

d. Dimming daylight harvesting will be used in areas required per the applicable energy code.

Area Description	Luminaires	Controls	Illuminance Levels
Typical Room Spaces			
Task Light	Under cabinet light luminaires will be provided on all upper cabinets.	Luminaires will have integral rocker switches when a single luminaire is used, and a wall switch when multiple luminaires are grouped together.	
Multi-Stall Toilet Rooms	Down lights and recessed perimeter cove light on wet wall	Switch with ceiling-mounted vacancy sensor	15 to 25 foot-candles
Single Stall Bathrooms	Down lights and recessed perimeter cove light on wet wall or Down lights and vanity luminaire	Wall switch type vacancy sensor	15 to 25 foot-candles
Small and Medium Conference Rooms	2'x4 dimmable volumetric type luminaires and dimmable down lights	Manual dimmers with ceiling-mounted vacancy sensors	30 to 50 foot-candles
Large Conference Rooms	Linear suspended with 40% up and 60% down distribution. LED downlights at perimeter.	Manual dimmers with ceiling-mounted vacancy sensors	30 to 50 foot-candles
Storage Rooms	Recessed acrylic lens luminaires in rooms with ceilings, suspended industrial luminaires in rooms without ceilings	Wall switch type vacancy sensor	10 foot-candles
Janitors Closets	Recessed acrylic lens luminaires in rooms with ceilings, suspended industrial luminaires in rooms without ceilings	Wall switch type vacancy sensor	15 foot-candles
Dock, Material Handling	Suspended or surface mounted industrial luminaires		20 to 30 foot-candles

Mechanical/Electrical Rooms	4' suspended industrial luminaires	Wall switch for safety	25 to 30 foot-candles
IT Rooms (MDF, IDF)	4' suspended industrial luminaires	Wall switch type vacancy sensor	50 foot-candles
Open Office	Linear suspended with 40% up and 60% down distribution.	Switch with ceiling-mounted occupancy sensor	30 to 50 foot-candles
Private Office	2'x4' or 2'x2' dimmable volumetric type luminaries	Manual dimmers with wall-mounted vacancy sensors	30 to 50 foot-candles
Stairs	Linear wall-mounted luminaires at each landing	Integral occupancy sensor	20 foot-candles
Lobby		Centralized lighting control system Timeclock/BAS via lighting contactor	15 to 30 foot-candles
Laboratory Spaces	Linear suspended with 40% up and 60% down distribution.	Switch with ceiling-mounted occupancy sensor and/or Timeclock/BAS via lighting contactor	75 foot-candles
Exterior Lighting			
Sidewalk	Pole-mounted LED pedestrian scale luminaires LED bollards	Centralized lighting control system Timeclock/BAS via lighting contactor	0.5 to 1 foot-candles
Entry Canopy		Centralized lighting control system Timeclock/BAS via lighting contactor	
Parking Lot	Pole-mounted LED area luminaires	Integral photo cell Centralized lighting control system	0.5 to 1 foot-candles

		Timeclock/BAS via lighting contactor	
Exterior Exits	Wall pack luminaires	Integral photo cell Centralized lighting control system Timeclock/BAS via lighting contactor	

d. Emergency Lighting
   1. Egress lighting will be served from the emergency power system backed up by a generator and designed to meet the requirements of NEC article 700.
   2. Exit signs will be edge lit LED type luminaires served from the emergency power system.
   3. Emergency battery-powered wall pack luminaires will be provided in the Life Safety transfer switch room, fire pump room, and the electrical service entrance room.

2. Power System Requirements
   a. Utility Service, Main Distribution, and Generators
      1. Please refer to the Electrical SD One-Line Diagram for information and sizing of the service, main distribution, and generators.
   b. Main Distribution
      1. The service entrance switchgear will be rated at 4160-volt, 1200 amp, 3-phase, 4-wire with main-tie-main circuit breaker configuration. The switchgear will use fixed-mounted power circuit breakers with a microprocessor-based breaker tripping system and electric metering capability. Spares and spaces will be provided to accommodate future loads. The switchgear will be provided with ground fault protection.
      2. A digital power meter will be provided on the load side of the main overcurrent protection device.
   c. Standby Generators
      1. Two paralleled 2400 kW/3000 kVA, standby rated, diesel emergency generator rated at 4106-volt, 3-phase, 4-wire will be provided.
      2. The generators will be located in weatherproof, sound-attenuated enclosures located in the exterior utility service yard. The generators will be provided with a dedicated sub-base tank suitable to provide 24 hours of run time at 100% load.
      3. Each generator will be provided with one fully rated output breaker to feed the 1200 amp rated paralleling switchgear.
      4. These generators will supply paralleling switchgear located in the main electrical room. The paralleling switchgear will serve the optional standby loads requiring generator backed up power

through 4-pole, closed transition, bypass isolation type automatic transfer switches and associated doubled ended unit substations.

5. Remote generator annunciator will be provided in the main electrical room.

d. Emergency Distribution

1. The NEC article 700 Life safety loads will be served by a separate generator and transfer switch. The transfer switch serving life safety loads will be 4-pole, closed transition, by-pass isolation type.
2. The Life safety generator distribution panel will be rated at 480/277-volt, 200 amp, 3-phase, 4-wire with a main circuit breaker. Spares and spaces will be provided to accommodate future loads.

3. Main Distribution

a. The unit substations will be located in the penthouse at each wing of the building. Within the unit substations, voltage will be stepped down to 480/277-volt 3-phase, 4-wire distribution level. The unit substations will feed the distribution equipment located within the utility service corridors on each level. Utility service corridors will house 480/277-volt distribution panels for lighting and equipment loads for the laboratory spaces, step-down transformers for 208/120-volt distribution, and branch circuit panelboards for receptacles and 208/120-volt equipment loads for the laboratory spaces. Laboratories will be provided with their own branch circuit panelboard.

b. Distribution equipment will be provided with dead front construction, and copper bussing, and sized with a minimum of 15% spare circuits.

c. Transformers will meet the 2016 Department of Energy efficiency standards. Transformers will have aluminum windings and will be rated for 115°C temperature rise over ambient. For transformers serving laboratory space branch circuits a K-4 rating and 200% neutral will be provided. Transformers will be installed on concrete housekeeping pads.

d. Variable frequency drives will be provided with manual bypass.

e. Transfer switches will be automatically operated with microprocessor-based controls to start the generator, transfer loads, and excise the generators. Transfer switches will be four pole, with bypass isolation.

f. A surge suppression system will be provided on the service entrance switchboard (Category “C” SPD), as well as on the secondary distribution panels fed from separately derived sources.

g. All wire will be copper.

h. An electrical load study, including short circuit analysis, voltage drop, arc flash and selective coordination, will be required to be carried out on the entire power system. This study will be performed by the selected manufacturer of the distribution equipment.

i. Feeder sizes will be increased as required to limit voltage drop from the service entrance to the branch circuit panel to not more than 2%.

4. Branch Distribution
    a. Branch circuit panels serving lighting and receptacle loads will use molded case, thermal magnetic type circuit breakers.
    b. Branch circuit panelboards will be sized with a minimum of 20% spare circuits. Where panelboards are flush mounted or installed in closets less than 2' deep, five empty 1" conduits will be stubbed into an accessible location above the ceiling for future use.
    c. Branch circuit panelboards will be provided with door-in-door construction with copper bussing.
    d. Branch circuit design will be based on a maximum of 1,900 volt amperes per 20 ampere, 120 volt circuit, and 4,400 volt amperes per 20 ampere, 277 volt circuit.
    e. 277 volts will be used for all general purpose lighting.
    f. All receptacles will be heavy-duty grade with stainless steel coverplates in laboratory spaces and unbreakable thermoplastic coverplates in public spaces.
    g. GFCI receptacles will be provided in exterior locations, locations within 6'-0" of all sinks, and at water coolers, and vending.
    h. GFCI receptacles with weatherproof, heavy duty in-use covers will be provided on the exterior of the building and near all roof-mounted mechanical equipment.
    i. Devices will be red in color for generator backed-up/emergency circuits.
    j. Minimum wire size will be #12 for power circuits and #18 for controls circuits.
    k. A dedicated neutral conductor will be provided in all branch circuits.
    l. Feeder sizes will be increased as required to limit voltage drop from the branch circuit panel to the terminal device to not more than 3%.
    m. Not more than three computer workstations will be served by a common circuit.
    n. Dedicated circuits will be provided to serve the following equipment:
        1. Refrigerators
        2. Freezers
        3. Fume hoods
        4. Copiers
        5. Microwave
        6. Coffee brewers
        7. Equipment with a load greater than 10 amps
    o. Motor Connection and Control
        1. Motors 3/4 horsepower and larger will be served at 480 or 208 volt, 3-phase, 3-wire. Motors less than 3/4 horsepower will be served at 120 volt service, 1-phase, 2-wire as applicable. Heating, ventilation, air conditioning, and other mechanical loads will generally be served at 480 volt, 3-phase, 3-wire.

2. Fans and large pumps will be controlled by VFDs. Smaller motors will be controlled by full voltage starters or manual starters as required.

5. Grounding System Requirements
   a. A grounding system and equipment grounding will be provided per National Electrical Code Article 250 for transformers, motor starters, panelboards, switchboards, transfer switches, wiring systems, etc.
   b. A green insulated equipment ground copper conductor, sized per National Electrical Code 250.122, will be run with all feeders and branch circuit homeruns.
6. Electronic Metering
   a. A power monitoring system will be provided. This power monitoring system will consist of electronic power monitoring devices on distribution panels as required to track receptacle, lighting, motor, fan, and miscellaneous loads separately.
   b. The metering system will be equipped with system display units for displaying data from the power monitoring devices and will be capable of displaying information on a facility computer via the local area network. The system will be provided with a network data and unique IP addresses. Gateways will be provided for meters without internet communication functionality.
   c. A PC-based power monitoring system will be provided to obtain the following information at all meters:
      1. Monitor and record load profiles, and chart energy consumption patterns.
      2. To calculate and record the following:
         a. Load factor
         b. Peak demand periods
         c. Consumption correlated with facility activities
      3. Power Quality Monitoring: Identify power system anomalies and measure, display, and record trends and alarms for the following power quality parameters:
         a. Voltage regulation and unbalance
         b. Continuous 3-phase rms voltage
         c. Periodic max./min./avg. samples
         d. Harmonics
         e. Voltage excursions
      4. System: Report equipment status and power system control.
   d. The system will be capable of the following features:
      1. Display metered values in real time
      2. Display circuit breaker status
      3. User defined with load-shedding automatically initiated, and executed schemes responding to programmed time schedules, setpoints of metered demands, utility contracted load shedding, or combinations of these.

4. Equipment Documentation: Database for recording of equipment ratings and characteristics, with capability for graphic display on monitors.
5. Graphics: Interactive color graphics platform with pulldown menus and mouse-driven generation of power system graphics in formats widely used for such drafting, to include the following:
    a. Site plan
    b. Floor plans
    c. Equipment elevations
    d. Single-line diagrams
6. Power Monitors
    a. Provide permanently installed instrument for power monitoring.
    b. As a minimum, the system will provide RMS real-time measurements for:
        1. Current: Each phase, neutral, average of three phases, and percent unbalance
        2. Voltage: Line-to-line each phase, line-to-line average of three phases, line-to-neutral each phase, line-to-neutral average of three phases, line-to-neutral percent unbalance
        3. Power: Per phase and three-phase total
        4. Reactive Power: Per phase and three-phase total
        5. Apparent Power: Per phase and three-phase total
        6. Power Factor: Per phase and three-phase total
        7. Displacement Power Factor: Per phase and three-phase total
        8. Frequency
        9. THD: Current and voltage
        10. Accumulated Energy: Real kWh, reactive kVARh, apparent kVAh (signed/absolute)
        11. Incremental Energy: Real kWh, reactive kVARh, apparent kVAh (signed/absolute)
        12. Conditional Energy: Real kWh, reactive kVARh, apparent kVAh (signed/absolute)

7. Fire Alarm and Communication System Requirements
    a. A complete NFPA 72 compliant addressable fire alarm system will be installed. The main fire alarm panel will be installed within the main electrical room. Additional remote LCD annunciators will be located at the main entrances and as required by the local fire department.
    b. Notification appliance circuit panels will be sized for 24 hours of standby operation and 15 minutes of alarm.

c. System notification will consist of ADA- and NFPA-compliant audio (tone), visual, and combination audio/visual devices.
d. System initiation will consist of individually addressable analog smoke and heat detectors, addressable fire pull stations, and sprinkler system flow switches.
e. Smoke detectors will be located in mechanical room, electrical rooms, storage rooms, equipment rooms, elevator equipment rooms, and elevator lobbies.
f. Duct-type smoke detectors to close smoke dampers and shut down air distribution systems will be provided.
g. Heat detectors will be provided in janitors' closets, elevator machine rooms, elevator shafts, and some mechanical rooms.
h. Pull stations will be located within a travel distance of 200 feet and at all exterior exits.
i. Door unlocking and hold-open devices will be provided for corridor doors per the life safety plans and applicable codes.
j. Sprinkler water flow detection and valve position annunciation will be provided.
k. All fire alarm system wiring will be installed in red-colored conduit.
l. NAC and SLC circuits passing through, but not serving, a 2 hour fire/smoke compartment will be routed in a 2 hour rated chase or will use MI cables.

8. Identification of Electrical System
    a. Labeling for Raceways
        1. 600 Volts and Below Normal: White letters on black background indicating feeder identification and voltage.
        2. 600 Volt and Below Emergency: White or black letters on red background indicating feeder identification and voltage.
        3. Fire Alarm: Red letter on white background indicating "FIRE ALARM"
        4. Temperature Control: White or black letters on blue background
        5. Grounding: White letters on green background indicating "GROUND" and equipment and designation
        6. Security System: Blue letters on yellow background indicating "Security"
        7. Telephone System: Green letters on yellow background indicating "Telephone"
    b. For all EMT conduit, provide color conduit as follows:
        1. Fire Alarm System: Red
        2. Normal Power Distribution System: Silver
        3. Emergency Power Distribution System: Orange
        4. Temperature Controls, Motor Controls and Other Control Systems: Blue
        5. Low Voltage and Telephone: Purple
        6. Clock, Sound and Intercom: Black
        7. Security: Yellow
        8. Grounding: Green

c. Labeling Instructions

1. Indoor Equipment: Self-adhesive, engraved laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2" high letters on 1-1/2" high label. Where two lines of text are required, use labels 2" high.
2. Elevated Components: Increase size of labels and letter to those appropriate for viewing from the floor.
3. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
4. Equipment to be labeled:
    a. Panelboards
    b. Switchgear
    c. Switchboards
    d. Transformers
    e. Power-generating units
    f. Transfer switches
    g. Variable speed controllers
    h. Contactors
    i. Enclosed switches
    j. Enclosed circuit breakers
    k. Enclosed controls (starters)
    l. Enclosures and electrical cabinets
    m. Access doors and panels for concealed electrical items
    n. Emergency system boxes and enclosures
    o. Color coding of equipment nameplates will be as follows:
        1. Normal Power: Black plate with white lettering
        2. Emergency Power Standby: Red plate with white lettering
        3. Fire Alarm: White plate with red lettering
        4. Temperature Controls: Blue plate with white lettering
        5. Grounding: Green plate with white lettering
5. Each switch and receptacle will be identified as to the circuit and panelboard from which it is fed. This will be identified both inside the junction box (permanent magic marker) and on the coverplate.
6. All junction, pull, and connection boxes will be provided with identification on the cover. Identification will be neatly handwritten with permanent magic marker denoting the wiring system, voltage, and panel and circuit numbers.
7. Panelboard directories will be created using Microsoft Word, and the typed printout should be provided in each panel. The Word file will be turned over to the Owner upon completion of the project.

9. Firestopping: All penetrations to fire rated wall will be fire stopped and labeled.

APPENDIX A:

APPLICABLE CODES, REGULATIONS, AND STANDARDS

General: The Design Development phase will verify all applicable Codes, Regulations and Standards and their current editions.

2021 Michigan building code (adopts the IBC 2021 with Amendments)

2021 Michigan Mechanical code (adopts the IMC 2021 with Amendments)

2021 Michigan Plumbing code (adopts the IPC 2015 with Amendments)

2021 Michigan Energy code (adopts the IECC 2015 with Amendments)

2017 National Electrical code (NEC) (adopts the NFPA70, 2017 with Amendments)

Boiler Code – 2010 ASME Boiler and Pressure Vessel Codes with 2011 Addenda
2011 National board inspection code
206 PA 407 Skilled Trades Regulation Act

Elevator Code – 2010 ASME A17.1 Safety code for elevators and Escalators
201 ASME A18.1 Safety Standard for Platform Lifts and Stairway chairlifts
2009 ASME A90.1 Safety Standard for Belt Manlifts
Elevator Safety Board General rules

2010 ADA standards

APPENDIX B:

LEED CHECKLIST

LEED v4 BD+C: New Construction

Project Checklist: State of Michigan PS+ES Lab

5/31/2023

Y	?+	?-	N			
1				Credit	Integrative Process	1

2	1	1	28	Location and Transportation	32	NOTES
			16	Credit LEED for Neighborhood Development Location	16	Not Applicable
1				Credit Sensitive Land Protection	1	Previously developed site
		1	1	Credit High Priority Site and Equitable Development	2	Unlikely to meet 20% of population is at or below poverty rate
			5	Credit Surrounding Density and Diverse Uses	5	Site challenge
			5	Credit Access to Quality Transit	5	Site challenge
			1	Credit Bicycle Facilities	1	No bicycle network
	1			Credit Reduced Parking Footprint	1	
1				Credit Electric Vehicles	1	EV parking for 5% of all parking spaces or EV ready for 10%

6	3	1	0	Sustainable Sites	10	NOTES
Y				Prereq Construction Activity Pollution Prevention	Required	
Y				Prereq Environmental Site Assessment	Required	
1				Credit Site Assessment	1	Conduct site assessment
2				Credit Protect or Restore Habitat	2	Restore 15% of site area - will need to lay out site and boundary accordingly
1				Credit Open Space	1	30% of site area as open space (excluding turfgrass)
	2	1		Credit Rainwater Management	3	Can we collect 70 or 75% of rainfall on site?
2				Credit Heat Island Reduction	2	No brainer
	1			Credit Light Pollution Reduction	1	Might be a challenge

6	0	5	0	Water Efficiency	11	NOTES
Y				Prereq Outdoor Water Use Reduction	Required	
Y				Prereq Indoor Water Use Reduction	Required	
Y				Prereq Building-Level Water Metering	Required	
1		1		Credit Outdoor Water Use Reduction	2	1pt inherent to project, 2nd pt for no potable water used in irrigation
3		3		Credit Indoor Water Use Reduction	6	TBD if we can get between 25-45% baseline water reduction
1		1		Credit Optimize Process Water Use	2	Easy to conduct a one-time potable water analysis, but 2nd point is maybe
1				Credit Water Metering	1	

11	8	5	9	Energy and Atmosphere	33	NOTES
Y				Prereq Fundamental Commissioning and Verification	Required	
Y				Prereq Minimum Energy Performance	Required	
Y				Prereq Building-Level Energy Metering	Required	
Y				Prereq Fundamental Refrigerant Management	Required	
4	2			Credit Enhanced Commissioning	6	Enhanced Cx is no brainer, but unclear if Enclosure Cx is desired
7	2		9	Credit Optimize Energy Performance	18	Reducing GHG emissions and EUI (follow ASHRAE 90.1-2016)
	1			Credit Advanced Energy Metering	1	Install advanced energy metering for all systems >10% of use
		2		Credit Grid Harmonization	2	Challenging to use demand response for labs (unless we submeter)
	2	3		Credit Renewable Energy	5	On site is limited, but purchasing off site RECs for 5% (need 20% for all 5)

	1			Credit	Enhanced Refrigerant Management	1	

7	3	1	2	**Materials and Resources**		13	**NOTES**
Y				Prereq	Storage and Collection of Recyclables	Required	
Y				Prereq	Construction and Demolition Waste Management Planning	Required	
2	1		2	Credit	Building Life-Cycle Impact Reduction	5	4 points with the Whole-Building Life-Cycle Assessment
1		1		Credit	Building Product Disclosure and Optimization - Environmental ProductDeclarations	2	
1	1			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2	
2				Credit	Building Product Disclosure and Optimization - Material Ingredients	2	
1	1			Credit	Construction and Demolition Waste Management	2	Pushing for 50% diversion is likely

11	2	3	0	**Indoor Environmental Quality**		16	**NOTES**
Y				Prereq	Minimum Indoor Air Quality Performance	Required	
Y				Prereq	Environmental Tobacco Smoke Control	Required	
2				Credit	Enhanced Indoor Air Quality Strategies	2	
2	1			Credit	Low-Emitting Materials	3	
1				Credit	Construction Indoor Air Quality Management Plan	1	
		2		Credit	Indoor Air Quality Assessment	2	
1				Credit	Thermal Comfort	1	Important for labs
1		1		Credit	Interior Lighting	2	Important for labs
2	1			Credit	Daylight	3	Important for labs
1				Credit	Quality Views	1	Important for labs
1				Credit	Acoustic Performance	1	Important for labs

5	1	0	0	**Innovation**		6	**NOTES**
4	1			Credit	Innovation	5	
1				Credit	LEED Accredited Professional	1	Inherent to project

1	3	0	0	**Regional Priority for 48917**		4	**NOTES**
	1			Credit	Regional Priority: Building Life-Cycle Impact Reduction (3pt threshold)	1	
	1			Credit	Regional Priority: Rainwater Management (2pt threshold)	1	
	1			Credit	Regional Priority: Renewable Energy (1pt threshold)	1	
1				Credit	Regional Priority: Enhanced Indoor Air Quality Strategies (1pt threshold)	1	

50	21	16	39	**TOTALS**	Possible Points:	126

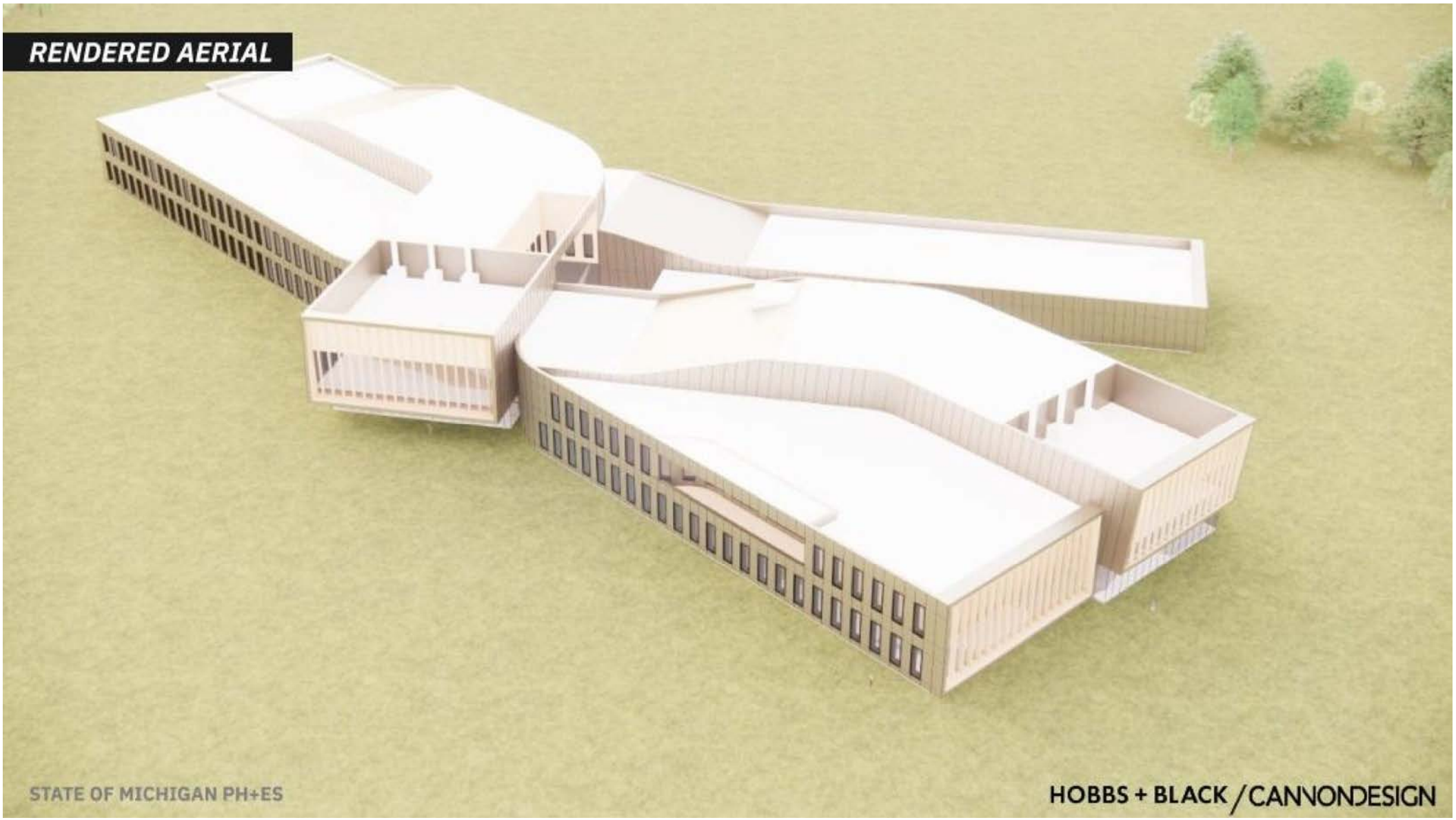
Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

* PATHWAY TO GOLD

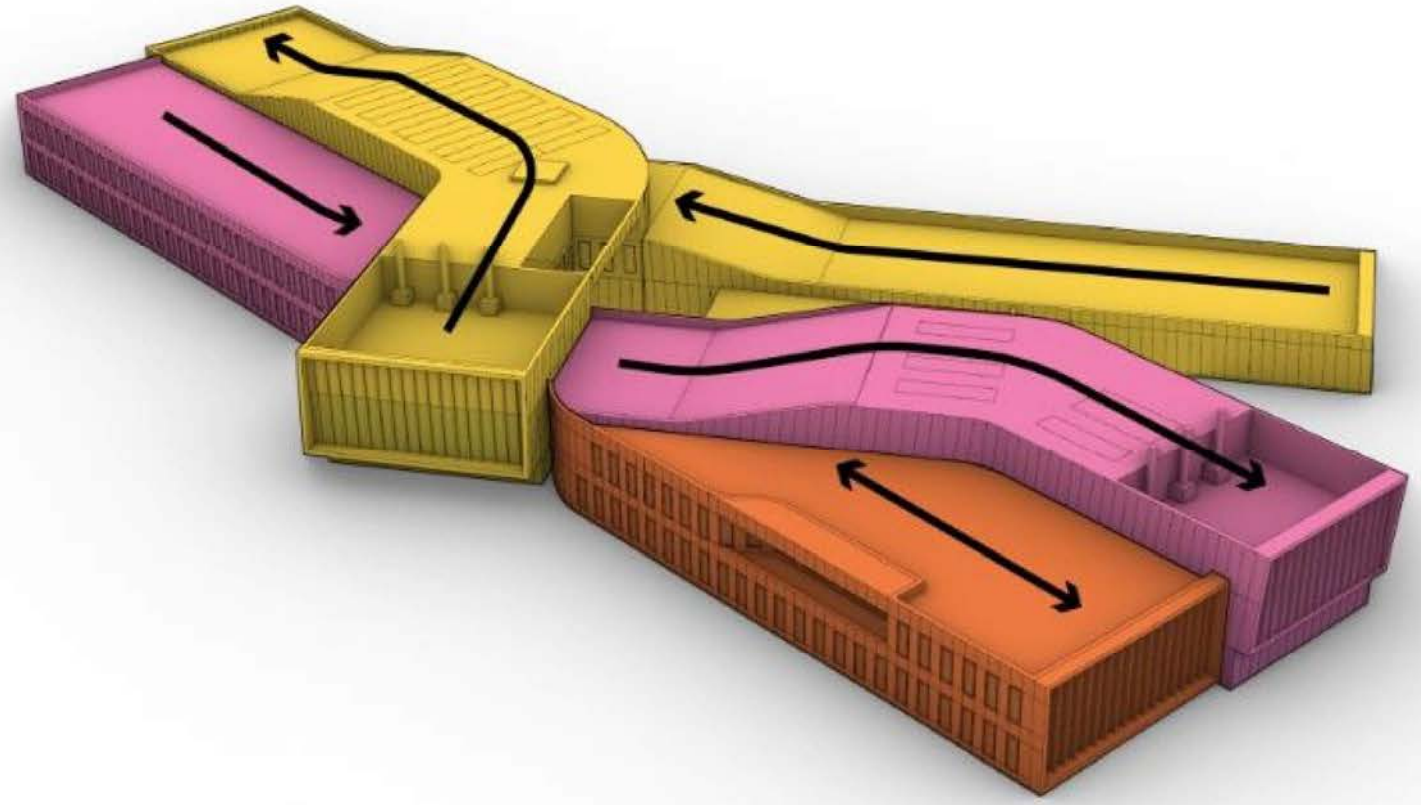
APPENDIX C:

RENDERINGS

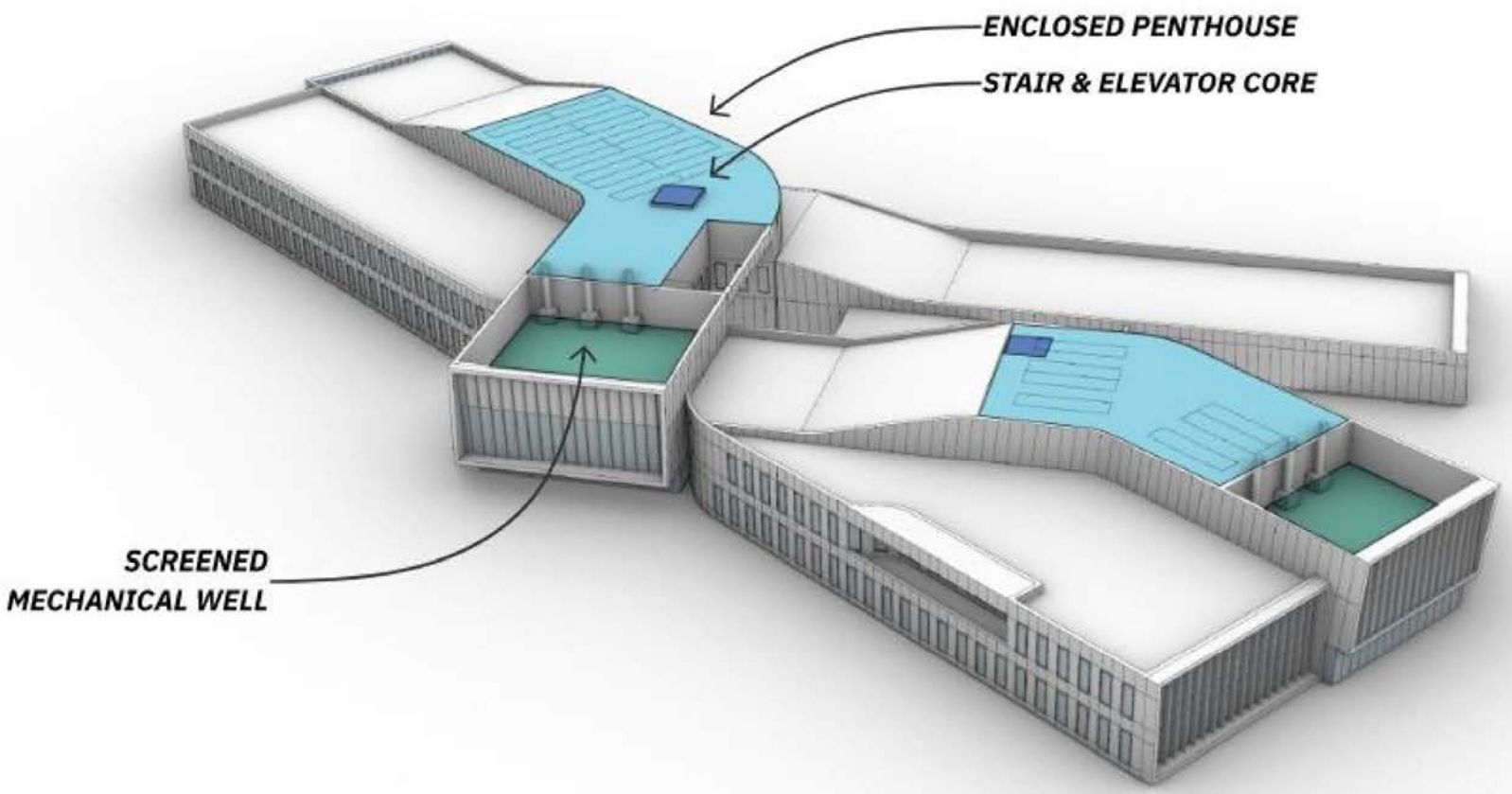
AERIAL SITE PLAN


RENDERED AERIAL
STATE OF MICHIGAN PH+ES
HOBBS + BLACK / CANNONDESIGN

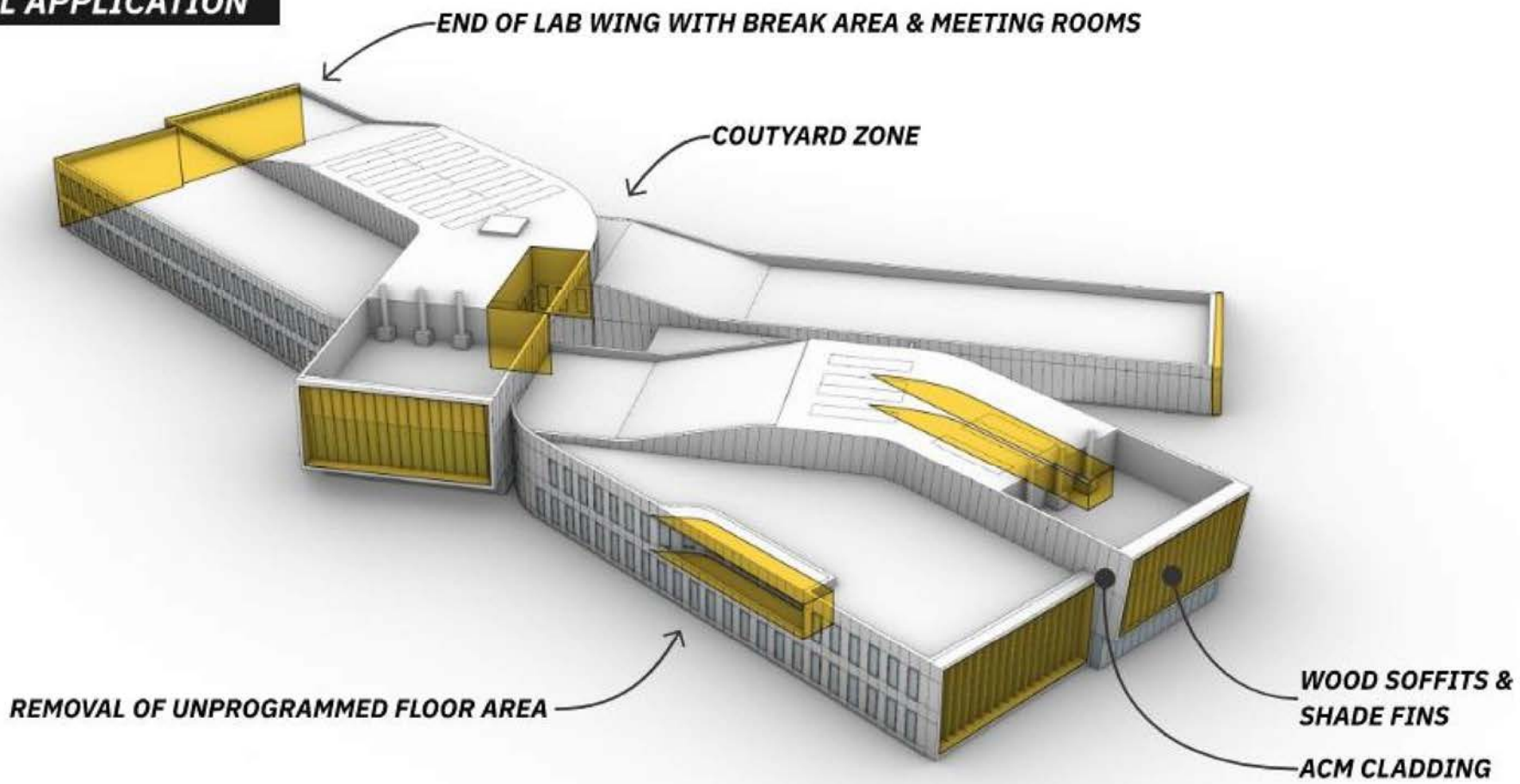
MASSING FORMAL LOGIC



ROOFTOP SERVICES



MATERIAL APPLICATION




MAIN ENTRY
STATE OF MICHIGAN PH+ES
HOBBS + BLACK / CANNONDESIGN


NICKEL / BRONZE
STATE OF MICHIGAN PH+ES
HOBBS + BLACK / CANNONDESIGN

APPENDIX D:

SPACE TYPE CRITERIA & BOD FINISHES

Break Rooms

Purpose: Break rooms are essential spaces to support staff's well-being and support productivity. These rooms range from a large central break room with café type food and beverage options, to small coffee stations, and variations in between. Breakrooms should provide respite through serene finishes and lighting, and should provide variety, from outdoor decks, to secluded alcoves, to areas with tables for quiet conversations or jubilant parties. Some of these areas will be open to surrounding office landscape areas, and some will be closed.

Adjacencies: Breakrooms occur throughout the facility, both within the laboratory wings and within the central core area of the building.

Safety/Security Requirements:

- These areas should be positively pressured relative to adjacent laboratory areas and follow standard practices for ventilation and sanitation of areas that include food and beverage services.
- Security will vary depending on location and anticipated users.

Environmental Requirements:

- These areas are supported by recirculating air schemes that include a portion of mechanically ventilated fresh outdoor air.
- The lighting levels should be variable, and be similar to coffee bars and casual dining environments. Linear cove lighting to be provided in the central core area as a design element.

Construction Requirements:

- Floor finish and wall base should be a large format porcelain tile with a dark grout color for cleanability in the central core area. Break rooms within laboratory wings will have a resilient tile floor with rubber base.
- Walls should be metal framed gypsum board with paint finish and decorative tile mosaic at the coffee bar.
- Ceilings in the central core space are to be open to structure with acoustic panels direct-applied for sound. Within laboratory wings the ceilings are to be lay-in acoustic ceiling tiles.
- The doors at these conferencing type spaces will be wood.

Fixtures/Furniture/Equipment:

- Casual dining and café style seating
- Food service equipment, varying from coffee machines, microwave ovens, refrigerators, vending machines, kitchenette sinks and counters, and some small scale cooking equipment.
- Casework to be provided with quartz countertops and wood veneer in the central core area and high-pressure laminate with a solid surface counter within the laboratory wings.

Technology Requirements: IT data to support communication/computation.

BSL-3 Biocontainment Suite.

Purpose: Biological Safety Level 3 (BSL-3) is a laboratory suite consisting of multiple individual lab rooms, anterooms, and support labs used for working with biological agents with potential for aerosol transmission. Microbes being manipulated in these labs have the potential to cause serious and lethal diseases. Within the overall suite there will be different degrees of 'enhancement' for different agents [TB, Rabies, Select Agents]. This BSL-3 suite will be shared by all the lab groups within infectious disease. By combining all the biocontainment labs there should be operational efficiencies in terms of servicing, reduced capital costs for the HVAC systems, improved safety and security, and improved long-term flexibility.

Adjacencies: Near Microbiology, Genomics, and Virology laboratories, adjacency to BSL3 training laboratory is preferred.

Safety/Security Requirements:
- BSL-3 space must be accessible only through a controlled entrance.
- Only personnel with appropriate training can enter the suite/lab.
- Entering and exiting BSL-3 suite must be via an air cascading vestibule with PPE gowning and de-gowning station.
- Hand-free hand washing sink near exit door from the suite is required.
- Biological waste must be autoclaved prior to leaving the suite. A pass-through autoclave is preferred.

Environmental Requirements:
- Single pass, HEPA filtered supply and exhaust air is required.
- Entire BSL-3 suite must be under negative pressure relative to adjacent area. If the pressure is compromised, an automatic alarm should sound.
- Lighting level should be appropriate for laboratory work. Recessed lighting fixtures should be hole-free one-piece seam welded housing. Additional task lighting to be provided where appropriate.
- Different lab rooms will have 'enhancements' which will typically require secondary anterooms and increased negative pressurization relative to other lab rooms.

Construction Requirements:
- Floors finishes should be monolithic liquid and chemical-resistant material such as trowel applied resinous material with integral coved base with a metal top cap. Resinous flooring material with quick cure time such as polyurethane or methyl methacrylate (MMA) are preferred over epoxy mortar system to reduce the lab operation down time in event that the flooring need to be patched and repaired.
- BSL-3 labs typically do not require high water pressure washdown. Typical walls and ceilings cleaning regiment includes wipe down with wet mop or cloth. High performance epoxy or urethane coating on gypsum board or CMU substrate wall is acceptable. Water based epoxy paint on gypsum board ceiling is acceptable. Walls to receive FRP panels where appropriate for durability.
- Doors and frames: Heavy duty, fully welded steel frame with heavy duty seamless door leave should be provided. Solid core FRP door and frame as alternative is acceptable.
- Wall electrical outlet boxes should be seamless, hole-free construction type.
- Sealed, fixed glazing where possible is desirable for comfort and to support safety and oversight.

Fixtures/Furniture/Equipment:
- Casework Material: Painted steel casework with epoxy countertops is the basis of design. In some areas or specific lab rooms stainless steel countertops will be required.
- Base cabinets, except at sink base, should be movable tables with cabinets suspended from the table frames to facilitate room cleaning.
- BSL-3 suite must be equipped with glassware washers and autoclaves within the suite. A pass-through autoclave will be required to decontaminate biological waste and exit the suite without traveling through BSL-3 again after leaving the autoclave.

Technology Requirements:
- High security access control, alarm systems, and hand-free communication systems.

Clean Rooms

Purpose: Clean rooms are used by various agencies for specialized testing and procedures that require a high level of cleanliness to avoid contamination. Cleanrooms are positively pressured spaces as opposed to most containment labs which have negatively pressured spaces. They also require specialized finishes to help maintain cleanliness. Typically, they are entered through an anteroom with cascading room air pressure and requires occupants to wear specialized gowning. Viewing windows into cleanrooms are common. The cleanrooms in this facility will target class 1000 (ISO 6) to class 10,000 (ISO 7), but do not intend to be certified.

Adjacencies: Adjacent to lab areas.

Safety/Security Requirements:

- Access to cleanrooms will be restricted.
- Entrances to the labs will typically be from an anteroom which includes space for gowning and de-gowning.
- All egress doors will swing in the direction of emergency escape.

Environmental Requirements:

- Cleanrooms will depend on a highly filtered recirculating air scheme with low wall returns and fan filter units which will allow cleanroom construction in the more constrained vertical height available in this facility. Both recirculated and outside air must be filtered.
- Anterooms will be negative pressure relative to both cleanrooms side and adjacent corridors and labs.
- The lighting level should be appropriate for laboratory work.

Construction Requirements:

- Cleanrooms' floors, walls, and ceilings must be airtight and constructed to prevent air leaks from or into the room. Finishes must be smooth and easy to clean. Flooring should be a seamless homogenous sheet product with integral cove base and metal top cap. All joints between walls, floors, and ceilings should be coved.
- Wall finishes to be epoxy-painted drywall and FRP panels where appropriate.
- A heavy duty cleanroom type ceiling grid with non-porous tiles whose assembly is airtight, with gasketed light fixtures is needed.
- Doors must be tight fitting, have air seals to help maintain positive pressure. One door should be wide enough to move equipment in and out of the lab.

Fixtures/Furniture/Equipment:

- Movable painted steel lab benching, and in some cases stainless steel, epoxy, or polypropylene finishes.
- Sinks designed for use in cleanrooms.
- Lab equipment -in various configurations- include chemical fume hoods, biosafety cabinets, various benchtop and floor mounted scientific instruments, might be used in cleanrooms.

Technology Requirements: Access control, security, IT data to support communication/computation.

Closed Support Lab

Purpose: Closed support laboratory rooms are used across all of the agencies, with variations in finishes, equipment and conditioning schemas depending on their specific use which includes the following: equipment/instrumentation, preparatory, cell/tissue culture, darkrooms, microscopy, PCR labs, laboratory waste holding rooms and potentially dangerous laboratory supply storage. These labs are provided for activities that cannot be accomplished effectively in an open laboratory.

Adjacencies: Adjacent to office lab areas and Linear Equipment Rooms, typically.

Safety/Security Requirements:

- BSL-2 laboratory space will be negatively pressured relative to open lab, office, public and amenity spaces for containment of potentially hazardous materials.
- Entrances to the labs will typically be from an open lab or the LER. In some cases these labs will need secure access.
- All egress doors will swing in the direction of emergency escape.
- Some closed labs which are isolated from adjacent open labs will have safety showers at every egress point.

Environmental Requirements:

- In most cases labs will be serviced by a 'once through' air scheme.
- The lighting level should be appropriate for laboratory work. For most of the closed lab rooms the ceilings will be lower and lighting fixtures inlaid with the suspended ceiling system.
- Where possible closed labs should have some glazing/window areas to provide visual connections to surroundings to provide improved safety and communication. Darkrooms and some other types are exceptions.

Construction Requirements:

- Floors finishes should typically be a chemical and stain resistant seamless homogenous resilient sheet with continuous coved base and metal top cap to minimize joints and cracks. In some cases, troweled applied resinous floor system might be required due to specific chemical usage within a lab. In other cases, static dissipative flooring might be required for some dry electronics labs.
- Ceilings to be lay-in type with washable ceiling tile and should be approximately 9 foot high. Lab services and power will typically be distributed in the wall for small closed labs, but in some cases there will also be through overhead service panels/carriers.
- Labs will have extensive cart traffic, corner guards and in some cases durable FRP wall protection will be required. Walls should have epoxy paint for cleanability. Where walls support fixed laboratory benching lab services and power should be delivered to the benchtop dropped through the walls.
- Doors should typically be metal with vision panels for safety and visibility between adjacent spaces.

Fixtures/Furniture/Equipment:

- Lab casework along walls will be a mix of fixed and movable table style with movable lower cabinets. Painted steel casework with epoxy or composite countertops for both fixed and movable benching. In labs doing trace metal work, or others with high corrosives, lab casework should be polypropylene.
- Sinks will be provided in most support labs depending on function. Wherever possible, sinks should be located along walls in fixed base cabinet.
- Lab equipment -in various configurations- include chemical fume hoods, biosafety cabinets, various benchtop and floor mounted scientific instruments.

Technology Requirements: Access control, security, IT data to support communication/computation.

Conference Rooms

Purpose: Conference rooms come in a range of sizes [small, medium, large and extra-large] to support the work of the testing agencies, administrative functions, and visitor activities. These conference rooms should be adaptable, acoustically private, and feature user friendly technology enabled featuring AV/IT and digital booking functionality, and extensive use of whiteboards. In addition to the conference rooms, the Training Classroom and the Genomics Analysis Room also function like conference rooms.

Adjacencies: Conference rooms occur throughout the facility, both within the laboratory wings and within the central core area of the building.

Safety/Security Requirements:

- These areas should be positively pressured relative to adjacent laboratory areas and follow standard practices for ventilation of conferencing, meeting, training, and assembly spaces.
- Security will vary depending on location and anticipated users.

Environmental Requirements:

- These areas are supported by recirculating air schemes that include a portion of fresh outdoor air.
- The lighting levels should vary depending on meeting, dimmable downlighting focused on table surfaces that allow for general darkening for visual presentations, lighting on whiteboard surfaces that makes them readable without excessive glare, and general office quality lighting conditions for other types of meetings.

Construction Requirements:

- Floor finish should typically be carpet with a rubber wall base, although some training spaces will have resilient flooring where it is appropriate.
- Suspended acoustical ceiling.
- Walls should be metal framed gypsum board with paint finish, acoustic wall panels to be applied for sound mitigation.
- Walls to receive either a dry-erase paint or markerboard wallcovering for group collaboration or presentations.
- Some conference rooms will be located on exterior walls and have windows to the outside. For conference rooms that do not have direct access to daylight it is recommended that they have some glazing that allows them access to borrowed daylight and views. Shades that allow full privacy can be provided.
- The doors at these conferencing type spaces will be wood.

Fixtures/Furniture/Equipment:

- Conferencing furniture, in some cases fixed tables with internal wiring may make sense, in other cases modular furniture than can be easily reconfigured will be appropriate.
- Casework for serving lunch or presentation materials to be provided in some conference rooms where large groups may gather. Casework to be high-pressure laminate construction with a quartz or laminate countertop.
- Whiteboards, flat screen monitors.

Technology Requirements: IT data to support communication/computation; conferencing and audio visual technology..

Environmental Lab

Purpose: Environmental laboratory rooms include primarily cold rooms, but also freezer rooms and a warm room. These rooms are typically a pre-engineered system from a vendor/manufacturer that includes compressors and/or heaters and other equipment needed to maintain specific environmental conditions, and includes prefabricated insulated wall, floor ceiling and door panels. Recessed floor slab may be desirable at some locations. They are typically used to store supplies, samples, specimens, as well as to perform some procedures.

Adjacencies: Adjacent to labs and LERs

Safety/Security Requirements:

- Flammable gases and liquids should not be used inside environmental chambers.
- Some chambers have 2 doors, one opening to the LER and the other to an adjacent lab. In some cases one or both of the doors may need secure access.
- Mold growth is possible in both cold and warm environments where there is high humidity.

Environmental Requirements:

- The lighting level should be appropriate for laboratory work.
- Temperature controls are part of the 'prefabricated' system.

Construction Requirements:

- Floors, walls, ceilings and doors, compressors and other mechanical equipment are all part of the manufacturer's prefabricated system.

Fixtures/Furniture/Equipment:

- Prefer to use stainless steel casework and shelving because of high humidity in cold and warm rooms.
- Sinks will be provided in most cold rooms, not freezer rooms.

Technology Requirements: Temperature controls and alarms.

Linear Equipment Room

Purpose: The linear equipment rooms area multipurpose corridors within the lab areas that provides floor space for equipment like refrigerators and freezers, racks for lab gas cylinders, space for pumps and compressors and similar noisy, dirty, or heat generating devices. Linear equipment corridors also served as service access to the labs, and circulation that supports safe egress and convenience for 'back of the house' circulation.

Adjacencies: All labs, direct access to service elevators.

Safety/Security Requirements:
- LER's will have restricted access controlled by the access control system.
- Safety markings on the floor are required to maintain a free and clear egress path.

Environmental Requirements:
- This should be considered as lab space and be negatively pressured relative to office and public corridor areas.
- Lighting level should be appropriate for laboratory work.

Construction Requirements:
- Floors finishes should typically be a chemical and stain resistant homogenous resilient sheet with continuous coved base and metal top cap to minimize joints and cracks.
- Walls should be painted and have a durable, impact resistant finish, with corner guards wall protection rails and FRP panels as cart traffic will be common in the LERs.
- Provide continuous power strips for accommodation of equipment, racks to support lab gas cylinders, waste holding [cardboard], will be located in future design development.
- Provide an open ceiling with acoustic panels with racks for managing piping and ductwork distribution; it is anticipated that valves, meters and controls will be located in this space to reduce the need for servicing of lab equipment within the labs themselves.

Fixtures/Furniture/Equipment:
- Storage cabinets, cylinder racks, and waste handling stations will comprise the majority of FFE within the LERs.

Technology Requirements:
- Access control at entry points, equipment alarm systems, surveillance cameras.

Penthouses and Mechanical/Electrical Equipment

Purpose: These spaces house the building service equipment needed to operate the building, including electrical, mechanical, plumbing, and special lab system equipment. [IT rooms are covered with server rooms, because they house similar IT and computation equipment.]

Adjacencies: Distributed throughout the building, to seek optimal locations to minimize the length of ductwork, piping, and cabling.

Safety/Security Requirements:

- The equipment in these spaces can be hazardous, and many of these spaces will have code required construction and separation requirements.
- Spaces will be locked with limited access.

Environmental Requirements:

- Minimal heating and ventilation required.
- Provide basic, energy efficient lighting.

Construction Requirements:

- The floors will be polished and sealed concrete with a rubber base where drywall occurs.
- Walls should be metal framed gypsum board with paint finish or concrete block, with FRP wall protection in areas where forklifts and carts will be travelling.
- Open ceilings to structure.
- Heavy duty doors should be sized to accommodate the materials being stored.

Fixtures/Furniture/Equipment:

Technology Requirements:

Mother/Wellness Rooms

Purpose: Mother/Wellness rooms are code required spaces that permit nursing mothers privacy and to support other individuals who need the quietude and privacy that these rooms provide.

Adjacencies: Mother/Wellness rooms are located near office areas on each wing and floor.

Safety/Security Requirements:

- These areas should be positively pressured relative to adjacent laboratory areas and follow standard practices for ventilation and sanitation of areas that include food and beverage services.
- Doors should be lockable from the inside.

Environmental Requirements:

- These rooms are supported by recirculating air schemes that include a portion of mechanically ventilated fresh outdoor air with a thermostat so occupants can control temperature range.
- The lighting levels should be muted and indirect, and the ability to be adjusted.

Construction Requirements:

- Floor finish should be carpet or resilient flooring with a rubber base.
- Walls should be metal framed gypsum board with paint finish.
- Lay-in ceiling tile and grid
- The doors at these conferencing type spaces will be wood.

Fixtures/Furniture/Equipment:

- Cushioned lounge or armchairs with side tables.
- Sink and refrigerator.
- High-pressure laminate casework with a solid surface countertop to be provided.

Technology Requirements: Ideally these rooms would be shielded so digital devices cannot be used.

Open Laboratory

Purpose: Open laboratory areas are used across all agencies, with variations in finishes, equipment and conditioning schemas depending on their specific use which includes the following: chemistry, biology, trace metals, dry electronics, accessioning and sample receiving. Open labs offer greater short term adaptability, long term flexibility, reduced capital and operating costs, and enable more effective collaboration while providing more humane working conditions.

Adjacencies: Adjacent to office areas and closed support lab areas.

Safety/Security Requirements:

- Laboratory space (BSL-2) will be negatively pressured relative to office, public and amenity spaces for containment of potentially hazardous materials.
- Entrances to the labs will typically be card reader access controlled.
- All egress doors will swing in the direction of emergency escape.
- Open labs will have safety showers at every egress point.

Environmental Requirements:

- In most cases [with the possible exception of some dry electronics labs] labs will be serviced by a single-pass supply and exhaust air scheme.
- The lighting level should be appropriate for laboratory work. For most of the open lab areas the ceilings will be higher and permit suspended light fixtures which provide both direct and indirect lighting to improve lighting conditions at the work surface while reducing overall energy consumption.
- The walls between the offices and the labs will extend to the underside of the structure. Maximum amount of glazing where possible will enable borrowed natural light to enter the lab areas and provide indirect views through the office areas to nature outside. This includes high window 'transoms' combined with 'light shelves' that can bounce natural light deep into the lab zones.
- Lab Services: Compressed air and vacuum needs will be evaluated in the next stage of design, as well as detailed needs for laboratory gases

Construction Requirements:

- Floor finishes should typically be a chemical and stain resistant homogenous resilient sheet with continuous coved base and metal top cap to minimize joints and cracks. In some cases, a troweled floor system might be required due to specific chemical usage within a lab. In other cases, attic dissipative flooring might be required for some dry electronics labs.
- Ceilings to be lay-in type with washable ceiling tile and should be approximately 10 foot high to permit direct/indirect suspended lighting systems. Lab services and power will be distributed above the ceiling and accessed to lab benching through overhead service panels/carriers.
- Labs will have extensive cart traffic, corner guards, wall protection rails and in some cases durable FRP wall protection will be required. Walls should have epoxy paint for cleanability. Where laboratory caseworks are mounted against walls, lab services and power should be delivered to the benchtop dropped through the walls.
- Extensive glazing should occur on the walls between the labs and adjacent office space, bringing borrowed natural light into the open lab areas.
- Doors to the office areas can be wood, doors to the linear equipment room and closed support labs should be metal with vision panels for safety and visibility between adjacent spaces.

Fixtures/Furniture/Equipment:

- Lab caseworks along walls will be fixed mounted, otherwise casework will be movable table style with movable base cabinets. Painted steel casework with epoxy or composite countertops for both fixed and movable casework. In labs doing trace metal work, or others with high corrosives, lab benching should be polypropylene.
- Sinks will occur regularly throughout all open lab areas, except at some dry electronics labs. Wherever possible, sinks should be located along the walls in fixed base cabinets.
- Lab equipment -in various configurations- include chemical fume hoods, biosafety cabinets, various benchtop and floor mounted scientific instruments.
- Most open labs will have lab stools and 'write up' areas for documenting test results.

Technology Requirements: Access control, security, IT data to support communication/computation.

Open Office/Workstation

Purpose: Open office areas with workstations serve to provide workspace for laboratory staff. Most staff will have a dedicated workstation, but some will share workstations with multiple individuals. Over time the number of shared workstations will likely increase as staff grows.

Adjacencies: Near laboratories, closed offices, conference and break areas, and most of these open office areas have direct adjacency to outdoor light and views.

Safety/Security Requirements:
- These areas should be positively pressured relative to adjacent laboratory areas.
- These areas are generally separated from the public and require card reader access.

Environmental Requirements:
- These areas are supported by recirculating air schemes that include a portion of fresh outdoor air
- The lighting level should be appropriate for office work. The general office area will be lit by a combination of outdoor and artificial ambient light, and workstations will be provided with task light. Light sensitive sensors and automated dimming lighting systems should be considered for ambient light to 'harvest' natural light.

Construction Requirements:
- Floor finish should typically be carpet, with resilient tile flooring at selected locations within EGLE with a rubber wall base provided with either flooring finish.
- Ceilings to be open to structure, with distributed suspended acoustical 'cloud' ceiling treatments.
- Walls should be metal framed gypsum board with paint finish.
- Extensive glazing should occur on the walls between the adjacent labs and open office space, allowing visual connection.
- The doors at the open office areas will be wood.

Fixtures/Furniture/Equipment:
- Workstations will be systems furniture provided by preferred vendor per State of Michigan. For the borrowed light concept to work, workstation partitions should be kept as low as possible. Consider using translucent or vision panels at the upper portions of the panel.
- Lab equipment -in various configurations- include chemical fume hoods, biosafety cabinets, various benchtop and floor mounted scientific instruments.

Technology Requirements: Access control, security, IT data to support communication/computation.

Private Office

Purpose: Private offices are walled with glazing and a door typically dedicated to an occupant. Per state of Michigan standards the vast majority of private offices will not be located directly with an outside wall, therefore large windows or a glazed wall on at least one side of the office allows it to get borrowed light and views.

Adjacencies: Most private offices occur within an open office landscape, near workstations, conference rooms, laboratories and support spaces.

Safety/Security Requirements:
- These areas should be positively pressured relative to adjacent laboratory areas.
- These areas are generally separated from the public and require card reader access, offices doors are also lockable.

Environmental Requirements:
- These areas are supported by recirculating air schemes that include a portion of fresh outdoor air.
- The lighting level should be appropriate for office work and will include a combination of overhead lighting and task lighting.

Construction Requirements:
- Floors finish should typically be carpet or resilient tile where appropriate in EGLE, rubber base to be included with either flooring finish.
- Suspended acoustical ceiling, tegular grid system.
- Walls should be metal framed gypsum board with paint finish.
- Glazing should be adequate to allow for borrowed light and views to the outside.
- The doors at the private offices will be wood.

Fixtures/Furniture/Equipment:
- Systems furniture provided by preferred vendor per State of Michigan to fit out. For the borrowed light concept to work, workstation partitions should be kept as low as possible. Consider using translucent or vision panels at the upper portions of the panel.
- Lab equipment -in various configurations- include chemical fume hoods, biosafety cabinets, various benchtop and floor mounted scientific instruments.

Technology Requirements: IT data to support communication/computation.

Public Areas

Purpose: Public areas include corridors, lobby, public elevators, and associated open stairs that function as the first impression of the building.

Adjacencies: These public areas occur throughout the building.

Safety/Security Requirements:
- These areas are the only areas of the building where the public can access without special permission and escort.
- Security will vary depending on location and anticipated users.

Environmental Requirements:
- These areas are supported by recirculating air schemes that include a portion of mechanically ventilated fresh outdoor air.
- The lighting levels should be variable and include some highly decorative and dramatic effects in lobby areas. Specialty lighting to be provided.
- Elevator cabs to receive recessed downlighting.

Construction Requirements:
- Floors finish should include hard, durable and decorative surfaces that can be easily cleaned. Flooring and wall base to be large format porcelain tile with a dark colored grout. Vestibule and public elevators to receive a walk-off carpet tile.
- Walls should be metal framed gypsum board with paint and Level 05 drywall finish. Some walls will have decorative treatments such as wood, metal, glass, or brick. Elevator cabs to receive a Forms + Surfaces panel system with a graphic treatment.
- Ceilings to be open to structure with acoustic panels direct-applied for sound mitigation. Some metal framed gypsum board accents to occur as a design element.

Fixtures/Furniture/Equipment:
- Highly durable and well designed chairs and tables similar to what you would find in a corporate lobby.
- Casework to be provided in main lobby space for welcoming visitors and check-in. Casework to be custom millwork fabrication composed of wood veneer and quartz elements.

Technology Requirements: IT data to support communication/computation. Interactive kiosks, highly equipment intensive security stations.

Server/IT Rooms

Purpose: Server rooms support computer equipment, primarily server racks, essential to data collection and preservation in support of the core business of the laboratory. IT closets that support the entire building will be essentially the same type of room.

Adjacencies: Server rooms are strategically positioned to support specific groups and IT closets are distributed based on cable run lengths.

Safety/Security Requirements:

- These areas should be positively pressured relative to adjacent areas, dust particles are not good for this equipment.
- These rooms should be lockable and could optionally be card key accessed.

Environmental Requirements:

- The equipment in these rooms generate a lot of heat, additional cooling and exhaust are required.
- Provide basic lighting.

Construction Requirements:

- Floors finish will be static dissipative resilient tile or sheet with a rubber wall base.
- Open ceilings are acceptable.
- Walls should be metal framed gypsum board with paint finish.
- Doors should be compatible with surrounding spaces.

Fixtures/Furniture/Equipment:

- In some cases a desk may be included. The rooms will typically be populated by computer and IT equipment, with the walls open to accommodate wall mounted racks.

Technology Requirements: These spaces will have high power and data service requirements.

Storage and Waste Holding Rooms

Purpose: There is a wide range of storage rooms and waste holding rooms, including for hazardous chemicals, lab supplies, office supplies and paper files.

Adjacencies: Toilet rooms will be located near the ends of each lab wing, and within the central core of the building, to minimize travel distances cost effectively.

Safety/Security Requirements:
- Safety will vary depending on the materials being stored.
- Security will vary depending on the materials being stored.

Environmental Requirements:
- Most of the storage areas within the building will be conditioned because of the nature of the materials being stored. For hazardous storage and waste holding areas, special ventilation will be required.
- Provide basic, energy efficient lighting.

Construction Requirements:
- Where samples and waste are present, floor finishes should be monolithic liquid and chemical-resistant material such as trowel applied resinous material with integral coved base with a metal top cap. Resinous flooring material with quick cure time such as polyurethane or methyl methacrylate (MMA) are preferred over epoxy mortar system to reduce the lab operation down time in event that the flooring need to be patched and repaired.
- Basic storage rooms for non-samples or non-waste items to have a floor finish of polished and sealed concrete or resilient tile.
- Walls should be metal framed gypsum board with and epoxy paint finish.
- Generally storage rooms will not have ceilings, some hazardous materials storage might need hard ceilings depending on code issues.

Fixtures/Furniture/Equipment:
- Shelving, occasionally tables or desks.

Technology Requirements:

Toilet and Locker Rooms

Purpose: Toilet and locker rooms support staff and visitors throughout the facility. Toilet room counts are determined by code. Locker rooms will be provided for supporting staff that work in potentially hazardous lab environments, and in industrial spaces like warehouses and the service dock. Some specialized labs may have shower facilities within them to address potential contamination situations.

Adjacencies: Toilet rooms will be located near the ends of each lab wing, and within the central core of the building, to minimize travel distances cost effectively.

Safety/Security Requirements:

- Toilet rooms will typically be accessible to the spaces around it and that are served by it.
- Security will vary depending on location and anticipated users.

Environmental Requirements:

- These areas are supported by recirculating air schemes that include a portion of mechanically ventilated fresh outdoor air.
- The lighting within restrooms should generally be moderately low, but with brighter lighting on the mirrors. Indirect cove lighting to be provided in public toilets adjacent to the main lobby space.

Construction Requirements:

- Floor finish will be porcelain tile with a dark colored grout, different sizes of tile will be used in different locations to coordinate with adjacent spaces.
- Locker spaces will receive a rubber tile or carpet flooring and rubber wall base.
- Walls should be metal framed gypsum board with porcelain tile finish. Metal trim pieces at outside corners is required. Lockers rooms will receive a painted drywall finish.
- Ceilings will be painted gypsum board in areas with plumbing fixtures, locker room to receive a lay-in ceiling tile.

Fixtures/Furniture/Equipment:

- Water efficient plumbing fixtures, stone or composite countertops, and toilet partitions.
- Lockers to be high-pressure laminate construction in areas adjacent to workstations or laboratories. Lockers located in the warehouse to be metal.

Technology Requirements:

Unknowns BSL-3

Purpose: The 'Unknowns' BSL-3 Lab is a small laboratory suite with an anteroom designed to meet the requirement of Biological Safety level 3 (BSL-3). This lab will serve as repository and triage space for unknows items or substances that have potential to be airborne infected agents or highly explosive materials. Once the unknowns' materials have been identified, work may continue in this lab, or they may be moved to other labs with appropriate handling protocol.

Adjacencies: Near 24 hr. drop-off area and loading dock.

Safety/Security Requirements:
- Accessible only through a controlled entrance with appropriate credential only.
- Anteroom with PPE gowning and de-gowning station.
- Hand-free hand washing sink near exit door from the suite is required.
- Portion of exterior walls and/windows to be equipped with 'blow-out' explosion relief panel.

Environmental Requirements:
- Single pass, HEPA filtered supply and exhaust air is required.
- Operate under negative pressure relative to adjacent area. If the pressure is compromised, an automatic alarm should sound.
- The lighting level should be appropriate for laboratory work. Recessed lighting fixtures should be hole-free one-piece seam welded housing.

Construction Requirements:
- Floor and wall finishes will be similar to BSL-3 labs.
- Doors and frames: Heavy duty, fully welded steel frame with heavy duty seamless door.
- Wall electrical outlet boxes should be seamless, hole-free construction type.
- Sealed, fixed glazing where possible is desirable for comfort and to support safety and oversight.

Fixtures/Furniture/Equipment:
- Casework Material: Painted steel casework with epoxy countertops is the basis of design with additional stainless-steel casework and countertops where required.
- Specialty lab equipment such as glove boxes and Class II, B2 biosafety cabinets will be required.
- Specialty containment and exhaust devices to capture heat and allergens powder substances will be required.

Technology Requirements: High security access control, alarm systems, and hands-free communication systems.

Warehouse

Purpose: These warehouses house large quantities of supplies and equipment essential to the facility's operations.

Adjacencies: Near shipping and receiving dock, clear access to service elevators.

Safety/Security Requirements:
- Safety will vary depending on the materials being stored.
- Security will vary depending on the materials being stored.

Environmental Requirements:
- Minimal heating and ventilation required.
- Provide basic, energy efficient lighting.

Construction Requirements:
- The floors will be polished and sealed concrete with a rubber wall base where drywall occurs.
- Walls should be metal framed gypsum board with paint finish, with FRP wall protection in areas where forklifts and carts will be travelling.
- Open ceilings; consideration should be given to skylights or clerestory windows for natural lighting.
- Heavy duty doors should be sized to accommodate the materials being stored.

Fixtures/Furniture/Equipment:
- Warehouse style high deep shelving.

Technology Requirements:

APPENDIX E:

TECHNOLOGY NARRATIVE

Technology Design Narrative
for
Public Health & Environmental Sciences Lab
Lansing, Michigan

IMEG #22010122.00
May 19, 2023

A. Telecommunications

1. Standards

a. The telecommunications system will be designed to comply with EIA/TIA and State of Michigan Standards.

b. Telecommunication Rooms will be designed in accordance with the general requirements of the EIA/TIA Standard. Equipment racks, wall termination space, fiber optic termination cabinets, copper termination, and full cable management for all cabling will be provided. Ladder rack will also be provided for overhead distribution of cabling and equipment patch cords.

2. Space Requirements

a. A converged, universal cabling infrastructure requires appropriately sized spaces.

b. Rooms of approximately 120 square feet are required for every 30,000 to 35,000 square feet of floor plate.
   1) The ideal room dimension is 10' x 12'.
   2) In no case can the dimension of the room be less than 8', and any decrease in room dimension width must be compensated for in room length delete any unneeded titles. Replace with your information.

c. A new Demarcation location will be required. The Demarcation Room will be located on the first floor.
   1) The Demarcation Room is located where the utilities will be brought into the Facility from local providers.
   2) The state-wide fiber optic telecommunications backbone will terminate in the Main Telecommunication Room (MTR)

B. Horizontal Cabling Systems

1. An EIA/TIA Category 6A structured cabling system will be installed to support voice, data, and wireless LAN (802.11) applications. Commscope Systimax will be the basis of design.

2. The telecommunications cabling infrastructure will be provided, in whole, by the Contractor's construction contract. The cabling infrastructure will not be provided by the Owner.

3. A universal field wiring concept will be designed. The universal field approach consists of:

   a. All horizontal cabling, regardless of function, will be identical cable in terms of performance, color, and installation methods. There are no specific color requirements.

   b. All horizontal cabling will terminate in a rack-mounted modular patch panel, regardless of function.

   c. The functionality of the cable will be determined in the closet, by the cross-connect method.
      1) Cables for data use will cross connect from the modular patch panel to the network electronics.
      2) Cables for converged building systems will cross connect to the appropriate termination type based on the requirements of the system.

4. The structured cabling system will support the requirements of other IP-based building systems (e.g., security, building automation, etc.). It is anticipated that these systems will terminate, where practical, on modular patch panels, and those patch panels will be segmented from the data/voice patch panels but terminate in the same cabinets in the Telecommunications Rooms.

   a. Additional building systems that are not conducive to patch panel termination will also be supported by the structured cabling system inside the Telecommunications Rooms.

   b. It is anticipated that building systems will be provided with dedicated wall space within the Telecommunications Rooms and cabling will terminate using an appropriate termination method within the wall space.

   c. Typical outlet locations will consist of the following:
      1) 1-Port Information Outlet:

a) 1-Port Information outlets will be provided for all:
   (1) Lab Spaces – Wall and ceiling mounted coordinated with furniture and lab equipment. Information outlets on perimeter walls will be every 6' and coordinated with electrical.
   (2) Offices with one information outlet on opposite walls, coordinated with electrical.
   (3) Information outlets will consist of 2-port faceplates with one Cat 6A jack and one blank port.

b) Information Outlets will include:
   (1) One Cat. 6A Ports (Data)

2) 3-Port Information Outlet:
   a) 3-Port Information outlets will be provided for all Conference Rooms with one information outlet per wall, coordinated with electrical.
   b) Locations will include:
      (1) One Cat. 6A Ports (Data)
      (2) Local audio visual connectivity

3) Ceiling Projector Locations:
   a) One port information outlets will be provided for all ceiling projector locations.
   b) Locations will include one Cat. 6A port (data) and local audio visual connectivity.

4) Computer Locations:
   a) Data ports will be provided for all computer/technology workstations. In areas where the computer workstations are grouped in clusters, outlet configurations will be sized appropriately to support each cluster.
   b) Computer workstation location will include one port/station per CPU.

5) Voice only Locations:
   a) Wall phone locations will be provided in all Conference Rooms. Wall phone locations will include one port (with faceplate including mounting lugs).
   b) Wall phones will be provided in common areas for "house phone" convenience.

6) Wireless Access Point:
   a) Access Points (AP) will be provided throughout the Building. APs will be located below the ceiling.

b) APs will be powered via Owner-provided PoE (Power over Ethernet switches).

c) One Cat. 6A cable will be provided at Owner-determined locations. Twenty feet of available slack will be provided at device location to allow Owner adjustment.

5. Cables will terminate using the EIA/TIA 568B wiring pin out.

6. All State of Michigan cables within the building will route to and terminate in the closest Telecommunications Room located on the same floor.

7. All cables will terminate on modular Category 6, 48-port angled patch panels located in equipment rack. Horizontal wire managers will be provided above and below each patch panel. Vertical wire management will be provided between adjacent racks.

8. Overhead ladder rack will be provided for cable routing and management.

9. Patch cords for voice and data systems will be provided and installed by the Owner.

10. Interior pathways will be provided to support all low voltage cabling. The cable support system shall consist of basket tray and J-Hook assemblies installed every 5' to 7' extending from each information outlet rough-in location to the area serving telecommunications closet.

11. Workstation rough-ins shall include a 4" square backbox with a single-gang plaster ring. A 1" EMT conduit will be routed above the accessible ceiling and terminate with a nylon bushings to protect the cable upon exit.

12. Wall phone locations will include a 4" square backbox with a single-gang plaster ring and shall have 1" EMT conduits routed above the accessible ceiling and terminate with nylon bushings to protect the cable upon exit.

13. Velcro will be used throughout to bundle the cabling into organized groups logical to the Building and Administration (Labeling) Standards.

14. Commscope Systimax is the preferred basis of design.

C. Backbone Cabling Systems (Campus-wide infrastructure)

1. Service Entrance

a. Copper and fiber optic cabling will be routed from the Demarcation Room to the Main Telecommunication Room (MTR).

1) Three (3) rigid steel conduits, 4" in diameter will originate at the property line and terminate in a hand-hole just outside the area adjacent to the building.
2) Three (3) 4" conduits shall connect the hand-hole to the DMARC room.
3) Three 1-1/4" HDPE innerducts will be placed in each 4" conduit.

2. Main Telecommunication Room

a. The MTR shall serve as the main computer room for the facility.
1) 24-strand single mode optical fiber backbone and 24-strand 50 micron OM4 optical fiber shall be routed from the MTR to each TR. Each fiber shall be a homerun in a star configuration. The fiber shall be terminated at each end of the fiber with LC connectors.
2) 50-pair category copper backbone will be provided to support legacy devices.

3. The Telecommunication Rooms (TR) will serve as cross-connect locations between the backbone and horizontal cabling.

a. The Owner's electronics will be located in these rooms.

b. These rooms will also be the main mounting location for all other low voltage building systems.

c. Lockable Hubbell H3 Network cabinets (H3N4242) will be provided in the MTR and in each TR.

d. Backbone cabling will be determined as the design progresses. The following are assumptions:
1) Fiber optic, single mode (OS2) 24-strand and 24-strand 50 micron OM4 optical fiber will be installed from the main cross-connect room to each Telecommunications Room in a radial feed architecture.
2) One Cat. 3 50-pair copper cable will be installed from the main cross-connect room to each Telecommunications Room in a radial feed architecture.

D. Security Management Systems

1. Access Control System

a. A new access control platform will be provided to serve as a common platform for all alarm, access control, duress and other security related requirements.

b. The system will be a client/server-based architecture, with a network of IP-enabled distributed intelligence control panels. Control panels will:
   1) Support access control and power to access controlled doors.
   2) Provide input/output points for alarm management, including duress.
   3) Allow the Police Department or Facilities to lock or unlock specific portals during emergency events.

c. Areas of access control include:
   1) Entrance/exit points to the building.
   2) Telecommunications Rooms.
   3) Electrical/Mechanical Rooms.

2. Closed Circuit Television (CCTV) System

a. New cameras will be provided and connected to the existing networked video surveillance system. New cameras will be IP based, with Category 6 cable drops to each camera. Existing server(s) will be expanded to provide additional recording and storage capabilities due to the increased number of cameras on the system.

b. Video storage will be off site on an existing system.

c. The CCTV system will be integrated with the access control system for software-programmed triggering and alarm notification.

d. Cameras/camera coverage will be planned for (but not limited to) the following areas:
   1) Exterior traffic areas.
   2) Public entrances, public circulation and waiting areas.
   3) Private/Staff-only and vendor entrances.
   4) Reception / Welcoming desks.
   5) Areas with cash handling.
   6) Sensitive utility areas and Telecommunications Rooms.
   7) Additional locations as directed by Public Safety.

E. Audio/Video System

1. Presentation Audio/Video Systems:

a. The audio/video solution will consist of two main types: Huddle Rooms and Conference Rooms.
   1) Huddle Rooms

a) Will include local permanent point-to-point cabling to support portable source input from the table and connectivity to an Owner-furnished wall mounted display.

b) Speakers within the display will provide sound reinforcement of content sent to the display.

2) Conference Rooms

a) Will be equipped with fixed display equipment to accommodate portable source equipment.

b) An audio/video wall plate will be provided to accommodate a multitude of connection types including HDMI (for a laptop).

c) The audio/video wall plate will be permanently wired to the built-in projector (or display device).

d) Active control of this room will be provided. Basic source selection and volume control will be dependent on the portable source and input connection selected.

e) Provide connections for an owner-provided in-room display of video sources including a Blu-ray player and video conferencing codec.

f) Provide the capability for the display of temporary video sources connected through a wireless connection or auxiliary input panel.

g) Provide a video camera for video input to the videoconferencing codec.

h) Provide routing of video sources and accompanying audio via a matrix switcher.

i) Provide flat panel display mounted on the front wall of the room as the primary display device.

F. Sound/Paging:

1. Speakers and a zone amplifier will be added for the entire building to meet specific sound and paging requirements. Each speaker and the new amplifier will be directly connected to a supervised paging head-end located on the first floor by way of a two-conductor shielded cable.

2. The overhead paging system will be a 70V system. The paging system will be accessed from the following:

a. Standalone Desktop microphones will provide paging in the event of a network failure. Quantity and locations are to be determined.

b. Telephone system with a paging access code.

3. Speakers will be 8" ceiling-mounted 70V speakers distributed in such a pattern as to provide even volume and intelligible speech reproduction. A safety wire will be provided for each speaker to prevent the speaker from falling.

Prepared by: Joe Kowols, RCDD, CNID; Dale Niethammer, PE

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APPENDIX F:

RESPONSIBILITY MATRIX

Public Health + Environmental Sciences Lab

5/25/2023

Responsibility Matrix - Accessories/Equipment

	Design Criteria	Specification	Drawing	Infrastructure	Funding	Budget	Procurement	Installation	Comments
Toilet Accessories									
Paper Towel Dispensor	DTMB	AE	AE	-	Construction	GC	GC	GC	
Soap Dispensor	DTMB	AE	AE	-	Construction	GC	GC	GC	
Toilet Paper Dispensor	DTMB	AE	AE	-	Construction	GC	GC	GC	
Trash Cans	DTMB	ID	ID	-	Construction	Furniture	DTMB	Vendor	
Equipment									
Clocks	DTMB	AE	AE	-	Construction	GC	GC	GC	
Coat Hooks	DTMB	AE	AE	-	Construction	GC	GC	GC	
Coffee Maker	Agency	Agency	AE	AE	Agency	Lab	Lab	GC	
Dishwasher	DTMB	AE	AE	AE	Construction	GC	GC	GC	
Display Cases	DTMB	AE	AE	-	Construction	GC	GC	GC	
Door Key Blanks	DTMB	AE	AE	-	Construction	GC	GC	GC	
Door Locks	DTMB	AE	AE	-	Construction	GC	GC	GC	
Fire Extinguisher Cabinets	DTMB	AE	AE	-	Construction	GC	GC	GC	
Food Refrigerator	DTMB	AE	AE	AE	Construction	GC	GC	GC	
Garbage Disposal	DTMB	AE	AE	AE	Construction	GC	GC	GC	
Ice Maker	DTMB	AE	AE	AE	Construction	GC	GC	GC	
Incinerator	Agency	Agency	AE	AE	Construction	GC	-	GC	Existing to be relocated
Lockers	DTMB	AE	AE	-	Construction	GC	GC	GC	
Mail Slots	DTMB	AE	AE		Construction	GC	GC	GC	
Microwave	DTMB	AE	AE	AE	Construction	GC	GC	GC	
Mop Holders	DTMB	AE	AE	-	Construction	GC	GC	GC	
Mop Soap Dispensor	DTMB	AE	AE	-	Construction	GC	GC	GC	
Site Furnishing	DTMB	AE	AE	-	Construction	GC	GC	GC	
Under sink pipe protection	DTMB	AE	AE	-	Construction	GC	GC	GC	
Vending Machines	DTMB	AE	AE	AE	Construction	GC	GC	GC	
Warehouse Shelving	Agency	AE	AE	AE	Construction	GC	GC	GC	
Waste Handling Equipment	DTMB	AE	AE	AE	Construction	GC	GC	GC	
White Board	DTMB	AE	AE	-	Construction	GC	GC	GC	
Window Treatment	DTMB	AE	AE	-	Construction	GC	GC	GC	

Public Health + Environmental Sciences Lab

6/5/2023

Responsibility Matrix - Lab Equipment

	Design Criteria	Specification	Drawing	Infrastructure	Funding	Budget	Procurement	Installation	Comments
Lab Equipment									
Aesbestos Testing (LEO)	Agency	Agency	AE	AE	Agency	Agency	Agency	Agency	
Autoclave - Built-In	Agency	Agency	AE	AE	Agency	Agency	Agency	GC	
Autoclave - Freestanding	Agency	Agency	AE	AE	Agency	Agency	Agency	Agency	
Benches	AE	AE	AE	AE	Construction	GC	GC	GC	
Bio Safety Cabinets	Agency	Agency	AE	AE	Agency	Agency	Agency	Agency	
Casework	AE	AE	AE	AE	Construction	GC	GC	GC	
Centrifuges	Agency	Agency	AE	AE	Agency	Agency	Agency	Agency	
DI Polishers	Agency	Agency	AE	AE	Agency	Agency	Agency	GC	
Down Draft Tables	AE	AE	AE	AE	Construction	GC	GC	GC	
Dunk Tank	Agency	Agency	AE	AE	Agency	Agency	Agency	GC	
Exhaust Snorkels	AE	AE	AE	AE	Construction	GC	GC	GC	
Fume Hood	AE	AE	AE	AE	Construction	GC	GC	GC	
Fume Hood - Pass Thru	AE	AE	AE	AE	Construction	GC	GC	GC	
Gas - Bulk Connection/Piping	Agency	AE	AE	AE	Construction	GC	GC	GC	
Gas - Bulk Tank	Agency	Vendor	AE	AE	Agency	Agency	Agency	Agency	
Gas - Manifold System	Agency	AE	AE	AE	Construction	GC	GC	GC	
Gas - Individual Tanks	Agency	Vendor	AE	-	Agency	Lab	Lab	Lab	
Genetic Screening Processors	Agency	Agency	AE	AE	Agency	Lab	Lab	Lab	
Glass washer	Agency	Agency	AE	AE	Agency	Lab	Lab	GC	
Glove Dispensers	Agency	Agency	AE	-	Agency	Lab	Lab	Lab	
Incubators	Agency	Agency	AE	AE	Agency	Agency	Agency	Agency	
Instrument supply cabinets	Agency	Agency	AE	-	Agency	GC	GC	GC	
Lab ovens	Agency	Agency	AE	AE	Agency	Agency	Agency	Agency	
Machine Shop Tools (LEO)	Agency	Agency	AE	AE	Agency	Agency	Agency	Agency	Bandsaw, Drill Press, Grinder
Mass Spectrometers	Agency	Agency	AE	AE	Agency	Agency	Agency	Agency	
N20 Generator	Agency	Vendor	AE	AE	Agency	Agency	Agency	Agency	Piping by GC
Pass-Thru Window	AE	AE	AE	AE	Construction	GC	GC	GC	
Refrigerator	Agency	Lab	AE	AE	Agency	Agency	Agency	Agency	
Scullary Sinks	AE	AE	AE	AE	Construction	GC	GC	GC	
Sharps Container	Agency	Lab	AE	-	Agency	Agency	Agency	Agency	
ULT-Freezer	Agency	Lab	AE	AE	Agency	Agency	Agency	Agency	
Walk-In Cold Room/Freezer	Agency	AE	AE	AE	Construction	GC	GC	GC	
Water Baths	Agency	Lab	AE	AE	Agency	Agency	Agency	Agency	
Water Purification system	Agency	AE	AE	AE	Construction	GC	GC	GC	
Work Tables	Agency	AE	AE	-	Construction	GC	GC	GC	
XRD (X-Ray Diffractometer)	Agency	Lab	AE	AE	Agency	Agency	Agency	Agency	

Public Health + Environmental Sciences Lab

6/16/2023

Responsibility Matrix - Technology Scope

	Design Criteria	Specification	Drawing	Funding	Budget	Procurement	Installation	Comments
Incoming Services								
Fiber	DTMB IT	DTMB IT	-	Project	DTMB IT	DTMB IT	Vendor	ATT, Others?
Copper	DTMB IT	DTMB IT	-	Project	DTMB IT	DTMB IT	Vendor	Used for Elevator
DSL	DHHS	DHHS	-	Project	DHHS	DHHS	Vendor	Used for Federal Servers
Satellite TV	DHHS	DHHS	-	Project	DHHS	DHHS	Vendor	Used for emergency news
Pathways	DTMB IT/Vendor	AE	AE	Construction	GC	GC	GC	
IT Network								
IT Racks / Servers / Switches	DTMB IT	DTMB IT	-	Project	DTMB IT	DTMB IT	DTMB IT	
WI-FI Access Points	DTMB IT	DTMB IT	AE	Project	DTMB IT	DTMB IT	DTMB IT	
Cabling	DTMB IT	DTMB IT	-	Project	DTMB IT	DTMB IT	DTMB IT	
Raceways	DTMB IT	AE	AE	Construction	GC	GC	GC	
Cable Tray	DTMB IT	AE	AE	Construction	GC	GC	GC	
Public WI-FI								
Security Cameras								
Camera Head End	DTMB OIP	DTMB OIP	AE	Project	DTMB OIP	DTMB OIP	Vendor	Vendor: Allied Universal
Cameras	DTMB OIP	DTMB OIP	AE	Project	DTMB OIP	DTMB OIP	Vendor	
Camera Monitors	DTMB OIP	DTMB OIP	AE	Project	DTMB OIP	DTMB OIP	Vendor	
Cabling	DTMB OIP	DTMB OIP	-	Project	DTMB OIP	DTMB OIP	**GC**	**Confimation Needed**
Raceways	DTMB OIP	AE	AE	Construction	GC	GC	GC	
Access Control System								
Access Control Head End	DTMB OIP	DTMB OIP	AE	Project	DTMB OIP	DTMB OIP	DTMB OIP	
Card Readers	DTMB OIP	DTMB OIP	AE	Project	DTMB OIP	DTMB OIP	Vendor	Vendor: Honeywell
Door Position Monitor	DTMB OIP	AE	AE	Construction	GC	GC	GC	
Electric Strike/Hardware	DTMB OIP	AE	AE	Construction	GC	GC	GC	
Panic Alarms	DTMB OIP	DTMB OIP	AE	Project	DTMB OIP	DTMB OIP	Vendor	Vendor: Honeywell
Cabling	DTMB OIP	DTMB OIP	-	Project	DTMB OIP	DTMB OIP	GC	
Raceways	DTMB OIP	AE	AE	Construction	GC	GC	GC	
Devices								
Phones	DTMB IPT	DTMB IPT	AE	Project	DTMB IPT	DTMB IPT	DTMB IPT	AE shows locations, Raceway
Computers	DTMB FS	DTMB FS	AE	Project	DTMB FS	DTMB FS	DTMB FS	
Printers	DTMB FS	DTMB FS	AE	Project	DTMB FS	DTMB FS	DTMB FS	
Copiers	DTMB FS	DTMB FS	AE	Project	DTMB FS	DTMB FS	DTMB FS	

	Design Criteria	Specification	Drawing	Funding	Budget	Procurement	Installation	Comments
A/V								
TVs	DTMB BOD/Labs	AE	AE	Construction	GC	GC	GC	Possibly DTMB IPT Cisco system
Speaker/Mic	DTMB BOD/Labs	AE	AE	Construction	GC	GC	GC	
Camera	DTMB BOD/Labs	AE	AE	Construction	GC	GC	GC	
Cabling	DTMB BOD	AE	AE	Construction	GC	GC	GC	
Raceways	DTMB BOD	AE	AE	Construction	GC	GC	GC	
Building Systems								
Fire Alarm	DTMB BOD	AE	AE	Construction	GC	GC	GC	
Two-Way Communication	DTMB BOD	AE	AE	Construction	GC	GC	GC	
Intercom/Paging	DTMB BOD/Labs	AE	AE	Construction	GC	GC	GC	
Building Automation System	DTMB BOD	AE	AE	Construction	GC	GC	GC	
Lab Air Valves	DTMB BOD/Labs	AE	AE	Construction	GC	GC	GC	
Lab Systems								
Lab Monitoring System (Vaisala)	DHHS	DHHS	AE	Agency	DHHS	DHHS	DHHS	On DTMB IT network.
Lab Monitoring System (Vaisala)	EGLE	EGLE	AE	Agency	EGLE	EGLE	EGLE	On DTMB IT network.
Biowatch (Federal)	DHHS	DHHS	-	Agency	DHHS	DHHS	DHHS	Not currently on SOM

Public Health + Environmental Sciences Lab

6/5/2023

Responsibility Matrix - Project Expenses

	Design Criteria	Specification	Drawing	Infrastructure	Funding	Budget	Procurement	Installation	Comments
Fees									
AE Fee					Project	DTMB/AE			
Survey					Project				Included in AE Fee
Commissioning Agent					Project				Included in AE Fee
Envelope Consultant					Project				Included in AE Fee
Geotech Engineering					Project				Included in AE Fee
DTMB Administrative Costs					Project	DTMB			
Tap Fees					Project	GC			
Regulatory Fees					Project	GC			
Special Inspections & Testing					Project	GC			
Equipment Move					Project	GC			
Furniture					Project	DTMB			
Other Non-Construction FF&E					Project	N/A			
Signage					Project	DTMB/AE			
Contigency					Project	DTMB/GC			

APPENDIX G:

CLIENT STANDARDS

CAPITAL OUTLAY DESIGN MANUAL
DTMB-0494

July 2022

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL

FOR

STATE UNIVERSITIES, COMMUNITY COLLEGES,

STATE AGENCIES

AND

PROFESSIONAL SERVICE CONTRACTORS

"Capital Outlay" means a project or facility financed either in whole or in part with state funds, including lease purchase agreements, to demolish, construct, renovate, or equip a building or facility for which total project costs exceed $1,000,000.00. These projects may be on state owned property, property owned by an institution of higher education, property owned by a community college, or property under the control of the state building authority. - MCL 18.1113

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Acronyms used in this document:

DTMB: Department of Technology, Management and Budget, State of Michigan
JCOS: Joint Capital Outlay Subcommittee, Legislature of the State of Michigan
DTMB-SFA: Department of Technology, Management and Budget, State Facilities Administration, Design & Construction Division
SBA: State Building Authority, Department of Treasury
U/CC: University or Community College
PSC: Professional Service Contractor, Professional Architectural and/or Engineering firm
DTMB-FS: Department of Technology, Management and Budget, Financial Services

PURPOSE

This document outlines the requirements for planning major capital outlay design and construction projects for agencies and consultants and lists other requirements for State of Michigan buildings.

CAPITAL PLANNING PROCESS – FUNDING, REVIEW AND AUTHORIZATION OF MAJOR CAPITAL OUTLAY PROJECTS

The Capital Planning Process centers primarily on the acquisition, design, construction, renovation, and maintenance of capital projects estimated to cost $1 million or more. This process is put in place to ensure value to the State of Michigan, State Agencies, and State Colleges and Universities. The Capital Planning Process outlines the manner in which projects are planned, funded, and authorized. The reviews and approvals within the process provide the mechanism for ensuring high quality projects with appropriate disbursement of State of Michigan assets.

Projects flow through the process in the following sequence. Details of submittal requirements are contained in Appendices.

PLANNING FUNDING AND AUTHORIZATION PHASE:

Step 1: Capital Outlay Request: State Agencies, Universities, and Community Colleges develop a five-year capital outlay plan. Requests for projects exceeding $1,000,000 are submitted annually to the Department of Technology, Management and Budget (DTMB) with justification and other information as requested by the State Budget Office.

- The State Budget Office reviews the capital outlay requests, and if approved, includes the request in a planning authorization bill. The Executive Budget contains planning authorizations.

- For University/College (U/CC) projects, programming and schematic design is performed at the University's or College's expense. The Legislature may appropriate up to $100 from the State's General Fund. For State Agencies, the planning authorization appropriates monies for programming and schematic design purposes. It is important to note that legislative planning authorization does not guarantee final State support for a project. Also, while a planning authorization may be approved through a legislative initiative or planning authorization bill, the Governor may line-item veto a project. Cost incurred prior to planning authorization cannot be credited to the project appropriation or total project cost.

- For State Agencies, projects must be requested as total projects; a single project may not be split into several smaller projects of less than $1M in order to circumvent the capital outlay planning limit.

- If the total project cost is to be shared between a U/CC and the State of Michigan, agreement on the share shall be obtained as part of the initial planning authorization process.

- Projects must comply with the Joint Capital Outlay Subcommittee policies.

Step 2: Legislative Authorization: A line item must appear in a planning authorization bill providing for the preparation of a program statement and schematic planning.

- Following this authorization, the U/CC or State Agency has twenty-four months after the last day of the fiscal year in which the planning authorization was made to submit the program and schematic plan to the State Budget Office. However, the expectation is that the U/CC or State Agency will proceed speedily to prepare its program statement and schematic design submittal. If the Budget Office agrees that there is State support for the project, the program and schematic plan is submitted to the DTMB State Facilities Administration Design and Construction Division (DTMB-SFA) for approval and submittal to the Joint Capital Outlay Subcommittee (JCOS).

- A U/CC may request that the DTMB-SFA provide high-level management of the project at this stage. The U/CC should notify the DTMB-SFA in writing within 30 days of legislative planning authorization whether the project will be self-managed or request DTMB-SFA management.

- Authorizations with multiple buildings and/or phases may be considered separate projects and will be assessed separate fees.

- The DTMB-SFA or the U/CC, through a competitive selection process, selects a professional service contractor to prepare the program and schematic documents. DTMB-SFA, Universities, and Community Colleges are required to use a competitive selection process for both professional service contractors and construction management firms. For U/CC projects, the U/CC shall provide a letter to the DTMB-SFA Project Director describing the selection process used and its results or shall include a description in the program/schematic submission.

PROGRAM STATEMENT AND SCHEMATIC DESIGN PHASE:

Step 3: Programming and Schematic Design Planning: The Professional Service Contractor prepares a project program and schematic design with DTMB-SFA and the State Agency or the U/CC. A U/CC with appropriate professional staffing may prepare its own project program but will need a Professional Service Contractor to prepare the Schematic Design.

- The Program Statement and Schematic Design establishes the total project cost for inclusion in an appropriations act. The project must appear in an appropriations act as a line item to complete final design and construction prior to commencing the preliminary design and planning.

- Requirements of the Program/Schematic Design Submission are Appendix 2 of this Manual.

- The Program and Schematic Design must conform to the Space Utilization Guidelines in Appendix 3 of this Manual.

- Professionally prepared programs shall be done in accordance with the procedures and process as outlined in the American Institute of Architects “Manual of Professional Practice,” chapters on programming. Programs shall also contain information as required in Appendix 2 of this Manual.

- Schematic Design Planning shall establish the scope and nature of the proposed project in accordance with the Capital Outlay Design Manual and construction requirements of the State of Michigan and the U/CC and applicable codes. The Schematic Design Planning will form the basis of the total project cost and the appropriation of line-item monies to complete final design and construction.

- Data Area Calculations – Data Sheet(s) are found in Appendix 8.

Step 4: Program/Schematic Design Review: State Budget Office evaluates the Program/Schematic Design Submittal for conformance with the Capital Outlay request and bonding availability and confirms that the project meets State priorities. If acceptable, the DTMB-SFA will review the submittal for conformance with the Design Guide, Building Requirements, and assesses the proposed schedule and Total Project Cost.

- If acceptable, the DTMB-SFA recommends the Program/Schematic Design Submittal to the State Budget Office for submission to JCOS for approval. If approved through JCOS, the Total Project Cost is included in an appropriations act to provide for final design planning and construction. The appropriations act must pass through the House, the Senate, and be signed by the Governor to be passed in final form. Another $100 authorization from the General Fund may be appropriated as part of the Total Project Cost in the appropriations act.

- After passage of the appropriations act, the DTMB-SFA authorizes the U/CC or the Professional Service Contractor to proceed to the Preliminary Design Phase.

PRELIMINARY/DESIGN DEVELOPMENT PHASE:

Step 5: Project Management Agreement: Universities and Colleges self-managing a project enter into a Project Management Agreement with the DTMB outlining their duties and responsibilities. A sample Management Agreement is Appendix 4 of this Manual.

- Universities and Colleges will be required to submit several deliverables during this phase. These are:

  - Local Share/Matching Funds: Certified letter from the U/CC to the Director of the DTMB certifying available matching funds. The "Local Share" of the Total Project Cost must be expended first. A draft of this letter is attached to the Project Management Agreement and is found in Appendix 4.

  - Proof of Ownership of Subject Property from the U/CC to the State Building Authority: Certified letter from the U/CC to the Director of the DTMB certifying that the U/CC owns the property proposed for construction, including a copy of the deed to the property to be affected by the project. Verify that the boundary of the property to be bonded in the proposed project does not overlap property currently bonded. A draft of this letter is attached to the Project Management Agreement and is found in Appendix 4.

  - Phase I Environmental Survey from the U/CC submitted to DTMB-SFA. The Phase I Environmental Survey must not be more than seven years old and must be for the specific site. If environmental laws have changed since the latest Phase I Environmental Survey, then the survey must be redone. If the Phase I Environmental Survey indicates a contaminated site, the U/CC must indicate the steps it proposes to take to ensure a clean, uncontaminated site. The cost of the Phase I Environmental Survey and any site remediation or cleanup is not an Allowable Project Cost.

  - Hazardous Material Survey from U/CC submitted to DTMB-SFA. If the project involves work in an existing building and/or utility system, the U/CC is to determine the scope of potential hazardous materials contamination that may require testing, abatement and/or removal prior to the renovation and/or during the new construction work of the Project. The cost of the Hazardous Material Survey is not an Allowable Project Cost but the cost of the any remediation to accommodate the renovation of existing physical space that will become part of the Project is an Allowable Project Cost.

Step 6: Preliminary Design and Planning Submittal: The Professional Service Contractor and the user agency or U/CC prepare the Preliminary Design and Planning Submittal.

- This submission further refines the planned project, continuing the direction established during Schematic Design. The Preliminary Design Submittal provides more detail and definition, allowing a check on compliance with the approved Schedule, Total Project Cost, Design Guide, Capital Outlay Manual and Building Requirements of the State of Michigan.

- Requirements of the Preliminary Design Submittal are Appendix 5 of this Manual.

- Quarterly Design Progress Report: The U/CC shall submit a brief design progress report to the DTMB-SFA once every three months. Describe the progress of the final design and documentation, outlining any issues and including design progress meeting minutes. This report will keep the DTMB-SFA apprised of schedule changes and design and budget issues. This report may be provided in hard copy or via e-mail and can be waived if the DTMB-SFA agrees to a request.

Step 7: Preliminary Design Review: The DTMB-SFA reviews the Preliminary Design Submittal. The DTMB-SFA may elect to use the services of an Audit Consultant to assist with this review. The cost for the audit consultant is taken from the DTMB fee.

- If disapproved, the DTMB-SFA will discuss issues with the user agency to help gain resolution.

- If approved, the DTMB-SFA forwards an approval letter to the user agency authorizing them to proceed to Final Design/Construction Documents. Copies of this letter are forwarded to the Budget Office and the State Building Authority.

FINAL DESIGN/CONSTRUCTION DOCUMENTS PHASE:

Step 8: Final Design and Construction Documents: The Professional Service Contractor and the user agency prepare the Final Design and Construction Documents.

- The Final Design and Construction Documents document the proposed project to the level of detail required for effective bidding and construction and form the basis of the construction contract. The Final Design and Construction Documents also include a construction cost estimate.

- For State Agencies, the construction documents are prefaced by the MICHSPEC™ specification; this establishes the relationships, during construction, of the State, the Professional Service Contractor, and the Construction Contractor.

- Self-managing Universities/Colleges may use their preferred construction specification form and contract.

- The DTMB-SFA must review and approve the University/College bidding and award procedures, criteria and processes prior to advertisement of bids.

- All major Capital Outlay projects, whether for Universities/Colleges or for State Agencies, must follow any applicable Prevailing Wage U/CC administrative requirements and/or laws.. Additionally, all major Capital Outlay projects must include the State project sign (see Appendix 9).

- Monthly Design Progress Report: The U/CC shall submit a brief design progress report to the DTMB-SFA once each month. Describe the progress of the final design and documentation, outlining any issues and including design progress meeting minutes. This report will keep the DTMB-SFA apprised of schedule changes and design and budget issues. This report is to be submitted electronically (hardcopy to be provided upon request) and can be waived if the DTMB-SFA agrees to a request.

Step 9: Final Design/Construction Documents Review: The DTMB-SFA reviews the Final Design/Construction Documents Submittal. The DTMB-SFA may elect to use the services of an Audit Consultant to assist with this review, with the cost for that consultant coming from the DTMB Fee. One electronic set, including Specifications, are required for review. Upon DTMB-SFA request hard copies are also to be provided.

- If disapproved, the DTMB-SFA will discuss issues with the user agency to help gain resolution.

- If approved, the DTMB-SFA forwards an approval letter to the U/CC authorizing bidding or proceeds to bidding in the case of a State Agency. The U/CC may not bid without this approval. Copies of this letter will be forwarded to the Budget Office and the State Building Authority.

- If the U/CC elects to construct a project in phases, the Final Design/Construction Documents Submittal is repeated as required

BIDDING AND AWARD PHASE:

Step 10: Bid Tabulations: The tabulated results of bidding, including all bidders, are reviewed by the DTMB-SFA. These are provided by the U/CC to the DTMB-SFA or produced by the DTMB-SFA in case of a State Agency project. The requirement for bid tabulations extends to the selection of construction management firms and the subcontractor bids taken by the construction management firms. The results are forwarded to JCOS when the project is completed.

Step 11: Construction Contract Award: If bidding results are acceptable, the DTMB-SFA authorizes the U/CC to award the construction contract, or awards the construction contract in case of a State Agency project

CONSTRUCTION PHASE:

Step 12: Administer Construction Contracts: DTMB-SFA or the U/CC, through its Project Management Agreement, administers construction contracts. The DTMB-SFA will also provide intermittent observation of the construction progress through participation in construction meetings and site visits.

- Monthly Reports: During construction, beginning with the first construction contract, the self-managing U/CC is required to report progress, encumbrances, change orders, schedule, projected cash flow and expenditures to the DTMB-SFA in monthly reports. Requirements for monthly reports are found in Appendix 4. These reports are to be submitted electronically (hardcopy to be provided upon request) for records retention.

- Direct Payments and Expenditure Reporting: The U/CC is requested to report on a monthly basis, their direct project payments and expenditures. If these payments are reported from the project's start, they are recorded as journal entries; the eventual reimbursement is thus made simpler and quicker. Cash flow projections will assist the SBA in timing the financing which allows reimbursement after the U/CC has met its share. These reports must be detailed for review by the DTMB-SFA. Certain expenditures may not be included as part of the Total Project Cost. Should expenditures be denied or questioned, the report and reimbursement request will be returned to the U/CC for revision and the request must be re-submitted before any payment may be authorized. An example of a monthly expenditure report is attached to the Project Management Agreement and is found in Appendix 4. This report is to be submitted electronically (hardcopy to be provided upon request).

- A list of charges allowed and disallowed against the total authorized cost is found in Appendix 7. Reimbursements may be made up to 12 months after substantial completion of the project, as determined by the issuance of a Certificate of Tenantability and is found in Appendix 10.

LEASE AND BONDING PHASE -- FINANCING WITH THE STATE BUILDING AUTHORITY:

Step 13: Funding for Construction-in-Progress: In order for State Building Authority (SBA) financing to occur the following steps must be accomplished.

- The DTMB-SFA will notify the SBA of the start of project construction, whether the U/CC or DTMB-SFA manages the project. After notification, SBA prepares the Project Lease. Information that will be needed:

    - Project Budget (see attached example of exhibit A) - from U/CC
    - Project Description – in brief (one or two paragraphs, including building area) – from DTMB-SFA Project Director
    - Legal description – from U/CC

- Project completion date – from U/CC
- Architect and Contractor names and addresses - from U/CC
- Rental Range (SBA will obtain from an independent appraiser)

Step 14: Proceeding with the Lease: In order for the SBA to proceed with the Lease, the U/CC must be in compliance with the Management Agreement by including:

- Timely monthly progress reports submitted to DTMB-SFA (including monthly project expenditure detail).

- Legal proof of ownership of the project site, free of title restrictions
  - Copy of the deed
  - No recorded liens (i.e.: tax, mortgage, or construction liens, etc.)
  - No easements or rights of way that may conflict with the project
  - No rights of reverter or re-entry
  - No other conflicting rights (i.e.: mineral exploration, imperium rights, etc.)

- Evidence of a contamination free site

- U/CC is within design and program scope of the project

Step 15: Approval of the SBA Board of Trustees:

- Resolution of the State Building Authority Approving Construction Agreements, Conveyances of Property, Leases and Easement Agreements, if necessary, for certain facilities
  - Establishes an annual rental range for the project.

- Approval of a supplemental resolution to the Trust Indenture of the Commercial Paper Program
  - Allows the project to be brought in under the original Trust Indenture and included in the Authority's short-term financing program.

Step 16: Approval of the State Administrative Board (SAB):

- Resolution of the State Administrative Board Approving Construction and Completion Assurance Agreements, Conveyances of Property and Leases for Certain Facilities
  - Establishes an annual rental range for the project

Step 17: Approval of the U/CC Board of Trustees:

- Resolution of the Board of Trustees of the U/CC Approving a Construction and Completion Assurance Agreement, a Conveyance of Property, a Lease and an Easement Agreement, if necessary, for the U/CC Project
  - Approves an annual rental range for the project.

- Bill of Sale for the Facility

Step 18: SBA Commercial Paper Issuance: After all of the above steps have been completed and if the U/CC remains in compliance with the Management Agreement, SBA can issue commercial paper to fund the Authority's share of the project.

- The SBA will notify DTMB Fiscal Management and State Facilities Administration, Design and Construction Division that SBA financing is in place.

- After the U/CC has spent their share of the project and the SBA financing has occurred, the U/CC can request reimbursement for project expenditures. Reimbursement requests must be sent to the DTMB-SFA Project Director (see Appendix 4).

Step 19: SBA Policy Related to Advancing Funds for State Agency Projects

- Once construction has commenced, the Agency, through the assigned Project Director, may request an advance of funds for upcoming expenditures.
- Advance of funds is made on a quarterly basis for the upcoming quarter.
- The total advance requested must be justified by a detailed list of projected expenditures.
- The Project Director must review and sign-off on the advance request and forward to the SBA for review.
- Expenditures in which the SBA does not consider "bondable" (see Appendix 7) will be communicated to the Project Director (who will in turn communicate to the Agency).
- Once both the Project Director and SBA approve the list of expenditures, SBA will request the transfer of funds to the Agency through Financial Services.
- Financial Services should be notified of the justification for any unspent funds in the following quarter.

Step 20: Long-term Financing of the Project: When the project is completed and the U/CC can take occupancy, the short-term notes that were used for financing the construction-in-progress are retired with long-term bonds.

- Certificate of Tenantability issued by the Architect – the text of a Certificate of Tenantability is attached as Appendix 10 and may not be modified.
- Lease is Executed
    - An independent appraiser determines the true annual rental for the project.
    - The SAB approves the "Resolution of the State Administrative Board Determining the Rental and Confirming Other Matters Regarding the Conveyances of Property and the Leases for Certain Facilities and Authorizing the Execution and Delivery of a Continuing Disclosure Agreement" which approves the conveyance of the Facility, the authorization of the lease between the State and the U/CC, and approves the annual true rental.
    - The Governor, Secretary of State, U/CC and the SBA sign the Lease.
- Warranty Deed is executed by the U/CC and conveys the property to the SBA.
- The short-term commercial paper notes are refinanced, and monthly rental payments begin. The rental payments are applied to the bond debt service. When the bonds are paid or redeemed, the lease is canceled, and the property is reconveyed back to the State, the University, or the College. The bond periods can vary, and bonds are often redeemed early.

PRESENTATION TO JOINT CAPITAL OUTLAY SUBCOMMITTEE

The University, Community College, or Agency may be called upon to present or discuss their project with the Joint Capital Outlay Subcommittee (JCOS), or the DTMB may be called upon to discuss a project on their behalf. Additionally, the U/CC is encouraged to meet with JCOS members to answer questions or present information on their project. Presentation materials, if desired, shall be mounted on boards and shall include plans, elevations, and site development. The presentation should last no longer than 5-10 minutes. Be prepared to field questions from the JCOS members. Answers should be brief and to the point. The following is an outline of a suggested presentation format. Provide this single page outline to the DTMB-SFA Project Director with each design submission, including Schematic Design.

A. Representative of Agency/College/University:
   1. Introduction of presenters
   2. **Purpose of project. Emphasize how this project will benefit the State Agency or the University/College, or how it will impact the Mission Statement of the Agency.**
   3. Impact and effects the project will have on the surrounding community, economy, jobs, etc.

B. Professional Architect/Engineer responsible for the project:
   1. Site Description
   2. Brief description of the facility, including all necessary components
   3. Materials and building systems proposed
   4. Total cost
   5. Schedule – drawings complete, construction start, construction complete, occupancy

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***Items listed in bold indicate items of most importance**

INFORMATION FOR PLANNERS

BUILDING EFFICIENCY AND APPROPRIATE USE

It is expected that State Agency and U/CC capital outlay projects demonstrate space and cost-efficient design. Buildings must meet the efficiency ratios outlined in Appendix 8. Large circulation spaces may not be designated as usable areas by furnishing them as lounge, waiting, or study areas unless those areas are clearly required by the building program.

U/CC capital outlay projects are to serve an academic program, or other functions that provide indirect support to the academic program. The program should not include recreation rooms, television lounges, billiard or gaming areas, or other spaces not integral to the academic program. Consult with the DTMB-SFA and/or the State Budget Office prior to including food service facilities, bookstores, child development centers, or other self-liquidating activities (for which a fee, tickets, or other revenue is collected) in the program.

GREEN BUILDINGS

The energy efficiency of all materials used in the construction, alteration, repair, or rebuilding shall be considered. Sustainable design principles should be used in the design and construction of capital outlay-supported projects; the LEED Green Building Rating System is a convenient and industry-accepted standard of reporting and measurement.

Many recent capital outlay-supported projects have achieved LEED scores of Silver or Gold.

Submit LEED Scorecards with each phase review package. USGBC review and certification is optional. Information on the USGBC and the LEED Scorecard can be obtained from the United States Green Building Council at (202) 828-7422 or at www.usgbc.org

CODE REVIEW AND BUILDING PERMITS

All State of Michigan projects performed with the DTMB-SFA require code review and building permits. Code review is required prior to bidding. Costs for Michigan Department of Licensing and Regulatory Affairs (LARA) Bureau of Construction Codes (BCC) review may be interagency billed.

U/CC: Universities may elect to have projects reviewed through their local municipalities or through the Bureau of Construction Codes. Community Colleges generally come under the jurisdiction of their local municipality, but that local municipality may choose not to perform the plan review. In that case, the Bureau of Construction Codes will perform the plan review. The Michigan LARA Bureau of Fire Services is responsible for performing fire safety plan reviews and inspections for all new construction and remodeling of schools, colleges, and universities

State Agency: the LARA Bureau of Construction Codes must review State Agency projects. It is DTMB-SFA practice to require this review be completed prior to bidding.

CODES, REGULATIONS, LAWS:

All State Agency major and minor capital outlay projects must comply with the following codes, regulations, and laws. Certain projects may require additional review or approvals from other agencies or compliance with other regulations. It is the Professional's responsibility to determine which laws and regulations apply to a project.

University and College major capital outlay projects must comply with building codes as specified by each University or College.

Should a national and a state code contain conflicting items, the Professional shall use the more restrictive requirement.

State of Michigan projects on State-owned lands are not subject to local municipal, township, or county building permit or plan review. However, plans for projects may be shared with local officials on an informational basis only. An inspection conducted by a local inspector shall be of an advisory nature only.

DTMB State Facilities Administration Design and Construction Division (517) 284-7900
http://www.michigan.gov/dcd

Bureau of Construction Codes, 611 W. Ottawa Street, 1st Floor Ottawa Building, Lansing, MI 48933
Mailing Address: PO Box 30254, Lansing, MI 48909
http://www.michigan.gov/lara

Michigan Building, Mechanical and Plumbing Codes	(517) 241-9308
LARA BCC Plan Review	(517) 241-9328
Michigan Energy Code	(517) 241-9328
Michigan Barrier-Free Design Rules	(517) 241-9300

The current Administrative Rules, Codes Public Acts & Standards currently in force can be found at:
https://www.michigan.gov/lara/0,4601,7-154-89334_10575_17550---,00.html

Michigan Bureau of Fire Services (517) 241-8847
http://www.michigan.gov/lara/0,4601,7-154-35299_42271---,00.html
3101 Technology Boulevard, Suite H, Lansing, MI 48910

Americans With Disabilities Act (Federal Register July 26, 1991) (202) 514-0301
US Dept. of Justice Office on the ADA, Washington, DC 20530

Sedimentation Control Act (Part 91 of 1994 PA 451) (616) 356-0276
Michigan Department of Environmental Quality
350 Ottawa Avenue NW, Grand Rapids, MI 49503-2341

DTMB-managed projects contact DTMB-SFA Sedimentation and Erosion Control Section (517) 284-7900

Department of Health & Human Services (517) 373-3740
333 S. Grand Avenue
P.O. Box 30195
Lansing, MI 48909

PROJECT SIGN

A project sign must be installed at the construction site for all projects over $500,000.00. The sign shall conform to DTMB-SFA guidelines in Appendix 9. Advertisement and names of contractors or consultants are not allowed. Universities and Community Colleges shall provide a photograph of the erected sign in the first monthly report.

DOCUMENT REQUIREMENTS

OUTLINE SPECIFICATIONS

A preamble to the outline specifications shall name the separate prime contracts being proposed and the scope of each, any proposed construction phasing, or describe any proposed unusual construction techniques, as well as unusual conditions affecting the design or cost, e.g., restricted working conditions or limited access.

Use the divisions of the Construction Specifications Institute and within each division use the broad scope section titles and sequences as shown in the most recent edition. In Division 1 - General Requirements, include those Special Project Procedures and other items which are special or unique to the project. This shall be an outline specification only. Show various materials in their proper divisions and include a preliminary finish schedule in Division 9 - Finishes. Cover the mechanical and electrical divisions as thoroughly as the previous divisions.

DOCUMENTS CHECKLIST

Planning, bidding requirements, and contract documents are reviewed and approved by the DTMB-SFA at various stages or phases, only for: 1) general compliance with the approved program statement and its amendments; 2) with legislative, budgetary, and time limitations; 3) with required format and 4) with pertinent documents previously approved by the DTMB-SFA.

It is the responsibility of the Professional Services Contractor to check and correct the documents which he/she prepares, for errors and omissions; for engineering and technical performance; for coordination of the various systems; for conflicts or discrepancies in drawings and specifications and for compliance with applicable codes, regulations, and standards.

For specifications, use the CSI division format and within each division use the broad scope section titles and sequences.

BIDDING AND CONTRACT REQUIREMENTS

The principle of competitive bidding must at all times be maintained. Do not use proprietary or trade names unless at least two are named and then only in the specifications. Do not use proprietary or trade names on the drawings. The phrase "or equal" shall be used or included by reference in the special conditions or instructions to bidders. An equal is permitted only upon the written approval of the professional service contractor, and then the construction contractor is responsible for all costs due to the acceptance or use of

it. An equal product should be distinguished from a substitution. Universities or Colleges may use the following or similar paragraphs in the “Special Project Procedures” or “Instructions to the Bidders”. State Agencies shall use the MICHSPEC®:

The use of an equal product, defined by describing a proprietary product or the use of two or more trade names, if not inserted, shall be implied. The specific product described or named shall be understood to establish the minimum requirements for fulfilling contract obligations in regard to quality, function, installation, material, manufacture, and standard of design. Equal products, other than those that are specifically described or named, will be permitted provided that written approval is obtained from the professional service contractor prior to placement of orders and further provided that the Contractor be totally responsible for all costs incurred by use of the equal product. No approvals concerning any part of the contract by either owner or professional service contractor shall be valid unless given in writing. The professional service contractor shall be the sole judge of an "equal" and no extras will be allowed due to the requesting contractor's assumption of equality of products.

The substitution of material or equipment different from that specified shall be considered only if a request for same, in writing, is received by the professional service contractor at least 14 days prior to the date for opening of bids. The request shall include complete data for evaluation of the proposed substitution, including estimated savings or additional costs resulting from its use. If the substitution is approved, an addendum will be issued to all recipients of bid documents.

GENERAL REQUIREMENTS

Allowances. No allowance shall be used without the express written authorization from the DTMB-SFA Project Director.

Measurement and Payment. Provide procedures and submittal requirements for schedule of values, application for payment, and unit prices. Do not use unit prices except with express written authorization from the DTMB-SFA Project Director.

Alternates/Alternatives. No alternatives or alternates are to be used except with express written authorization from the DTMB-SFA Project Director. Alternates shall be deduct only. Design and bid the project which meets the budget and plan for deductive alternates in case of higher-than-expected bids. Alternates shall be listed in the order in which they will be taken and may not be taken in combinations which will affect contract award.

Special Project Procedures. Include special procedures if required by the State Department the project is for.

Temporary Facilities and Controls. Make certain that it is clear what is to be provided, by whom and who pays for it. Verify with State Agency and DTMB-SFA for availability.

Contract Close Out. Make certain that it is clear when project is to be accepted by owner, when warranties are to begin, when owner's liability for operations, maintenance and insurance is to be assumed and what the Contractor's residual obligations are and for how long. Consider Builder’s Risk Insurance and the establishment of Liquidated Damages.

SITE WORK

General. Obtain information for boundary and topographic surveys from the DTMB-SFA Project Director, or U/CC. The bidding documents are to contain a sheet showing all existing conditions (same scale and orientation as site plan) with no other work shown on this sheet. Provide Project Sign (see Appendix 9) for all projects over $500,000.00.

Subsurface Investigation. Obtain soils information as part of the basic professional services. Involve the testing engineers in planning the boring locations and consult with them during the time borings are being

done and during the design of footings or foundations. Provide the DTMB-SFA with a final indexed PDF report. Include locations of test holes and log of borings on plan of existing conditions.

Demolition. Do not allow rubble to backfill in basement areas. Clear basements, break up concrete floors and backfill with granular fill. Basement walls and broken up concrete basement floors may remain in place. Be certain that possible hazardous waste is properly handled per regulations of the Department of Environmental, Great Lakes & Energy.

Site Preparation. Include protection for existing trees and shrubs which are to remain.

Earthwork. Provide for controlled compaction of backfill that supports structures parking or walks. Ensure that brick-filled areas are protected from frost and water. If engineered fill is required, prevent settlement that may cause structural damage.

Soil Erosion and Sedimentation Control: Comply with 1994 PA 451, Part 91 (Soil Erosion and Sedimentation Control). Ensure that best practices are followed and that the design of an SESC plan is submitted for review to the appropriate agency. For DTMB-managed projects coordinate review submission with Project Director as plan review is completed within DTMB-SFA Design and Construction Division.

Paving and Surfacing. Keep islands and small structures to a minimum in order to facilitate snow removal with power equipment. Provide for snow storage.

Sewage and Drainage. Make certain that building ground floor is placed at an elevation that will permit positive surface drainage away from the structure and so that no possibility exists for storm water to enter doors or other large openings in case of catch basin or drain stoppage.

Landscaping. Design landscape structures keeping in mind the likelihood of damage by powered snow removal equipment handled by inexperienced operators. Utilize tree and shrub stock native or adaptive to site. Avoid exotic species and monocultures.

CONCRETE

Concrete Accessories. In concrete swimming pools, provide special water stops at all construction or expansion joints. Do not rely on coatings.

Cast-In-Place Concrete. Make provision for controlled expansion, contraction and differential movement or settlement. Do not use spread or wall footings without steel reinforcement.

Precast Concrete. Anchorage details should be tested and proven prior to actual installation. Consider the appearance factor of this material as a finished surface after ten or more years of exposure. Consider accumulation of atmospheric soils and wash-off.

MASONRY

Masonry Accessories. Make provision for controlled expansion, contraction and differential movement or settlement.

Unit Masonry. Anchorage details for precast units should be tested and proven prior to actual installation. Masonry back-up for masonry veneers is preferred. Provide for differential movement.

Stone. Use exterior materials proven to be impervious to frost action.

METALS

General. Make provision for controlled expansion and contraction and provide for protection against corrosion due to electrolysis between dissimilar metals.

Structural Metal Framing. Use of "Cor-ten" or similar steel is to be used with discretion, taking particular care to avoid inappropriate rust staining of adjacent materials.

Metal Joists. Joists shall comply with the Steel Joists Institute Standard Specifications for open web steel joints.

Metal Decking. Use sufficient depth and gauge to overcome excessive deflection causing roofing membrane rupture or delamination when foot traffic occurs.

Metal Fabrications. Observe OSHA, ADA, and MBF requirements on railings and stair details.

WOOD AND PLASTICS

Plastic Fabrications. Vinyl handrail covers shrink or expand severely. Avoid these unless material is proven. Avoid exposure to sunlight at interior locations.

THERMAL AND MOISTURE PROTECTION

General. Provide for controlled expansion-contraction-differential movement or settlement. Observe criteria and standards of Michigan Energy Code.

Waterproofing. Provide for protection against damage in backfill operations.

Insulation. Make certain that sufficient insulation or vapor barriers are provided to prevent moisture condensation or that any insulation subject to moisture condensation is properly vented to allow dissipation of this moisture without damage to structure or content. Insulation shall comply with code compression standards.

Shingles and Roofing Tiles. Provide adequate roof slope for conditions and materials to avoid back-up leakage due to ice and snow formations. Provide verification.

Manufactured Roofing and Siding. Provide adequate roof slope for conditions and materials to avoid back-up leakage due to ice and snow formations. Provide standing seam roofing only.

Membrane Roofing. Specify single ply elastomeric membrane, totally adhered or mechanically fastened with possible option of coal tar pitch and gravel, if design conditions are correct. Provide slope of at least 1/4" per foot to avoid ponding. Try to avoid high parapet walls and their attendant flashing problems. For built-up tar pitch roofs, a twenty-year total system manufacturer’s warranty shall be provided to cover roofing, insulation, flashing, connections, labor material, and installation. For single-ply membrane roofs a twenty-year total system manufacturer’s warranty shall be provided to cover roofing, insulation, flashing, connections, labor material, and installation; an additional five-year warranty on the membrane shall be provided. For all roofing systems a two-year warranty shall be provided by the general contractor that shall commence with the date of substantial completion of the total project.

Flashing and Sheet Metal. Provide for controlled expansion and contraction. Check overhang or eave details for potential problems of icing and roof water back-up. Check for downspout or conductor icing. Detail flashing to allow removal and reinstallation for reroofing.

Skylights. Skylights are not allowed because of the perennial leakage problems. Consider monitors for daylighting.

Joint Sealers. Do not rely on sealants as primary water stop.

DOORS AND WINDOWS

General. Provide construction, glazing, and weatherstripping for maximum energy conservation consistent with budget. In mental or penal structures use special security screws only in areas accessible to patients or inmates.

Metal Doors and Frames. Provide for rust or corrosion protection, and for proper back-up plates for secure hardware attachment and anchorage.

Wood and Plastic Doors. Avoid for exterior use except under special conditions.

Provide overhead doors with safety switches with electric eyes, not seal switches (which freeze).

Metal Windows. Consider problems of through conduction, condensation runoff, and attendant damage. Provide proper flashing and blocking.

Hardware. Include special agency requirements for the Departments Health & Human Services and Corrections.

Glazing. Observe Fire Marshal rules on glass. Be certain of proper degree of security and safety in mental or correctional structures. Consider provision for interior reglazing in multistory structures. Provide for controlled expansion/contraction/differential movement, especially to prevent cracking of multipane glazing.

FINISHES

Lath and Plaster. Make provision for controlled expansion and contraction, especially for exterior work. Use galvanized lath and solid zinc edge, corner or other termination pieces for exterior or interior high humidity areas.

Gypsum Board. Avoid for exterior use even if protected against weather. Do not use in locations exposed to aggressive behavior. Provide proper accessories for closure and trim.

Tile. For exterior use, specify certified frost proof vitreous tile.

Terrazzo. Avoid use for exterior and do not use on ramp or sloped floors because of slipping danger.

Acoustical Treatment. Consider appropriations in reference to fragility, damage by occupants, cleanable and sanitation factors.

Wood Flooring. Provide controlled expansion and contraction and consider likelihood of exposure to high humidity or water.

Resilient Flooring. Avoid in wet areas.

Carpet. Avoid use in areas occupied by or accessible to incontinent persons because of cleaning and sanitation problems. Make certain of limitations regarding fire and smoke.

SPECIALTIES

Compartments and Cubicles. Comply with barrier-free codes.

Louvers and Vents. Provide for drifting or blowing snow problems.

Access Flooring. Avoid where subjected to heavy wheeled loads.

Identifying Devices. Include in contract, uniform and consistent typography and colors throughout the structure, campus or institution. Comply with barrier-free codes. Coordinate design of interior and exterior signage.

Protective Covers. Make certain that canopies are protected against vehicle or truck damage.

Storage Shelving. State agency and professional service contractor shall determine usage prior to bidding, not after construction is in place.

Toilet and Bath Accessories. Check details carefully with user or manager of maintenance staff for compatibility with stock paper, soap, etc. Provide substantial backing for adequate anchorage.

EQUIPMENT

General. Where applicable consult with and obtain required approvals from Department of Health & Human Services, Office of Fire Safety, or other cognizant agencies. Include any required fire extinguishers in building contract.

Security and Vault Equipment. Make certain that enclosing wall, floor and ceiling construction is at least equal to vault door.

Loading Dock Equipment. Do not use depressed loading docks which rely on drainage by means of a sump or grate. These plug and freeze. Provide adequate roof clearance for semitrailers.

FURNISHINGS

Window Treatment. Include shades, blinds, drapes or other similar devices, complete with operating hardware and installation, usually as separate bids and contracts.

Furniture and Accessories. Not normally included in building contract except by written authorization.

Multiple Seating. Fixed seating shall be included in construction contract.

Interior Plants and Planters. Not normally included in building contract except by written authorization.

SPECIAL CONSTRUCTION

Integrated Assemblies. Make certain that trade jurisdiction problems are accounted for.

Aquatic Facilities. Consult with and obtain written approval of Department of Health & Human Services for both construction and operation.

CONVEYING SYSTEMS

Elevators. Begin with a description of the elevator, giving area, weight of lift, speed, number of stops, approximate distance of travel, class (freight, passenger, both) type of operation. Follow with a detailed method of operation. On contracts for repairs, specify testing and include a clause requiring the Contractor to inspect the equipment carefully, assume all responsibility for damage due to his/her testing, and to deliver the repaired machine in a first class operable condition. Consider height of freight elevator cab to facilitate furniture delivery.

MECHANICAL

General. Insist on adequate physical space for the placement, operation, maintenance, removal and repair of all mechanical equipment, piping, and ducts. Observe criteria and standards of Michigan Energy Code and its superseding revisions. Coordinate design work with architectural designer to avoid unsightly exposures of cooling towers, meters, stacks, vents, piping, conduit, etc. In mental and penal buildings use special security screws in areas accessible to patients or inmates. Consider humidity control and proper ventilation to avoid and prevent mold and fungal growth in buildings.

Fire Protection. Consult with and obtain written approval of the Bureau of Fire Services.

Plumbing. Provide floor drains in all toilets and all other spaces housing water using devices, e.g., drinking fountains, water heaters, etc.

Heat Generation. Provide for adequate combustion air supply. Consider energy recovery devices.

Heat Transfer. Consult with DTMB-SFA.

Air Distribution. Check for possible cross-contamination on supply and exhaust ports.

Controls. Consider sophistication of systems in relation to probable operating and maintenance staff capabilities.

ELECTRICAL

General. Be certain that adequate space and clearance is provided for safe and proper operation, maintenance, and removal of all electrical equipment. In psychiatric hospitals, juvenile detention centers, and penal facilities, use security equipment and fasteners only in areas designated by the state agency. Practice energy conserving designs, e.g., high efficiency motors and light sources, realistic sizing of transformers and conductors. Prime factors for consideration in selecting equipment shall be cost effectiveness, energy efficiency, durability, ease of maintenance, compatibility with existing equipment and systems, simplicity of operation and availability of parts and service. Provide a comprehensive, concise description of the work to be performed in this division.

General. For State-owned and managed buildings, follow the applicable DTMB-SFA Design and Construction Standards obtained at: https://www.michigan.gov/dtmb/procurement/design-and-construction/sample-contracts-and-forms/office-design-and-construction-standards, and any additional standards provided by the DTMB-SFA Project Director.

Basic Electrical Materials and Methods. Use performance specifications as much as possible and generic rather than trade or brand names. Ensure wiring is proper type and color throughout project.

Power Generation - Built-Up Systems. Consult with the DTMB-SFA, Design and Construction Division before discussion with state agency personnel. Ascertain whether on-site auxiliary plant is required.

Medium Voltage Distribution. Outdoor transmission is preferred to be in underground duct or in tunnels.

Service and Distribution. Consider the effect of alteration or addition to the distribution system on the State unit's existing concept and/or long-term planning.

Grounding. Ensure grounding path has sufficiently low impedance to provide safe ground. Use footing-type grounding electrode for steel framed buildings.

Lighting. Illumination levels shall be based on the recommendation of the most current I.E.S. Edition. Specific task areas shall be illuminated to higher levels than the general area lighting. Selective switching should be considered in multi-use areas.

Special Systems. Relative costs, reliability and usage shall be considered in selection of emergency light and power systems and equipment. The building construction shall be evaluated for lightning protection and cathodic protection of utility system components.

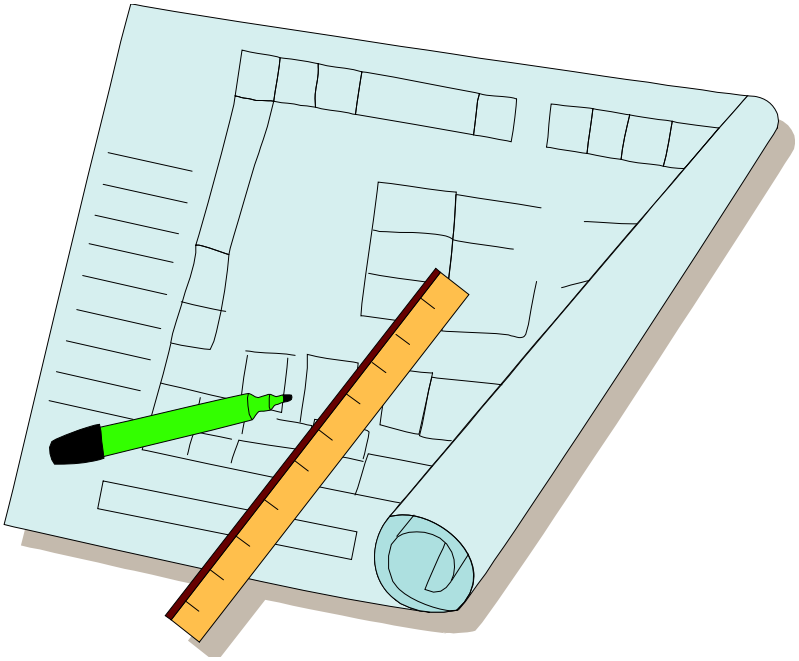
Communications. Important considerations in design of systems and selection of equipment are compatibility with existing state agency equipment and capability of staff to maintain it.

Controls and Instrumentation. Considerations of system selection shall include its compatibility with existing systems necessary with which to interface, sophistication of the system relative to the capabilities of the maintenance and operating staff and availability of parts and service.

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX ONE

GENERAL REQUIREMENTS FOR DESIGN SUBMITTALS



APPENDIX ONE – GENERAL REQUIREMENTS FOR DESIGN SUBMITTALS

- Number and timing of reviews: Formal reviews may be necessary at the 50% and 90% stage of each design phase (Programming, Schematic Design, Design Development, Construction Documents), depending on project size, complexity, funding, etc. The requirement for review is subject to the discretion of the DTMB-SFA. Informal reviews are valuable and can be arranged with the DTMB-SFA Project Director.

- Each formal review shall include a written approval from either the State Agency or the U/CC. State Agencies shall note the importance of its timely, careful, and thorough review of the planning documents at each phase for program and operational compliance. This will help avoid delays, additional design and planning fees, and additional construction costs caused by changes to previously approved design documents.

- Each design submittal shall contain the following information:

    - Phase (Programming, Schematic Design, Design Development)
    - State Facilities Administration Design and Construction Division (State) File Number -- obtain from Project Director and use on **all** correspondence and **all** submittals.
    - State Department and/or Agency, U/CC Title
    - Location
    - Project Title (remain consistent throughout project)
    - Date (or current revision date) common to all materials, drawings, etc.
    - Table of Contents with submittals in order listed in phases, tab text for easy reference
    - Name and Address of Professional Service Contractor(s), total project team; include Michigan Registration seal and signature of a principal of the Professional Service Contractor pursuant to Public Act 299 of 1980.

- All correspondence, including transmittals, shall reference the File Number, Project Title, Location, and Agency.

- All pages shall be numbered.

- Original drawings may be 24" x 36", 30" x 42", or smaller, but for design (schematic and preliminary/design development) submittals, the presentation format shall be 8-1/2" x 11" (foldouts acceptable), bound and tabbed for easy reference. If using foldouts, please ensure that they are folded to fit 8 ½” x 11” format.

- Graphic Scale required

- Lettering shall be legible when reduced

- North arrows shall point up or to the left

- State of Michigan block within title block (contact Project Director for an AutoCad block file)

- Construction Specifications Institute format (49 divisions) required for Specifications, including broad scope section titles and sequences within each division.

- Avoid slang, trade, and regional terms.

- Room names and numbers shall appear directly within their respective room, not on a key located elsewhere on the drawing. This is critical for speedy review of drawings.

- Calculate building areas and volumes according to the requirements of Appendix 8. Do not use BOMA or any other standard for building area and volume calculation.

- Notes preferably appear on their respective plans, sections, elevations, and details. If necessary, notes may appear on a keynote list located elsewhere on the drawing sheet to which they refer. A separate notes sheet or notes located in the Specifications is not acceptable.

- Equipment, finish, door, and window schedules shall be on the drawings.

- Lengthy notes shall be placed in the Specifications.

- Use highlighted key plans if the plan size exceeds the capacity of a single sheet. Orient same as plans.

- Use lighter line weight for mechanical and electrical backgrounds. Line diagrams for power distribution, power alarms, communication, and monitor shall be provided at 50% and 90% review stages.

- Provide symbol legends at the right edge of each respective classification (architectural, mechanical, structural, etc.)

- Include a LEED checklist showing expected LEED points.

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX TWO

PROGRAM STATEMENT AND SCHEMATIC DESIGN SUBMISSION REQUIREMENTS

APPENDIX TWO – PROGRAM STATEMENT AND SCHEMATIC DESIGN SUBMISSION

Phase 200/300 - Program Statement and Schematic Design Submission

Notify the State Budget Office when planning to submit a Program Statement/Schematic Design Submission. Submit a minimum of three (3) draft copies of the Program Statement/Schematic Design Submission to the State Budget Office. If the project is found acceptable, the State Budget Office will provide instruction on the preparation and submittal of final documents for submittal to JCOS.

A. Title: "Program Statement for the (name of building) at (name of institution, agency, and location). Authorized by P. A. XXX of 20XX (Insert appropriation act number and year). Approved by: (name and title of agency, University, or Community College head) on (date of approval).

B. Introduction: Discuss the instructional goals (for U/CC projects) or operational goals (for State Agency projects) of the project. Include a short justification for the project. Describe the proposed project, summarizing the result of the program analysis and schematic design. Describe planned phases or project components. Describe the competitive selection process for the PSC and/or the Construction Manager.

C. Approval Letters: Program statement, program amendments and applicable approval letters from University, State Agency, DTMB-SFA, State Budget Office.

D. Building Program Areas: Compile or tabulate the building program, listing all spaces organized by department or classification. Describe the extent and proposed use of spaces which will be vacated upon occupancy of the proposed facility or if demolition is necessary. List the capacity of the building by rooms in terms of students, beds, patients, inmates, staff, workstations, books, etc.

E. Space Classification: Provide a summary tabulation organizing the building spaces into categories of uses. Building space is classified into two major classifications: 1) agency space – necessary for the working requirements of the building occupants, and 2) building space – necessary to make the building technically function.

F. Net and Gross Areas: Establish net to gross efficiency ratios for building type. In no case may the net to gross ratio be less than 55% percent -- see "Net to Gross Ratio Guidelines."

G. Furnishings and Equipment List: Organized by department or to correspond to program organization. Provide as developed by the State Agency, University, or College. The purpose of the furnishings and equipment list is to provide the furnishings and equipment required to make the facility complete and ready for use. This budget item is not to be used as a device to upgrade or replace the existing equipment inventory. The list should be accompanied by a narrative attachment to indicate the extent that existing equipment will be used in the facility. The list should indicate the percentage of the total the new equipment represents of the anticipated total project cost. The list should have columns indicating the quantity, description, estimated unit cost, and total estimated cost of the furnishings and equipment. Group like categories of similar equipment items within an overall heading description of the whole group of equipment. It is not intended to be an individual list of each item of equipment at the program and schematic level.

H. Site and Exterior Space Relationships: Site analysis and studies defining site relationships to existing and future structures, utilities, environmental factors, traffic patterns, public transportation, open space, related features, and any anticipated special utilities or operational issues.

I. Building Space Diagram: Flow, bubble, or matrix diagrams, sketches or other information showing net square footage components to scale in their approximate relationships and adjacencies.

J. Building and Construction Systems: Describe the structural, mechanical, and electrical systems. Describe the basic utilities, including their availability, capacity, and environmental impact. Include

a LEED checklist outlining the energy efficiency and sustainable design aspects of the proposed project.

K. Project/Program Cost: Provide cost estimate with total project cost as well as for individual portions of the project, if the project will be completed in separate phases. Use Project Data Sheets for format, refer to Appendix 8.

L. Design and Construction Schedule: By month and year, indicating schedule of proposed submittals, bidding, award, and construction. Discuss project delivery methods (phased construction, multiple bid packages, construction management, etc.) and if possible, show projected bidding schedule.

M. Annual Operating Budget: Show projected costs of utilities, insurances, janitorial/maintenance services, window washing, security, etc.

N. Drawings:
   a. Location Map
   b. Legal description where applicable
   c. Existing Conditions Site Plan showing only (except delineate in proposed structure) existing physical features including topography and all overhead and underground utilities (same scale and orientation as following Site Plan)
   d. Site Plan showing roadways, walkways, soil boring data, preliminary landscape layout and other significant features
   e. Floor plans at appropriate scales, including room names and square feet in each room
   f. Elevations in block or mass form
   g. LEED checklist.

O. Executive Summaries: Provide an executive summary, unbound but stapled. This summary is provided for the members of the JCOS and should provide a concise and understandable synopsis of the project. The summary shall include the following items:
   a. Discussion of instructional goals (for U/CC projects) or operational goals (for State Agency projects) of the project. Include a brief justification of the project.
   b. Brief project description, summarizing the result of the program analysis and schematic design and including description of proposed construction.
   c. Describe planned phases or project components.
   d. Net and Gross Areas.
   e. Project Data Sheets.
   f. Design and Construction Schedule.
   g. Annual Operating Budget.

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX THREE

SPACE UTILIZATION GUIDELINES

APPENDIX THREE -- SPACE UTILIZATION GUIDELINES

STATE OFFICE SPACE STANDARDS – refer to the Administrative Guide to State Government, 0210.02 Office Space Standards for uniform standards for state-owned and leased facilities. The Guide is on the Internet:

0210.02 Office Space Standards (michigan.gov)

UNIVERSITY AND COLLEGE SPACE STANDARDS: Various higher education facilities planning guides exist and may provide guidance for standards of space allocation. The following tables of space utilization standards are provided as a guide.

CLASSROOMS: Assignable square feet (ASF) per station.

- For classrooms averaging 20 stations: approximately 21 ASF per station
- For classrooms averaging 30 stations: approximately 17 ASF per station
- For classrooms averaging 40 stations: approximately 15 ASF per station
- For classrooms averaging 80 stations: approximately 12 ASF per station
- For classrooms averaging 120 stations: approximately 11 ASF per station.

CLASS LABORATORIES: Assignable square feet (ASF) per station, including the floor area of related service rooms (workload support space).

Academic Programs	Lower Division	Upper Division & Graduate
Agriculture and Natural Resources	60-70	60-70
Engineering	50-90	75-125
Architecture Environmental Design Biological Sciences Fine and Applied Arts Home Economics Physical Sciences Psychology “Lab” Social Sciences (typically Archaeology, Criminology, Anthropology)	55-65	85-95
Communications	35-45	55-65
Education (excluding Physical Education)	30-50	30-50
Area Studies Business and Management Computer and Information Sciences Foreign Languages Letters Library Science Mathematics Military Science Public Affairs and Services “Non-Lab” Social Sciences, (typically History, Economics, Sociology, International Relations, Demography, Urban Studies, Ethnic Studies)	25-35	25-35

Technical/Vocational	Assignable Square Feet per station
Business and Commerce	25-35
Printing, Photography, Graphic Arts	55-65
Hotel and Restaurant Management	55-65
Transportation and Public Utilities	125-175
Computer Technologies	50-80
Health Services & Paramedical (Except Physical Therapy)	40-60
Physical Therapy	90-110
Mechanical & Engineering Technologies (except Graphics and Drafting)	120-160
Graphics and Drafting	55-65
Natural Science Technologies	40-60
Public Service-Related Technologies	
Interdisciplinary	Combine the factors of the various academic programs from which the interdisciplinary courses are combined.

Research and Graduate Training Facilities: Includes service (workload support) space.

Academic Program	Assignable Square Feet per Faculty Member Engaged in Research
Agriculture and Natural Resources, Engineering, Biological Sciences, Physical Sciences	900-1,300
Architectural Design, Fine & Applied Arts, Home Economics, Psychology, Communications	600-900
Education, Area Studies, Business and Management, Computer and Information Science, Foreign Languages, Letters, Library Science, Mathematics, Public Affairs and Science, Law, Theology	150-200

OFFICE AND CONFERENCE FACILITIES:

Organizational Unit	Type of Institution	Assignable Square Feet per FTE Staff Requiring Space*
Academic Units (see note below)	University	140/170 ASF/FTE Staff
	4-year	125-150 ASF/FTE Staff
	2-year	110-130 ASF/FTE Staff
Non-Academic Units	All Institutions	140-170 ASF/FTE Staff

*These values include allowances for office, office service, conference room, and conference room service types of facilities.

Note: This system does not provide differential values of the criterion for different groups of employees. However, suggested differential values for academic offices are as follows:

- Single faculty member or equivalent: 110 +\- 10 net square feet
- Double faculty member or equivalent: 165 +\- 15 net square feet
- Department chairpersons or equivalent: 165 +\- 15 net square feet
- Deans or equivalent: 200+\- 20 net square feet

Although faculty and professional staff usually are given larger offices and generate the requirements for conference room space, the other groups of employees create the demand for most office service facilities. The overall factors thus tend to even out.

Study Facilities, Libraries:

Stack Space: If “volume” is arbitrarily defined as a bound volume, the single value of 0.10 ASF per volume is appropriate. The calculation of volume equivalents is so complex as to be inappropriate as a required step in a generalized planning system. Therefore, it is suggested that a planning criterion of 0.10 ASF per bound volume be used with the recognition that use of this factor carries with it an implied assumption concerning the mix of library resources.

Study (Seating) Spaces: A value of 25-35 ASF per station for library study is appropriate for most institutions. However, a higher value for library study space may be required in those instances where private study cubicles are provided for faculty and/or graduate students. The number of stations to be provided is determined on the basis of a policy decision which should be explicit in the program. The requirements for a law library, for instance, may be such that a station for each student may be required.

Library Service Processing Space: This space (recommended at 5% of the sum of stack and study areas) should include only such areas as card catalogs or catalog stations, circulation desks, or other direct processing space. Library office space requirements should be calculated in accordance with space requirements for similar office spaces in other organizational units.

If library office space is not calculated separately, then the sum of the office and other library processing areas will range from 20% (for large libraries) to 25% (for smaller libraries) of the total amount of space in the study and stack categories.
Special, General, and Support Uses: Space requirements for such spaces will be individually assessed.

- Special Use: armories, athletic, physical education, audio/visual, clinic (non-medical), demonstration and field-service facilities.
- General Use: assembly, exhibition, food, student health, lounge, merchandising, and recreation facilities.
- Support: Central food store, central laundry facilities, data processing and computer, shop, storage, and vehicle storage.

STATE OF MICHIGAN
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STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX FOUR

SAMPLE MANAGEMENT AGREEMENT, MONTHLY REPORT FORMAT, BUDGET SHEET, PROOF OF OWNERSHIP, MATCHING FUNDS AND MONTHLY EXPENDITURE REPORTING FORMAT

APPENDIX FOUR – SAMPLE MANAGEMENT AGREEMENT,
MONTHLY REPORT FORMAT AND BUDGET SHEET

Note: Final text of a Project Management Agreement for a particular project may vary from this sample.

CAPITAL OUTLAY
PROJECT MANAGEMENT AGREEMENT

This Project Management Agreement ("the Agreement") is made between the State of Michigan Department of Technology, Management and Budget ("the DTMB") and xxxxxxxxxxxxxxxxxxxxxxxx ("the Project Agent") for the xxxxxxxxxxxxxxx("the Project") and is effective as of the date of the final signature to the Agreement.

WHEREAS, the Project Agent intends to expend the total authorized costs for the construction of the Project, appropriated pursuant to xxxxxxxxx;

WHEREAS, the State of Michigan (the "State"), agrees to provide the Project Agent with the State share of funding for the Project authorized and appropriated pursuant to xxxxxxxxxxxx, and subject to the terms and conditions of the Agreement;

WHEREAS, sections 237, 237a, 242, 244, 246, and 248 of 1984 PA 431 ("the Management and Budget Act") establish conditions for the expenditure of capital outlay project appropriations; and

WHEREAS, the DTMB and the Project Agent desire to establish the terms and conditions set forth in the Agreement.

NOW, THEREFORE, in consideration of the mutual rights and obligations set forth in the Agreement, the DTMB and the Project Agent agree as follows:

Section I. Definitions

As used in the Agreement:

A. "DTMB-FS" means DTMB Financial Services, Fiscal Management Division.

B. "DTMB-SFA" means DTMB State Facilities Administration, Design and Construction Division.

C. "JCOS" means the Joint Capital Outlay Subcommittee of the Appropriations Committees of the Michigan Legislature.

D. "Project" means a capital improvement project as defined in a program statement and schematic design approved by the DTMB.

E. "SBA" means the State Building Authority.

Section II. Total Authorized Cost

A. The Project will be constructed within the total authorized cost of $xxxxxxxxx.00 (SBA share $xxxxxxxx.00; General Fund/General Purpose share $xxxx.00; College share $xxxxxxxx.00), appropriated pursuant to xxxxxxxxxx.

B. The Project Agent shall provide funding from College sources for any costs exceeding the total authorized cost of the Project, subject to authorization by the Michigan Legislature in a budget act or in a concurrent resolution.

C. The Project Agent shall certify by letter to the DTMB-SFA that the College share of the total authorized cost established for the Project pursuant to xxxxxxxxx is available prior to the start of construction of the Project. The Project Agent shall use Attachment A in providing such certification.

D. The Project Agent shall receive approval from the DTMB-SFA to use in-kind materials, equipment, or other items as part of the College share of the total authorized cost established for the Project pursuant to xxxxxxxx prior to submitting the certification under Section II. (C). The Project Agent shall provide an independent third-party evaluation of the value of the in-kind contribution(s) to DTMB-SFA. The value of in-kind materials, equipment, or other items authorized by DTMB-SFA shall be determined at the time of approval.

E. The Project Agent shall document and receive prior approval from the DTMB-SFA to use any expenditures, other than planning costs, incurred prior to enactment of xxxxxxxxxx as part of the College share of the total authorized cost established for the Project pursuant to xxxxxxxxx prior to submitting the certification under Section II. (C).

F. The Project Agent shall not use expenditures incurred for Phase I and Phase II environmental surveys, or costs of site environmental cleanup as part of the College share of the total authorized cost established for the Project pursuant to xxxxxxxxxx.

G. The DTMB-SFA shall not authorize expenditures for changes that are inconsistent with the intent of the approved program statement as part of the College share, the SBA share, or the GF/GP share of the total authorized cost established for the Project pursuant to xxxxxxxx.

H. The total authorized cost of the Project shall include DTMB-SFA fees pursuant to Section III (F).

I. The DTMB-FS shall release, upon approval by DTMB-SFA, the SBA share, and the GF/GP share of the total authorized cost established for the Project pursuant to xxxxxxxxx subject to the following conditions:

1. The Project Agent has documented to the DTMB-SFA that the College share of the total authorized cost of the Project established pursuant to xxxxxxxxx has been entirely expended.

2. All requirements established by the SBA for the Project established pursuant to xxxxxxxxx have been completed, submitted and approved by the SBA. Specific SBA requirements take precedence over the Agreement and any other agreement and contract associated with the Project.

3. All requirements established by the Agreement for the Project established pursuant to xxxxxxxxx have been completed, submitted and approved by the SBA.

J. The DTMB-FS shall reduce the SBA share, the College share, and the GF/GP share (only if GF/GP share is greater than $200.00) of the total authorized cost in the same proportion, if expenditures for the Project are less than the total authorized cost established pursuant to xxxxxxx.

Section III. Project Expenditures

A. The Project Agent shall issue payments for allowable costs of the Project as defined in the Capital Outlay Design Manual *(the document this sample agreement is incorporated)*,

prepared by the DTMB-SFA. Only payments for materials, equipment, and services directly related to the Project will be allowed, subject to the review and approval of DTMB-SFA.

B. The project agent shall give preference to goods or services, or both, that are manufactured or provided by Michigan businesses if they are competitively priced and of comparable quality.

C. The Project Agent shall not expend funds from the total authorized cost of the Project established pursuant to xxxxxxxxxx for Phase I and Phase II environmental surveys nor for site environmental cleanup.

D. The Project Agent shall not expend funds from the total authorized cost of the project established pursuant to xxxxxxxx for College employees and/or staff performing construction, construction management services, or project inspections.

E. The Project Agent shall receive approval from the DTMB-SFA prior to expending funds from the total authorized cost of the Project established pursuant to xxxxxxxxxx for asbestos abatement, lead paint remediation and lighting ballast removal in remodeled areas of existing buildings.

F. The DTMB-SFA shall charge a fee for document verification, audit, and expenditure review services. The Project Agent shall allow the DTMB-SFA, the DTMB-FS, and the SBA access to expenditure records of the Project, as necessary to provide these services. The fee shall equal 1 percent of the total authorized cost established pursuant to xxxxxx, but shall be no less than $75,000.00, and no more than $500,000.00.

G. The Project Agent shall submit evidence of payments certified by a College official, monthly, to the DTMB-SFA. The Project Agent shall use Attachment B in submitting such reports.

H. The Project Agent shall assume the cash flow burden associated with issuing payments for the construction of the Project until all approvals and financing needed for the SBA share of the total authorized cost of the Project have been completed. Pending SBA reimbursement, the Project Agent shall authorize expenditures for more than the College share of the total authorized cost of the Project. Neither the State nor the SBA will reimburse the Project Agent for any costs incurred to meet cash flow requirements, including interest costs.

I. The Project Agent shall assume responsibility for any costs incurred to bring the Project to satisfactory completion under Section VIII. (C). of the Agreement.

J. The funding for the total authorized cost of the project established pursuant to xxxxxxxxxxx is available for expenditure for a period not to exceed 23 months after the Project is substantially complete, as determined by the issuance of a Certificate of Tenantability, pursuant to section 248, 1984 PA 431.

Section IV. Property Ownership

A. The Project Agent shall provide the DTMB-SFA with legal documentation that the Project will be located on a site owned by the University/College. The Project Agent shall use Attachment C in submitting such documentation and shall also include copies of the current deed(s) for the property.

B. In Attachment C, the Project Agent shall also stipulate and provide legal documentation to support that the Project site is free of liens, easements or other title restrictions that would hinder development or prevent conveyance of good and marketable title to the SBA.

Section V. Environmental Conditions of Property

A. The Project Agent shall provide the DTMB-SFA with documentation that the Project will be located on a site free of environmental contamination not more than 90 days after signing this Agreement.

B. The Project Agent shall provide documentation supported by a Phase I environmental survey and, if required, a Phase II environmental survey as determined by the American Society for Testing Materials standard practice for E1527-97 Environmental Site Assessment.

C. The Project Agent shall retain sole responsibility for any environmental contamination on the Project site and for any required cleanup of contamination. The Project Agent shall indemnify and hold harmless the DTMB and the SBA, their agents, employees and representatives from any and all liability incurred as a result of or arising out of any environmental contamination.

Section VI. Plan Review

A. The Project Agent shall ensure the Project will not exceed the design and program scope represented in the program statement and schematic design submitted to the DTMB-SFA and approved by the DTMB Director and the State Budget Director on xxxxxxxxx.

B. The Project Agent shall ensure compliance with the approved program statement for the Project by reviewing preliminary plans and final construction documents, and confirming that the estimated budget for the Project does not exceed the total authorized cost established pursuant to xxxxxxxxxxx.

C. The Project Agent shall submit preliminary planning documents and detailed budget sheet for the Project to the DTMB-SFA for approval. The Project Agent shall use the format described in the Capital Outlay Design Manual *(the document this sample agreement is incorporated)* balance of this document, prepared by DTMB-SFA, and Attachment D in submitting such documentation.

D. The Project Agent shall submit an outline of the proposed bid process to the DTMB-SFA.

E. The Project Agent shall submit final construction documents for the Project to the DTMB-SFA evidencing the Project is substantially unaltered from the approved preliminary planning documents.

F. The DTMB-SFA shall notify the Project Agent of the approval of the bid process and final construction documents and authorize the Project Agent to begin a bidding process for the Project pursuant to section 242, 1984 PA 431.

G. All construction bidding shall be conducted in an open, fair and competitive environment. The construction contract award shall be made to the lowest responsive, responsible bidder who submits a bid that conforms in all material respects with the requirements of the bidding documents.

H. The Project Agent shall provide DTMB-SFA with bid tabulations and itemized accounting of the total budget for the Project after receiving the construction bids and prior to awarding contracts. The itemized budget must indicate the Project can be completed within the total authorized cost established pursuant to xxxxxx. The itemized budget must be certified by a College official and by the architect for the Project. The Project Agent shall use the format in Attachment D (updated with bid results) in submitting this documentation.

I. The DTMB-SFA shall notify the Project Agent of approval to proceed with the awarding of contracts pursuant to section 237a, 1984 PA 431.

Section VII. Project Management and Oversight

A. The Project Agent shall provide day-to-day inspection of the Project construction.

B. The Project Agent shall provide monthly progress reports to the DTMB-SFA, including current cash flow projections, copies of all change orders approved by the Project Agent, field orders and a description of any other changes to the final construction documents. The Project Agent shall use the format in Attachment E in submitting the progress reports. Reports will be due by the 20th of the month for the month preceding.

C. The Project Agent shall ensure that contracts awarded by the Project Agent conform to the Project budget estimate and result in completion of the Project within the total authorized cost and in conformance with scope and purpose as approved by the DTMB-SFA.

D. The Project Agent shall notify the DTMB-SFA of any meetings related to the Project to allow for DTMB-SFA attendance.

E. The Project Agent shall allow the DTMB-SFA to observe on-site construction activities.

F. The Project Agent shall provide the DTMB-SFA with access to shop drawings, field reports, meeting minutes, schedules, testing reports, payment records and other documents necessary to substantiate the status of the Project.

G. The Project Agent shall report to the DTMB-SFA and to the SBA any event that adversely impacts the Project budget or completion schedule, including any claims or lawsuits, within two weeks of the occurrence of the event or legal filing. The Project Agent shall provide copies of claims and lawsuits to the DTMB-SFA.

Section VIII. Rescission of Project Agent Responsibilities

A. The DTMB-SFA Project Manager shall notify the Project Agent when the Project Agent is not in compliance with provisions of the Agreement. If issues of non-compliance are not addressed by the College within two weeks of notification, the DTMB-SFA Project Manager will call a meeting of the Project Agent, SBA, and State budget office for the purpose of developing a compliance plan. Failure on the part of the Project Agent to address issues within the timeframes outlined in the compliance plan will require notification to the DTMB Director.

B. The DTMB Director shall provide written notification to the Project Agent, State Budget Director, and JCOS when, in the reasonable opinion of the DTMB Director, the status of the budget or the scheduled completion of the Project jeopardizes the financial interest of the State or the SBA.

C. The Project Agent shall have thirty (30) days to resolve the specific issues outlined in the notification letter from the DTMB Director.

D. The DTMB Director may take appropriate action to bring the Project to a satisfactory completion if the specific issues outlined in the letter from the DTMB Director are not resolved to the reasonable satisfaction of the DTMB Director. Any costs associated with such action shall be the responsibility of the College.

Section IX. Nondiscrimination

In connection with the Agreement, the Project Agent agrees to comply with the provisions of the Elliott-Larsen Civil Rights Act, 1976 PA 453, as amended, and the Michigan Handicappers' Civil Rights Act, 1976 PA 220, as amended, and specifically agrees not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, privileges of employment because of a handicap that is unrelated to the individual's ability to perform the duties of a particular job position, or because of race, color, religion, national origin, age, sex, height, weight, or marital status. Breach of this covenant may be regarded as a material breach of the Agreement.

Section X. Cancellation

The Project Agent acknowledges that the Agreement is subject to appropriation for the Project. In the event the Legislature fails to provide, or terminates, the funding necessary for the Project, the State may cancel the Agreement without further liability by providing written notice to the Project Agent thirty (30) days prior to the date of cancellation provided, however, that in the event that the action of the Legislature results in an immediate absence or termination of funding, cancellation may be made effective immediately upon delivery of written notification to the Project Agent. In the event of a termination, the Project Agent shall unless otherwise directed by the State in writing, immediately take all reasonable steps to terminate its operations and to avoid and/or minimize further expenditures under the Agreement.

Section XI. Governing Law

The Agreement shall be governed by the laws of the State of Michigan.

Section XII. Authorized Signatures

To evidence the Agreement set forth above, the Project Agent and the DTMB execute the Agreement on the dates set forth below each signature.

XXXXXXXXXXXXXXX Department of Technology, Management and Budget

_____ _____

Signature and Title *current director*, Director

Printed Name: _____

_____ _____

Date Date

Created: *Date*
State Budget Office
Michigan Department of Technology, Management and Budget

FORMAT FOR THE
CERTIFICATION OF MATCHING FUND AVAILABILITY
ON UNIVERSITY (U) AND COMMUNITY COLLEGE *(CC)*
CAPITAL OUTLAY PROJECTS

[University/Community College Letterhead]

Date

Dear Project Director, DTMB-SFA

I, _____ , the _____ (e.g. Vice President of Finance), pursuant to the Project Management Agreement for the _____ (the "Project"), dated _____, certify to the following with respect to the University/Community College (University) funds on hand to satisfy the match requirements of the University Project cost share.

Funds on Hand

The University has in its possession the funds that fully satisfies the $_____ match requirement for the Project. These funds are in the form of cash or investments that are readily accessible for construction expenditures.

BY: (University/Community College)

_____

Signature Date
Printed Name:

ATTACHMENT B

FORMAT FOR THE
MONTHLY PAID EXPENDITURE REPORT

- The following is a format to be used by Universities (U) / Community Colleges (CC) to report direct expenditures made by the U/CC on major capital outlay projects.

- Begin submitting these reports when the project is legislatively authorized, during the design phase.

- The U/CC shall submit this report to DTMB-SFA, monthly, clearly stating the period ending dates, organized in budget categories, and attaching supporting documentation. Supporting documentation should include a copy of the invoice and evidence of payment.

- A requisition memorandum and cash flow projection is requested as part of the monthly paid expenditure report.

- DTMB-FS will compute the reimbursement amount. Please do not include any unreimbursed amounts from previous months in the current monthly detail.

- Reports are to be submitted monthly once projects begin to incur expenses, even if the U/CC is not yet receiving any reimbursements. The expenditures will accumulate in a timely manner and once the U/CC meets its match, reimbursement will be much quicker.

- It is not necessary to compute expenditure reporting to exactly meet the match amount. DTMB-FS will note that the match has been met and will begin reimbursement at whatever amount exceeds the match.

- If the project is completed without expending the total authorized project cost, the DTMB-FS will calculate the pro rata share of expenditures in accordance with the respective financing shares established in the total authorized project cost. If a U/CC has paid for project costs in excess of its pro rata share, the U/CC will be refunded excess funds.

- Projects under one appropriation, but consisting of multiple phases, must be reported separately. This will ensure the U/CC is reimbursed on a timely basis for each phase of the project.

- It is the intent of the DTMB to have a 14 day turn around time on U/CC requests for reimbursement. DTMB similarly requests the same turn around time from the U/CC for project expenses paid to the State of Michigan.

See Format on Next Page…

ATTACHMENT B

REQUISITION MEMORANDUM

Req. No. _____
Date: _____

MEMORANDUM

TO: Department of Management and Budget
State Facilities Administration, Design and Construction Division

FROM: (University/Community College)

SUBJECT: (Project Title)

This Requisition, in the total amount of $_____, is to be advanced from the State's General Fund for (University/Community College)'s expenditures relating to the State Building Authority's share of the cost of the (Project Title). Detail of (University/Community College)'s expenditures are contained in the attached supporting documentation. Please remit the payment of $_____ to (University/Community College) at the following address:_____.

With this request, the (University/Community College) hereby certifies:

1. This Requisition is being made for costs which would be properly chargeable to the State Building Authority and has not been the basis of a previous payment.

2. The cost to (University/Community College) represented by this Requisition is not less than the amount to be paid thereunder.

3. All Bills of Sale necessary to vest title to the portion of the facility covered by this Requisition in the State Building Authority have been executed and delivered or assigned to (University/Community College).

4. Nothing has occurred to the knowledge of (University/Community College), which prevents the (University/Community College) from entering into the lease with the State of Michigan and the State Building Authority.

5. The project cost, as authorized by the Legislature, is sufficient to complete a tenantable facility, as contemplated by the proposed State Building Authority lease.

6. Estimated completion date of the facility is _____.

_____

(University/Community College)
BY: _____
TITLE: _____

APPROVED BY STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

BY: _____ DATE: _____

ATTACHMENT B

MONTHLY PAID EXPENDITURE REPORT

Great Lakes University
Science Center Renovation - Phase I
File No.: 332/00365.XYZ

Report No. 1
Period Ending 12/31/2030

DATE PAID BY COLLEGE	CATEGORY (FROM BUDGET)	CONTRACTOR/VENDOR	DOCUMENT NO.	AMOUNT
PROFESSIONAL SERVICES AND CODE REVIEW				
12/9/2030	Arch/Engin/Code Review	Great Architects, Inc.	WO53013	$13,193.96
12/9/2030	Quality Control Testing	Cautious Testers Co.	WO56557	$2,833.29
12/9/2030	Consultant	Fine Engineering, Inc.	WO61030	$2,645.26
Total Professional Services and Code Review - Phase I				**$18,672.51**
CONSTRUCTION AND SITE IMPROVEMENTS				
12/17/2030	Construction	Careful Construction, Inc.	WO58734	$1,363,998.86
FURNISHINGS				
12/13/2030	Furnishings	Aspen, Cedar & Assoc.	PO60299	$17,595.00
12/11/2030	Furnishings	Hunter Scientific Co.	PO57260	$13,768.00
Total Construction and Furnishings - Phase I				**$1,395,361.86**
AMOUNT OF DIRECT EXPENDITURES to be APPROVED by DTMB-SFA for Period Dec. 1 - Dec. 31, 2030				$1,414,034.37
Previously submitted for approval through Nov. 30, 2030 (whether reimbursed or not)				$1,323,414.62
TOTAL DIRECT EXPENDITURES as of DECEMBER 31, 2030				**$2,737,448.99**

ATTACHMENT C

FORMAT FOR THE
CERTIFICATION OF PROJECT SITE OWERNERSHIP ON
UNIVERSITY (U) and COMMUNITY COLLEGE (CC)
CAPITAL OUTLAY PROJECTS

[University/Community College Letterhead]

Date

Dear Project Director, DTMB-SFA

I, _____ , the _____ (e.g. Vice President of Finance), pursuant to the Project Management Agreement for the _____ (the "Project"), dated _____, certify to the following with respect to the University/Community College (University) proof of ownership of the Project site.

Proof of Ownership

The University is the current owner of the Project site, and the University's ownership of the Project site is free and clear of any restrictions that would prevent the University from conveying clear title to the State Building Authority. These restrictions include, but are not limited to, rights of reversion, rights of re-entry, mortgages, liens, life estates, leases, easements, rights of way, divested mineral rights, contract rights or third party rights. If any such restrictions or any ownership defects are discovered after the date of this certification, the University acknowledges that the restrictions and defects must be eliminated (or modified to the satisfaction of the State Building Authority) before the State Building Authority advances funds for the Project.

BY: (University/Community College)

_____

Signature Date
Printed Name:

BUDGET (All columns must be completely filled out)				
PROJECT:				
CATEGORY	Actual Amounts When Bids are Received	Budget for New Construction	Budget for Renovation	Total Budget Number
PROFESSIONAL SERVICES:				
Architectural or Engineering	$	$	$	$
Surveys and Site Investigations				
Quality Control Testing				
Construction Management				
Commissioning				
CONSTRUCTION:				
Structures-Gen/Mech/Elect/Etc. (BID AMOUNT)	$	$	$	$
Services/Utility Extensions to Site				
Site Improvements				
Code Review/Permits Paid by: _____				
Asbestos Abatement (if applicable)				
Other Costs/Commitments				
Telecommunications				
Furnishings/Equipment				
Contingency (A Minimum of 7% of Estimated Construction Cost must be shown)				
DTMB-SFA Fees *				
TOTAL PROJECT AUTHORIZATION/COST	**$**	**$**	**$**	**$**

DTMB-SFA Fees* When the U/CC designates DTMB-SFA to provide management and construction oversight of the project, the DTMB-SFA fee is 1.5% of the authorized project cost. When the U/CC self-manages the project, the fee is 1% of the authorized project cost (with a minimum fee of $75,000 and maximum of $500,000).

FORMAT FOR THE
MONTHLY CONSTRUCTION PROGRESS REPORT
UNIVERSITY (U) AND COMMUNITY COLLEGE (CC)
CAPITAL OUTLAY PROJECTS

ATTACHMENT E

I. **Executive Summary:**

A. A brief description of the project.

B. A written summary of the Progress to Date, including a listing of any problems that may cause delay or additional cost to the project and project completion percentage.

C. A written summary of the Project Budget indicating the authorized project funds, amounts encumbered, (under contract), change orders increasing or decreasing the contract amount, project and construction contingencies, and pending changes to the contracts.

D. An updated Cash Flow projection.

E. A written summary of the project schedule.

II. **Project Status Report Attachments:**

A. Review of current status.

1. Architecture and Engineering.

2. Construction, including average daily on site construction personnel and status of work in progress broken, down by trades and project safety report.

3. Identify issues which may have an impact on the project schedule.

4. Project Meeting Minutes

B. A Project Data Sheet with budget breakdown for the following categories (see Budget Sheet):

1. The structure (general, mechanical, electrical) with a separate line item for telecommunications.

2. Services from five feet outside of structures (sewers, water supply, gas, electrical service, etc.).

3. Site improvements (roads, walks, grading, etc.).

4. Furnishings (furniture, movable equipment, etc. not considered a part of the structure nor requiring fixed mechanical and/or electrical services).

5. Professional fees, surveys, site investigations, fees for project management consultants, etc.

6. Project contingencies.

7. Total project cost (cannot exceed authorized appropriation).

C. Each of the above categories is to be broken down further to reflect the following:

Approved Budget (dated)	Current Contract Amount
Bids	Payments to Date

Initial Contract Amount Balance to be Paid
Change Orders

Each of the trades, material suppliers, subcontractors, code review fees, telecommunications, etc. amounts are to be listed as line items and broken down.

D. A Change Order Report listing the following:

1. The Change Order Number
2. Change Order Title
3. Explanation
4. Amount

E. A Request for Information (RFI) Log.

F. An original approved, (submitted at the start of construction) and an updated Project Schedule indicating all activities for the project.

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX FIVE

PRELIMINARY/DESIGN DEVELOPMENT SUBMISSION REQUIREMENTS

APPENDIX FIVE – PRELIMINARY/DESIGN DEVELOPMENT SUBMISSION REQUIREMENTS

Phase 400 - Preliminary/Design Development Submission

The Project Management Agreement between a University/Community College and the Department of Technology, Management and Budget must be signed and in place before submitting the Preliminary/Design Development Submission. Submit an electronic copy of the Design Development Submittal to the DTMB-SFA for approval in accordance with this Capital Outlay Manual Design Manual. Upon DTMB-SFA request hard copies are also to be provided. Allow a minimum of three weeks for review and approval.

A. Introduction: Update from Program/Schematic Submission, incorporating the results of the Preliminary/Design Development Submission. Outline changes to approach, design, program, and project from the previous submission. Discuss the instructional goals (for U/CC projects) or operational goals (for State Agency projects) of the project. Include a short justification for the project. Describe the proposed project, summarizing the result of the preliminary/design development phase. Describe planned phases or project components.

B. Phase I Environmental Report: Provide a copy of the Phase I Environmental Report per the requirements of the Management Agreement. This report may be provided in advance of the total Preliminary/Design Development Submission but should be provided within 90 days after the Management Agreement is signed The Phase I Environmental Survey must not be more than seven years old and must be for the specific site. If environmental laws have changed since the latest Phase I Environmental Survey, then the survey must be redone.

C. Proof of Ownership and Matching Funds: Provide a copy of the Proof of Ownership and Matching funds per the requirements of the Management Agreement. This copy may be provided in advance of the total Preliminary/Design Development Submission but must be in place before requesting authorization to bid.

D. Property Deed: Provide a copy of the deed for the specific property where the project is to be located.

E. Net and Gross Areas: Updated from Schematic Design Submittal in accordance with findings and results of design development phase. Establish net to gross efficiency ratios for building type. Only for particular project types such as hospitals and laboratories may the net to gross ratio be less than 60 percent – see “Net to Gross Ratio Guidelines,” in Appendix 8.

F. Building Capacity: Updated summary tabulation based on capacities established in Schematic Design. List the capacity of the building in terms of students, beds, patients, inmates, staff, workstations, books, etc.

G. Outline Specifications: Include architectural, structural and mechanical/electrical systems criteria, descriptions and operating modes and limitations.

H. Furnishings List: By item and department as developed by the State Agency, University, or College.

I. Project/Program Cost: Provide cost estimate with total project cost as well as individual phases. Use Project Data Sheets (Appendix 8) for format.

J. Design and Construction Schedule: By month and year, indicating schedule of proposed submittals, bidding, award, and construction. Show projected bidding schedule with bidding phases. See Appendix 8 for format.

K. Annual Operating Budget: Show projected costs of utilities, insurances, janitorial/maintenance services, window washing, security, etc.

L. Approvals: Program, program amendments, and applicable approval letters from U/CC, State Agency, DTMB-SFA, State Budget Office.

M. Drawings: (May be half-size or foldout in 8-1/2" x 11"):

a. Location Map
b. Legal Description
c. Existing Conditions Site Plan showing only (except delineate in proposed structure) existing physical features including topography and all overhead and underground utilities (same scale and orientation as following Site Plan)
d. Site Plan(s) showing soil boring data, landscape layout, erosion and sedimentation control, location and sizes of proposed structures and related roads, walks utilities, services, grading, and other significant features.
e. Floor Plans at appropriate scales, including room names and area figures in each room. Show the essentials of built-in equipment and movable furnishings.
f. Elevations developed with materials and heights.
g. LEED checklist.
h. Basic building cross-sections.
i. Primary wall sections.
j. Floor Plans showing all structural systems and utilities systems shafts.
k. Preliminary single-line mechanical/electrical diagrammatic concept.

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX SIX

FINAL DESIGN/CONSTRUCTION DOCUMENT SUBMITTALS

Phase 500 – Final Design/Construction Document Submission

Provide one electronic set of construction documents to the DTMB-SFA for approval in accordance with the Capital Outlay Design manual. Upon DTMB-SFA request hard copies are also to be provided. Construction documents must include complete contract documents and specifications including complete General Conditions and contract language. Provide a submission for each phase of construction bidding. Drawings are preferred in half-size hard copy sets rather than full size rolls.

Provide a description of the U/CC's bid review and award process and criteria to the Project Director for approval prior to requesting construction document review and approval to proceed to bidding. Discuss the criteria, requirements, scoring, or other qualifications assessments to be used by the U/CC.

The State of Michigan can assist a U/CC by advertising the project bids or RFPs on Welcome to CGI Advantage Vendor Self Service Portal: Home (michigan.gov), the State's online bid advertisement program. If the U/CC would like to use this service, please contact the Project Director for an Advertisement form.

Items required to support the financing and bonding are also required:

A. Budget Estimates: Provide a complete budget review, showing the current budget status prior to bidding, prepared by the professional services contractor or the construction manager, showing all phases and budget categories.

B. Performance and Payment Bonds: Provide performance and payment bonds written by a surety authorized to do business in the State of Michigan by the Department of Insurance and Financial Services, listed on the current U.S. Department of the Treasury Circular 570, and, unless otherwise authorized by the University/CC or the DTMB in writing, must have at least an A– Best's rating and a Class VII or better financial size category per current A. M. Best Company ratings. The bonds must be payable to the U/CC, the State of Michigan, the SBA, and the Trustee as their interests may appear, assuring completion of the project and payment of all contracts and claims for acquisition, construction, installation, renovation and equipping of the project or a certificate in form and substance satisfactory to the Executive Director of the SBA evidencing the existence of the performance and payment bonds.

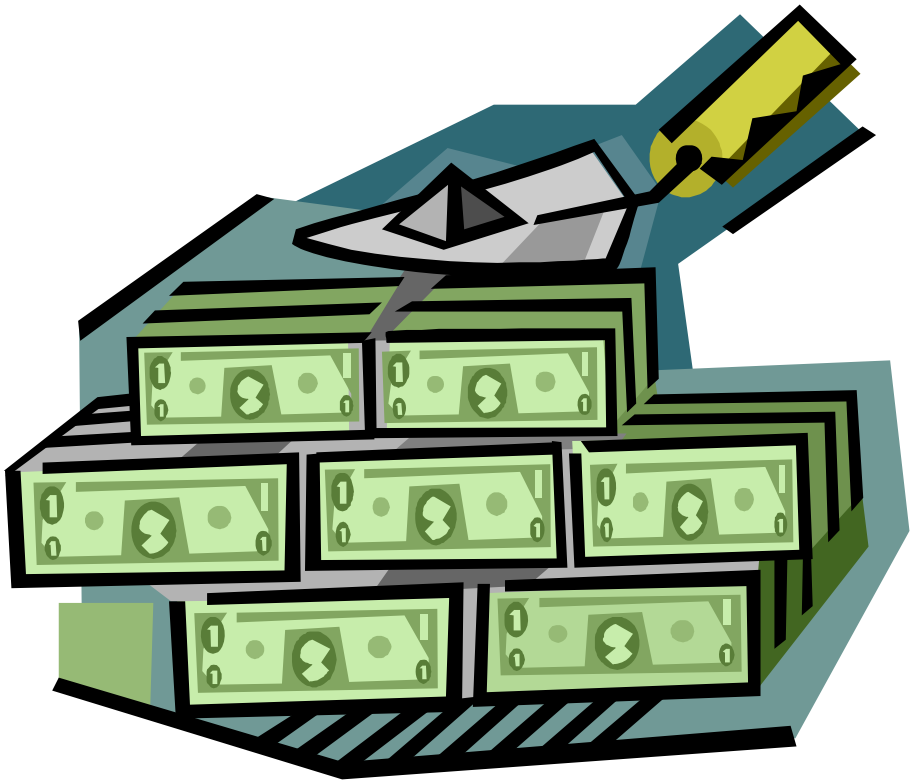
C. Builder's Risk Insurance Policy: Provide Builder's Risk insurance policy or policies issued by a financially responsible insurer fully qualified under the laws of the State to provide such insurance, insuring all contractors, the State and its departments, boards, commissions, officers and employees, the SBA, the Bank, and the Trustee in form and amount satisfactory to the Architect and the Executive Director of the SBA or a certificate in form and substance satisfactory to the Executive Director of the SBA evidencing such insurance, as the Executive Director of the SBA shall direct.

D. Copies of Contracts: Provide copy of the contract between the U/CC and the Professional Services Contractor, and between the U/CC and the Construction Contractor or Construction Manager.

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX SEVEN

ALLOWABLE CHARGES AGAINST TOTAL PROJECT COST



APPENDIX SEVEN – ALLOWABLE CHARGES AGAINST TOTAL PROJECT COST

The Michigan Legislature appropriates monies towards the project with the intention that those monies will be spent towards the design and construction of an instructional building. The State Agency, University, or College is expected to bear other costs as part of their operating expenses for which other appropriations have already been made. The intention, as well, is for a project to result in an occupiable, fully furnished building. In addition, requirements of the bonding providing the financing for the project require that certain costs not be charged against the total project cost.

A list of allowable and non-allowable charges against Total Project Cost follows. Should there be any questions, please contact the Project Director for information. Adherence to these guidelines will prevent delays in reimbursement throughout the course of the project. The local (University or College) share is considered an appropriation and is subject to the determination of allowability.

Allowable Charges (15):

1. Professional Design, Survey, Architectural, and Engineering Services
2. Professional Inspection and Testing Services
3. Audit Review (out of DTMB-SFA fee)
4. Insurances
5. Moving expenses to move operations out of remodeling or construction area
6. Specialized Consultants -- programming, furniture, communications, acoustical, legal, and environmental contractual services - verify prior to charging or hiring with DTMB-SFA
7. Construction Trades, including general conditions
8. Utilities to construction site and within construction site
9. Site work (walks, drives, landscaping)
10. Equipment
11. Furniture, furnishings
12. Demolition (for renovation only) of U/CC buildings
13. Telecommunications, computer networks, computers installed in the project building.
14. Advertisement for Bids
15. Plan Review Fees

Non-allowable charges (25):

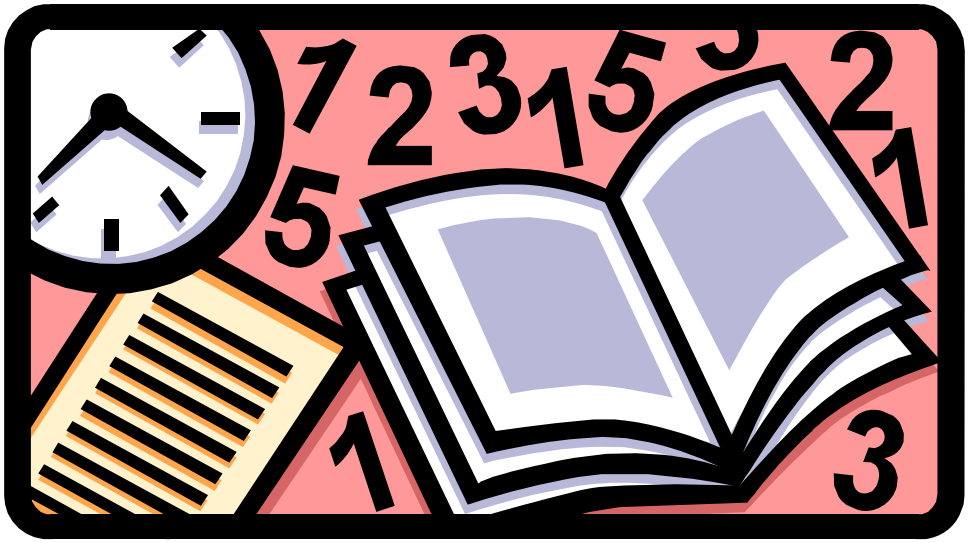
1. Land Purchase Cost
2. Fundraisers, promotional costs
3. Renderings, models
4. Ground breaking event costs
5. Force Account labor (work performed by any University/College staff or student labor during regular working hours or in overtime whether limited term or otherwise)
6. Relocation expenses (rent on temporary space, relocation consultants)
7. Moving expenses to move operations into the completed space or move operations within campus or other Agency building
8. Parking meters
9. Artwork, sculptures, fountains, non-instructional displays
10. Cost of preparing Phase I Environmental Study, Hazardous Materials investigations and/or subsequent environmental studies
11. Cost of title search
12. Bonding, legal or loan costs associated with local share raising
13. Costs associated with deed preparation, condominium creation and title clearance
14. Alcoholic beverages, food, drink
15. Investigation or research travel by University committee members
16. Office equipment, computers, office furniture if not installed in the project building
17. Software
18. University/college overhead - phones, internal printing, copying, utilities, motor pool vehicles, staff expenses, including overtime
19. Charges incurred prior to planning authorization

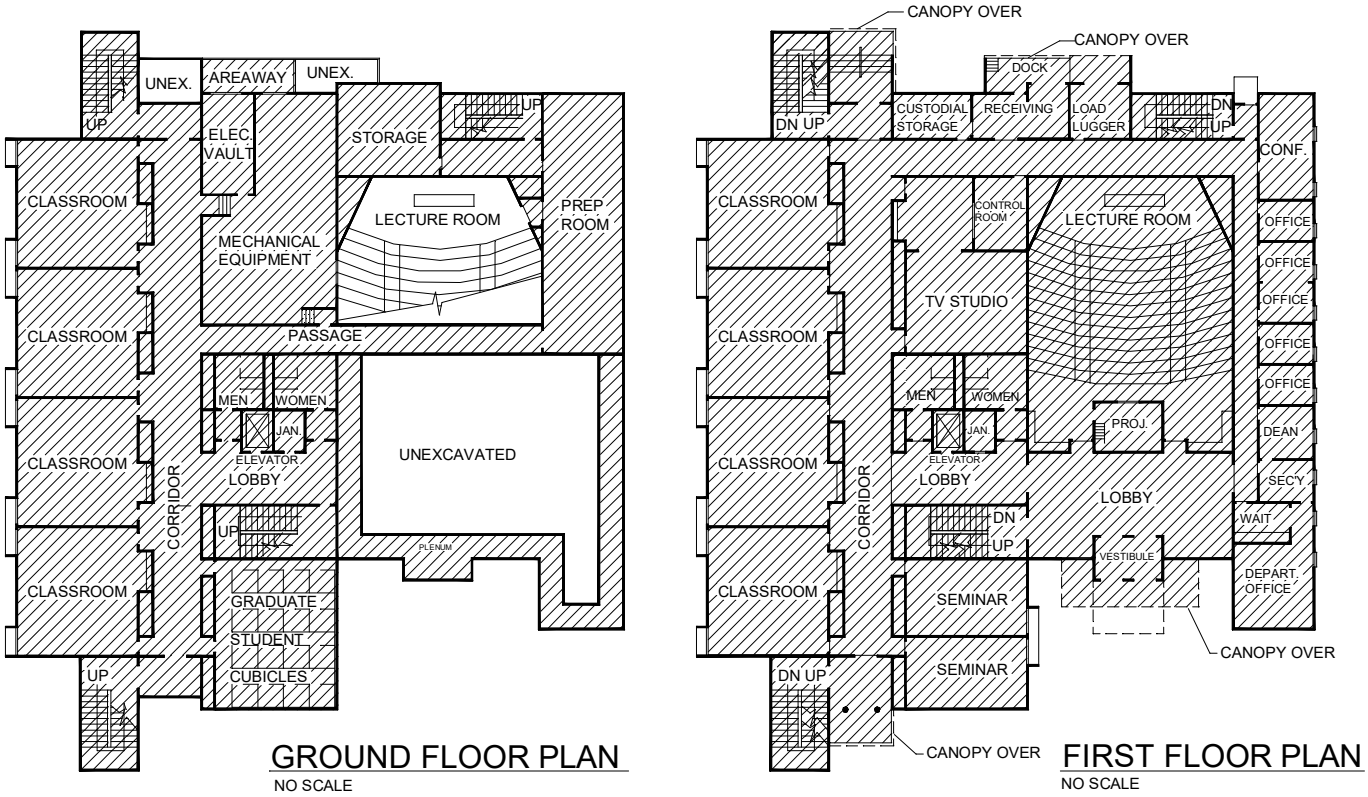
20. Demolition of a prior building to clear site for construction
21. Internal University or Community College Administrative Fees
22. Repair or maintenance of the building.
23. Storage Costs
24. LEED Registration
25. Rented or Leased Equipment

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION, DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX EIGHT

AREA CALCULATIONS – DATA SHEET(S)





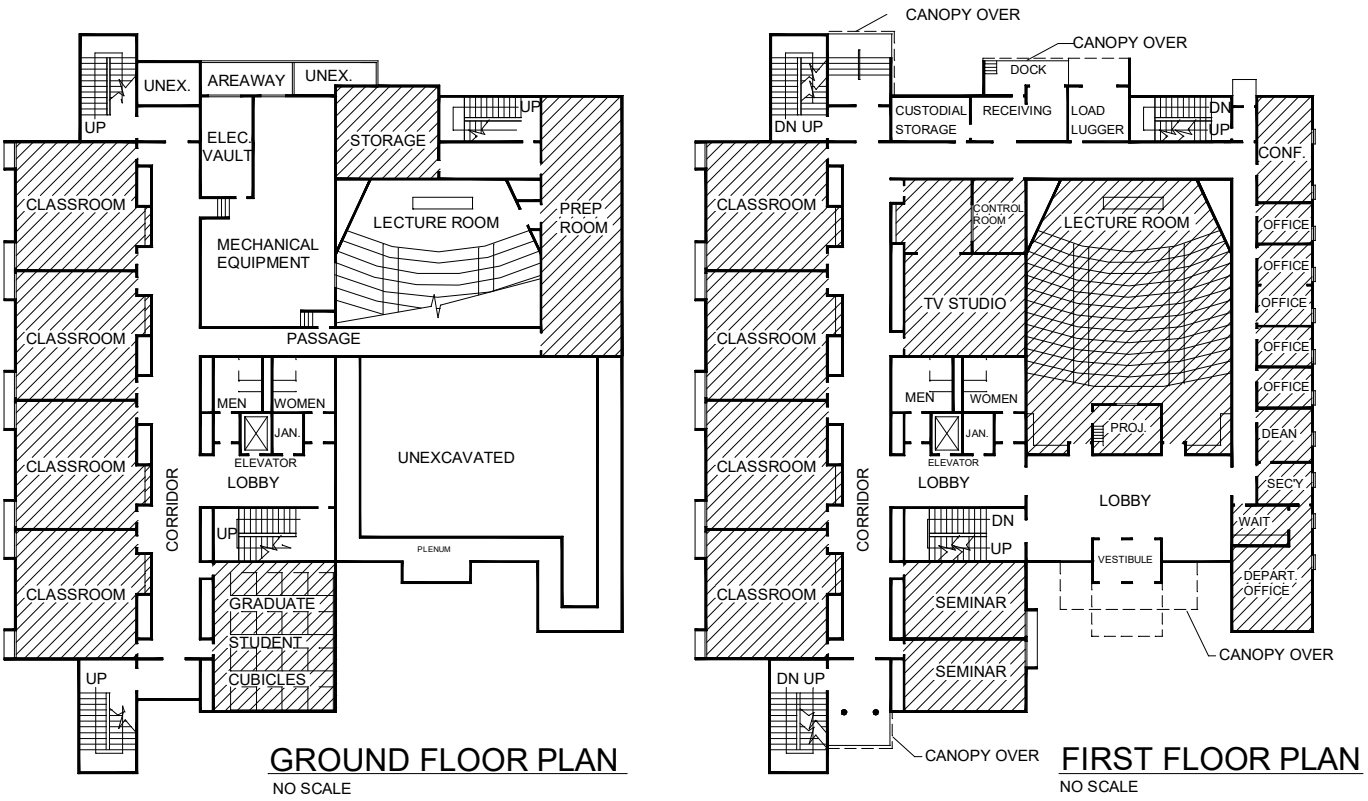
Gross Area

Definition: Gross area shall be construed to mean the sum of the floor areas included within the outside faces of exterior walls for all stories or areas which have floor surfaces.

Basis for Measurement: Gross area shall be computed by measuring from the outside face of exterior walls, disregarding cornices, pilasters, buttresses, etc., which extend beyond the wall face.

Description: In addition to floored spaces obviously covered above, gross area should include basements (except unexcavated portions), attics, garages, enclosed porches, penthouses and mechanical equipment floor, lobbies, mezzanines, all balconies (inside or outside) used for operational functions, and corridors, provided they are within the outside face lines of the structure. Roofed loading or shipping platforms should be included whether within or outside the exterior face lines of the structure.

Limitations: Open courts and light wells, or portions of upper floors eliminated by rooms or lobbies which rise above single floor ceiling height, shall not be included in the gross area, nor shall unenclosed roofed-over areas or floored surfaces with less than 6’-6” clear headroom be included, unless they can properly be designated and used as either net assignable, mechanical, circulation, or custodial areas.



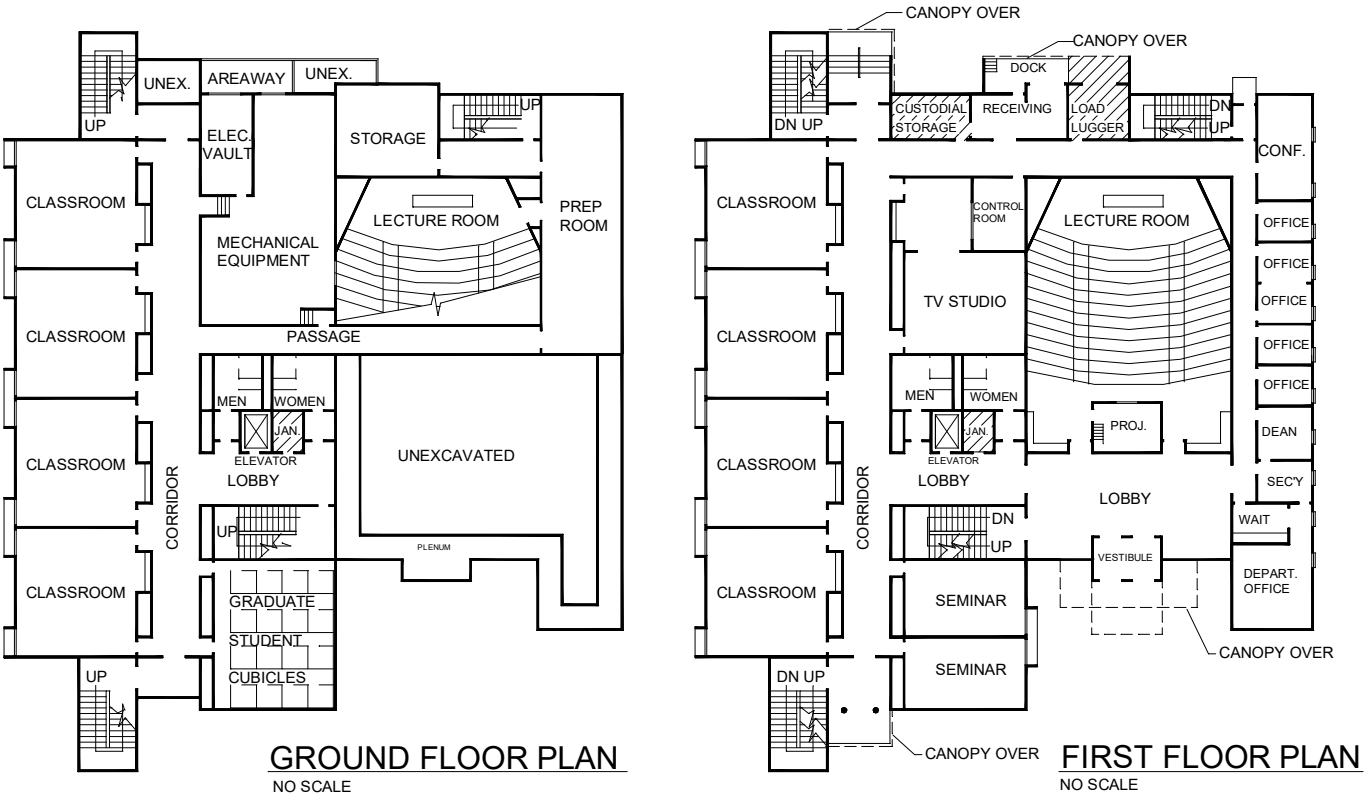
Net Assignable Area

Definition: Net assignable area shall be construed to mean the sum of all areas on all floors of a structure assigned to, or available for assignment to, an occupant, including every type of space functionally usable by an occupant (except those spaces elsewhere separately defined in custodial, circulation, and mechanical area classifications).

Basis for Measurement: All net assignable areas shall be computed by measuring from the inside finish of permanent outer building wall to the office side of corridors and/or to permanent partitions.

Description: Included shall be space subdivisions for offices, classrooms, laboratories, seminar and conference rooms, libraries, file rooms, storage rooms, etc., including those for special purposes (e.g., auditoriums, cafeterias, TV studios, faculty and student locker and shower rooms, maintenance and research shops, garages), which can be put to useful purposes in accomplishment of the institution's mission.

Limitations: Deductions shall not be made for columns and projections necessary to the structure.



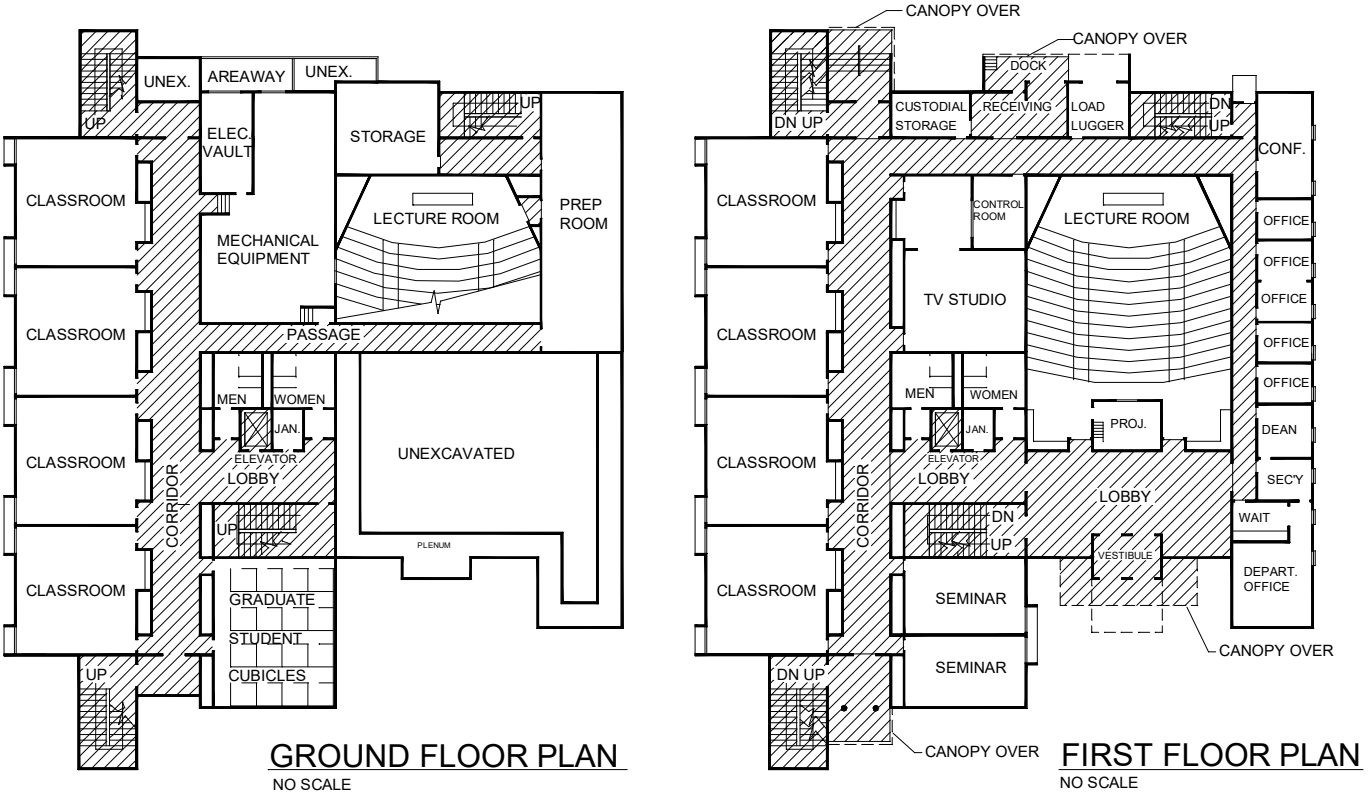
Custodial Area

Definition: Custodial area shall be construed to mean the sum of all areas on all floors of a structure used for protection, care, maintenance, and operation.

Basis for Measurement: These areas shall be measured from the inside surfaces of enclosing walls.

Description: Included shall be such areas as custodial, locker rooms, janitor's closets, and maintenance rooms.

Limitations: Deductions shall not be made for columns and projections necessary for the structure.



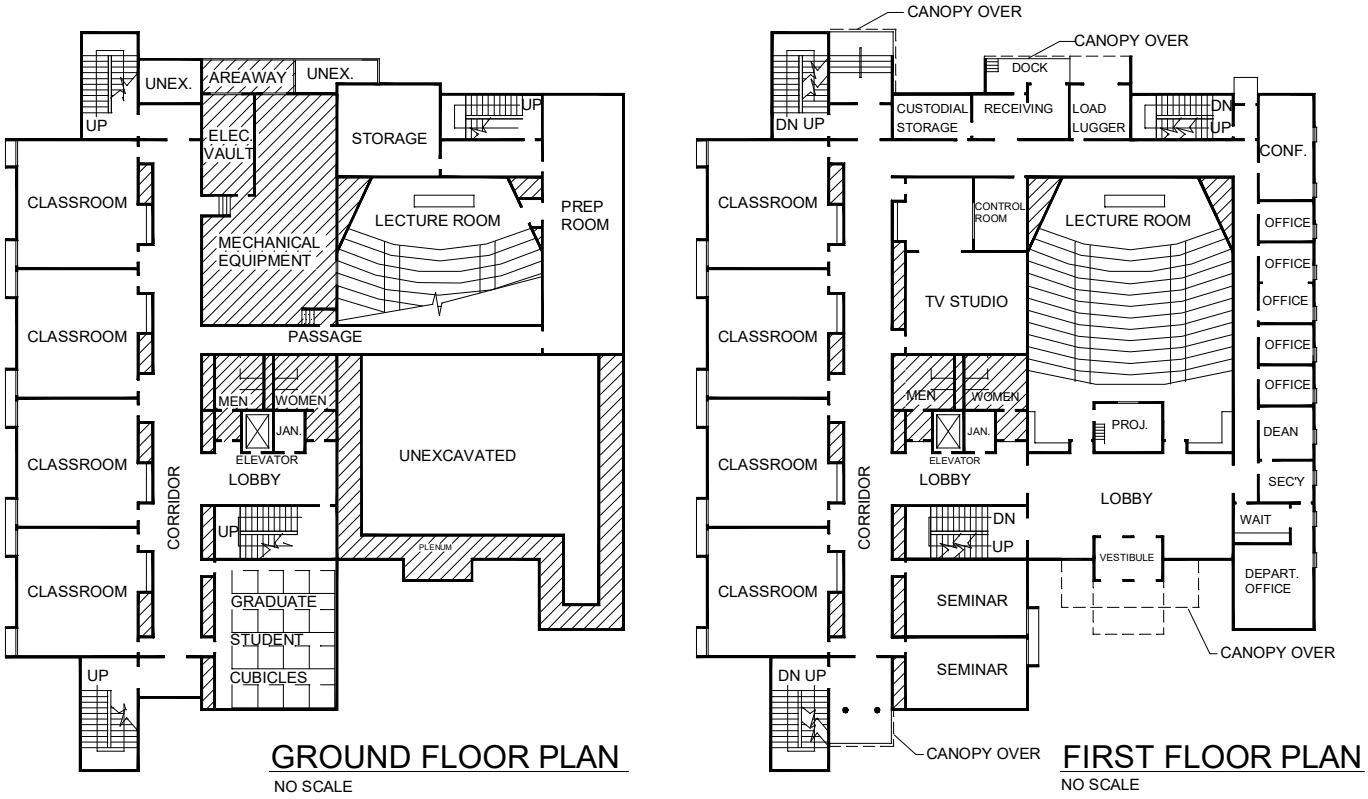
Circulation Area

Definition: Circulation area shall be construed to mean that portion of the gross area (whether or not enclosed by partitions), which is required for physical access to some subdivision of space.

Basis for Measurement: Circulation area shall be computed by measuring from the inner faces of the walls or partitions which enclose horizontal spaces used for such purposes; or, when such spaces are not enclosed by walls or partitions, measurements shall be taken from imaginary lines which conform as nearly as possible to the established circulation pattern of the structure.

Description: Circulation areas shall include, but not be limited to: corridors (access, public, service, also “phantom” for large unpartitioned areas); elevator shafts; escalators; fire towers or stairs; stairs and stair halls; loading platforms (except where required for operational reasons and thus includable in net assignable area); lobbies (elevator, entrance, public, also public vestibules); tunnels and bridges (not mechanical).

Limitations: When assuming corridor areas, only horizontal spaces required for general access shall be included, not aisles which are normally used only for circulation within offices or other working areas. Deductions shall not be made for columns and projections necessary to the structure.



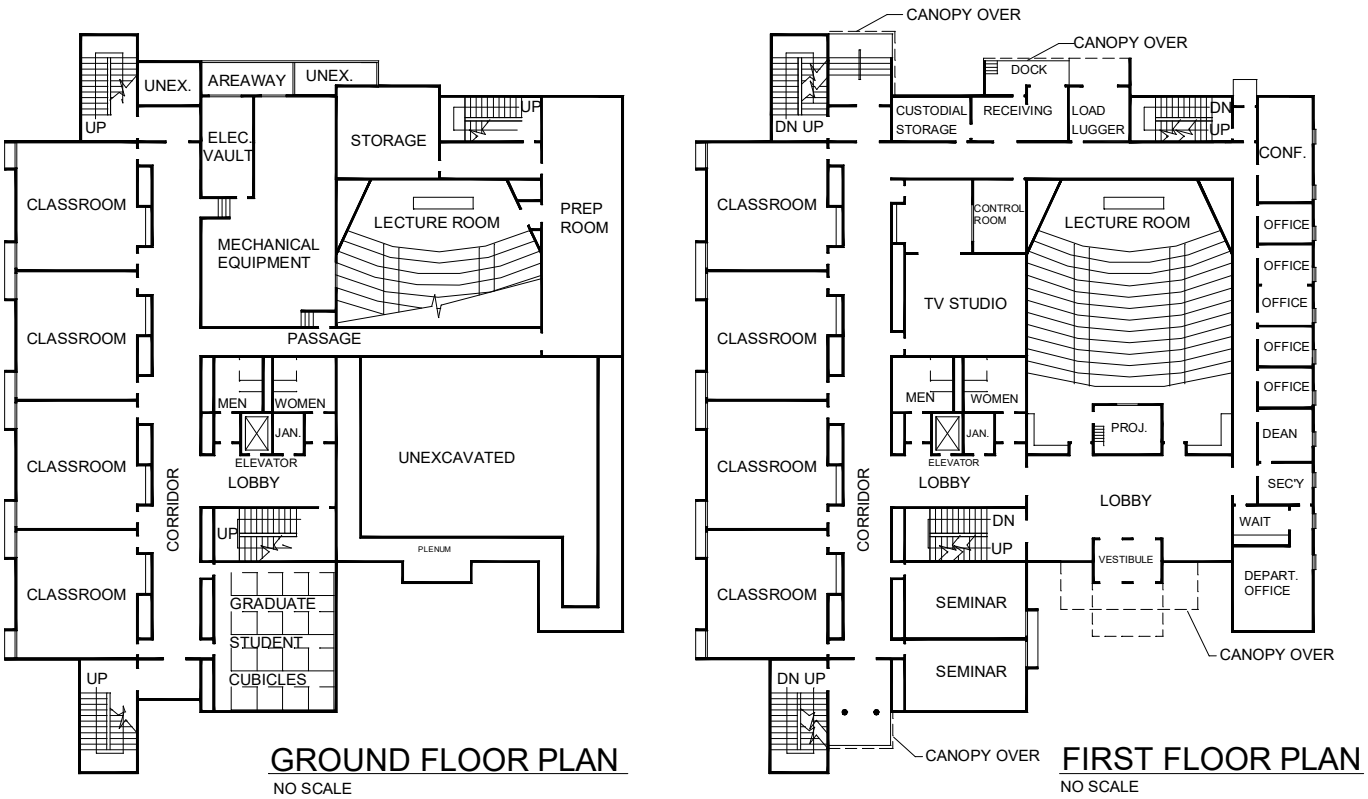
Mechanical Area

Definition: Mechanical area shall be construed to mean that portion of the gross area designed to house mechanical equipment, utility services, and non-private toilet facilities.

Basis for Measurement: Mechanical area shall be computed by measuring from the inner faces of the walls, partitions, or screens that enclose such areas.

Description: Mechanical areas shall include, but not be limited to: Air duct shafts; boiler rooms; fixed mechanical and electrical equipment rooms; fuel rooms; mechanical service shafts; meter and communications closets; service chutes; stacks; and non-private toilet rooms (custodial and public).

Limitations: Deductions shall not be made for columns and projections necessary to the structure.



Construction Area

Definition: Construction area shall be construed to mean that portion of the gross area which cannot be put to use because of the presence of structural features of the structure.

Basis for Measurement: Precise computation of construction area is not contemplated under these definitions. Some construction features are included in the computation of other areas. However, total construction area shall generally be determined by assuming it to be the residual area after the net assignable, circulation, custodial, and mechanical areas have been subtracted from the gross area.

Description: Examples of areas normally classified as construction area are exterior walls, firewalls, permanent partitions, and unusable areas in attics, basements, or comparable portions of the structure.

Computation of Construction Area:

Gross Area	34,578 Square Feet	100.0 Percent
Net Assignable Area	15,596	45.1
Circulation Area	10,385	30.0
Custodial Area	577	1.7
Mechanical Area	**4,186**	**12.0**
Construction Area	3834 Square Feet	11.2 Percent

PROJECT DATA SHEET

(If project has several phases or parts, provide a data sheet for each part, as well as a total)

SUBJECT: File No.
Department/Agency/Facility/University/Community College
Scope of Work/Project Description
City, Michigan

Enter Schematics or Preliminaries prepared by: (Enter Name of Architectural/Engineering Firm)

Estimated Cost of:

1. The structure (General, mechanical, electrical, fixed equipment, and contingencies)..... $ _____

   1. a. Telecommunications (incl. above) $_____

2. Services from five feet outside of the structure (Sewers, water supply, etc.)..... $ _____

3. Site improvements (Roads, walks, grading, etc.) ..... $_____

4. Architectural/Engineering fees, surveys, site investigations, State supervision (if applicable) etc. ..... $_____

5. DTMB fee* ..... $ _____

   Design and Construction cost per gross sq. ft. (1 thru 4 ÷ gross sq. ft.)... $/gross sq.ft.

6. Furnishings (Furniture, movable equipment, etc., not considered a part of the structure nor requiring fixed mechanical and/or electrical services) ..... $_____

7. Other (*i.e., asbestos abatement*)..... $ _____

8. Total estimated project cost, bid _____ _____..... $_____
   Month Year

   Total project cost per gross sq. ft. (1 thru 6 = 7 ÷ gross sq. ft.)..... $/gross sq. ft.

Total net square feet _____

Total gross square feet _____

Building design efficiency (ratio of net/gross) _____

Building occupant design capacity _____

Parking spaces provided _____ Ratio of occupant/parking space ___/space

* DTMB Fee: When the U/CC designates DTMB-SFA to provide management and construction oversight of the project, the DTMB-SFA fee is 1.5% of the authorized project cost. When the U/CC self-manages the project, the fee is 1% of the authorized project cost (with a minimum fee of $75,000 and maximum of $500,000).

ANNUAL OPERATING BUDGET

SUBJECT: File No.
Agency/Department/Facility/University/Community College
Project Name
City and State

NET AND GROSS AREAS/VOLUME

SUBJECT: File No.
Agency/Department/Facility/University/Community College
Project Name
City and State

l.	*Gross Area	_____	square feet
2.	Net Assignable Area	_____	square feet
3.	Custodial Area	_____	square feet
4.	Circulation Area	_____	square feet
5.	Mechanical Area	_____	square feet
6.	Construction Area	_____	square feet

*Ratio of net assignable area in 2. above to gross area in l. is ( ) percent.

*Volume _____ cubic feet

Net assignable area in program statement and schematic plans is from one approved by the Department of Technology, Management and Budget and Joint Capital Outlay Subcommittee. Gross area in 1. above is equal to the sum of all other areas (2. through 6.).

*Limited to three significant figures.

DESIGN AND CONSTRUCTION SCHEDULE

SUBJECT: File No.
Agency/Department/Facility/University/Community College
Project Name
City and State

Program Analysis (Month/Year)

Schematic Design (Month/Year)

Review and Joint Capital Outlay Subcommittee/
Department of Technology, Management and Budget Approval (Month/Year)

Preliminary Design (Month/Year)

Review and Department of Management
and Budget Approval (Month/Year)

Final Design (Month/Year)

Review and Department of Management
and Budget Approval (Month/Year)

Bid (Month/Year)

Review and Department of Management
and Budget Approval (Month/Year)

Award (Month/Year)

Construction Commences (Month/Year)
(add phase breakdown if appropriate)

Occupancy (Month/Year)

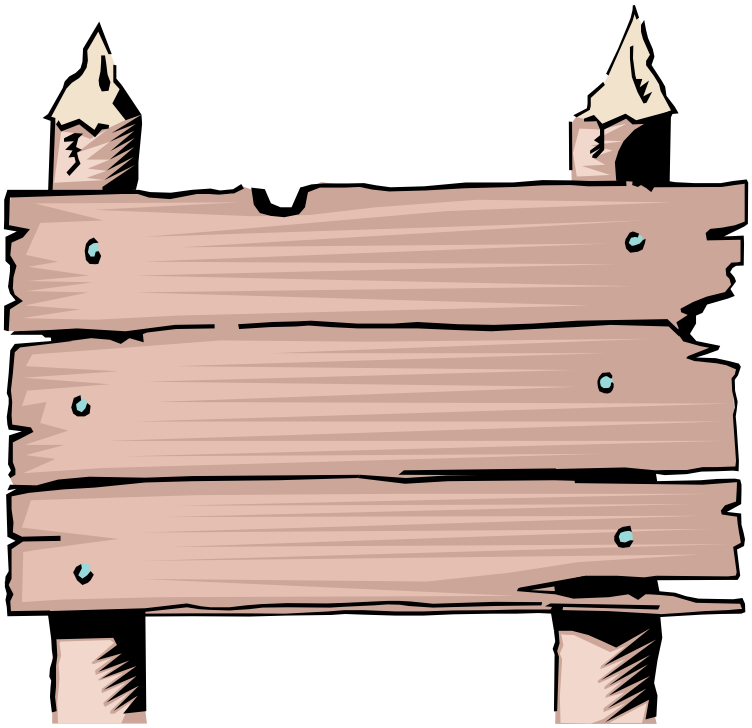
NET TO GROSS RATIOS GUIDELINES FOR VARIOUS BUILDING TYPES

BUILDING TYPE	NET TO GROSS RATIO	EFFICIENCY
Administrative	1.50	67%
Auditorium	1.42	70%
Biology	1.61	62%
Chemistry	1.70	59%
Classroom	1.51	66%
Courthouse	1.62	61%
Dining Hall	1.38	72%
Dormitory	1.54	65%
Engineering	1.64	61%
Garage	1.18	85%
Gymnasium	1.42	70%
Hospital	1.83	55%
Laboratory	1.71	58%
Library	1.32	76%
Office	1.35	75%
Science	1.67	60%
Service	1.20	83%
Warehouse	1.08	93%

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX NINE

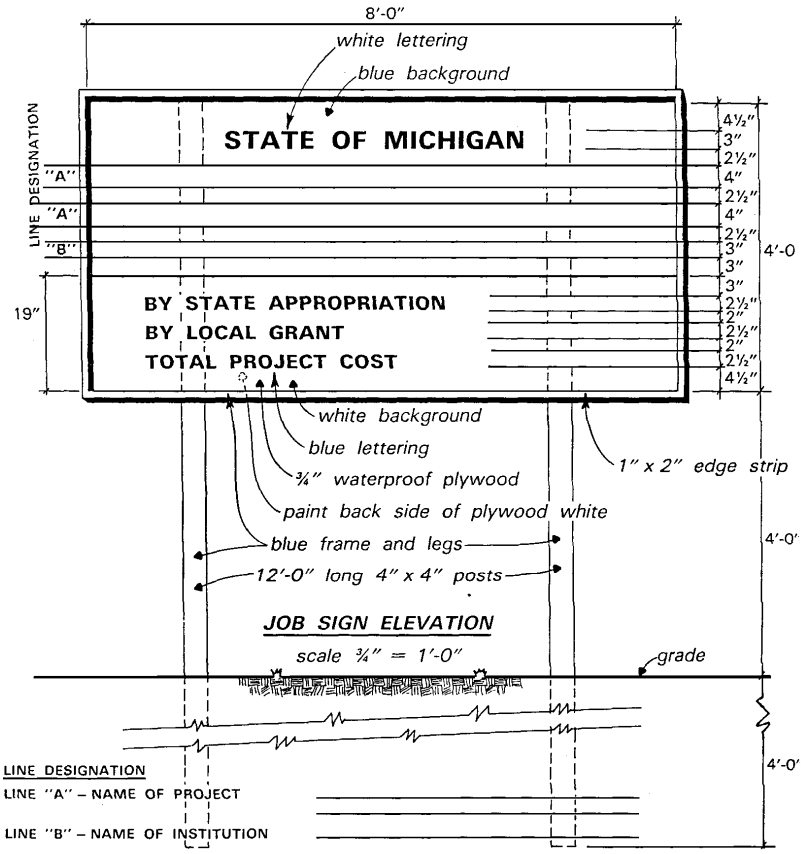
PROJECT SIGNS

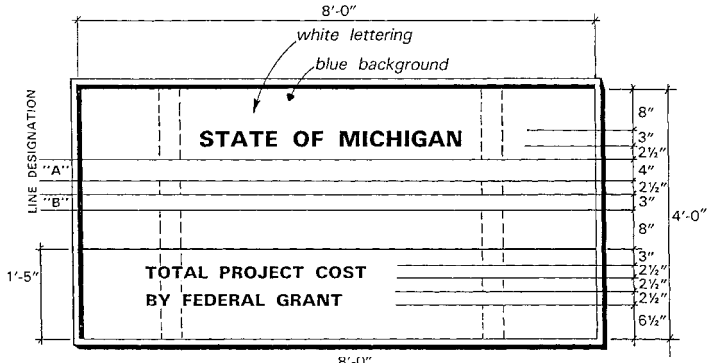


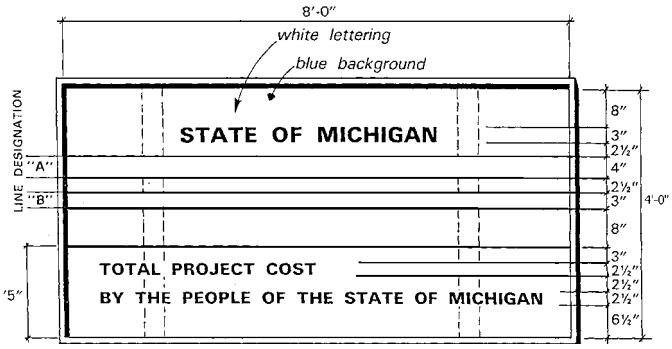
PROJECT SIGNS:

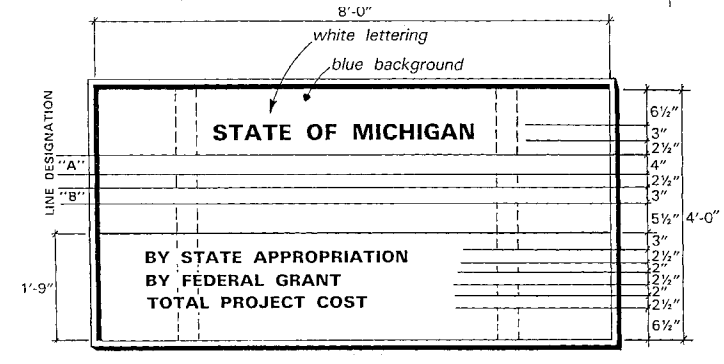
Five examples of project signs. Sign lettering corresponds with the funding arrangement of the project. Alternate signs may be considered; please contact the DTMB-SFA Project Director.

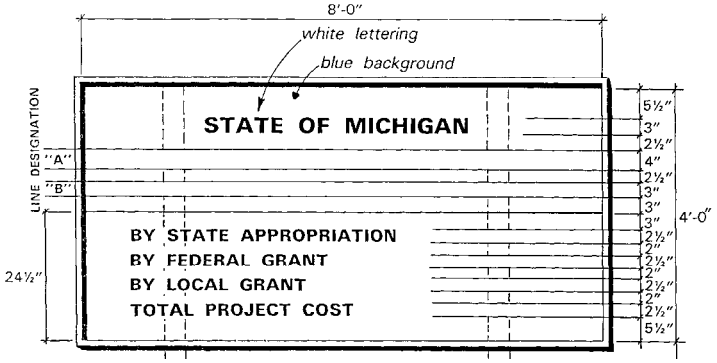
Provide a photo of the sign in the initial monthly report.











STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION,
DESIGN AND CONSTRUCTION DIVISION

CAPITAL OUTLAY DESIGN MANUAL APPENDIX TEN

CERTIFICATE OF TENANTABILITY EXAMPLE

APPENDIX TEN – CERTIFICATE OF TENANTABILITY EXAMPLE

Certificate Of Tenantability

The Certificate of Tenantability must be completed by the University, Community College, or the Professional Service Contractor on their letterhead with the date the building was ready for occupancy (not necessarily the date the building project achieved Substantial Completion or a code official's Certificate of Occupancy). The Certificate of Tenantability should be sent to the DTMB-SFA Project Director. The Certificate language is as required by the State Building Authority Lease and cannot be modified. If a portion of the project is completed prior to the completion date of the entire facility, a partial Certificate of Tenantability should be prepared.

(University, Community College or PSC Firm Letterhead)

NAME OF AGENCY, UNIVERSITY, OR COMMUNITY COLLEGE
NAME OF PROJECT

CERTIFICATE OF TENANTABILITY

This Certificate is being issued pursuant to Section 2.5 of the State Building Authority Lease for (NAME OF AGENCY, UNIVERSITY, OR COMMUNITY COLLEGE), (NAME OF PROJECT), (CITY), Michigan. To the best of my knowledge, after such inquiry as I deemed appropriate taking into account the responsibilities of the position which I hold, the facility has been completed in accordance with the Plans, as defined in the Lease, and is as of (DATE), ready for occupancy.

To the best of my knowledge, after such inquiry as I deemed appropriate taking into account the responsibilities of the position which I hold, all Costs of the Facility have been paid, except for such Costs which are not now due and payable or which are being contested or disputed by the (agency, university, community college). Nothwithstanding the foregoing, this Certificate is given without prejudice to any rights against third parties which may exist at the date hereof or which may subsequently come into being.

(NAME OF University, Community College, or PSC FIRM)

Signature, title of principal or U/CC Officer Date

OFFICE CONSTRUCTION AND TENANT FITOUT

DESIGN AND CONSTRUCTION STANDARDS

STATE OF MICHIGAN

Department of Technology, Management and Budget

August 21, 2020

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STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET

I. INTRODUCTION

These office and tenant fitout 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), Program, State Agency Supplementary Standards, and other attachments for unique products or systems set forth by the requesting State Agency. 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 prior to submitting proposal. 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. Complete construction documents and specifications must be provided to the State Agency, Real Estate and/or to Design and Construction for the opportunity to review and comment prior to construction (2-week duration). Review does not constitute approval but is used to ensure general compliance – Lessor is responsible to ensure that the construction is compliant with these standards and all applicable codes or authorities having jurisdiction (AHJ).

The Lessor must comply with all Design and Construction Standards and the complete RFP requirements. The Lessor is to include a list of all items within the submitted proposal that will not comply with the Design and Construction Standards for a Tenant Fitout only. The reasoning must be due to existing conditions and the reasons behind the request are to be provided with the RFP response.

The Lessor is to conduct construction progress meetings twice a month in which an updated task/progress schedule will be distributed and discussed. The meetings will be scheduled by the Real Estate Division. Meeting minutes will be issued to all attendees and noted key contacts, by the Lessor, within 5 days of the meeting for the team to comment and/or respond. When a Field Representative (from DTMB/SFA/Design and Construction) is included as part of the team, the Field Representative will attend such meetings and must be given full independent site access to conduct site reviews on a regular basis. The Field Representative will note any discrepancies from the Design and Construction Standards and report back to the team to be addressed.

For leased facilities only, these Design Standards and the Lease agreement take precedence over the Construction Documents. Any conflicts within the Design Standards, the Lessor is to assume the most stringent and confirm with DCD prior to proceeding.

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

II. GENERAL REQUIREMENTS

A. SUSTAINABLE DESIGN

1. If identified in the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 Lessor will be required to provide a written understanding of the construction of the building envelope and HVAC systems. This will then be reviewed and assessed by the Design and Construction Division for compliance with the RFP or potential acceptable savings based on any non-compliance.
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.
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 fire-stopped 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 required, unless demountable partitions are requested by the Agency within the RFP.
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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards, provide conduit and power for a card access management system matching the existing State of Michigan access system which is currently

manufactured by Honeywell Security Products. 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards, provide conduit and power for security cameras covering all access points.
4. Transaction windows shall have pre-manufactured transaction window(s) with speaker port(s), 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 and systems 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards, or if required for code compliant exiting, provide an additional employee-only entrance with doorbell.
2. If required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 swing doors are to be provided unless otherwise requested in the Request for Proposal (RFP), Program, or State Agency Supplementary Standards. If sliding doors are requested, 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards: 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards: Provide a separate area for a trash compactor.
6. Where required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards: Provide a guard station in loading dock area with adequate power and data to serve this function.

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. Provide a minimum of a lockable door hardware with occupied/unoccupied indicator.
5. "Safe Room": Where required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, provide an interior "safe room" to meet FEMA Standards. The "safe room" may be a conference, toilet room, or office. Provide signage for the "safe room".

    a) Reference: https://www.fema.gov/emergency-managers/risk-management/safe-rooms

6. Evacuation Routes and Shelter-in-Place: Provide color coded diagrams mounted in acrylic throughout the facility noting all emergency egress routes, fire existing and shelter-in-place locations. Size of floor plans are to be sized (minimum 8-1/2" x 11") as required to allow all information to be legible – coordinate size with Agency.

7. 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards, provide commingled recycling areas and service.
8. Mechanical Equipment Room: Ceiling height to be a minimum 12'. Control noise transmission to adjacent spaces. Refer to Mechanical Design Requirements for additional descriptions.
9. 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.
10. Locate vertical shafts adjacent to core areas with no offsets allowing for maintenance accessibility and additions for future utilities.
11. Switchgear and electrical rooms located in basement areas must have provisions for removing water with a back-up emergency electrical power source.
12. Main telecommunication and telecommunication rooms: Locate, design, and outfit per requirements of https://stateofmichigan.sharepoint.com/teams/insidedtmb/work_/policies/IT%20Policies/1345.00.02%20Network%20and%20Telecommunications%20Infrastructure%20Facility%20Standard.pdf#search=network%20and%20telecommunications%20infrastructure%20facility%20standard 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 2-coats 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards: provide special floor loading requirements for computer room loads, special equipment loads and storage loads.
3. Where required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards: 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 for New Construction:

    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 for New Construction:

    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 for new construction: 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 for new construction: 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 new construction parking structures use corrosion inhibiting additives and cathodic protection or epoxy coated reinforcing bars and surface sealers.

15. Attachment of new 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 new partitions:

    a) Adequately support non-structural, rigid partitions so as 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.

III. 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 for new construction:

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 for new construction:

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 for new construction:

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 for new construction:

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 for new construction: 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-gauge minimum face and backer sheet steel with Kynar 500 finishing consisting of 1-color coat and 1-primer coat (both faces).

G. Roof for new construction:

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-gauge 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 for new construction:

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.

IV. 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 (abuse resistant 8-foot and below each finish floor elevation): 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 such as vestibules, mechanical rooms, janitor closets etc. 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-gauge 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-4	D-5	D-5	D-5	D-1 or D-2	D-2 or D-4**	D-2 or D-4**	D-2 or D-4**
Door Hardware	H-1 or H-2	H-6 or H-7	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-2	WF-2	WF-1	WF-1	WF-1	WF-3	WF-3	WF-3
Floor Type	F-1	F-4	F-1/F-2	F-1	F3/F6	-	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-4	Hollow metal frame and solid wood door
D-5	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.

*** Provide Door Type D-4 when opening is within the line-of-site of other wood 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
H-7	Mortise lock set with Occupied/Unoccupied Indicator, hinges, closer, wall bumper (single occ. Toilet rm)

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” cementitious bd and ceramic tile to 6’ 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	Paint. Provide Type II medium-duty vinyl wallcovering if Wall Coverings are required per the Checklist of Building Components.
WF-2	Paint; wall tile provided as indicated for all Wall Type W-2 designations and chair rail at waiting and conference rooms. Provide Type III heavy-duty vinyl wallcovering if Wall Coverings are required per the Checklist of Building Components.
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 / F-6	Vinyl composition tile with base / Luxury vinyl tile with base
F-4	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 tegular ceiling tile
C-2	½” gypsum board on metal suspension system, painted
C-3	Open, no ceiling, no paint

V. 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 galvanized (G-90) 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 galvanized (G-90) 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 (G-90) 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 (G-90) sheet steel with minimum of 2-inch polyurethane insulation bonded to facing sheets (thermally broken) 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 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. Caulking, Sealants:

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

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

L. Interior Doors and Openings: Use standard height and width doors wherever 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-gauge cold-rolled, 1-3/4-inches thick at interior locations and Grade III, extra-heavy duty, 16-gauge 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-gauge steel. Exterior steel frames must be welded type 16-gauge 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.

M. Access doors are to be fabricated with 16-gauge steel frames with 14-gauge steel doors, primed with a cylinder lock.

N. Hardware: Hardware shall be detailed, handled, supplied and serviced through an architectural hardware consultant. Where required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards: 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 per piece of hardware, unless stated otherwise in the lease documents.

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. Furnish and install door hardware to comply with the latest edition of the State of Michigan DTMB Office of Infrastructure Protection Door Hardware Specification which is available at https://w3.michigan.gov/documents/dtmb/030718_DTMB_Door_Hardware_Spec_Revised_634971_7.pdf and are to comply with the following general minimum requirements:

   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 throw latch bolt. All exterior locksets 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 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 requirements with local fire marshal or authority having jurisdiction).
   c) Interior: Cylindrical lockset with heavy duty lever handle. Knob handles are not acceptable.
   d) Exit devices: 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 a latch paddle.
   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 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 and Key Cabinet for key control, unless stated otherwise in the lease documents.
   g) Hinges and butts: Full-mortise type with non-removable pins at exterior doors and IT equipment related rooms. 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 or authority having jurisdiction.

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.

VI. FINISHES -- see TABLE A1 ARCHITECTURAL DOOR, ROOM AND FINISH SCHEDULE (*REFER TO PAGES 14 and 15*)

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 grout 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 small ancillary 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 (tegular) 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 or Luxury Vinyl Tile, Class III, 2.5 mm 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards: 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 may also be utilized for 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: Shaw Contract
   Primary Contact: Patrick Coulston, Account Manager
   Shaw Industries, Inc. 616 E. Walnut Ave. Dalton, GA 30722
   Email: Patrick.Coulston@shawinc.com
   Cell: (616) 719-9800

2. Installation & Secondary Contact:

   Timmothy Spaulding, State Contract Coordinator & Project Manager

   Seelye Group LTD. 912 East Michigan Ave. Lansing, MI 48912
   Email: Tim.Spaulding@sglyes.com
   Tel: (517) 449-1533

Field Carpet Selections	"Constellation" #59326 24" x 24" - Colors: 810, 110, 310, 910, 420 "Glitz" #59360 24" x 24" - Colors: 530, 755, 485, 505, 713, 201, 500, 400, 585, 309 "Radiance" #59361 24" x 24" - Colors: 530, 585, 485, 309, 713, 201, 500, 400, 755, 505
Walk-Off Carpet	"Path" #5T034 24" x 24" "Portal" #5T035 24" x 24"

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: If required by the Checklist of Building Components, 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. Provide poly corner guards up to 60" above finish floor on all outside corners to protect painted wall.

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.

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 (coordinate final elevation with furnishings for each space prior to installation), 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.

VII. 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 required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, requires it, or 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. Provide LED illumination from within the unit.

C. Interior Signage: Interior signage shall meet the DTMB standard interior signage design. Refer to https://w3.michigan.gov/documents/dtmb/Signage_Standards_634895_7.pdf for design and layout requirements. 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. If required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, provide signage for all spaces.

D. Exterior Post, Panel and Pylon Signage: If required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 floor mounted and overhead braced 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)	Line voltage plug-in touchless (no battery), one per lavatory fixture, refillable. (Mount plug high under sink so as to not be visible)
Hand dryers	World Dryer SMARTdri, AirMax, or SLIMdri	Hardwired touchless, energy efficient
Faucets	Delta, Moen, American Standard	Line-voltage (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	
Mop and Broom Holders	Two per janitor's closet	

I. Operable Partitions: Where required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 vinyl vertical blinds or shade fabric roller blinds at all exterior windows. Blinds are to be a minimum 3-1/2 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 solid surface with eased 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: If required in the Request for Proposal (RFP), Program, or State Agency Supplementary Standards Fiberglass ballistic panels shall be 5/16-inch thickness with UL-752, 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.

VIII. 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards.

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 (or 2 stops). The need and description for a freight elevator in a two-story building is to be noted in the Request for Proposal (RFP), Program, or State Agency Supplementary Standards.

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.

IX. FIRE SUPPRESSION

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

B. Sprinkler piping shall be schedule 40, schedule 10, or copper. No saddle fittings or flexible fire sprinkler connections will be permitted.

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.

X. 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards.

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.

1. Existing HVAC components, piping and devices no longer being used shall be completely removed and not abandoned in place. All openings in existing walls, floors, and shafts shall be properly fire-stopped after the removal of old HVAC components and piping.

E. Gas Service Entrance: Gas piping entering the building must be protected from accidental damage by vehicles, foundation settlement or vibration. Where practical, the entrance should be above grade and provided with a self-tightening swing joint prior to entering the building.

F. Mechanical/HVAC Design and Planning

1. Energy savings should be a primary component and part of the selection of HVAC equipment. The facility or building design shall comply with both the mandatory and prescriptive provisions of latest ASHRAE standards. The proposed building performance rating compared to baseline building performance rating per ASHRAE standards (without amendments) by building simulation method is to be 14% higher on new buildings and 7% higher on existing buildings.
2. Design systems that require zero use of CFC-based refrigerants for new systems; complete a comprehensive CFC phase-out conversion when reusing existing systems.
3. Design HVAC and refrigeration systems with refrigerants with no or very little ozone depleting potential. Projects shall comply with current LEED 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; and must meet requirements of the Lease.
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 (if provide based on size of facility).
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 Agency contact is to be provided with the following: 3 copies of prints identifying HVAC zones, record drawings and specifications (both hard copy and on a USB drive w/ indexed PDF), 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 with bottle filler.
8. Dishwashers: If required by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 replabacker. 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 – *no PEX piping will be accepted.*
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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards or the building program, provide special HVAC equipment required for any Computer Data Centers, Server Rooms or Computer Training 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 (± 5°F for Leases)
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-feet of ceiling diffusers.
Miscellaneous	Provide a minimum of 1 electric water cooler and drinking fountain combination unit with bottle filler. 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 *(no PEX)*	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

XI. 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.

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, dishwashers 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 https://stateofmichigan.sharepoint.com/teams/insidedtmb/work_/policies/IT%20Policies/1345.00.02%20Network%20and%20Telecommunications%20Infrastructure%20Facility%20Standard.pdf#search=network%20and%20telecommunications%20infrastructure%20facility%20standard 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 (preferred) 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 Request for Proposal (RFP), Program, or State Agency Supplementary Standards. 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 circuits or main feeders shall be solid tubular (Non-flexible) type conduit. *Flexible conduit is only acceptable as a 6-foot whip for either light fixtures or power poles.*
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.
c) Computer Data Centers Server Rooms: If required in the Request for Proposal (RFP), Program, or State Agency Supplementary Standards or the building program, provide required electrical for any Computer Data Centers, Server Rooms or Computer Training Rooms.

XII. 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.
https://stateofmichigan.sharepoint.com/teams/insidedtmb/work_/policies/IT%20Policies/1345.00.02%20Network%20and%20Telecommunications%20Infrastructure%20Facility%20Standard.pdf#search=network%20and%20telecommunications%20infrastructure%20facility%20standard

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 SFA 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 with double doors providing access	3’x 7’ minimum,

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 (and between MTR's and all TR's), 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.

7. 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.

8. 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.

9. 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.

10. 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.

XIII. SITE UTILITIES (NEW CONSTRUCTION)

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.

J. Roof downspouts are to be connected to onsite storm drainage structures at all locations within 25-feet of a door. All others are to be routed to discharge a minimum of 6-feet from the building perimeter.

XIV. 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". https://mdotjboss.state.mi.us/SpecProv/specBookHome.htm

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.

1. 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.

2. 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.

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

4. 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 by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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 by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, 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, gas meters, generators, etc.

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 by the Request for Proposal (RFP), Program, or State Agency Supplementary Standards, install any specialized signs provided by the Tenant Agency.

XV. 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 OFFICE CONTRUCTION AND FITOUT DESIGN AND CONSTRUCTION STANDARDS

State of Michigan
Administrative Guide to State Government

0210.02 Office Space Standards

Issued: January 6, 1997
Revised: August 28, 2018

PURPOSE

To establish uniform standards for office space within typical office environments.

APPLICATION

Executive Branch Departments and Sub-units.

CONTACT AGENCY

Department of Technology, Management and Budget (DTMB)
State Facilities Administration (SFA)
Real Estate Division (RED)

Telephone: 517-284-7930

Fax: 517-284-7974

SUMMARY

The following constitutes office space standards for state government.

APPLICABLE FORMS

DTMB-0123 Special Services Request for DTMB-Owned Facilities

DTMB-0618 Space Request

PROCEDURES

DTMB RED

- In cooperation with each agency, based on the standards below, develops agency-specific standards to accommodate the functional needs of each type of employee.
- In addition to standards for typical office environments, develops space standards for unique office environments, such as branch offices, customer service offices, posts, and parole offices.
- In cooperation with each agency, develops a program of space allocation, including total square feet and office workstation design.
- Determines space requirements and assignments in accordance with space use guidelines.

Agency

- Provides information on staffing levels, equipment requirements, program adjacencies and business needs.

State Office Standards

- For most personnel, the standards for state offices in state-owned and leased facilities with open plan modular partitions is 64 square feet.
- For 15- and 16-level managers with direct reports, the standards for state offices in state-owned and leased facilities with open plan modular partitions is based on 64 square feet. The 64 square feet workstations will typically be coupled with consultation rooms for manager/personnel conversations.
- State agencies are also encouraged to consider flexible and innovative space arrangements to minimize space usage, including sharing conference rooms among multiple programs, implementing hoteling for mobile workers, and utilizing teaming rooms to allow for reduced workstations.
- Floor-to-ceiling offices, open offices, and conference rooms will be located off the window walls (where feasible) to improve natural light distribution and HVAC circulation throughout a building.
- Floor-to-ceiling offices, when deemed essential, are recommended for Division Director level and higher with an average of 120 to 150 square feet. Department Director level with an average of 180 to 225 square feet. Exceptions will be based on functional needs to be determined in cooperation between DTMB and the applicable agency.

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DTMB DOOR HARDWARE SPECIFICATION

6/2/2022

PART 1 - GENERAL

1.1 Refer to "General and Special Conditions", and "Instructions to Bidders", Division 1 of Specifications. Requirements of these Sections and the project drawings shall govern work in this section.

1.2 Work Included:

A. Furnish all items of Finish Hardware specified, scheduled, shown or required herein except those items specifically excluded from this section of the specification.

B. Related work:

1. Division 00 00 00 – Procurement and Contracting Requirements
2. Division 01 00 00 – General Requirements
3. Division 06 00 00 – Wood, Plastics, and Composites
4. Division 08 00 00 – Openings
5. Division 10 00 00 – Specialties
6. Division 11 00 00 – Equipment
7. Division 26 00 00 – Electrical
8. Division 27 00 00 – Communications
9. Division 28 00 00 – Electronic Safety and Security

C. Specific Omissions: Hardware for the following is specified or indicated elsewhere, unless specifically listed in the hardware sets:

1. Cabinet Hardware.
2. Signs, except as noted.
3. Folding partitions, except cylinders where detailed.
4. Sliding aluminum doors
5. Chain link and wire mesh doors and gates
6. Access doors and panels
7. Overhead and Coiling doors

1.3 Quality Assurance

A. Requirements of Regulatory Agencies:

1. Furnish finish hardware to comply with the requirements of laws, codes, ordinances, and regulations of the governmental authorities having jurisdiction where such requirements exceed the requirements of the Specifications.
2. Furnish finish hardware to comply with the requirements of the regulations for public building accommodations for physically handicapped persons of the governmental authority having jurisdiction and to comply with Americans with Disabilities Act.
3. Provide hardware for fire-rated openings in compliance with NFPA 80 and state and local building code requirements. Provide only hardware that has been tested and listed by UL for types and sizes of doors required and complies with requirements of door and door frame labels.

B. Hardware Supplier:

1. Shall be an established company dealing in Commercial Door Hardware. The Commercial Door Hardware company must have adequate inventory, qualified personnel on staff and be located within 100 miles of the project. The distributor must be a factory-authorized dealer for all materials required.

2. All door hardware product must be **B.H.M.A. (Builders Hardware Manufactures Association) Certified.**

C. Electrified Door Hardware Supplier:

1. Shall be an experienced door hardware supplier who has completed projects with electrified door hardware similar in material, design, and extent to that indicated for this project, whose work has resulted in construction with a record of successful in-service performance, and who is acceptable to manufacturer of primary materials.
2. Shall prepare data for electrified door hardware, including shop drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies like those indicated for this project.
3. Shall have experience in providing consulting services for electrified door hardware installations.

D. Pre-installation Meeting:

1. Before hardware installation, General Contractor/Construction Manager will request a hardware installation meeting be conducted on the installation of hardware; specifically, that of locksets, closers, exit devices, overhead stops and coordinators. Manufacturer's representatives of the above products, in conjunction with the hardware supplier for the project, shall conduct the meeting. Meeting to be held at job site and attended by installers of hardware for aluminum, hollow metal and wood doors. Meeting to address proper coordination and installation of hardware, per finish hardware schedule for this specific project, by using installation manuals, hardware schedule, templates, physical product samples and installation videos.
2. When any electrical hardware is specified, this meeting shall also include the following trades/installers: Electrical, Security, Alarm systems and Architect.
3. Convene one week or more prior to commencing work of this Section.
4. The Hardware Supplier shall include the cost of this meeting in his proposal.

E. Manufacturer:

1. Obtain each type of hardware (latch and locksets, hinges, closers, etc.) from one manufacturer, although several may be indicated as offering products complying with requirements.
2. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.

1.4 Submittals:

A. Hardware Schedule

1. Submit number of Hardware Schedules as directed in Division 1.
2. Follow guidelines established in Door & Hardware Institute Handbook (DHI) Sequence and Format for the Hardware Schedule unless noted otherwise.

3. Schedule will include the following:
   a. Door Index including opening numbers and the assigned Finish Hardware set.
   b. Preface sheet listing category only and manufacturer's names of items being furnished as follows:

CATEGORY	SPECIFIED	SCHEDULED
Hinges	Manufacturer A	Manufacturer B
Lock sets	Manufacturer X	Manufacturer X
Kick Plates	Open	Manufacturer Z

   c. Hardware Locations: Refer to Article 3.1 B.2 Locations.
   d. Opening Description: Single or pair, number, room locations, hand, active leaf, degree of swing, size, door material, frame material, and UL listing.
   e. Hardware Description: Quantity, category, product number, fasteners, and finish.
   f. Headings that refer to the specified Hardware Set Numbers.
   g. Scheduling Sequence shown in Hardware Sets.
   h. Product data of each hardware item, and shop drawings where required, for special conditions and specialty hardware.
   i. Electrified Hardware system operation description.
   j. "Vertical" scheduling format only. "Horizontal" schedules will be returned "Not Approved."
   k. Typed Copy.
   l. Double-Spacing.
   m. 8-1/2 x 11-inch sheets
   n. U.S. Standard Finish symbols or BHMA Finish symbols.

B. Product Data:

1. Submit Manufacturers Catalog cut sheets of scheduled hardware.
2. Submit product data with hardware schedule.

C. Samples:

1. Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample, if required, of each type of exposed hardware unit, finished as required and tagged with full description for coordination with schedule.
2. Samples will be returned to the supplier. Units, which are acceptable and remain undamaged through submittal, review and field comparison procedures may, after final check of operation, be used in the work, within limitations of keying coordination requirements.

D. Key Schedule:

1. Submit detailed schedule indicating clearly how the Owner's final keying instructions have been followed.
2. Submit as a separate schedule.
3. The DTMB Office of Infrastructure Protection Access Control will do all the locksmith pinning off cores and install cores for the DTMB buildings. (except for MSP Forensic Labs and Hall of Justice)

E. Electrified Hardware Drawings:

1. Submit elevation drawings showing relationship of all electrical hardware components to door and frame.

a. Include wiring drawing showing point to point wire hook up for all components.
b. Include system operations descriptions for each type of opening; describe each possible condition.

F. Submit to General Contractor/Construction Manager, the factory order acknowledgement numbers for the various hardware items to be used on the project. The factory order acknowledgement numbers shall help to facilitate and expedite any service that may be required on a hardware item. General Contractor/Construction Manager shall keep these order acknowledgement numbers on file in the construction trailer.

1.5 Product Delivery, Storage, and Handling:

A. Label each item of hardware with the appropriate door number and Hardware Schedule heading number and deliver to the installer so designated by the contractor.

1.6 Warranties:

A. During the warranty period, replace defective work, including labor, materials and other costs incidental to the work. Replace work found to be defective as defined in the General Conditions.

PART 2 - PRODUCT

2.1 Furnish of each category with the door hardware products can be multiple door hardware brands unless specified otherwise by DTMB Office of Infrastructure Protection, Access Control Supervisor.

2.2 Provide all door hardware specification of the product being used on the project.

A. Hinges:

1. Furnish hinges 4.5” x 4.5”.
2. Manufactured by any B.H.M.A member.

B. Continuous Gear Hinge:

1. 6063-T6 aluminum alloy, anodized finish (cap on entire hinge painted if specified). Manufacture to template, uncut hinges non-handed, pin less assembly, three interlocking extrusions, full height of door and frame, lubricated polyacetal thrust bearing, fasteners 410 stainless steel plated and hardened. All hinge profiles to be manufactured to template bearing locations, with standard duty bearing configurations at 5-1/8” spacing with a minimum of 16 bearings: and heavy duty at 2-9/16” spacing with a minimum of 32 bearings. Anodizing of material shall be done after fabrication of components so that all bearing slots are anodized.
2. Length: 1" less than door opening height. Fastener 12-24 x 1/2" #3 Phillips keen form stainless steel self-tapping at aluminum and hollow metal doors, 12- 1/2" #3 Philips, flathead full thread at wood doors.
3. Furnish fire rated hinges "FR" at labeled openings.

a. For Wood and Hollow Metal frames
4. Manufactured by any B.H.M.A member.

C. Flush Bolts:
1. Manufactured by any B.H.M.A member.

D. Locksets and Latch sets - Mortise Type:

1. Mortise type not acceptable without approval from DTMB Office of Infrastructure Protection, Access Control Supervisor.

E. Locksets and Latch sets – Heavy Duty Cylindrical Type:

1. Function numbers listed are Dormakaba-Best or Allegion-Schlage
2. Provide 2-3/4 inch backset.
3. Provide strikes with extended lips where required to protect trim from being marred by latch bolt. Provide strike lips that do not project more than 1/8" beyond doorframe trim at single doors, have 7/8" lip to center at pairs of 1-3/4" doors and rose size 3 1/2 diameter
4. Locksets and Latch sets:
   a. Dormakaba-Best 9K series
   b. Schlage ND Schlage ND series
5. Lockset:
   a. Dormakaba-Best 14 – Curved Return
   b. Schlage ND Sparta (SPA) Curved Return

F. Roller Latches:
1. Manufactured by any B.H.M.A member.

G. Exit Devices: Allegion-Von Duprin

1. Exit devices shall be touchpad style, fabricated of brass, bronze, stainless steel, or aluminum, plated to the standard architectural finishes to match the balance of the door hardware.
2. All exit devices shall incorporate a fluid damper, which decelerates the touchpad on its return stroke and eliminates noise associated with exit device operation. Touchpad shall extend a minimum of one half of the door width. All latch bolts to be dead latching type, with a self-lubricating coating to reduce wear.
3. Endcap will be sloped to deflect any impact from carts, and they shall be flush with the external mechanism case. End caps that overlap and project above the mechanism case are unacceptable. End cap shall utilize a two-point attachment to the mounting bracket.
4. Touchpad shall match exit device finish, and shall be stainless steel for US26, US26D, US28, US32, and US32D finishes. Only compression springs will be used in devices, latches, and outside trims or controls.
5. Plastic templates shall be included with each exit device to facilitate a quick, easy and accurate installation.
6. Strikes shall be roller type and come complete with a locking plate to prevent movement.
7. All rim and vertical rod exit devices shall have passed a 5 million (5,000,000) cycle test based on ANSI A156.3, 1994, Grade 1 test standards and certified by an independent testing lab.

8. All mortise exit devices shall have passed a 10 million (10,000,000) cycle test based on ANSI A156.3, 1994, Grade 1 test standards and certified by an independent testing lab.
9. Exit devices shall be UL listed panic exit hardware. All exit devices for fire rated openings shall be UL labeled fire exit hardware.
10. Lever trim for exit devices shall be vandal-resistant type, which will travel to a 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
11. No external vertical rod on an exit device.
12. Surface mount vertical rod are acceptable.
13. Allegion-Von Duprin 98/99 and 33A/35A Series. Series and function numbers as listed in sets.
14. Allegion-Von Duprin 990 pull trim, 5 standard functions:
    a. Classroom (TP)
    b. Storeroom (NL)
    c. Dummy trim (DT)
    d. Passage (TP-BE)
    e. Exit only (EO)
15. Allegion-Von Duprin 33A/35A Series popular trims
    a. 360: lever or thumbpiece trim, 3 standard functions:
        1) Classroom (L, T)
        2) Passage (L-BE, T-BE)
        3) Dummy (L-DT)
    b. 386: pull trim, 2 standard functions:
        1) Storeroom (NL)
        2) Dummy (DT)
    c. 388: optional pull trim, 1 standard function:
        1) Storeroom (NL-OP)
16. Allegion-Von Duprin 98/99 and 33A/35A QELA Baseplate Conv. Kit series.
17. Allegion-Schlage PS902 or Von Duprin PS 914 with a Von Duprin 900-2RS is a 2 Relay EL Panic Device Control Board output power supply for connection of electrified devices such Von Duprin exit devices equipped with the (QELA Baseplate Conv. Kit series.)

H. Recessed Exit Devices:
1. Recessed exit devices shall be of the push pad design with straight or horizontal motion to eliminate pinch points. The push pad shall project a maximum of 1-3/4" from the face of the door in the closed position. The push pad shall project a maximum of 1-1/4” from the face of the door in the open position.
2. Latch bolts shall have a self-lubricating coating to reduce friction and wear.
3. Endcaps shall be diecast aluminum and be of a sloping design to deflect impact from carts.
4. Exit devices shall have compression springs, and all internal parts shall be zinc dichromate coated to prevent corrosion.
5. Outside trim shall be heavy-duty type and fasten by means of concealed studs and through-bolt from the inside. Lever trim shall be cast brass with a minimum average thickness of .130”.
6. Exit devices shall be tested in accordance to ANSI/BHMA A156.3 Grade 1 by a BHMA certified testing laboratory.
7. A written certification showing successful completion of a minimum of one million cycles must be also provided.
8. Recessed exit devices shall be as manufactured by Von Duprin. Exit device series shall be 94/95 series.
9. Trim: Levers to match lockset design.

I. Removable Mullion:

1. Interior/Exterior doors, mullion is removable only using building keys.
   a. Allegion-Von Duprin KR4954
2. Interior Doors - UL listed, Mullion is removable only using building keys.
   a. Allegion-Von Duprin KR9954

J. Push and Pull Hardware:

1. Push Plates: 6 x 16 x .050 inches. If stile widths will not accept 6 inches, provide stile width less two inches.
2. Push-Pull Units: One-inch round rod. Push: Straight push bar, Pull: 90-degree offset, 12-inch centers. Attach top post of pull back to back with latch stile end of push bar, bottom post of pull and hinge stile end of push bar with end caps.
3. Pull, Offset: One-inch round rod, 90-degree offset, 12-inch centers.
4. Pulls: One-inch round rod, straight 12-inch centers.
5. Pull Plates: 4 x 16 x .050 inches. 8" center.
6. Pull, Bi-Fold: Dummy Lever Trims. Levers to match lockset lever design.
7. Pull, Wire: 3/4-inch diameter, 6-inch centers.
8. Vandal Resistant Pulls: Stainless steel construction 0.120 inches thick.
9. Manufactured by any B.H.M.A member.

K. Coordinator – Frame Stop Mounted:

1. Door coordinator shall prevent the active door from closing before inactive door. Stop mounted channel 1-5/8" x 5/8" steel tubing x length to suit door opening. Coordinator shall be UL listed. Furnish filler bars to fill gap between end of coordinator and inactive door frame. Furnish mounting brackets for all stop mounted hardware such as exit device strikes, door closer PA shoes, etc. Coordinators shall be prepared (cutout) at the factory for surface applied or concealed vertical rod panic devices if required.
2. Furnish with carry bar CB1 when required for proper operation.
3. Manufactured by any B.H.M.A member.

L. Electric Strike:

1. Electric strikes shall provide remote release of latch bolts. They shall be designed for use with the type locks shown at each opening where required. Strikes will be UL Listed for Burglary-Resistant Electric Door Strike, and where required, shall be UL listed as electric strikes for Fire Doors or Frames. Faceplates shall be stainless steel with finish as specified for each opening. The locking components shall be stainless steel to resist damage and abuse.
2. Furnish strikes manufactured by Dormakaba or Allegion-Von Duprin
   a. Dormakaba RCI F2 series Part # F2164
   b. Allegion-Von Duprin 6400 Series electric
   c. Alternative subject to approval from DTMB Office of Infrastructure Protection, Access Control Supervisor.
   d. Allegion-Von Duprin 6300 is a surface mount electric strike is specifically designed for Von Duprin 98/99 series rim exit devices.

M. Electric Power Transfer:

1. Transfer power from door frame to edge of door, UL listed R4504.
2. Allegion-Von Duprin EPT

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N. Access control wire:
   1. Honeywell Profusion Genesis series cable 22/6+22/4+22/2+18/4 – Plenum or FTS.

O. Closers:

   1. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder. Cylinder body shall be 1 ½" in diameter, and double heat-treated pinion shall be 11/16" in diameter with double D slab drive arm connection.
   2. Hydraulic fluid shall be of a type requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to –30 degrees F.
   3. Spring power shall be continuously adjustable over the full range of closer sizes and allow for reduced opening force for the physically handicapped. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
   4. All closers shall have solid forged steel main arms (and forged forearms for parallel arm closers).
   5. All surface mounted mechanical closers shall be certified to exceed ten million (10,000,000) full load cycles by a recognized independent testing laboratory.
   6. Closers will have Powder coating finish certified to exceed 100 hours salt spray testing by ETL, an independent testing laboratory used by BHMA for ANSI certification.
   7. Refer to door and frame details and furnish accessories such as drop plates, panel adapters, spacers and supports as required to correctly install door closers. State degree of door swing in the hardware schedule.
   8. Furnish closers manufactured by LCN
      a. Allegion-Von Duprin -LCN Series 4000.

P. ADA Special Closers

   1. Where "Low Energy Power Operated Door" as defined by ANSI Standard A156.19 is indicated for doors required to be accessible to the disabled, provide electrically powered operators complying with the ADA requirements for opening force and time to close standards.
   2. Full closing force shall be provided when the power or assist cycle ends.
   3. Modular design, adjustments easily accessible from the front, UL listed for use on labeled doors.
   4. Shall have "Second Chance" function to accommodate momentary resistance, "Breakaway" function in the electronically controlled clutch, "Soft Start" motor control function and "Maintain Hold-Open Switch" to hold the door open at 90 degree.
   5. Shall have built in 12V and 24V power supply for actuators, card readers, electric strikes and magnetic door locks, inputs for both swing and stop side sensors and available to accept either 120VAC or 220VAC input power. All wiring connections between operator modules made by easy-to-handle electrical connectors. Shall comply with both UL and NEC requirements for Class 1 and Class 2 wiring by providing separate conduits for each.
   6. Shall have seven independent electronic adjustments to tailor the operator for specific site conditions. Opening speed, holding force at 90 deg., sequential trigger and time delay, hold-open time at 90 deg., opening force, clutch "breakaway" force setting, electric strike trigger and time delay.
   7. Shall have separate and independent adjustments for back check, main speed and latch speed.
   8. Furnish actuators and other controls as shown in Hardware Sets.
   9. Furnish operators manufactured by:

10. All installers must be certified by the **American Association of Automatic Door Manufacturers (AAADM**) is a trade association of power-operated automatic door manufacturers.
11. Accepted units:
    a. Stanley Magic Force
    b. Horton Automatics Easy Access Series 4100LIE or Easy Access Series 7100
    c. Record 6100 or 8100 Heavy Duty

Q. Overhead Holders and Stops:

1. Plastic end caps hold open mechanisms and shock blocks are not allowed. End caps must be finished same as balance of unit.
2. Manufacture products using base material of Brass/Bronze for US3, US4, & US10B finished products and 300 Stainless Steel for US32 & US32D finished products.
3. Manufactured by any B.H.M.A member.

R. Kick Plates:

1. Furnish .050 inches thick, beveled three sides, 10" high x door width less 2" at single doors and less 1" at pairs. Where glass or louvers prevent this height, supply with height equal to height of bottom rail less 2".
2. Manufactured by any B.H.M.A member.

S. Bumpers:

1. Wrought, forged, or cast, approximately 2-1/2 inch diameter, convex or concave rubber center, concealed fasteners.
2. Manufactured by any B.H.M.A member.

T. Wall Stops:

1. Length to exceed projection of all other hardware. Provide with threaded studs and expansion shields for masonry wall construction. Install with slope at top.
2. Manufactured by any B.H.M.A member.

U. Floor Stops:

1. Half dome. Furnish height to suit undercut.
2. Manufactured by any B.H.M.A member.

V. Wall Holders:

1. Products specified by series only; furnish strike length to exceed projection of all other hardware.
2. Manufactured by any B.H.M.A member.

W. Door Holding Magnets:

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1. Electrically controlled, fail-safe, holds door open until current is interrupted.
2. Units will have 35 lbs. of holding force.
3. Units will be “tri-voltage”, 12VDC, 24VAC/DC & 120VAC.
4. Furnish model to hold door away from wall to allow for any trim or levers on pull side of door.
5. Manufactured by any B.H.M.A member.

X. Thresholds:

1. 1/2" high - 5" wide. Cope at jambs.
2. Furnish full wall opening width when frames are recessed.
3. Cope in front of mullions if thresholds project beyond door faces.
4. Furnish with non-ferrous Stainless-Steel Screws and Lead Anchors.
5. Manufactured by any B.H.M.A member.

Y. Door Sweeps:

1. Surface Sweeps
2. Manufactured by any B.H.M.A member.

Z. Weather-stripping:

1. Apply to head and jamb stops.
2. Solid Bar stock all sides
3. Manufactured by any B.H.M.A member.

AA. Meeting Stile Weather-stripping:

1. 2 Pc. Nylon brush type to seal gap between pairs of doors.
2. Manufactured by any B.H.M.A member.

BB. Astragal:

1. Stainless steel, type 304, Finish 2B. 12 gauge 1-5/8 inch wide. #10 x 3/4" sheet metal screws.
2. Manufactured by any B.H.M.A member.

CC. Sound Seal:

1. Adjustable type perimeter seal.
2. Manufactured by any B.H.M.A member.

DD. Smoke and Draft Control Seals: (Use this section for hollow metal ‘S’ labeled doors.)

1. Gaskets must comply with UBC7.2 (1997) Part 2, UL1784 (1995), and NFPA 105 (1999) for use on all ‘S’ labeled wood and hollow-metal Positive Pressure door assemblies.
2. Manufactured by any B.H.M.A member.

EE. Fire and Smoke Seals: (Use this section for 20, 45, & 60-minute rated wood door with ‘S’ label)

1. Gaskets must comply with UBC7.2 (1997) Part 1 & 2, UL1784 (1995) NFPA 105 (1999) for use on (Category 'B') 20, 45, & 60-minute wood door assemblies:
2. Manufactured by any B.H.M.A member.

FF. Fire and Smoke Seals: (Use this section for 90-minute rated wood doors with 'S' label)

1. Gaskets must comply with UBC7.2 (1997) Part 1 & 2, UL1784 (1995) NFPA 105 (1999) for use on (Category 'B') 90 – minute wood door assemblies:

2. Lock protector shall eliminate gap between door and frame. No exposed fasteners on face of unit.
3. Manufactured by any B.H.M.A member.

GG. Fasteners:

1. Furnish fasteners of the proper type, size, quantity and finish. Use machine screws and expansion shields for attaching hardware to concrete or masonry, and wall grip inserts at hollow wall construction. Furnish machine screws for attachment to reinforced hollow metal doors and frames and reinforced aluminum doors and frames. Furnish full thread wood screws for attachment to solid wood doors and frames. "TEK" type screws are not acceptable.
2. Sex bolts will not be permitted on reinforced metal doors or wood doors where blocking is specified.

2.3 Finishes:

A. Generally, Dull Chrome, US26D / BHMA 626. Provide finish for each item as indicated in sets.

2.4 Templates and Hardware Location:

A. Furnish hardware made to template. Supply required templates and hardware locations to the door and frame manufacturers.

B. Furnish metal template to frame/door supplier for continuous hinge.

C. Refer to Article 3.1 B.2, Locations, and coordinate with templates.

2.5 Cylinders and Keying:

A. Locks Cylinders and keys will be furnished with Best Small Format Interchangeable Core (SFIC). Coordinate keying requirements with State of Michigan Department of Technology, Management and Budget, Office of Infrastructure Protection.

B. Provide cylinders with construction cores or keying for use during the construction period.

DTMB DOOR HARDWARE SPECIFICATION

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PART 3 - EXECUTION

3.1 Installation

A. General:

1. Install hardware according to manufacturer’s installations and template dimensions. Attach all items of finish hardware to doors, frames, walls, etc. with fasteners furnished and required by the manufacture of the item.
2. Provide blocking/reinforcement for all wall mounted Hardware.
3. Reinforced hollow metal doors and frames and reinforced aluminum door and frames will be drilled and tapped for machine screws.
4. Solid wood doors and frames: full thread wood screws. Drill pilot holes before inserting screws.
5. Continuous gear hinges attached to hollow metal doors and frames and aluminum doors and frames: 12-24 x 1/2" #3 Phillips Keen form self-tapping. Use #13 or 3/16 drill for pilot.
6. Continuous Gear Hinges require continuous mortar guards of foam or cardboard 1/2" thick x frame height, applied with construction adhesive.
7. Install weather-strip gasket prior to parallel arm closer bracket, rim exit device or any stop mounted hardware. Gasket to provide a continuous seal around perimeter of door opening. Allow for gasket when installing finish hardware. Door closers will require special templating. Exit devices will require adjustment in backset.

B. Locations:

1. Dimensions are from finish floor to center line of items.
2. Include this list in Hardware Schedule.

CATEGORY	DIMENSION
Hinges	Door Manufacturer's Standard
Flush Bolt Levers	72" and 12"
Levers	Door Manufacturer's Standard
Exit Device Touch Bar	Per Template
Dead latch Cylinder	43" unless conflicting with push-pull.
Deadlock MS Cylinder	43" unless conflicting with push-pull.
Hospital Push-Pull	Manufacturer's Template
Roller Latch	At Head
Push-Pull Units	42" to centerline of Pull
Offset Pulls	Suitable for Exit Devices
Pulls - Flush Cup	46"
Pulls (BTB)	46"
Push-Pulls	46"
Push Plates	52"
Pull Plates	42"
Wire Pulls	42"
Wall Stops/Holders	At Head
Astragals	Pull side of active leaf
Trim Protector Bars	Push side of door below lever handle
Lock Protectors	Pull side of door

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C. Field Quality Inspection:

1. Provide the services of a representative to inspect material furnished and its installation and is adjustment, and to instruct the Owner's personnel in adjustment, care and maintenance of hardware.
2. Locksets and exit devices shall be inspected by the factory representative after installation and after the HVAC system is in operation and balanced, to insure correct installation and proper operation.
3. Closers shall be inspected by the factory representative **(and adjusted when required after a Pre-Installation meeting has been conducted)** after installation and after the HVAC system is in operation and balanced, to insure correct installation and proper operation.
4. The manufacturer's representative shall prepare a written report stating compliance and recording locations and kinds of noncompliance. The original report shall be forwarded to the Architect with copies to the Contractor, hardware distributor, hardware installer and building owner.

D. Technical and Warranty Information:

1. At the completion of the project, the technical and warranty information coalesced and kept on file by the General Contractor/Construction Manager shall be given to the Owner or Owner's Agent. In addition to both the technical and warranty information, all factory order acknowledgement numbers supplied to the General Contractor/Construction Manager during the construction period shall be given to the Owner or Owner's Agent. The warranty information and factory order acknowledgement numbers shall serve to both expedite and properly execute any warranty work that may be required on the various hardware items supplied on the project.
2. Submit to General Contractor/Construction Manager, two copies each of parts and service manuals and two each of any special installation or adjustment tools. Include for locksets, exit devices, door closers and any electrical products

For question on the specification contact DTMB Office of Infrastructure Protection.

Craig Thornton
Access Control Building Trades Supervisor
Office of Infrastructure Protection
Michigan Department of Technology, Management & Budget
Cybersecurity & Infrastructure Protection
Joint Operations Center, 615 W. Allegan Street, Lansing, MI 48933
thorntonc3@michigan.gov
517-242-9026

DTMB
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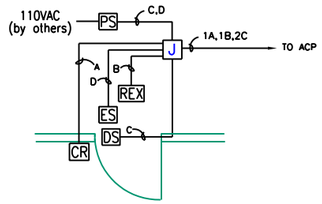
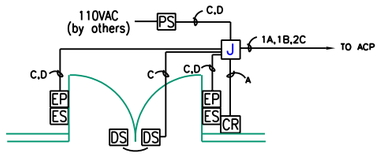
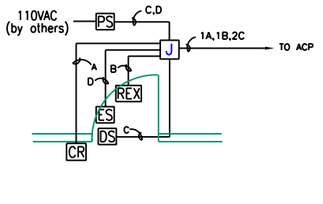


PLAN VIEW 1



PLAN VIEW 2



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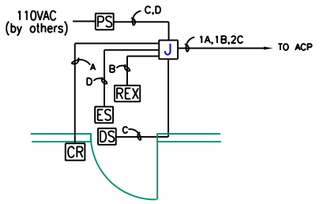

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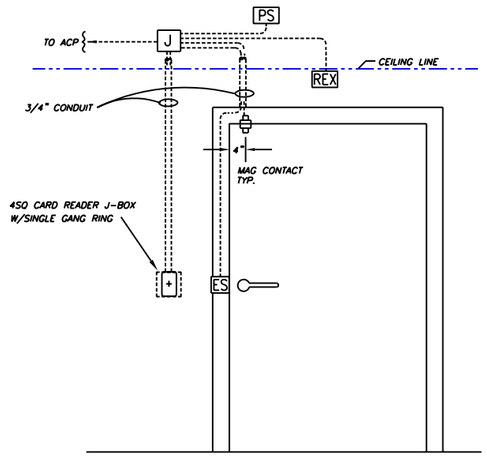
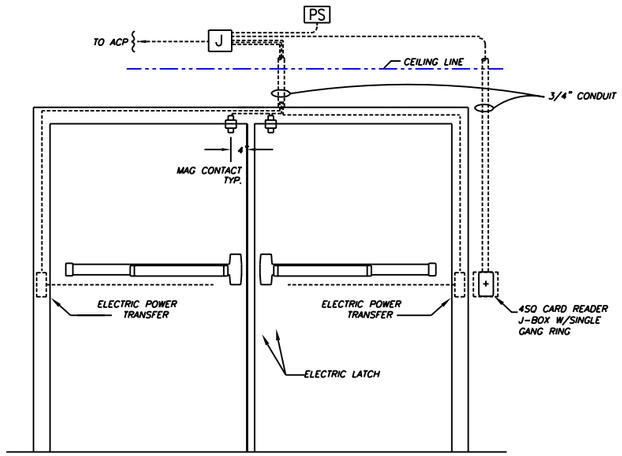
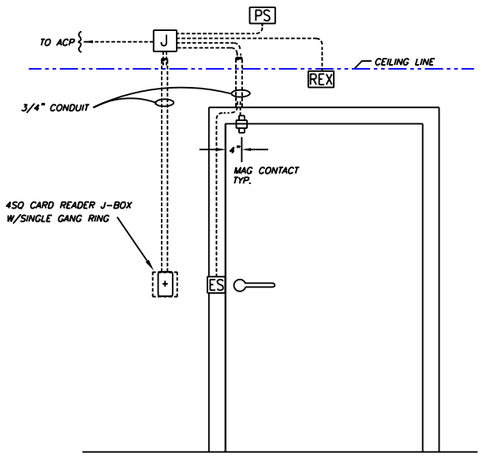


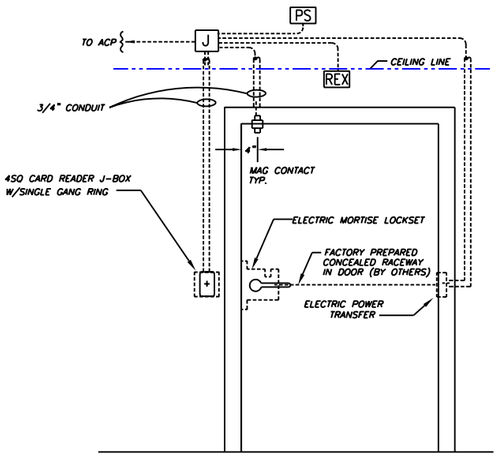
ELEVATION 1



ELEVATION 2



ELEVATION 3



ELEVATION 4

OPERATIONAL DESCRIPTION

The card reader shall unlock the electric strike when a valid user card is presented to the reader. Once the strike time on the reader elapses, the electric strike shall re-lock the door.

OPERATIONAL DESCRIPTION

The card reader shall control the locking and unlocking of the door. When a valid user card is presented, the latchbolts on the exit device shall retract allowing the card-holder to open the door. After the strike time on the card reader elapses, the latchbolts on the exit divices shal extend and latch. Authorized egress is accomplished by pushing on the push pad, which will shunt any alarms. If the fire alarm goes into an active state, the power to the power supply shall be cut.

OPERATIONAL DESCRIPTION

The card reader shall unlock the electric strike when a valid user card is presented to the reader. Once the strike time on the reader elapses, the electric strike shall re-lock the door.

OPERATIONAL DESCRIPTION

The lever trim on the secure side of the opening shall be held electrically locked. The card reader shall control the locking and unlocking of the lever trim. If the fire alarm goes into an active state, the lever-handle trim shall unlock.

1/10 Typical Single Door Layout

2/10 Typical Double Door Layout

3/10 Typical Single Door Layout

4/10 Typical Single Door Layout

CABLE LEGEND	
A	18 AWG, 3 pair, shielded
B	18 AWG, 2 pair
C	18 AWG, 1 pair
D	12 AWG, 1 pair
E	

SYMBOL LEGEND			
REX	Request to exit PIR	PS	Power Supply (by others)
ES	Electric Strike/Latch	EP	Exit Pushbar Switch
DS	Door position switch	ACP	Access Control Panel
CR	Card reader	J	Junction Box
LM	Latch Monitor Switch	FA	Fire Alarm Module

REV F		BY
REV E		BY
REV D		BY
REV C		BY
REV B		BY
REV A		BY

Door Typicals – 1

Honeywell *ExpertISE* ©

49116 Wixom Tech Drive, Wixom, MI. 48393

FILE: | DATE: | SHEET:

DRAWING NUMBER | REV

PROJECT DESIGN:	SYSTEM DESIGN:	CONTRACTOR:	HONEYWELL DESIGN:	HONEYWELL INSTALLATION:	DRAFTER:	APPROVED BY:

09/06/2001 - 11:20

Door_Typical_1

State of Michigan
Technical Standard

1345.00.01 Network and Telecommunications Local Area Network (LAN) Cabling Standard

Issued: 05/03/2010
Revised: 06/29/2021
Reviewed: 05/12/2020
Next Review Date (1 yr): 06/29/2022

Authoritative Policy: 1345 Information Technology Network & Infrastructure Policy (https://www.michigan.gov/documents/dmb/1345.00_282982_7.pdf)
Associated Procedures: n/a
Distribution: Statewide

Purpose

To establish a statewide standard for Local Area Network (LAN) cabling within state of Michigan (SOM) government agencies in a consistent manner as well as to comply with Public Act 431 of 1984, as amended.

Contact/Owner

Department of Technology, Management and Budget (DTMB)
Infrastructure & Operations (I&O)
Network and Telecommunications Services Division (NTSD)

Scope

Applicable to all state of Michigan information technology systems that require DTMB NTSD Local Area Network (LAN) cabling.

Standard

DTMB NTSD or its appointed designee shall provide installation services to SOM Executive Branch Agencies for information transport cable within their areas. All such LAN cabling shall identify and define the following:

- A listing of the most common applicable Standards and Codes bodies.
- A partial listing of standards, codes and best practices for management of information transport systems (ITS) media relating to LAN cabling.

Applicable Codes and Standards

A partial list of the most common applicable Codes and Standards bodies follows:

1. National Electrical Code (NEC)
2. National Fire Protection Association (NFPA)

3. Underwriters Laboratory (UL)
4. American National Standards Institute (ANSI)
5. Electronic Industries Alliance (EIA)
6. Telecommunication Industry Association (TIA)
7. Building Industry Consulting Services International (BICSI)

REQUIREMENTS

Information provided herein is a basic guide for the installation of LAN information transport system cable. This guide provides general information as to the type of cable and terminating hardware to be used in SOM buildings. It is the responsibility of DTMB NTSD or its assigned designee for installation services to apply for and obtain all applicable permits as well as meet or exceed all applicable standards and codes.

LAN ITS CABLE

1. The information transport system will adhere, but not be limited, to NEC, NFPA, ANSI/EIA/TIA and BICSI codes and standards.
2. Required permits will be on site as work commences.
3. The horizontal cabling system will adhere to, but not be limited to, the EIA/TIA 568 Standard and BICSI Standards. The data cable will be rated CAT 5e or above. New building construction data cable will be rated CAT 6 or above.
4. LAN cable in the main telephone room (MTR) or telephone room (TR) will be terminated on an RJ45 jack or patch panel. This jack or patch panel will be rated with a bandwidth at least the same or higher than the attached cable.
5. LAN cable will be terminated on an RJ45 jack at the distributed end (work area). This jack will be rated with a bandwidth at least the same or higher than the cable from the MTR/TR.
6. Patch panels will be wall or rack mounted.
7. Plenum cable will be installed in all plenum areas. Non-plenum areas do not require plenum cable.
8. Wall fields and equipment racks will contain cable management systems (CMS).
9. All LAN cable termination points will be properly labeled with unique drop numbers per floor, at both cable ends, in accordance with ANSI/TIA/EIA-606-B standard.

Note: Documentation of the ANSI/TIA/EIA, BICSI, NEC and NFPA standards referenced in this document can be purchased from the responsible organization:

- BICSI (www.bicsi.org)
- TIA (www.tiaonline.org)

- ANSI (http://webstore.ansi.org).
- EIA (https://ecia.memberclicks.net/eia-technical-standards) standards are now managed by the Electronic Components Industry Association.
- 'NEC' the National Electrical Code is a trademark of the National Fire Protection Association (https://www.NFPA.org).

GLOSSARY

ANSI

American National Standards Institute – A private, nonprofit organization that functions as an administrator and coordinator of American voluntary standardization systems. Its membership includes private and public sector organizations.

BICSI

Building Industry Consulting Services International – Helps develop standards and guidelines for networking. Its certifications are de-facto standards for cable installers.

CAT 5e

Enhanced Category 5 – An unshielded twisted pair (UTP) cable that can support data speeds of 1000 Mbps, i.e., gigabit speed. Cables can reach a length of 100 meters.

CAT 6

Category 6 – A UTP cable that is backward compatible with CAT 5e has greater immunity from noise and crosstalk, and can handle data speeds of 10 Gigabits per second (Gbps, i.e. 10 GBase-T). It provides performance of up to 250 MHz.

CAT 6A

Category 6A, or Augmented Category 6. This has improved alien crosstalk characteristics, enabling 10 GBase-T to be run for a distance of 100 meters. It has doubled the bandwidth frequency from 250 MHz (CAT 6) to 500 MHz.

CBTC

Commercial Building Telecommunications Cabling – A subcommittee of the TIA (see below), tasked with revising the TIA's "Building Automation System Cabling Standard."

CMS

Cable Management System.

DMARC

Demarcation point – This is the physical point at which 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.

ECIA

Electronic Components Industry Association (see EIA below).

EIA

Electronics Industries Alliance – This organization ceased operations in February 2011. It assigned the maintenance of existing interconnect, passive electro-mechanical (IP&E) standards to the ECA, (Electronic Components Association), which in turn has joined the ECIA (Electronic Components Industry Association). From the ECIA's website as of 5/31/2013, "the EIA standards brand will continue for IP&E standards within ECIA."

ITS

Information Transport Systems – Systems and infrastructure that move information within a commercial building. That information can be audio, video, voice, data, electronic safety and security, environmental, and building controls.

MTR

Main Telecommunication Room – The room, located in the center of a building, for the telephone (voice), data and video services (DMARC). The room may also serve as the Telecommunication Room (TR) of the floor on which it exists.

NEC

National Electrical Code – Set of standards for the safe installations of electrical wiring and equipment. It is not a legally binding regulation, but it is often used by states and municipalities. "NEC" and "National Electrical Code" are registered trademarks of the National Fire Protection Association (NFPA). The NEC has also been approved by ANSI as a national standard.

NFPA

National Fire Protection Association – The organization that sets standards for fire protection and safety, including: requirements for protecting Plenum spaces; standards for plastics used in the construction of Plenum cables.

Plenum Cable

The type of cable deployed in Plenum spaces. They are required by NFPA standards to be coated with fire-retardant cable so that in the event of a fire they do not release toxic gases.

Plenum Space

The space in a building used to circulate air for air-conditioning and heating. It is also commonly used to house the cables for the building's telephone and computer networks. The most common examples are the space between the structural ceiling and the suspended ceiling or the space under a raised floor.

TIA

Telecommunications Industry Association – Accredited by ANSI to develop standards for information and communication technologies.

TR

Telecommunications Room – The rooms stacked on each floor of a multi-floor building (except the MTR) to house information outlet terminations and cable terminations for the riser system.

UL

Underwriters Laboratories – This is a global independent safety science company offering expertise in certification, validation, testing, inspections, auditing, education and advisory services.

APPROVING AUTHORITY

Brom Stibitz, Director Revised: 06/292021

State of Michigan
Technical Standard

1345.00.02 Enterprise Operations Center – User Experience Infrastructure Facility Standard

Issued: 05/03/2010
Revised: 10/19/2022
Reviewed: 04/12/2022
Next Review Date (1 yr): 10/19/2023

Authoritative Policy: 1345 Information Technology Network & Infrastructure Policy (https://www.michigan.gov/dtmb/-/media/Project/Websites/dtmb/Law-and-Policies/Admin-Guide/1300/POLICY-1345-Enterprise-Information-Technology-Infrastructure.pdf)
Associated Procedures: n/a
Distribution: Statewide

Purpose

To establish a statewide facilities standard for Main Telecommunications Rooms and Telecommunications Rooms in newly built or significantly remodeled State owned DTMB managed facilities or State leased facilities within state of Michigan (SOM) government so that consistency is maintained and so that DTMB is in compliance with Public Act 431 of 1984, as amended.

Contact/Owner

Department of Technology, Management and Budget (DTMB)
Office of the Chief Technology Officer (CTO)
Enterprise Operations Center – User Experience (EOC-UX)

Scope

Compliance with this standard is mandatory for Executive Branch Departments, agencies, and sub-units. Its provisions apply to all design, construction, and maintenance of SOM telecommunications rooms. This guide is limited to the following:

- The design considerations regarding the telecommunication rooms, pathways, entrance facilities, environmental and electrical requirements, cabling and equipment components of the SOM's telecommunication network.
- The construction and installation requirements for telecommunication rooms, pathways, entrance facilities, environmental and electrical requirements, cabling, and equipment components for SOM's communication network infrastructure relative to state owned and/or leased facilities.

STANDARD

The SOM requires an appropriate environment for network and telecommunication products/infrastructure to support voice, data and video systems based on requirements of the building and its occupants. Telecommunication items incorporated in any building shall adhere to American National Standards Institute (ANSI) / Telecommunications Industry Association (TIA) and Building Industry Consulting Services International (BICSI) Standards. The detailed specification for network and telecommunications may override the ANSI/TIA and BICSI Standards in some areas due to changes in technology. In addition to the ANSI/TIA and BICSI Standards, all applicable building standards and codes must be incorporated. Appendix #1 and Appendix #2 of this document describe the National Electrical Code (NEC), applicable codes and current industry standards all relating to building spaces, pathways and equipment which will be required from the building owner in order to achieve compliance.

To allow for cost and resource limitations in bringing SOM facility infrastructure to complete compliance with this Standard, the following timeframes are established:

- New SOM-owned DTMB-managed facilities must comply with this standard as they are built or significantly remodeled, affecting the Main Telecommunications Rooms.
- New SOM-leased facilities must comply with this standard within four (4) years of DTMB assuming the lease.

Exceptions to this standard, that cannot be agreed to by the requesting agency and DTMB (IT and facilities), shall be requested through the DTMB Executive Technology Review Board (ETRB) per SOM 1305.00.02 Policy and Product Exception Process Standard.

GLOSSARY

ANSI

American National Standards Institute.

BICSI

Building Industry Consulting Services International – Helps develop standards and guidelines for networking. Its certifications are de-facto standards for cable installers.

BTU

British Thermal Unit.

CAT 3

Category 3 – An unshielded twisted pair (UTP) 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 (UTP) cable that can support data speeds of 100 Mb or more. It provides performance up to 100 Mhz. Cables can reach length of 100 meters.

CAT 5e

Enhanced Category 5 that supports 1000 Mb, i.e., gigabit speed.

CAT 6

Standard for cable used for Gigabit Ethernet, i.e., 1000-Base-T (GbE) and 10-Gigabit Ethernet (10 GbE). It is backward compatible with CAT 5/5e and CAT 3 standards. It provides performance up to 250 MHz and it has a maximum length of 100 Meters, though only 55M when used for 10GbE. It has more stringent specifications for preventing crosstalk.

CAT 6A

Augmented Category 6. This is characterized to 500 MHz and can run 10 Gigabit Ethernet for 100 meters.

CBTC

Commercial Building Telecommunications Cabling – a subcommittee of the TIA (see below), tasked with revising the TIA's "Building Automation System Cabling Standard."

CMS

Cable Management System.

Crosstalk

A phenomenon by which a signal transmitted on one circuit or channel of a transmission system creates interference or an undesired effect in another circuit or channel.

DMARC

Demarcation point – This is the physical point at which 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.

LM/Ft2

Lumens per square foot – a standard for measuring brightness in foot candles.

MTR

Main Telecommunication Room – located near the center of the building. When possible, this placement will minimize the size and length of the vertical cable as well as the length of the horizontal information transportation system. For example: In a 9-story single-tenant office building, place the MTR on the fifth floor.

NEC

National Electrical Code – Set of standards for the safe installations of electrical wiring and equipment. It is not a legally binding regulation, but it is often used by states and municipalities. “NEC” and “National Electrical Code” are registered trademarks of the National Fire Protection Association (NFPA). The NEC has also been approved by ANSI as a national standard.

TGB

Telephone ground bar.

TIA

Telecommunications Industry Association – Accredited by ANSI to develop standards for information and communication technologies. Also, TIA’s website states that its “Engineering Committee TR-42 develops and maintains voluntary telecommunications standards for telecommunications cabling infrastructure in user-owned buildings, such as commercial buildings, residential buildings, homes, data centers, industrial buildings, etc.”

TR

Telecommunications Room.

REFERENCES

Public Act 431 of 1984, as amended
(http://legislature.mi.gov/doc.aspx?mcl-Act-431-of-1984)

SOM 1305.00.02 Policy and Product Exception Process Standard
(https://stateofmichigan.sharepoint.com/teams/insidedtmb/work_/policies/IT%20Policies/1305.00.02%20Technical%20Policy%20and%20Product%20Exception%20Standard.pdf)

APPROVING AUTHORITY

Michelle Lange, Acting Director Revised: 10/19/2022

APPENDIX #1 – GENERAL SPECIFICATIONS

A. Building Entrance Conduit

Building Entrance Conduit Overview: A minimum of three (3) conduits having a four (4) inch diameter are required to facilitate building entrance of outside cables. These conduits are to originate at the property line and terminate in a manhole or hand-hole just outside the landscape area adjacent to the building. Also, there must be a minimum of three (3) – four (4) -inch conduits placed which connect the manhole or hand-hole to the Telecommunication DMARC room. The placement of underground conduits, with respect to location on the property line and required redundancy, is to be coordinated with the SOM Department of Technology, Management and Budget, Enterprise Operations Center – User Experience Division. Note: See the Technical Specifications in Appendix #2 of this document.

B. Building Main Telecommunication Room (MTR)

1. The Telecommunication System for a building requires a Main Telecommunication Room (MTR) for telephone (voice), data and video services. This room is to be located near the center of the building. When possible, this placement will minimize the size and length of the vertical cable as well as the length of the horizontal information transportation system. For example: In a 9-story single-tenant office building, place the MTR on the fifth floor.

2. Considerations for off-loading and moving the equipment to the MTR and stacked Telecommunication Rooms (TRs) along with availability of elevators, passageways and loading docks should be kept in mind. These TRs are to be established using, the ANSI/TIA and BICSI standards, but should not be limited to them.

C. Telecommunication Rooms (TR)

Each floor, with the exception of the floor which contains the Main Telecommunication Equipment Room, shall have at least one TR.

1. The location of the TR is to be centrally located in the area it is servicing, when possible.

2. The TR will house, at a minimum, information outlet terminations, cable terminations for the riser system and at least one cabinet and/or relay rack.

3. The number of TRs per floor is dependent on the maximum length of the station cable terminating in that TR. This length is not to exceed two hundred ninety (290) feet. This means that if the footprint of the building does not allow all areas of the floor being served by this TR to be served with cable equal to or less than two hundred ninety (290) feet, then an additional TR will be required. This distance requirement also holds true on the floor which contains the MTR.

4. When possible, the TRs shall be “stacked”, one above the other on adjacent floors.
5. Voice wall field will consist of 110A-type connecting blocks.
6. TR data cables, CAT 5e and above, will terminate in equipment rack mounted patch panels that will support the applicable Category certified data rate.
7. Horizontal cable will be plenum and/or non-plenum depending on the application. The cable type must be as required in the applicable national electric code (NEC).
8. The TR wall field is to incorporate a cable management system.
9. The TR equipment racks are to be equipped with a cable management system.
10. Equipment racks mounted in the TRs are to be arranged with clearances as prescribed in BICSI standards.

D. Backbone Pathways

A pathway must be installed which will allow for the placement of continuous riser communication cables from the MTR to each of the TRs. When the TRs are stacked one above and/or below the other, sufficient sleeves or slots must be installed which will allow the passage of cables to serve that and other TRs.

E. Horizontal Pathways

Each floor of the building will be provided with a cable management system (CMS). The CMS may consist of cable trays, J-hooks and/or conduits, and it will allow the placement of voice, data and video cable from the serving TR to the workstation. The CMS must be designed with no sharp edges which could damage the cable. Metallic cable trays and conduits must be bonded and grounded. CMS type must be determined and approved by DTMB EOC-UX. CMS design must be approved by DTMB EOC-UX.

F. Telecommunications Systems

The SOM has standardized on a DTMB-EOC-UX-approved end-to-end structured cable system (SCS) throughout all State buildings and supported venues. The SCS must be certified to operate at the maximum bandwidth of the category classification of the cable and hardware. The SCS shall possess a minimum twenty five (25) -year warranty and shall comply with the EIA/TIA 568 Standard.

The warranty must cover both labor and materials and must be provided by the equipment manufacturer not the installing contractor. Test records must be provided to the SOM by the equipment manufacturer or its certified vendor.

G. Horizontal Cable Systems

The horizontal cabling system will adhere to, but not be limited to, the EIA/TIA 568 Standard and BICSI Standards. The data cable shall be rated CAT 5e or above. New building construction data cable shall be rated CAT 6 or above. The cable will be run within the cable paths as described in the above section titled, “Horizontal Pathways.” All data cables will be certified to operate at the maximum bandwidth of the Category classification of the cable.

APPENDIX #2 – TECHNICAL SPECIFICATIONS

A. Building Entrance Conduits

1. All conduits are to be four (4) inch rigid steel unless otherwise agreed upon.
2. If bends in total length of conduit from property line to hand-hole exceed one hundred eighty (180) degrees an access box is to be installed at the point where adding another bend would exceed the one hundred eighty (180) degree limit. This is to be done for each length on conduit where bends would exceed one hundred eighty (180) degrees.
    a. All bends will be made with a sweeping radius. No sharp ninety (90) - degree bends are allowed.
3. Conduits within the building are to be reamed and have an insulated bushing on each end.
4. Hand-holes will be a minimum of three (3) feet by three (3) feet and eighteen (18) inches in depth.
5. Conduits are to be placed at least twenty-four (24) inches below finished grade.
6. All conduits placed underground are to be painted with corrosion inhibitor paint.
7. All ends of the conduits are to be sealed thereby blocking the entrance of debris and water into the conduits.
8. Conduits entering building and going to the DMARC require a hand-hole within thirty feet of the entrance wall.
9. Conduits placed from the outside hand-hole to the Telecommunication DMARC room shall be four (4) inch diameter unless otherwise agreed upon.
10. If bends totaling more than one hundred eighty (180) degrees are required a junction box measuring at least three (3) feet by three (3) feet will be placed at each point where the addition of a bend would result in that length of conduit having total bends in excess of one hundred eighty (180) degrees.
11. Conduits within the building are to be bonded and grounded.

B. Main Telecommunication Room (MTR)

1. Size of Main Telecommunication Room (MTR) area measurements must be determined and approved by the DTMBEnterprise Operations Center – User Experience (EOC-UX).
2. Walls are to be constructed of approved materials – masonry brick, drywall, cement block, etc.

3. Door is to be at least three (3) feet wide and at least eighty (80) inches tall. Door is to swing outward unless prohibited by local codes.

4. Door security hinge pins must be non-removable when accessible from outside the room, or door security pins must be installed to prevent door opening if hinge pins are removed. Standard hinge pins can be used when installed on the inside of the room.

5. Locking systems are to be high security pin-tumbler cylinder locks that meet the following requirements:

    a. Key-operated mortised or rim-mounted dead bolt lock.

    b. A dead bolt throw of one inch or longer.

    c. Double cylinder design. Cylinders are to have five (5) or more pin tumblers.

    d. Convenience type locking devices, such as card key or sequenced button activated locks, used in conjunction with electrical strikes, are authorized for use.

6. Telephone equipment room shall be environmentally controlled seven (7) days a week, twenty-four (24) hours a day.

    a. Average room temperature – is not to exceed 85F degrees.

    b. Humidity range: 20 - 60 percent relative.

    c. Heat dissipation: 750 - 10,000 BTUs per hour per cabinet.

7. Hazardous elements such as water, steam, gas pipes and explosive or corrosive atmosphere must be excluded from the Telecommunication Rooms.

8. It is preferred that the MTR shall be placed in line with the stacked Telecommunication Rooms (TRs) located on each of the other floors.

9. The MTR shall contain the Main Telephone Ground Bar.

10. The stacked TRs shall each contain a telephone ground bar.

11. The Main Telephone Room shall have four (4) 20A 110V circuits distributed on quadplex wall plugs. These circuits are to be connected to emergency power when available. These circuits are for equipment operation.

12. The power panel feeding the MTR shall be equipped with transient voltage surge suppression (TVSS).

13. Alternating Current (AC) outlets being served by emergency power are to be orange in color.

14. Circuits required for equipment operation, MTR lighting and MTR environmental conditions are to be connected to the emergency power when available.
15. The MTR shall contain one 15A 110V circuit distributed on duplex wall plugs. This circuit is for test equipment and such.
16. One 15A duplex receptacle is to be located on each wall.
17. Gaseous fire suppression equipment is recommended for use in the MTR.
18. Typically, one wall is to have six (6) feet by four (4) feet of fire-retardant plywood placed on it. Plywood is to be placed thirty (30) inches above finished floor.
    a. The wall containing the door is not one of the walls on which plywood can be placed.
    b. Plywood is to be clear grade.
    c. Plywood is to be 3/4inches in thickness.
19. The MTR requires the AC electrical power to be dedicated branch circuits.
20. The MTR are to have floors finished to keep dust to a minimum.
    a. Carpet is not to be used in the telecommunication equipment room.
    b. Antistatic floor tile or anti-static concrete sealer is required.
21. Food and drink are prohibited in the MTR.
22. The MTR shall be dedicated to communications use only and shall not be shared with departmental storage, janitorial staff, equipment, or other materials.
23. Hazardous or corrosive materials shall not be stored in the space.
24. Local exchange carrier requirements are to be taken into consideration for MTR requirements.
25. MTR walls must be from floor to deck.
26. Ceiling height must be at least 8 1/2 feet.
27. Emergency lighting is required in the MTR.
28. The lighting when measured at floor level must have:
    a. A uniform intensity of thirty (30) LM/Ft2.
    b. Light fixtures that are fused separately from those that provide service to the equipment or other electrical circuits in the equipment space.

29. There shall be four (4) inch conduit sleeves placed between the Telecommunication Rooms (Closets) for the purpose of providing a pathway for the riser cable system. The number of four (4) inch sleeves will depend on the riser cable design. A minimum of two (2) sleeves are required. If more than one sleeve is required to accommodate the riser cable system, then an additional empty sleeve shall be installed. This means that upon completion of this telecommunication system installation, a vacant four (4) inch sleeve between Telecommunication Rooms will exist. Conduits and sleeves will be fire-stopped in accordance with the NFPA.

30. All metal conduits and/or metal sleeves are to be reamed and bushed on both ends.

C. Telecommunication Room (TR)

1. The size and number of TRs must be approved by DTMB Enterprise Operations Center – User Experience Division (EOC-UX). DTMB considers basic guidelines for typical Telecommunication rooms:

Floor Size (usable square feet)	Room Dimensions
Greater than 8,000 to 10,000	10’ x 11’
Greater than 5,000 to 8,000	10’ x 9’
Under 5,000 usable SF	6’ x 8’

2. Door(s) are to be a minimum of three (3) feet wide and eighty (80) inches tall.

3. Walls are to be constructed of approved materials – masonry brick, drywall, cement block, etc.

4. Door is to swing outward when allowed by local building codes.

5. Door hinge security pins and/or security hinge pins must be non-removable when accessible from outside the room. Standard hinge pins can be used when installed on the inside of the room.

6. Locking systems are to be high security pin-tumbler cylinder locks that meet the following requirements:

    a. Key-operated mortised or rim-mounted dead bolt lock.

    b. A dead bolt throw of one (1) inch or longer.

    c. Double cylinder design. Cylinders are to have five (5) or more pin tumblers.

    d. Convenience type locking devices such as card key or sequenced button activated locks, used in conjunction with electrical strikes, are authorized for use.

7. Typically, one wall is to have six (6) feet by four (4) feet of fire-retardant plywood placed on it. Plywood is to be placed thirty (30) inches above finished floor.

    a. The wall containing the door is not one of the walls on which plywood can be placed.

    b. Plywood is to be clear grade.

    c. Plywood is to be 3/4 inches in thickness.

8. There should be one 15A 110V circuit e/w duplex receptacle on each wall. The purposes of these outlets are for plugging in test gear, etc.

9. Two (2) 20A 110V circuits are to be provided in the TRs. When possible, they will be connected to the emergency power source. They shall be distributed on quadplex outlets along the wall containing the plywood.

10. AC outlets being served by emergency power are to be orange in color.

11. Electrical circuits serving the telecommunication equipment are to be connected to the emergency power source, if available.

12. There shall be four (4) inch conduit sleeves placed between stacked TRs for the purpose of providing a pathway for the riser cable system. The number of four (4) inch sleeves will depend on the riser cable design. At a minimum two (2) sleeves are required. If more than one sleeve is required to accommodate the riser cable system, then an additional empty sleeve shall be installed. This means that upon completion of this communication system installation, a vacant four (4) inch sleeve between stacked TRs will exist.

13. All metal conduits and/or metal sleeves are to be reamed and bushed on both ends.

14. The floor is to be finished in a manner that will keep dust to a minimum.

15. Carpet is not to be used in the TRs.

16. Anti-Static floor covering or anti-static concrete sealer is to be used in the TRs.

17. Food and drink are prohibited in the TRs.

18. TR’s shall be dedicated to communications use only and shall not be shared with departmental storage, janitorial staff, equipment, or other materials.

19. Hazardous or corrosive materials shall not be stored in the space.

20. There are to be no electrical cabinets, transformers, water pipes, steam pipes, etc. within the TRs.

21. The TRs are to have a Telephone Ground Bar (TGB). This TGB is to meet ANSI/TIA Standards.
22. The lighting when measured at floor level must have a uniform intensity of 30 LM/ft.
23. The TR shall be environmentally controlled seven (7) days a week, twenty-four (24) hours a day.
24. Average room temperature– is not to exceed 85F degrees.
25. Humidity range: 20 - 60 percent relative.
26. Heat dissipation: 750 - 10,000 BTUs per hour per cabinet.

STATE OF MICHIGAN

BUILDING ADA SIGNAGE STANDARDS

SIGNAGE GENERAL NOTES

RAISED CHARACTERS:

1. DEPTH: RAISED CHARACTERS SHALL BE 1/32 INCH MINIMUM ABOVE THEIR BACKGROUND.
2. CASE: CHARACTERS SHALL BE UPPERCASE.
3. STYLE. CHARACTERS SHALL BE SANS SERIF AND SHALL NOT BE ITALIC, OBLIQUE, SCRIPT, HIGHLY DECORATIVE, OR OF OTHER UNUSUAL FORMS.
4. CHARACTER PROPORTIONS: SHALL BE A FONT WHERE THE WIDTH OF THE UPPERCASE LETTER “O” IS 55 PERCENT MINIMUM AND 110 PERCENT MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER “I”.
5. CHARACTER HEIGHT: CHARACTER HEIGHT MEASURED VERTICALLY FROM THE BASELINE OF THE CHARACTER SHALL BE 5/8 INCH MINIMUM AND 2 INCHES MAXIMUM BASED ON THE HEIGHT OF THE UPPERCASE LETTER “I”.
6. STROKE THICKNESS: STROKE THICKNESS OF THE UPPERCASE LETTER “I” SHALL BE 15 PERCENT MAXIMUM OF THE HEIGHT OF THE CHARACTER.
7. CHARACTER SPACING: CHARACTER SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT RAISED CHARACTERS. WHERE CHARACTERS HAVE RECTANGULAR CROSS SECTIONS, SPACING BETWEEN INDIVIDUAL RAISED CHARACTERS SHALL BE 1/8 INCH MINIMUM AND 4 TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM. WHERE CHARACTERS HAVE OTHER CROSS SECTIONS, SPACING BETWEEN INDIVIDUAL RAISED CHARACTERS SHALL BE 1/16 INCH MINIMUM AND 4 TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM AT THE BASE OF THE CROSS SECTIONS, AND 1/8 INCH MINIMUM AND 4 TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM AT THE TOP OF THE CROSS SECTIONS. CHARACTERS SHALL BE SEPARATED FROM RAISED BORDERS AND DECORATIVE ELEMENTS 3/8 INCH MINIMUM.
8. LINE SPACING: SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF RAISED CHARACTERS WITHIN A MESSAGE SHALL BE 135 PERCENT MINIMUM AND 170 PERCENT MAXIMUM OF THE RAISED CHARACTER HEIGHT.

BRAILLE:

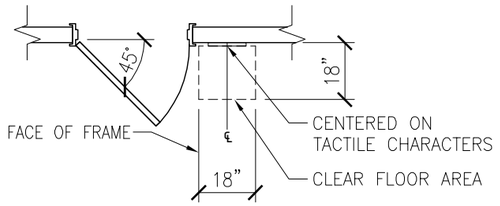
9. BRAILLE SHALL BE CONTRACTED (GRADE 2).
10. DIMENSIONS AND CAPITALIZATION: BRAILLE DOTS SHALL HAVE A DOMED OR ROUNDED SHAPE. THE INDICATION OF AN UPPERCASE LETTER OR LETTERS SHALL ONLY BE USED BEFORE THE FIRST WORD OF SENTENCES, PROPER NOUNS AND NAMES, INDIVIDUAL LETTERS OF THE ALPHABET, INITIALS, AND ACRONYMS.
11. POSITION: BRAILLE SHALL BE POSITIONED BELOW THE CORRESPONDING TEXT. IF TEXT IS MULTI-LINED, BRAILLE SHALL BE PLACED BELOW THE ENTIRE TEXT. BRAILLE SHALL BE SEPARATED 3/8 INCH MINIMUM FROM ANY OTHER TACTILE CHARACTERS AND 3/8 INCH MINIMUM FROM RAISED BORDERS AND DECORATIVE ELEMENTS.
12. FINISH AND CONTRAST: CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND.
13. ALL BRAILLE SIGNAGE MUST BE PROOFREAD BY SCOTT NORRIS. MR. NORRIS CAN BE REACHED AT NORRISS5@MICHIGAN.GOV

PICTOGRAMS:

14. PICTOGRAM FIELD: PICTOGRAMS SHALL HAVE A FIELD HEIGHT OF 6 INCHES MINIMUM. CHARACTERS AND BRAILLE SHALL NOT BE LOCATED IN THE PICTOGRAM FIELD.
15. TEXT DESCRIPTORS: PICTOGRAMS SHALL HAVE TEXT DESCRIPTORS LOCATED DIRECTLY BELOW THE PICTOGRAM FIELD.
16. FINISH AND CONTRAST: SYMBOLS OF ACCESSIBILITY AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. SYMBOLS OF ACCESSIBILITY SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER A LIGHT SYMBOL ON A DARK BACKGROUND OR A DARK SYMBOL ON A LIGHT BACKGROUND.

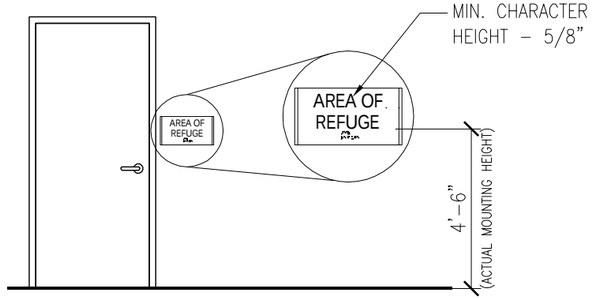
Bergmann associates
architects // engineers // planners

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
FACILITIES AND BUSINESS SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ROBERT C. HALL, RA, NCARB, DIRECTOR



LOCATION OF TACTILE SIGNS AT DOORS

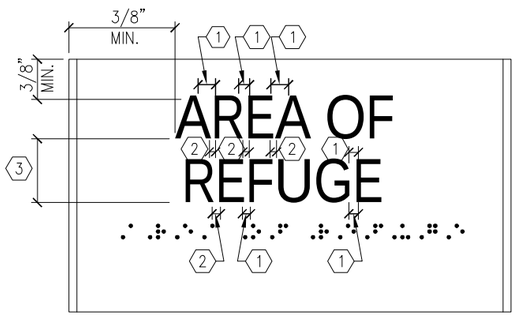
SCALE: NTS



HEIGHT OF TACTILE CHARACTERS A.F.F.

SCALE: NTS

NOTE:
SIGNAGE LOCATIONS SHOWN ABOVE ARE TYPICAL. WHEN CONFLICTS OCCUR WITH LOCATIONS INDICATED ON DRAWINGS THE CONTRACTOR SHALL VERIFY LOCATIONS WITH OWNER AND ARCHITECT PRIOR TO INSTALLATION.

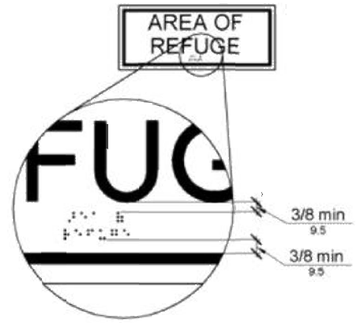


1. 1/8" MIN. TO 4(X) RAISED CHARACTER STROKE MAX.
2. 1/16" MIN. TO 4(x) RAISED CHARACTER STROKE MAX.
3. 135% TO 170% OF RAISED CHARACTER HAEIGHT

NOTE:
SEE RAISED CHARACTER NOTES ON SHEET G–001

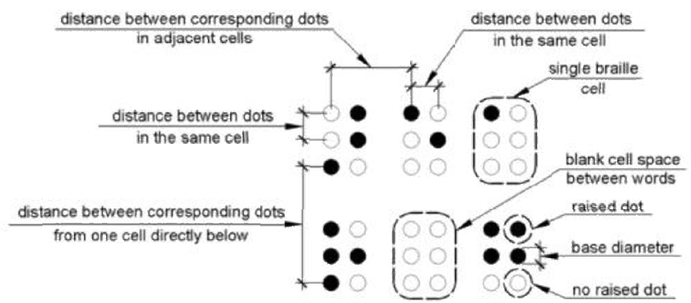
RAISED CHARACTERS SIGNAGE SPACING

SCALE: NTS



Measurement Range	Minimum in Inches Maximum in Inches
Dot base diameter	0.059 (1.5 mm) to 0.063 (1.6 mm)
Distance between two dots in the same cell[1]	0.090 (2.3 mm) to 0.100 (2.5 mm)
Distance between corresponding dots in adjacent cells[1]	0.241 (6.1 mm) to 0.300 (7.6 mm)
Dot height	0.025 (0.6 mm) to 0.037 (0.9 mm)
Distance between corresponding dots from one cell directly below[1]	0.395 (10 mm) to 0.400 (10.2 mm)

1. Measured center to center.



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architects // engineers // planners
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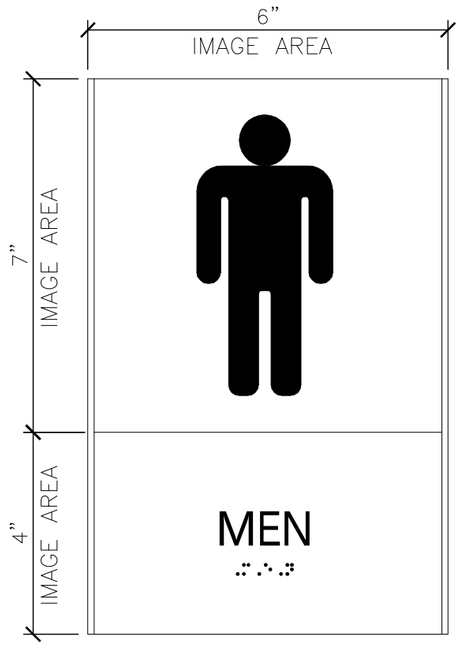
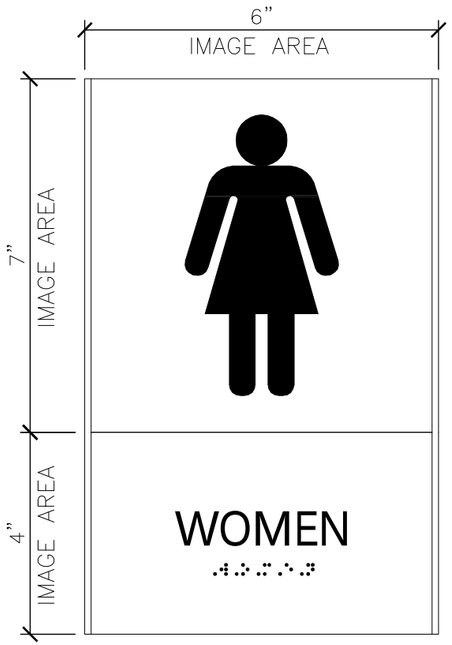
ADA AUDIT UPDATE - SIGNAGE PACKAGE

TYPICAL SIGNAGE MOUNTING LOCATION AND BRAILLE REQUIREMENTS

G-002 - SIGNAGE INFORMATION | NO SCALE |



T1 (11)



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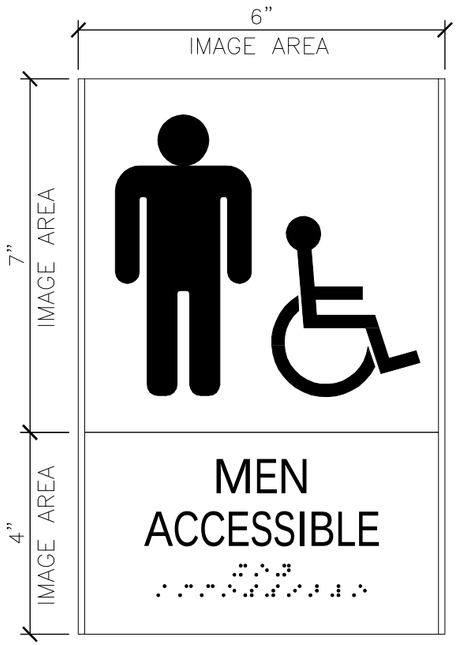

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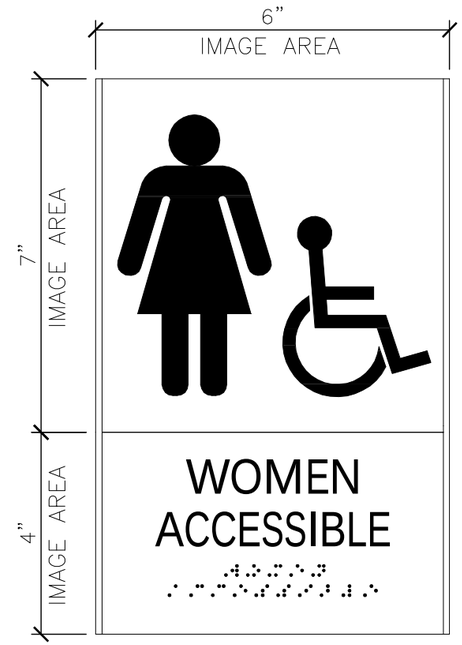

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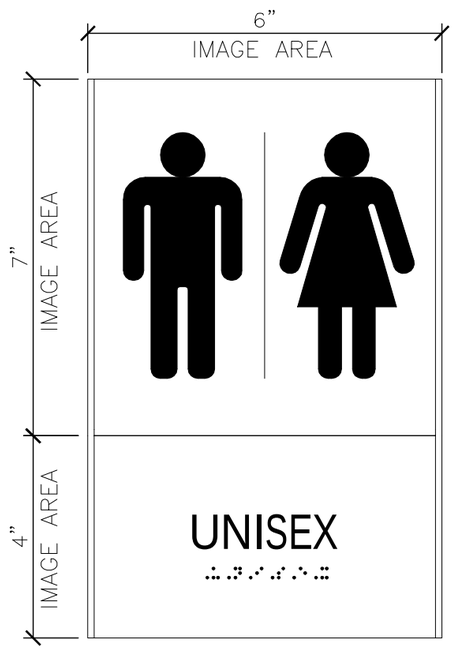

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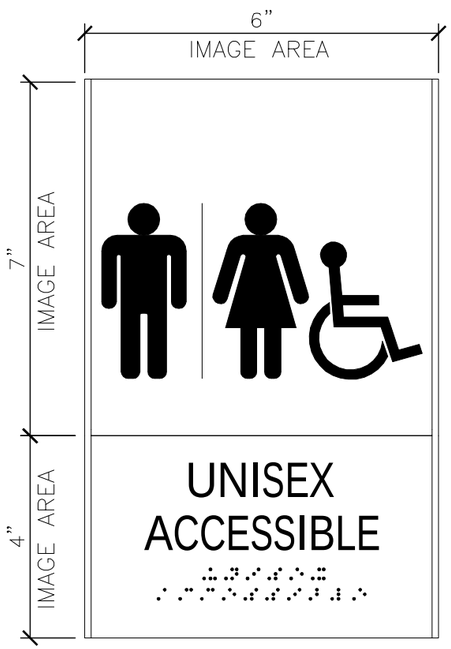

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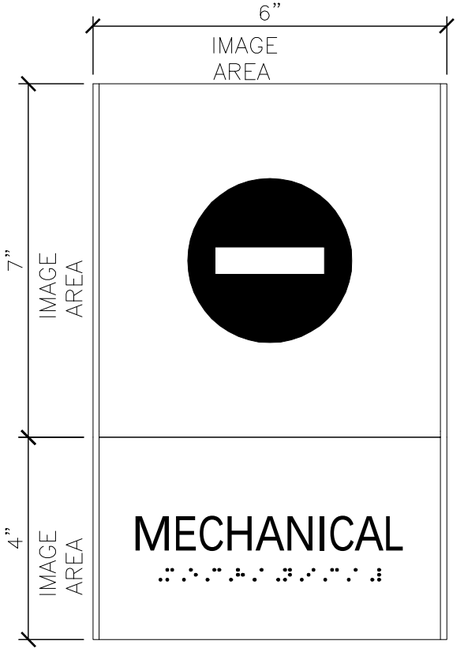

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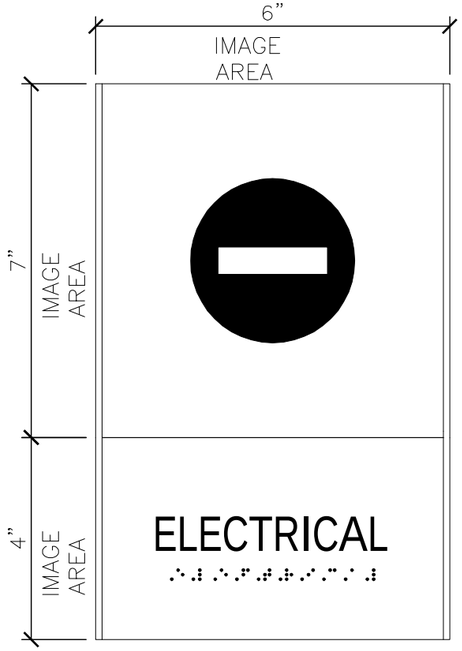

U2

NOTE:

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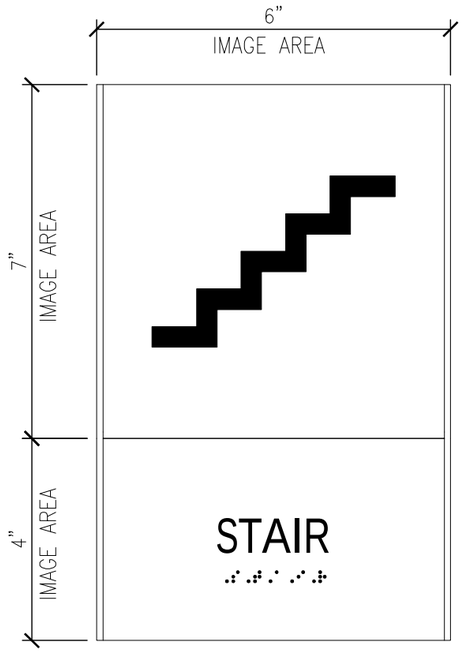
ADA AUDIT UPDATE - SIGNAGE PACKAGE

TYPICAL RESTROOM SIGNAGE

G-003 - SIGNAGE INFORMATION |

NO SCALE |



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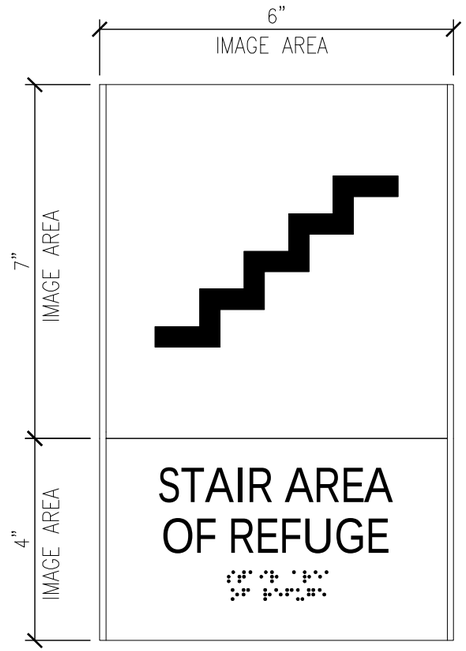
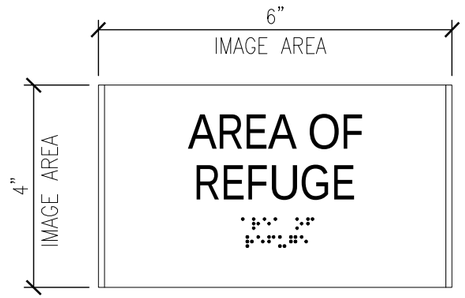


S2



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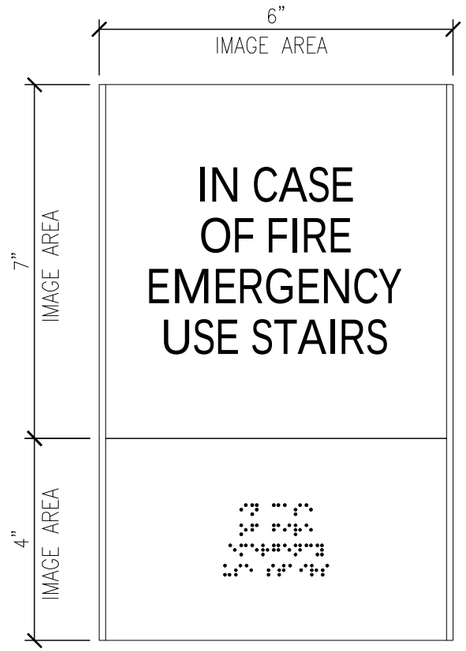

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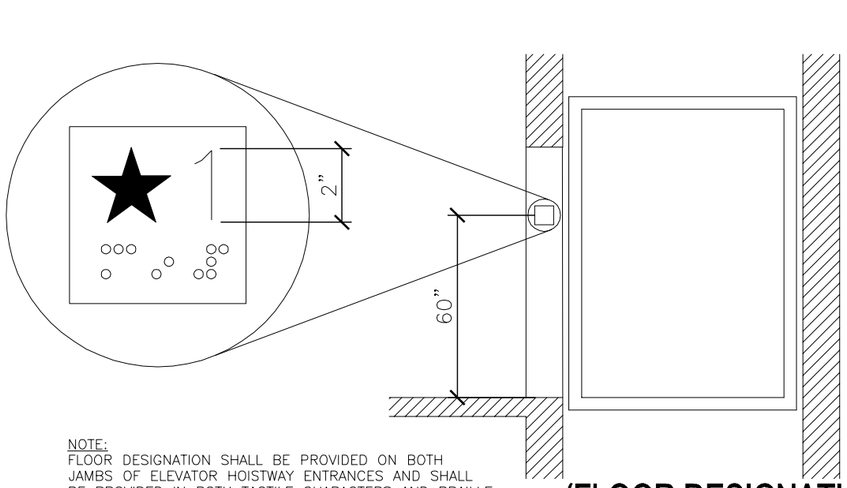
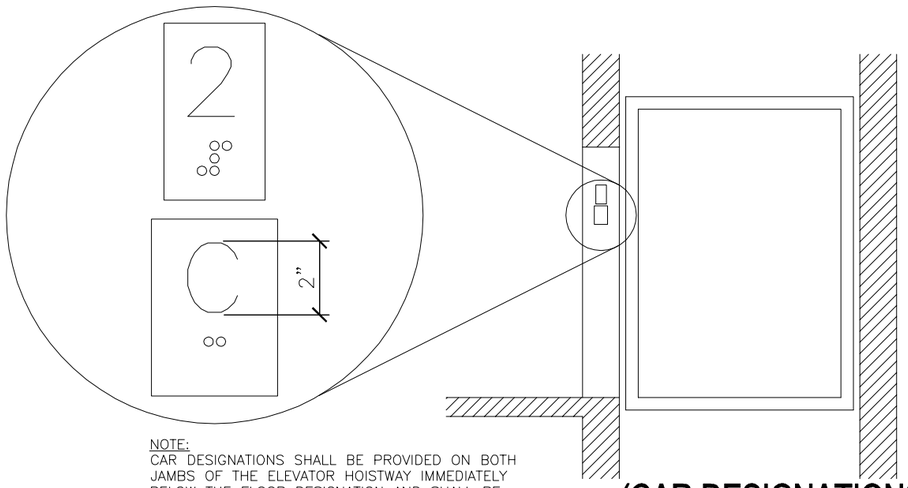


NOTE:
FLOOR DESIGNATION SHALL BE PROVIDED ON BOTH JAMBS OF ELEVATOR HOISTWAY ENTRANCES AND SHALL BE PROVIDED IN BOTH TACTILE CHARACTERS AND BRAILLE.

(FLOOR DESIGNATIONS)



NOTE:
CAR DESIGNATIONS SHALL BE PROVIDED ON BOTH JAMBS OF THE ELEVATOR HOISTWAY IMMEDIATELY BELOW THE FLOOR DESIGNATION AND SHALL BE PROVIDED IN BOTH TACTILE CHARACTERS AND BRAILLE.

(CAR DESIGNATIONS)

E1 (472)

NOTE:
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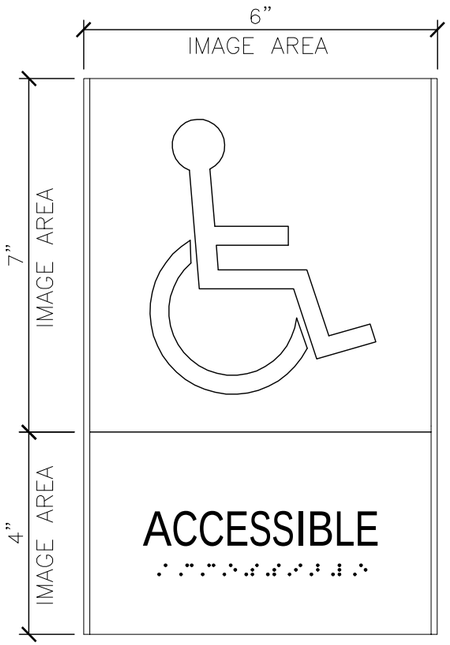
TYPICAL STAIR
AND ELEVATOR SIGNAGE

G-004 - SIGNAGE INFORMATION

NO SCALE



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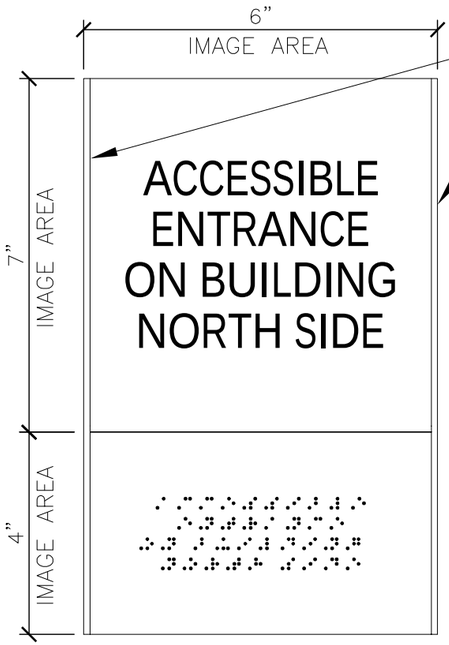

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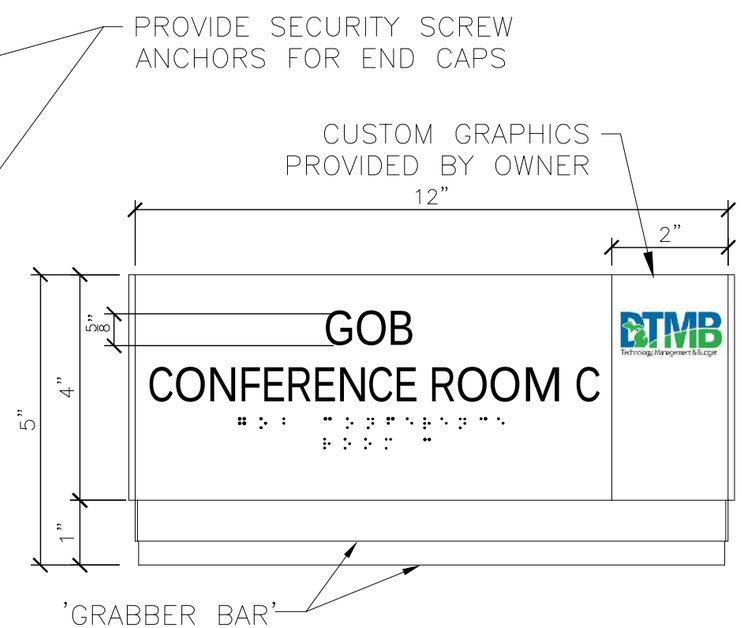
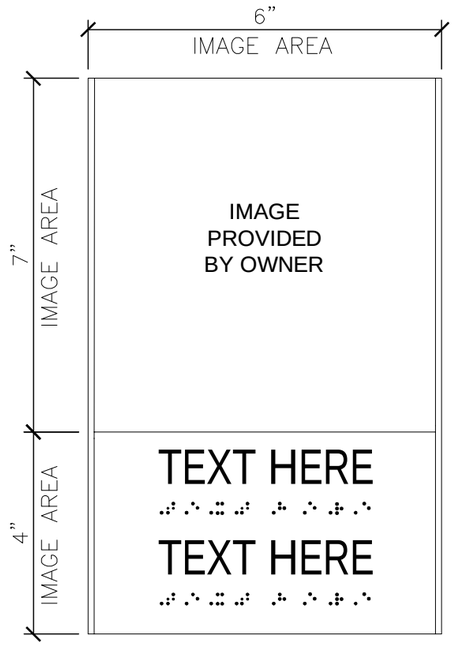


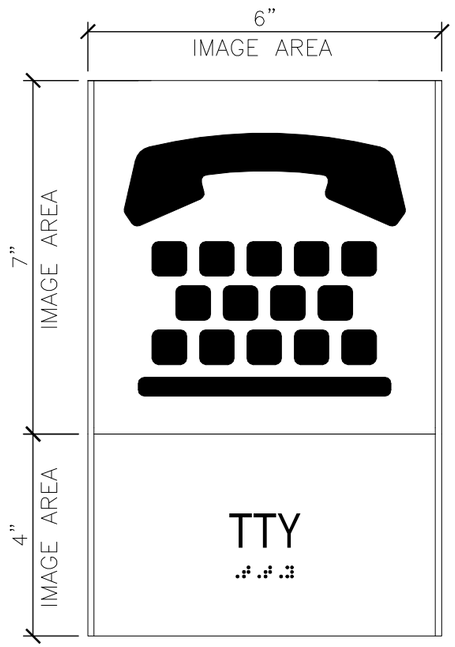
A3 (12)

NOTE:
TEXT SHOWNON A3 AND A4 ARE FOR REFERENCE ONLY. COORDINATE ACTUAL LETTERING WITH OWNER AND ARCHITECT FOR.

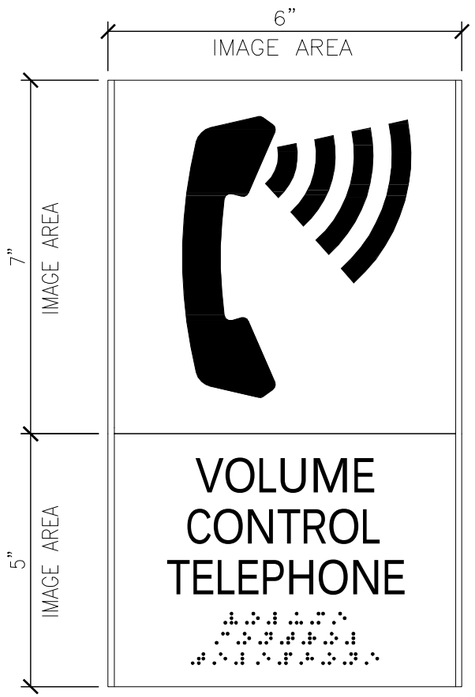


A4

M1 (9)



M2



M3

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P1

P2

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ADA AUDIT UPDATE - SIGNAGE PACKAGE

TYPICAL ACCESSIBLE AND GENERAL SIGNAGE

G-005 - SIGNAGE INFORMATION | NO SCALE |

Program Summary

Department	Size		GSF Allocation	
LEO	10,469 sf	6%	16,480 sf	
HHS	113,644 sf	62%	178,870 sf	
EGLE	60,352 sf	33%	94,990 sf	
Sub-Total	184,465 sf			
Ancillary (Lobby, Dock, Conference)	22,238 sf			
Total Program Spaces	**206,703 sf**			
Penthouse & MEP Spaces	45,200 sf			
Building Circulation	38,430 sf			internal lab circulation included above
GROSS BUILDING AREA	**290,300 sf**			

Program Statement

Department: LEO

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
1.1 - ANALYTICAL CHEMISTRY					
CHROMOTOGRAPHY LAB, ORGANIC CHEMISTRY	1	1754 sf	1,754 sf	Open Lab	
METALS LAB, INORGANIC CHEMISTRY	1	434 sf	434 sf	Closed Support Lab	
SPECTROSCOPY LAB, INORGANIC CHEMISTRY	1	1073 sf	1,073 sf	Open Lab	
XRD ROOM	1	255 sf	255 sf	Open Lab	
GLASSWASH	1	109 sf	109 sf	Open Lab	
1.2 - INSTRUMENT CALIBRATION & MAINTENANCE					
AMBIENT EQUIPMENT STAGING/STORAGE, AMBIENT	1	434 sf	434 sf	Closed Support Lab	
CALIBRATION LAB, DRY ELECTRONICS LAB	1	574 sf	574 sf	Open Lab	
INSTRUMENTATION LAB, DRY ELECTRONICS LAB	1	788 sf	788 sf	Open Lab	
MACHINE SHOP, DRY ELECTRONICS LAB	1	434 sf	434 sf	Closed Support Lab	
RECEIVING & STAGING	1	145 sf	145 sf	Open Office	
SOUND LAB, DRY ELECTRONICS LAB	1	319 sf	319 sf	Closed Support Lab	
WIND TUNNEL LAB, DRY ELECTRONICS LAB	1	297 sf	297 sf	Closed Support Lab	
1.3 - LAB SUPPORT					
CHEMICAL STAGING/STORAGE, AMBIENT	2	52 sf	104 sf	Linear Equipment Room	
CHEMICAL STAGING/STORAGE, AMBIENT	1	39 sf	39 sf	Linear Equipment Room	
CYL	1	81 sf	81 sf	Storage	
GAS CYLINDER ALCOVES, AMBIENT	1	47 sf	47 sf	Linear Equipment Room	
SECURE SAMPLE STORAGE	1	180 sf	180 sf	Closed Support Lab	
2.1 - EDUCATION/TRAINING					
CET LIBRARY	1	186 sf	186 sf	Open Office	
REF LIBRARY	1	299 sf	299 sf	Open Office	

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
4.1 - OFFICE					
OFFICE	1	90 sf	90 sf	Private Office	
WS	6	48 sf	288 sf	Open Office	
WS - ADMIN	2	48 sf	96 sf	Open Office	
WS - OHL	3	64 sf	192 sf	Open Office	
LEO OFFICES	1	1938 sf	1,938 sf	Open Office	
4.2 - OFFICE SUPPORT					
FILES, OPEN	1	42 sf	42 sf	Open Office	
SATELLITE/COPY	1	64 sf	64 sf	Open Office	
SECURE FILE STORAGE	1	85 sf	85 sf	Storage	
SUPPLY STORAGE	1	122 sf	122 sf	Storage	
TOTAL NET SQUARE FEET - LEO			10,469 sf		

Program Statement

Department: HHS

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
INFECTIOUS DISEASE					
1.1 - MICROBIOLOGY					
OPEN LAB BACT, MICRO	1	2371 sf	2,371 sf	Open Lab	
WS IN LAB (26), MICRO	1	789 sf	789 sf	Open Lab	
SATELLITE/COPY, MICRO IN LAB	1	27 sf	27 sf	Open Lab	
WALK-IN COLD ROOM	1	434 sf	434 sf	Environ Lab	
ANTE ROOM, POST AMP	1	50 sf	50 sf	Closed Support Lab	
STI TESTING	1	320 sf	320 sf	Closed Support Lab	
PCR OPEN LAB, MICRO	1	582 sf	582 sf	Open Lab	
POST AMP MOLEC SHARED, MICRO	1	411 sf	411 sf	Closed Support Lab	
ANTE, POST AMP	1	103 sf	103 sf	Closed Support Lab	
EXTRACTION, MICRO	1	305 sf	305 sf	Closed Support Lab	
REAGENT PREP, MICRO	1	304 sf	304 sf	Closed Support Lab	
TEMPLATE DIRTY, MICRO	1	301 sf	301 sf	Closed Support Lab	
REFERNCE	1	570 sf	570 sf	Closed Support Lab	
CENTRAL MEDIA PREP	1	212 sf	212 sf	Closed Support Lab	
AUTOCLAVE, MICRO	1	434 sf	434 sf	Closed Support Lab	
MICROBIOLOGY SUBTOTAL			7,213 sf		

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
1.2 - VIROLOGY					
CELL CULTURE CELL	1	156 sf	156 sf	Closed Support Lab	
ANTE	2	51 sf	102 sf	Closed Support Lab	
EXTRACTION ROOM	3	103 sf	309 sf	Closed Support Lab	
COBAS, VIROL	1	375 sf	375 sf	Closed Support Lab	
DARK ROOM	1	110 sf	110 sf	Closed Support Lab	
EXTRACTION AUTO MOLEC SHARED	1	296 sf	296 sf	Closed Support Lab	
EXTRACTION MANUAL MOLEC SHARED	1	300 sf	300 sf	Closed Support Lab	
FREEZER ROOM	2	103 sf	206 sf	Environ Lab	
CLEAN ROOM VIROL MOLEC SHARED	1	300 sf	300 sf	Clean Room	
OPEN LAB ANALYTIC MOLEC SHARED	1	759 sf	759 sf	Open Lab	
OPEN LAB, VIROL	1	1978 sf	1,978 sf	Open Lab	
POST AMP MOLEC SHARED	1	317 sf	317 sf	Open Lab	
SATELLITE/COPY, VIROLOGY IN LAB	1	24 sf	24 sf	Open Lab	
BSL-2 ARBO SER LAB	1	434 sf	434 sf	Closed Support Lab	
BSL-2 VECTOR BORNE LAB	1	434 sf	434 sf	Closed Support Lab	
TEMPLATE ADDITION MOLEC SHARED	1	300 sf	300 sf	Closed Support Lab	
WALK-IN COLD ROOM, SER	2	212 sf	424 sf	Environ Lab	
WS IN LAB (20), SER	1	762 sf	762 sf	Open Lab	
VIROLOGY SUBTOTAL			7,586 sf		
1.3 - GENOMICS					
ID SERVER ROOM	1	142 sf	142 sf	Server - IT	10X12 Dedicated Server Room w/ door to Analysis Room
ANALYSIS ROOM	1	256 sf	256 sf	Conference	
STORAGE	1	217 sf	217 sf	Open Lab	(4) Ref/Freezer and Dry Storage
POST-AMP	1	434 sf	434 sf	Closed Support Lab	
POST-AMP	1	212 sf	212 sf	Closed Support Lab	
PRE-AMP	2	212 sf	424 sf	Closed Support Lab	
LIBRARY PREP LAB	1	1905 sf	1,905 sf	Open Lab	
CLEAN ROOM, GEN	2	210 sf	420 sf	Clean Room	
LIQUID HANDLER (AUTO PLATFORM ROOM)	2	200 sf	400 sf	Closed Support Lab	
SEQUENCER ROOM	1	462 sf	462 sf	Closed Support Lab	Need to accommodate 42" deep benches.
EXTRACTION	1	201 sf	201 sf	Closed Support Lab	
EXTRACTION - VIROL	1	200 sf	200 sf	Closed Support Lab	
EXTRACTION - BACT	1	197 sf	197 sf	Closed Support Lab	
GENOMICS SUBTOTAL			5,470 sf		

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
1.4 - BSL-3 SUITE					
BSL-3 EXTRACTION, GEN	1	434 sf	434 sf	BSL-3	
BSL-2 MICRO, MYCOLOGY	1	208 sf	208 sf	BSL-3	
BSL-3 MICRO, MYCOLOGY	1	211 sf	211 sf	BSL-3	
BSL-3 ANTE	1	103 sf	103 sf	BSL-3	
BSL-2 MICRO, TB	1	150 sf	150 sf	BSL-3	
BSL-3 MICRO, TB	1	605 sf	605 sf	BSL-3	
BSL-3 ANTE	1	92 sf	92 sf	BSL-3	
BSL-2 MICRO, AF ID	1	208 sf	208 sf	BSL-3	
BSL-3 MICRO, AF ID	1	211 sf	211 sf	BSL-3	
DARK ROOM, MICRO	1	103 sf	103 sf	BSL-3	
INSTRUMENT	1	177 sf	177 sf	BSL-3	
TEMPLATE PCR	1	404 sf	404 sf	BSL-3	
MEDIA	1	103 sf	103 sf	BSL-3	
EXTRACTION	2	176 sf	352 sf	BSL-3	
AUTOCLAVE	2	320 sf	640 sf	BSL-3	
BSL-3 SA (SELECT AGENT)	3	319 sf	957 sf	BSL-3	
BSL-3 CORRIDOR	1	1513 sf	1,513 sf	BSL-3	
RABIES DARK ROOM	1	179 sf	179 sf	BSL-3	
RABIES SAMPLE RECEIPT	1	103 sf	103 sf	BSL-3	
RABIES SAMPLE PROCESSING	1	210 sf	210 sf	BSL-3	
RABIES BSL-3	1	212 sf	212 sf	BSL-3	
RABIES NECROPSY	1	212 sf	212 sf	BSL-3	
BSL-3 VIROL, SER	1	392 sf	392 sf	BSL-3	
EMERGING PATHOGEN ROOM	1	429 sf	429 sf	BSL-3	
BSL-3 SUBTOTAL			8,208 sf		
INFECTIOUS DISEASES SUBTOTAL			28,477 sf		

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
CHEMISTRY & TOXICOLOGY					
2.2 - NEWBORN SCREENING					
SPECIMEN PROCESSING AREA, NBS	1	1090 sf	1,090 sf	Closed Support Lab	10-15 people at 6' benches, (4-5 people= 18'bench length, double sided)
METABOLIC / ENDOCRINE LAB, NBS	1	4702 sf	4,702 sf	Open Lab	
MOLEC POST-AMP, NBS	1	646 sf	646 sf	Closed Support Lab	
MOLEC PRE-AMP, NBS	1	904 sf	904 sf	Closed Support Lab	
SATELLITE/COPY - IN LAB	1	28 sf	28 sf	Open Lab	
STORAGE, NBS	1	658 sf	658 sf	Closed Support Lab	
WALK-IN COLD ROOM, NBS	1	306 sf	306 sf	Environ Lab	
NEWBORN SCREENING SUBTOTAL			8,334 sf		
2.3 - ENVIRONMENTAL & CLINICAL CHEMISTRY					
FISH HANDLING OPEN LAB	1	430 sf	430 sf	Closed Support Lab	
FRZ ALCOVE	1	185 sf	185 sf	Open Lab	
FRZ ALCOVE	1	213 sf	213 sf	Open Lab	
LOW LEVEL ENV PREP	1	320 sf	320 sf	Clean Room	
ORGANIC PREP	1	1,159 sf	1,159 sf	Open Lab	
ORGANIC INSTRUMENT	1	3,912 sf	3,912 sf	Open Lab	
ORGANIC ENV PREP	1	653 sf	653 sf	Closed Support Lab	
SATELLITE/COPY - IN LAB	1	28 sf	28 sf	Open Lab	
TM INSTRUMENT CLEAN ROOM	1	878 sf	878 sf	Clean Room	
TM PREP CLEAN ROOM	1	542 sf	542 sf	Clean Room	
INORGANIC PREP	1	1,468 sf	1,468 sf	Open Lab	
WALK-IN COLD ROOM	2	103 sf	75 sf	Environ Lab	
CLINICAL ORGANIC CLEAN ROOM PREP	1	986 sf	986 sf	Clean Room	
VOC PREP AND INSTRUMENT CLEAN ROOM	1	656 sf	656 sf	Clean Room	
INORGANIC INSTRUMENT	1	2,086 sf	2,086 sf	Open Lab	
WALK-IN FRZ	2	103 sf	206 sf	Environ Lab	
ANTE ROOM	3	103 sf	309 sf	Clean Room	
ENV & CLINICAL CHEMISTRY SUBTOTAL			14,106 sf		
CHEM&TOX SUBTOTAL			22,440 sf		

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
3.0 - EDUCTATION/TRAINING					
CLASSROOM PREP	1	206 sf	206 sf	Public Spaces	
STORAGE / LOCKERS	1	222 sf	222 sf	Public Spaces	
TRAINING CLASSROOM	1	699 sf	699 sf	Public Spaces	
TRAINING BSL-3	1	212 sf	212 sf	BSL-3	
TRAINING LAB	1	1008 sf	1,008 sf	Open Lab	
BSL-3 ANTE	2	104 sf	208 sf	BSL-3	
TRAINING LAB PREP	1	182 sf	182 sf	Closed Support Lab	
TRAINING SUBTOTAL			2,737 sf		
SUPPORT					
4.1- CENTRAL ACCESSIONING					
COLD RM	1	109 sf	109 sf	Environ Lab	
24 HR DROP OFF	1	219 sf	219 sf	Closed Support Lab	
PROCESSING / ACCESSIONING	1	2443 sf	2,443 sf	Open Lab	
KITTING PREP	1	104 sf	104 sf	Open Lab	
UNKNOWNS BSL-3 ANTE	1	104 sf	104 sf	Unknowns BSL-3	
UNKNOWNS BSL-3	1	448 sf	448 sf	Unknowns BSL-3	
UNKNOWNS BSL-3	1	218 sf	218 sf	Unknowns BSL-3	
CORRIDOR	1	414 sf	414 sf	Open Lab	
CENTRAL ACCESSIONING SUBTOTAL			4,059 sf		
4.2 - CENTRAL SUPPORT					
CENTRAL DECON / AUTOCLAVE	1	633 sf	633 sf	Closed Support Lab	
CENTRAL GLASS WASH	1	656 sf	656 sf	Closed Support Lab	Workstation included in room.
BIOHAZAROUS WASTE	1	200 sf	200 sf	Waste Handling	
CHEM WASTE	1	333 sf	333 sf	Waste Handling	
GAS CYLINDER STORAGE	3	67 sf	201 sf	Storage	(1) Inert, (1) Flammable, (1) Oxidized
SOLVENT STOR	1	278 sf	278 sf	Storage	
LINEAR EQUIP ROOM (FIRST FLOOR)	1	3377 sf	3,377 sf	Linear Equip Room	
LINEAR EQUIP ROOM (SECOND FLOOR)	1	3376 sf	3,376 sf	Linear Equip Room	
CENTRAL SUPPORT SUBTOTAL			9,054 sf		

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
5.0 - QC LAB					
QC LAB	1	212 sf	212 sf	Closed Suppport Lab	
QC LAB SUBTOTAL			212 sf		
6.1 - OFFICE					
OFFICE DIRECTOR - BOL	1	225 sf	225 sf	Private Office	
OFFICE ADMIN - BOL	1	90 sf	90 sf	Private Office	
OFFICE H&S OFFICER	1	150 sf	150 sf	Private Office	
OFFICE DIV DIRECTOR - OPERATIONS DIR	1	90 sf	90 sf	Private Office	
OFFICE MANAGER LSS	1	90 sf	90 sf	Private Office	
OFFICE MANAGER LSS UNITS	2	90 sf	180 sf	Private Office	
OFFICE DIV DIRECTOR - DID	1	90 sf	90 sf	Private Office	
OFFICE ADMIN - DID	1	90 sf	90 sf	Private Office	
OFFICE MANAGER GENOMICS - SECTION	1	90 sf	90 sf	Private Office	
OFFICE SUPERVISOR GENOMICS - UNITS	4	90 sf	360 sf	Private Office	
OFFICE MANAGER MICROBIOLOGY - SECTION	1	90 sf	90 sf	Private Office	
OFFICE SUPERVISOR MICROBIOLOGY - UNITS	3	90 sf	270 sf	Private Office	
OFFICE MANAGER VIROLOGY - SECTION	1	90 sf	90 sf	Private Office	
OFFICE SUPERVISOR VIROLOGY - UNITS	3	90 sf	270 sf	Private Office	
OFFICE MANAGER - QA SECTION	1	165 sf	165 sf	Private Office	(includes 1 FTE, closing door, meeting table, & large amount of storage - other item storage must go elsewhere)
OFFICE SUPERVISOR - QA UNITS	2	90 sf	180 sf	Private Office	(1) DASH Accessioning, (1) DASH Coding
OFFICE DIV DIRECTOR - CHEM & TOX	1	90 sf	90 sf	Private Office	
OFFICE ADMIN - CHEM & TOX	1	90 sf	90 sf	Private Office	
OFFICE MANAGER CLIN CHEM - SECTION	1	90 sf	90 sf	Private Office	
OFFICE SUPERVISOR CLIN CHEM - UNITS	2	90 sf	180 sf	Private Office	
OFFICE MANAGER ENV CHEM - SECTION	1	90 sf	90 sf	Private Office	
OFFICE SUPERVISOR ENV CHEM - UNITS	2	90 sf	180 sf	Private Office	
OFFICE MANAGER NBS - SECTION	1	90 sf	90 sf	Private Office	
OFFICE SUPERVISOR NBS - UNITS	3	90 sf	270 sf	Private Office	
OFFICE SUPERVISOR MED TECH	2	90 sf	180 sf	Private Office	
OFFICE - WAREHOUSE	1	90 sf	90 sf	Private Office	
WS - MICROBIOLOGY	4	48 sf	192 sf	Open Office	
WS - VIROLOGY	4	48 sf	192 sf	Open Office	
WS - QC	4	48 sf	192 sf	Open Office	
WS - DASH - ACCESSIONING	10	48 sf	480 sf	Open Office	5/19/23: Increased 17 to 20
WS - DASH - DATA CODERS	10	48 sf	480 sf	Open Office	
WS - LSS	12	48 sf	576 sf	Open Office	
WS - OUTREACH	4	48 sf	192 sf	Open Office	
WS - ACCOUNTING	4	48 sf	192 sf	Open Office	

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
WS - BOL	3	48 sf	144 sf	Open Office	
WS - ENV/CLINC CHEM SCIENTISTS	38	48 sf	1,824 sf	Open Office	
WS - ENV/CLINC CHEM TECHNICIANS	11	48 sf	528 sf	Open Office	
WS - ENV/CLINC CHEM STUDENTS/FELLOWS	3	48 sf	144 sf	Open Office	
WS - NBS SCIENTISTS	18	48 sf	864 sf	Open Office	
WS - NBS TECHNICIANS	7	48 sf	336 sf	Open Office	
WS - BIOINFOR	30	64 sf	1,920 sf	Open Office	
WS - WAREHOUSE	4	64 sf	256 sf	Open Office	(1) located in loading dock office area
HHS OFFICES (FIRST FLOOR)	1	987 sf	987 sf	Open Office	
HHS OFFICES (FIRST FLOOR)	1	9478 sf	9,478 sf	Open Office	
HHS OFFICES (SECOND FLOOR)	1	1071 sf	1,071 sf	Open Office	
HHS OFFICES (SECOND FLOOR)	1	10447 sf	10,447 sf	Open Office	
OFFICE SUBTOTAL			34,365 sf		
6.2 - OFFICE SUPPORT					
FILES - ADMIN	2	26 sf	110 sf	Open Office	
FILES - CHEM & TOX	3	26 sf	110 sf	Open Office	
FILES - H&S	1	37 sf	37 sf	Open Office	
FILES - ID	1	54 sf	54 sf	Open Office	
FILES - ID	1	26 sf	26 sf	Open Office	
FILES - DASH DC	1	192 sf	192 sf	Open Office	For file and application hardware storage.
FILES - QC	1	22 sf	22 sf	Open Office	
LIMS SERVER ROOM	1	162 sf	162 sf	Server - IT	
SATELLITE/COPY - BOL	1	19 sf	19 sf	Open Office	
SATELLITE/COPY - CHEM & TOX	1	26 sf	26 sf	Open Office	
SATELLITE/COPY - ID	1	28 sf	28 sf	Open Office	
SATELLITE/COPY - NBS	1	48 sf	48 sf	Open Office	
SATELLITE/COPY - LSS	2	25 sf	121 sf	Open Office	
OFFICE SUPPORT SUBTOTAL			955 sf		

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
7.0 - WAREHOUSE					
WAREHOUSE	1	9,598 sf	9,598 sf	Warehouse	
FREEZER RM	1	410 sf	410 sf	Environ Lab	
K-12 & CHEM THREAT STOR	1	128 sf	128 sf	Storage	
K-12 & CHEM THREAT STOR	1	616 sf	616 sf	Storage	
H&S SUPPLY STOR	1	102 sf	102 sf	Storage	
INCINERATOR	1	279 sf	279 sf	ME Equipment Space	
MECHANICAL ROOM	1	212 sf	212 sf	ME Equipment Space	
WAREHOUSE SUBTOTAL			11,345 sf		
TOTAL NET SQUARE FEET - HHS			**113,644 sf**		

Program Statement

Department: EGLE

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
1.0 - ORGANIC					
1.1 - VOLATILES					
AIR VOLATILES, ORGANIC	1	2,461 sf	2,461 sf	Open Lab	
ANTE ROOM	2	103 sf	206 sf	Closed Support Lab	
ANTE ROOM	2	70 sf	140 sf	Closed Support Lab	
COLD ROOM	1	61 sf	61 sf	Environ Lab	
COLD ROOM	1	146 sf	146 sf	Environ Lab	
VOLATILE INSTRUMENT REPAIR	1	95 sf	95 sf	Open Lab	
VOLATILES LAB, VOLATILES	1	4,272 sf	4,272 sf	Open Lab	
1.1 - SEMI-VOLATILES					
SEMI VOLATILE INSTRUMENT LAB	1	4,207 sf	4,207 sf	Open Lab	
PFAS EXTRACTION LAB	1	435 sf	435 sf	Closed Support Lab	
PFAS LABORATORY	1	1,915 sf	1,915 sf	Open Lab	
COLD ROOM	1	212 sf	212 sf	Environ Lab	
DW COLD ROOM	1	212 sf	212 sf	Environ Lab	
N2 GENERATOR ROOM	1	211 sf	211 sf	Closed Support Lab	
SOIL ENVIRONMENTAL EXTRACTION LAB, ORGANIC	1	1,638 sf	1,638 sf	Open Lab	
SOIL EXTRACTION LAB, SLICA GEL ORGANIC	1	212 sf	212 sf	Closed Support Lab	
DW EXTRACTIONS	1	844 sf	844 sf	Closed Support Lab	
WATER EXTRACTION LAB	1	1,474 sf	1,474 sf	Open Lab	

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
2.0 - INORGANIC					
ANTE ROOM	1	103 sf	103 sf	Clean Room	
BACTERIOLOGY LAB, DRINKING WATER	1	1,016 sf	1,016 sf	Open Lab	
CNTRLLD TEMP RM, INCUBATOR	2	103 sf	206 sf	Environ Lab	
FILTER LAB	1	323 sf	323 sf	Closed Support Lab	
INORGANIC CHEMISTRY	1	2,092 sf	2,092 sf	Open Lab	
INORGANIC COLD ROOM	1	434 sf	434 sf	Environ Lab	
METALS CHEMISTRY LAB	1	2,681 sf	2,681 sf	Closed Support Lab	
PCR - AMPLIFICATION	1	103 sf	103 sf	Clean Room	
PCR - REAGENT PREP	1	103 sf	103 sf	Clean Room	
PCR - SAMPLE PREP	1	320 sf	320 sf	Clean Room	
PREP LAB	1	1,776 sf	1,776 sf	Open Lab	
STORAGE, INORGANIC CHEM	1	436 sf	436 sf	Open Lab	
TRACE LEVEL MERCURY LAB	1	603 sf	603 sf	Closed Support Lab	
VESTIBULE	1	105 sf	105 sf	Closed Support Lab	
3.1 - OFFICE					
CUSTOMER SERVICE REPORTING	1	530 sf	530 sf	Open Office	
LAB CERTIFICATION PROGRAM	1	252 sf	252 sf	Storage	
OFFICE - LAB DIRECTOR	1	200 sf	200 sf	Private Office	
OFFICE - INORGANIC SUP	1	120 sf	120 sf	Private Office	
OFFICE - ORGANIC SEMI-VOL SUP	1	120 sf	120 sf	Private Office	
OFFICE - ORGANIC VOL SUP	1	120 sf	120 sf	Private Office	
OFFICE - SUPPORT SERVICES SUP	1	120 sf	120 sf	Private Office	
OFFICE - QA	1	120 sf	120 sf	Private Office	
OFFICE - LIMS	1	120 sf	120 sf	Private Office	Added 5/18/23
WS - INORGANIC	12	48 sf	576 sf	Open Office	
WS - INORGANIC CUSTOMER SERVICE	4	48 sf	192 sf	Open Office	
WS - OFFICE	4	48 sf	192 sf	Open Office	
WS - ORGANIC	25	48 sf	1,200 sf	Open Office	(10 Volatiles, 12 Semi-Volatiles, 3 Growth)
WS - SUPPORT	7	48 sf	336 sf	Open Office	
WS - ADMIN	1	48 sf	48 sf	Open Office	Added 5/18/23, Adjacent to file area
EGLE OFFICES (FIRST FLOOR)	1	4,458 sf	4,458 sf	Open Office	
EGLE OFFICES (SECOND FLOOR)	1	5,698 sf	5,698 sf	Open Office	

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
3.2 - OFFICE SUPPORT					
FILE STORAGE - OFFICE	1	233 sf	233 sf	Storage	
FILES - OFFICE	3	48 sf	144 sf	Open Office	
FILES - OFFICE	2	67 sf	134 sf	Open Office	
SATTELITE / COPY - OFFICE	1	111 sf	111 sf	Open Office	
FILE STORAGE - ORGANIC UNIT 2ND FLOOR	1	266 sf	266 sf	Storage	
4.0 - SUPPORT					
AFTER HRS REC.	1	74 sf	74 sf	Closed Support Lab	
BOTTLE PREP & KITTING	1	2,094 sf	2,094 sf	Open Lab	
COLD ROOM	1	212 sf	212 sf	Environ Lab	
COLD ROOM	1	212 sf	212 sf	Environ Lab	
DRIVE THRU DROP OFF	1	198 sf	198 sf	Open Lab	
SAMPLE RECEIVING	1	2,058 sf	2,058 sf	Open Lab	
VEST	1	118 sf	118 sf	Open Lab	
LINEAR EQUIP ROOM (FIRST FLOOR)	1	2,399 sf	2,399 sf	Linear Equipment Room	Shared w/ LEO
LINEAR EQUIP ROOM (SECOND FLOOR)	1	2,631 sf	2,631 sf	Linear Equipment Room	
5.0 - WAREHOUSE					See 1/9/22 email for details:
CYLINDERS	1	191 sf	191 sf	Storage	
ACID STORAGE	1	210 sf	210 sf	Storage	Forklift access
BULK DRY CHEM STORAGE	1	191 sf	191 sf	Storage	Forklift access
EGLE WAREHOUSE	1	4,466 sf	4,466 sf	Warehouse	(4 sets) 4'x60' shelves Forklift access
HAZ WASTE	2	102 sf	204 sf	Waste Handling	91sf Acid Storage per 1/9/22 email
TRAILER	1	762 sf	762 sf	Warehouse	Away from dock fumes
TOTAL NET SQUARE FEET - EGLE			60,352 sf		

Program Statement

Department: Ancillary

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
1.1 - MECHANICAL					
FACILITY MAINTENANCE SHOP	1	316 sf	316 sf	Storage	
SERVER	1	108 sf	108 sf	Server - IT	
1.2 AMENITIES					
LOBBY	1	1693 sf	1,693 sf	Public Areas	
RECEPTION	1	252 sf	252 sf	Public Areas	includes security desk
WAITING	1	258 sf	258 sf	Public Areas	
VEST	1	230 sf	230 sf	Public Areas	
MOTHERS	5	110 sf	550 sf	Mother - Wellness	1 per wing per floor & 1 near training/conf requested
TOILET	1	50 sf	50 sf	Toilet & Locker Rooms	
RESTROOM	4	269 sf	1,076 sf	Toilet & Locker Rooms	
RESTROOM	4	231 sf	924 sf	Toilet & Locker Rooms	
RESTROOM	4	243 sf	972 sf	Toilet & Locker Rooms	
1.3 SUPPORT					
BREAK	1	348 sf	348 sf	Break Rooms	
BREAK	1	448 sf	448 sf	Break Rooms	
BREAK	1	244 sf	244 sf	Break Rooms	
BREAK	1	217 sf	217 sf	Break Rooms	
BREAK ROOM	1	1422 sf	1,422 sf	Break Rooms	
DOCK	5	176 sf	880 sf	Storage	(2) Depressed, (1) Grade, (2) Trash
DOCK STAGING	1	935 sf	935 sf	Storage	
DOCK STAGING	1	299 sf	299 sf	Storage	
JAN BREAK ROOM	1	159 sf	159 sf	Break Rooms	
JAN CLOSET	1	132 sf	132 sf	Storage	
LAB COAT	1	133 sf	133 sf	Storage	
SEC STORAGE	1	114 sf	114 sf	Storage	
1.4 - WAREHOUSE					
FM SUPPORT	1	1767 sf	1,767 sf	Open Office	

Space	Quantity	Area/Unit	Total Area	Space Type Criteria	Notes
2.1 - OFFICE					
LIMS IT ROOM	1	752 sf	752 sf	Server - IT	
DOCK MANAGER (OFFICE)	1	120 sf	120 sf	Private Office	
WORKSTATION, FACILITY MAINT	3	64 sf	192 sf	Open Office	
WORKSTATION, JANITOR	2	64 sf	128 sf	Open Office	
2.2 - OFFICE SUPPORT					
FURNITURE STORAGE	1	428 sf	428 sf	Storage	
LARGE CONF (20P)	1	471 sf	471 sf	Conference	
LARGE CONFERENCE (50P)	1	927 sf	927 sf	Conference	
LARGE CONFERENCE (50P)	1	953 sf	953 sf	Conference	
MED CONF	2	315 sf	630 sf	Conference	
MED CONF	1	403 sf	403 sf	Conference	
MED CONF	1	429 sf	429 sf	Conference	
MED CONF	1	307 sf	307 sf	Conference	
MED CONF	1	286 sf	286 sf	Conference	
MED CONF	1	321 sf	321 sf	Conference	
MED CONF	1	353 sf	353 sf	Conference	
SMALL CONF	1	160 sf	160 sf	Conference	
SMALL CONF	1	179 sf	179 sf	Conference	
SMALL CONF	1	165 sf	165 sf	Conference	
SMALL CONF	1	169 sf	169 sf	Conference	
SMALL CONF	1	301 sf	301 sf	Conference	
SMALL CONF	1	260 sf	260 sf	Conference	
COAT CLOSET	1	70 sf	70 sf	Open Office	
COAT CLOSET	2	66 sf	132 sf	Open Office	
COAT CLOSET	1	36 sf	36 sf	Open Office	
COAT CLOSET	1	88 sf	88 sf	Open Office	
WINTER COAT CLOSET	1	50 sf	50 sf	Open Office	
WINTER COAT CLOSET	1	48 sf	48 sf	Open Office	
CATERING PREP	1	353 sf	353 sf	Public Areas	
TOTAL NET SQUARE FEET - Ancillary			22,238 sf		

Program Statement

Department: MEP

Space	Quantity	Area/Unit	Total Area	Notes
ELEC DIST	1	873 sf	873 sf	
ELECTRICAL ROOM	1	2,739 sf	2,739 sf	
MAIN MECHANICAL	1	5,620 sf	5,620 sf	Heating/Cooling/Plumbing/FP
MAIN DISTRIBUTION FRAME	1	227 sf	227 sf	
COMM (BE)	1	80 sf	80 sf	Building Entrance
COMM (MDF)	1	224 sf	224 sf	
COMM (TR/IDF)	4	224 sf	896 sf	1 per wing/floor
NET AREA			10,659 sf	
Penthouse				
PENTHOUSE	1	21,336 sf	21,336 sf	
PENTHOUSE	1	13,209 sf	13,209 sf	
PENTHOUSE NET AREA			34,545 sf	
TOTAL NET SQUARE FEET - MEP			45,200 sf	

Project Manual

Architect's Project No. 20-320
Owner's File No. 171/22186.CAK
Owner's Index No. Y23037

Issued for Bid Package 1
Schematic Design

June 16, 2023

Public Health & Environmental Science Lab

Dimondale, Michigan

OWNER:
State of Michigan - DTMB

ARCHITECT:
Hobbs + Black Associates
117 E. Allegan Street
Lansing, MI 48933

CONSTRUCTION MANAGER:
The Christman Company
208 N Capitol Avenue
Lansing, MI 48933

DOCUMENT 00 01 03 - PROJECT DIRECTORY

1.01 PROJECT IDENTIFICATION

A. Project Name: New Public Health & Environmental Science Lab

B. Project Location: Dimondale, Michigan

C. Architect's Project No.: 22-320

D. Owner's File No. 171/22186.CAK

E. Owner's Index No. Y23037

1.02 OWNER TEAM

A. Owner: State of Michigan acting through the State Facilities Administration, Design and Construction Division of the Department of Technology, Management, and Budget (DTMB), 3111 West St. Joseph Street, Lansing, MI 48917.

1.03 DESIGN TEAM

A. Architect: Hobbs + Black Associates, Inc., 117 E. Allegan Street, Lansing, MI 48933
1. Representative: Tom Dillenbeck, 734-663-4189, tdillenbeck@hobbs-black.com

B. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

C. Structural Engineer: IMEG Corp, 201 S Ann Arbor Street, Saline, MI 48176, 734-316-5700
1. Representative: Dale Niethammer

D. Fire Protection: IMEG Corp, 201 S Ann Arbor Street, Saline, MI 48176, 734-316-5700
1. Representative: Dale Niethammer

E. Plumbing Engineer: IMEG Corp, 201 S Ann Arbor Street, Saline, MI 48176, 734-316-5700
1. Representative: Dale Niethammer

F. Mechanical Engineer: IMEG Corp, 201 S Ann Arbor Street, Saline, MI 48176, 734-316-5700
1. Representative: Dale Niethammer

G. Electrical Engineer: IMEG Corp, 201 S Ann Arbor Street, Saline, MI 48176, 734-316-5700
1. Representative: Dale Niethammer

H. Civil Engineer: PEA Group, 3135 Pine Tree Road, Suite D, Lansing, MI 48911, 517-393-2902
1. Representative: Eric Iversen

I. Landscape Architect: PEA Group, 3135 Pine Tree Road, Suite D, Lansing, MI 48911, 517-393-2902
1. Representative: Eric Iversen

J. Audio Visual / IT Consultant: IMEG Corp, 201 S Ann Arbor Street, Saline, MI 48176, 734-316-5700

1. Representative: Dale Niethammer

K. Geotechnical Consultant: PEA Group, 3135 Pine Tree Road, Suite D, Lansing, MI 48911, 517-393-2902
   1. Representative: Eric Iversen

L. Lab Planning, Interior Design: CannonDesign, 205 & 225 N Michigan Ave, Suite 1100, Chicago, IL 60601, 773-720-2136
   1. Representative: Nick Juhasz

M. Door Hardware Consultant: [Insert name and address]
   1. Representative: [Insert name and contact information]

N. Specification Consultant: Amy Baker Architect, 1012 Owana Avenue, Royal Oak, MI 48067
   1. Representative: Amy Baker, 248-931-3055, amy@amybakerarchitect.com
   2. Specifier: David Oglesby, 313-999-3449, david@amybakerarchitect.com

1.04 BUILDER TEAM

A. Contractor: The Christman Company, 208 N Capitol Ave., Lansing, MI 48933.
   1. Construction Manager for this Project is Project's constructor. The Construction Manager is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" as used herein means the Construction Manager or the Construction Manager's authorized representative.
   2. Representative: Chad Clark, 517-719-5666

END OF DOCUMENT 00 01 03

DOCUMENT 00 01 07 - SEALS PAGE

PROJECT: Public Health & Environmental Science Lab
Dimondale, Michigan

Architect's Project Number: 22-320

1.01 CERTIFICATIONS

A. By application of their seal and signature, each of the design firms identified below certify that they have prepared or directly supervised the preparation of their respective Drawings and Specifications, and that each is currently and legally licensed as an Architect or Engineer in the state of Michigan.

B. Each of the design firms below is responsible only for the content of the Drawings and Specifications which they prepared or directly supervised the preparation of, and are not responsibility for the content of Drawings or Specifications which were not prepared or directly supervised by them.

ARCHITECT OF RECORD	CIVIL ENGINEER
Firm: Hobbs + Black Associates, Inc.	Firm: PEA Group

STRUCTURAL ENGINEER	FIRE PROTECTION ENGINEER
Firm: IMEG Corp	Firm: IMEG Corp
PLUMBING ENGINEER	**MECHANICAL ENGINEER**
Firm: IMEG Corp	Firm: IMEG Corp

ELECTRICAL ENGINEER	LANDSCAPE ARCHITECT
Firm: IMEG Corp	Firm: IMEG Corp

END OF DOCUMENT 00 01 07

SECTION 00 01 10 - TABLE OF CONTENTS

Written Contract Documents and Specifications identified below are grouped by MasterFormat Divisions and are identified by issue purpose ID and most current date of issue including reissued revisions, if any. Refer to Division 00 Section "FORMATS AND CONVENTIONS" for a description of the Project Manual format and conventions.

This is a , multiple issue Project and it is understood that the Documents are continually evolving and, by the final Issue, will be a single complete set of Construction Documents reflecting the Work required to complete the Project. The intent of the various issue groups of Documents is to convey sufficient information to allow the designated portion of the Work to be bid upon and constructed. In each Issue, changes made to previous Issues (additions, deletions, and changes) are highlighted and the Issue ID and date are modified below to reflect the most current issue. All previously issued Contract Documents and Specifications apply to each successive issue and, if not printed and bound herewith, are available from the Construction Manager. The Construction Manager is responsible for evaluating all Contract Documents and Specifications issued, for both current and previous issues, and dividing and assigning work to the various trades and subcontractors.

DOCUMENT ISSUE DESCRIPTION/PURPOSE	ISSUE ID	DATE
Schematic Design / Bid Pack 01 Issue	01	06-16-2023

PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP

NUMBER	TITLE	ISSUE ID	DATE
DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS			
	INTRODUCTORY INFORMATION		
00 00 00	Project Manual Cover	01	06-16-2023
00 01 03	Project Directory	01	06-16-2023
00 01 07	Seals Page	01	06-16-2023
00 01 10	Table of Contents	01	06-16-2023
00 01 13	Formats and Conventions	01	06-16-2023
	PROCUREMENT AND CONTRACTING REQUIREMENTS		
00 31 32	Geotechnical Data	01	06-16-2023
	Geotechnical Report		
00 54 36	Building Information Modeling and Digital Data Protocol	01	06-16-2023
00 60 00	Project Forms	01	06-16-2023
00 62 11	Submittal Transmittal Form		
00 62 13	Submittals Schedule Form		
00 62 32	Comparable Product Request Form		
00 62 33.13	Proposed Products Form		
00 62 33.14	Proposed Firestopping Systems Schedule Form		
00 62 34.13	LEED V4 Checklist Form		
00 62 34.14	LEED V4 Materials Submittal Form		
00 62 34.15	LEED V4 Emissions Submittal Form		
00 62 34.16	LEED V4 Emissions Limits Table		
00 62 37	Subcontractors and Major Material Suppliers Form (CMc)		
00 62 76	Application for Payment - AIA Form G-702-1992		
00 62 76.11	Application for Payment Continuation Sheet Form - AIA G-703-1992		
00 62 76.16	Consent of Surety to Reduction in or Partial Release of Retainage - AIA Form G-707A-1994		
00 62 93	Schedule and Log of Required Tests and Inspections Form		
00 63 13	Request for Interpretation Form		

NUMBER TITLE ISSUE ID DATE

00 63 13.13 .....Request for Interpretation Log Form
00 63 24 .....Substitution Request (Pre-Bid) Form (CMc)
00 63 25 .....Substitution Request Form (During Construction)
00 63 54 .....Proposal Worksheet Summary Form
00 63 55 .....Proposal Worksheet Detail Form
00 63 57 .....Change Order Request (Proposal) Form
00 65 14 .....Completion and Correction List Form
00 65 19.13 .....Affidavit of Payment of Debts and Claims Form - AIA Form G-706-1994
00 65 19.16 .....Affidavit of Release of Liens Form - AIA Form G-706A-1994
00 65 19.19 .....Consent of Surety to Final Payment Form - AIA Form G-707-1994
00 65 19.21 .....Consent of Surety to Reduction in or Partial Release of Retainage - AIA Form G-707A-1994
00 71 00 .....Contracting Definitions 01 06-16-2023

ADDITIONAL PROCUREMENT AND CONTRACTING REQUIREMENTS

Additional Subcontract Procurement and Contracting Documents prepared by the Construction Manager are bound separately, and are not enumerated herein.

SPECIFICATIONS GROUP

General Requirements Subgroup

DIVISION 01 - GENERAL REQUIREMENTS

01 11 00 .....Summary of Work 01 06-16-2023
01 23 00 .....Alternates 01 06-16-2023
01 25 00 .....Substitution Procedures 01 06-16-2023
01 26 13 .....Requests for Interpretation 01 06-16-2023
01 31 13 .....Project Coordination 01 06-16-2023
01 31 23 .....Project Web Site 01 06-16-2023
01 32 19 .....Submittals Schedule Procedures 01 06-16-2023
01 32 33 .....Photographic Documentation 01 06-16-2023
01 33 00 .....Submittal Procedures 01 06-16-2023
01 33 29 .....Sustainable Design Reporting
01 35 46 .....Indoor Air Quality Management Procedures
01 35 75 .....Delegated Design Requirements 01 06-16-2023
01 42 00 .....References 01 06-16-2023
01 42 16 .....Definitions 01 06-16-2023
01 43 00 .....Quality Assurance 01 06-16-2023
01 43 36 .....Field Samples 01 06-16-2023
01 43 39 .....Mockups 01 06-16-2023
01 45 00 .....Contractor Quality Control 01 06-16-2023
01 45 23 .....Testing and Inspecting Services 01 06-16-2023
01 61 00 .....Common Product Requirements 01 06-16-2023
01 61 16 .....Common Product Requirements for Sustainability
01 62 00 .....Product Selection Options 01 06-16-2023
01 64 00 .....Owner-Furnished Products 01 06-16-2023
01 65 13 .....Product Delivery and Storage Requirements 01 06-16-2023
01 71 00 .....Examination and Preparation 01 06-16-2023
01 71 23 .....Field Engineering 01 06-16-2023
01 73 00 .....Execution 01 06-16-2023
01 73 29 .....Cutting and Patching 01 06-16-2023
01 74 13 .....Progress Cleaning 01 06-16-2023

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01 74 19	Construction Waste Management and Disposal		
01 74 23	Final Cleaning	01	06-16-2023
01 75 00	Starting and Adjusting	01	06-16-2023
01 77 00	Closeout Procedures	01	06-16-2023
01 78 23	Operation and Maintenance Data	01	06-16-2023
01 78 36	Warranties	01	06-16-2023
01 78 39	Project Record Documents	01	06-16-2023
01 78 40	Spare Parts and Extra Stock Materials	01	06-16-2023
01 78 53	Sustainable Design Closeout Documentation		
01 79 00	Demonstration and Training	01	06-16-2023
01 81 13	Sustainable Design Requirements		
01 91 13	General Commissioning Requirements		

Facility Construction Subgroup

DIVISION 02 – EXISTING CONDITIONS

None issued

DIVISION 03 – CONCRETE

03 30 00 ..... Cast-In-Place Concrete
03 35 43 ..... Polished Concrete Finishing

DIVISION 04 – MASONRY

04 05 00 ..... Common Work Results for Masonry
04 21 13 ..... Clay Brick Masonry
04 22 00 ..... Concrete Unit Masonry
04 43 00 ..... Stone Masonry

DIVISION 05 – METALS

05 05 13.13 ..... Shop-Applied Galvanic Coatings for Metal
05 05 13.16 ..... Shop-Applied Anodic Coatings for Metal
05 05 13.19 ..... Shop-Applied Prime Coatings for Metal
05 05 13.21 ..... Shop-Applied Paint Coatings for Metal
05 05 13.22 ..... Shop-Applied Paint Coatings for Metal Products Schedule
05 05 13.23 ..... Shop-Applied Paint Coatings for Metal Usage Schedule
05 12 00 ..... Structural Steel Framing
05 12 13 ..... Architecturally Exposed Structural Steel Framing
05 21 00 ..... Steel Joist Framing
05 31 00 ..... Steel Decking
05 40 00 ..... Cold-Formed Metal Framing
05 50 00 ..... Metal Fabrications
05 51 00 ..... Metal Stairs
05 51 33.23 ..... Alternating Tread Ladders
05 52 00 ..... Metal Railings
05 73 13 ..... Glazed Decorative Metal Railings

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

06 05 73 ..... Wood Treatment
06 10 53 ..... Miscellaneous Rough Carpentry
06 17 19 ..... Cross-Laminated Timber
06 16 00 ..... Sheathing

06 20 00 .....Finish Carpentry
06 41 00 .....Architectural Wood Casework
06 41 93 .....Cabinet and Drawer Hardware
06 42 00 .....Wood Paneling
06 61 16 .....Solid-Surfacing Fabrications
06 83 16 .....Fiberglass Reinforced Paneling

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 13 52 .....Modified Bituminous Sheet Waterproofing
07 14 16 .....Cold Fluid-Applied Waterproofing
07 21 00 .....Thermal Insulation
07 21 00.13 .....Thermal Insulation Product and Usage Schedule
07 27 00 .....Air Barriers
07 42 13.19 .....Insulated Metal Wall Panels
07 42 13.23 .....Metal Composite Material Wall Panels
07 53 00 .....Elastomeric Membrane Roofing
07 60 00 .....Flashing And Sheet Metal
07 60 00.13 .....Flashing and Sheet Metal Schedule
07 72 00 .....Roof Accessories
07 81 00 .....Applied Fireproofing
07 81 23 .....Intumescent Fireproofing
07 84 00 .....Firestopping
07 84 00.13 .....Firestopping Systems Schedule Form
07 91 00 .....Preformed Joint Seals
07 92 00 .....Joint Sealants
07 92 00.13 .....Joint Sealant Usage Schedule
07 92 00.14 .....Joint Sealant Products Schedule
07 95 00 .....Expansion Control
07 95 00.13 .....Expansion Control Device Schedule

DIVISION 08 – OPENINGS

08 11 13 .....Hollow Metal Doors and Frames
08 11 19 .....Stainless-Steel Doors and Frames
08 12 16.13 .....Interior Aluminum Frames
08 13 16 .....Aluminum Doors
08 14 16 .....Flush Wood Doors
08 14 33 .....Stile and Rail Wood Doors
08 16 13 .....Fiberglass Doors And Frames
08 31 13 .....Access Doors and Frames
08 33 23 .....Coiling Doors and Grilles
08 35 13.23 .....Accordion Folding Fire Doors
08 41 13.16 .....Fire-Rated Glazed Framing and Door Assemblies
08 43 13 .....Aluminum-Framed Storefronts
08 44 13 .....Glazed Aluminum Curtain Walls
08 51 13 .....Aluminum Windows
08 56 19 .....Pass Windows
08 71 00 .....Door Hardware
08 80 00 .....Glazing
08 80 00.13 .....Monolithic Glazing Unit Schedule
08 80 00.14 .....Laminated Glazing Unit Schedule
08 80 00.15 .....Insulating Glazing Unit Schedule
08 80 00.17 .....Fire-Rated Glazing Unit Schedule

08 91 19 .....Fixed Architectural Louvers

DIVISION 09 – FINISHES

09 05 61 .....Common Work Results for Floor Substrate Preparation
09 06 00.16 .....Finish Materials Schedule
09 22 16 .....Non-Structural Metal Framing
09 28 13 .....Cementitious Backing Boards
09 29 00 .....Gypsum Board
09 30 00 .....Tiling
09 30 00.13 .....Tiling Schedule
09 51 13 .....Acoustical Panel Ceilings
09 54 23 .....Linear Metal Ceilings
09 65 00 .....Resilient Flooring
09 65 13 .....Resilient Base and Accessories
09 65 36 .....Static-Control Resilient Flooring
09 67 23 .....Resinous Flooring
09 68 00 .....Carpeting
09 72 00 .....Wall Coverings
09 81 00 .....Acoustic Insulation
09 84 33 .....Sound-Absorbing Wall Units
09 90 13. .....Surface Preparation of Galvanized Metal for Painting
09 91 00 .....Painting
09 91 00.13 .....Paint Systems Schedule
09 91 00.15 .....MPI Paint Product Number Schedule
09 91 00.16 .....Paint Products Schedule
09 96 00 .....High-Performance Coatings

DIVISION 10 – SPECIALTIES

10 11 19 .....Fixed Markerboards and Tackboards
10 13 00 .....Directories
10 14 00 .....Signage
10 14 00.13 .....Signage Schedule
10 14 73 .....Fire-Rated Construction Signage
10 21 13 .....Toilet Compartments
10 21 16 .....Shower and Dressing Compartments
10 22 13 .....Wire Mesh Partitions
10 22 38 .....Operable Panel Partitions
10 26 00 .....Wall and Door Protection
10 28 00 .....Toilet, Bath, and Laundry Accessories
10 28 00 .....Toilet, Bath, and Laundry Accessories Schedule
10 41 16 .....Emergency Key Cabinets
10 43 13. .....Defibrilator Cabinets
10 44 00 .....Fire Protection Specialties
10 51 13 .....Metal Lockers
10 56 13 .....Metal Storage Shelving (freestanding)
10 56 26 .....Mobile Storage Shelving
10 71 13 .....Exterior Sun Control Devices
10 73 26 .....Metal Walkway Covers
10 75 00 .....Flagpoles

NUMBER TITLE ISSUE ID DATE

DIVISION 11 – EQUIPMENT

11 15 00. .....Security Control Equipment
11 52 13 .....Projection Screens
11 53 00 .....Laboratory Equipment
11 53 13 .....Laboratory Fume Hoods
11 53 29 .....Laboratory Controlled-EnvironmentCabinets
11 53 33 .....Emergency Safety Appliances
11 53 43 .....Service Fittings and Accessories

DIVISION 12 – FURNISHINGS

12 10 00 .....Art
12 24 13 .....Roller Window Shades
12 35 53 .....Laboratory Casework
12 36 00 .....Countertops
12 36 53 .....Laboratory Countertops
12 40 00 .....Furnishings and Accessories
12 48 13 .....Entrance Floor Mats and Frames
12 50 00 .....Furniture
12 59 00 .....Systems Furniture
12 90 00 .....Other Furnishings
12 92 00 .....Interior Planters and Artificial Plants

DIVISION 13 – SPECIAL CONSTRUCTION

None issued

DIVISION 14 –CONVEYING EQUIPMENT

14 21 00 .....Electric Traction Elevators

DIVISION 15-19 - RESERVED

Facility Services Subgroup

DIVISION 20 - RESERVED

DIVISION 21 - FIRE SUPPRESSION

21 05 00 .....Basic Fire Suppression Requirements
21 05 03 .....Through Penetration Firestopping
21 05 29 .....Fire Suppression Supports and Anchors
21 05 48 .....Fire Protection Vibration Isolation
21 05 53 .....Fire Suppression Identification
21 13 02 .....Fire Protection Performance Based Design

DIVISION 22 - PLUMBING

22 05 00 .....Basic Plumbing Requirements
22 05 03 .....Through Penetration Firestopping
22 05 13 .....Motors
22 05 16 .....Plumbing Expansion Compensation
22 05 29 .....Plumbing Supports and Anchors
22 05 48 .....Plumbing Vibration Isolation

NUMBER TITLE ISSUE ID DATE

22 05 53 .....Plumbing Identification
22 05 93 .....Plumbing Testing, Adjusting, and Balancing
22 07 16 .....Plumbing Equipment Insulation
22 07 19 .....Plumbing Piping Insulation
22 09 00 .....Instrumentation
22 10 00 .....Plumbing Piping
22 10 23 .....Natural Gas and Propane Piping
22 10 30 .....Plumbing Specialties
22 15 19 .....Compressed Air Systems
22 30 00 .....Plumbing Equipment
22 40 00 .....Plumbing Fixtures
22 60 00 .....Laboratory Gas Systems
22 67 00 .....Plumbing Pure Water Piping and Equipment

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

23 05 00 .....Basic HVAC Requirements
23 05 03 .....Through Penetration Firestopping
23 05 13 .....Motors
23 05 16 .....HVAC Expansion Compensation
23 05 29 .....HVAC Supports and Anchors
23 05 30 .....Roof Support and Wind Bracing
23 05 48 .....HVAC Vibration Isolation
23 05 53 .....HVAC Identification
23 05 93 .....Testing, Adjusting, and Balancing
23 07 13 .....Ductwork Insulation
23 07 16 .....HVAC Equipment Insulation
23 07 19 .....HVAC Piping Insulation
23 09 00 .....Controls
23 09 13 .....Instrumentation
23 09 20 .....Venturi Valve Airflow Control System
23 21 00 .....Hydronic Piping
23 21 16 .....Hydronic Specialties
23 21 23 .....HVAC Pumps
23 25 00 .....Chemical (Water) Treatment
23 25 33 .....HVAC Water Filtration Equipment
23 31 00 .....Ductwork
23 33 00 .....Ductwork Accessories
23 34 13.13 .....Mixed Flow Laboratory Exhaust Fans
23 34 16 .....Centrifugal Fans
23 34 23 .....Power Ventilators
23 36 00 .....Air Terminal Units
23 37 00 .....Air Inlets and Outlets
23 40 00 .....Air Cleaning
23 51 00 .....Breechings, Chimneys, and Stacks
23 57 00 .....Heat Exchangers
23 57 33 .....Geothermal Heat Exchangers
23 64 16 .....Electric Water Chillers
23 65 33 .....Evaporative Closed Circuit Cooling Tower
23 72 00 .....Energy Recovery Devices
23 73 23 .....Custom Air Handling Units
23 82 00 .....Terminal Heat Transfer Units
23 82 16 .....Air Coils

NUMBER TITLE ISSUE ID DATE

DIVISION 24 - RESERVED

DIVISION 25 - INTEGRATED AUTOMATION

None issued

DIVISION 26 - ELECTRICAL

26 05 00 .....Basic Electrical Requirements
26 05 13 .....Wire and Cable
26 05 15 .....Medium-Voltage Cable and Accessories
26 05 17 .....Electric Heat Trace and Snow Melt
26 05 26 .....Grounding and Bonding
26 05 27 .....Supporting Devices
26 05 33 .....Conduit and Boxes
26 05 35 .....Surface Raceways
26 05 48 .....Seismic Requirements for Equipment and Supports
26 05 53 .....Electrical Identification
26 05 73 .....Power System Study
26 08 00 .....Commissioning of Electrical
26 09 13 .....Power Monitoring and Control System
26 09 16 .....Electrical Controls and Relays
26 09 33 .....Lighting Control Systems
26 11 00 .....Secondary Unit Substation
26 12 13 .....Liquid-Filled Substation Distribution Transformers
26 12 19 .....Pad-Mounted, Liquid-Filled Transformers
26 13 14 .....Pad Mounted Medium Voltage Switchgear
26 13 34 .....Medium Voltage Metal-Enclosed Load Interrupter Switchgear (Air Interrupter Switches)
26 13 35 .....Paralleling & Distribution Switchgear Medium Voltage 5kv
26 20 00 .....Service Entrance
26 22 00 .....Dry Type Transformers
26 24 13 .....Switchboards
26 24 16 .....Panelboards
26 24 19 .....Motor Control
26 27 16 .....Cabinets and Enclosures
26 27 26 .....Wiring Devices
26 27 29 .....Electric Vehicle Charging Station
26 28 13 .....Fuses
26 28 16 .....Disconnect Switches
26 28 21 .....Contactors
26 29 23 .....Variable Frequency Drives
26 32 13 .....Packaged Engine Generator Systems
26 36 00 .....Transfer Switch
26 41 00 .....Lightning Protection Systems
26 43 00 .....Surge Protection Devices
26 51 19 .....LED Lighting

DIVISION 27 - COMMUNICATIONS

27 05 00 .....Basic Communications Systems Requirements
27 05 03 .....Through Penetration Firestopping
27 05 26 .....Communications Bonding
27 05 28 .....Interior Communication Pathways

27 05 43 .....Exterior Communication Pathways
27 05 53 .....Identification and Administration
27 11 00 .....Communication Equipment Rooms (CER)
27 13 00 .....Backbone Cabling Requirements
27 15 00 .....Horizontal Cabling Requirements
27 17 10 .....Testing
27 17 20 .....Structured Cabling System Warranty
27 41 00 .....Professional Audio/Video System
27 51 13 .....Paging Systems

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 05 00 .....Basic Electronic Safety and Security System Requirements
28 05 03 .....Through Penetration Firestopping
28 05 37 .....Distributed Antenna System (DAS) for Public Safety Networks
28 13 00 .....Electronic Access Control
28 16 00 .....Intrusion Detection System
28 23 00 .....Video Surveillance
28 26 05 .....Rescue Assistance Communication
28 31 01 .....Fire Alarm and Detection Systems Addressable
28 31 50 .....Air Sampling Smoke Detection Systems (ASSD)

DIVISION 29 - RESERVED

Site and Infrastructure Subgroup

DIVISION 30 - RESERVED

DIVISION 31 - EARTHWORK

31 05 13 .....Soils for Earthwork
31 20 00 .....Earth Moving
31 23 19 .....Dewatering

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 05 16 .....Aggregates for Exterior Improvements
32 12 16 .....Asphalt Paving
32 13 13 .....Concrete Paving
32 14 00 .....Unit Paving
32 31 13 .....Chain Link Fences and Gates
32 84 00 .....Planting Irrigation
32 90 00 .....Planting

DIVISION 33 - UTILITIES

33 01 31 .....Manhole Grade Adjustment
33 05 13 .....Manholes and Structures
33 05 16 .....Utility Structures
33 11 16 .....Site Water Utility Distribution Piping
33 12 16 .....Water Utility Distribution Valves
33 12 19 .....Water Utility Distribution Fire Hydrants
33 13 00 .....Disinfecting of Water Utility Distribution
33 31 00 .....Sanitary Utility Sewerage Piping

NUMBER TITLE ISSUE ID DATE

33 41 00 .....Storm Utility Drainage Piping
33 42 13 .....Pipe Culverts
33 46 00 .....Subdrainage

DIVISION 34 - TRANSPORTATION

None issued

DIVISION 35 - WATERWAY AND MARINE CONSTRUCTION

None issued

DIVISION 36-39 - RESERVED

Process Equipment Subgroup

DIVISION 40 - 49

None issued

END OF DOCUMENT 00 01 10

DOCUMENT 00 01 13 - FORMATS AND CONVENTIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Document establishes a common basis for understanding the organization of this Project Manual. It is based on industry standards published by The American Institute of Architects (AIA) and The Construction Specifications Institute/Construction Specifications Canada (CSI/CSC).

B. Related Requirements
   1. Requirements of this Document apply to, and are a component part of, each Section of the Specifications.

1.02 DEFINITIONS

A. Work Result: Permanent or temporary aspects of construction projects achieved in the production stage or by subsequent alteration, maintenance, or demolition processes, through the application of a particular skill or trade to construction resources.

1.03 FORMATS AND CONVENTIONS

A. Project Manual Concept and Format: The Project Manual is organized into Divisions and Sections using CSI/CSC's "MasterFormat™" 50-division format and numbering system.
   1. The Project Manual is a collection of certain written Construction Documents and project requirements whose contents and functions are best implied by the title "Project Manual." The Project Manual concept provides an organizational format and standard location for all of the various Construction Documents involved.
   2. The Project Manual was prepared in coordination with the Owner.
   3. The Procurement Requirements, Contract Forms, and Conditions of the Contract may be included, but they are not Specifications. "MasterFormat™" assigns standard locations and numbers for these Documents for inclusion in the Project Manual. The remainder of the Project Manual is made up of Specification Sections.
   4. The Project Manual may be divided into separate volumes when the number of pages makes them impractical to bind together in a single volume. Addenda and modifications, issued separately, shall be added to the bound project manual and considered an integral part thereof.
   5. The provisions of the Conditions of the Contract and the Agreement apply broadly to the Work of the Project. Division 01 expands on these provisions, giving just enough detail to apply broadly to all the other Specification Sections. The Specifications and Drawings further expand on Division 01 and provide detailed requirements for specific portions of the Work.

B. "MasterFormat™": The main purpose of MasterFormat™ is to organize the Project Manual and to help users of the Project Manual find information in standard locations. "MasterFormat™" establishes the organizational structure for the Documents and Sections within the Project Manual, each with a unique number and title. Titles are arranged in a logical sequence for those Specification Sections required for this construction Project.

C. Divisions: "MasterFormat™" arranges related construction practices, or work results, into groups or series called Divisions. Central to the arrangement and use of contents of the Divisions in "MasterFormat™", and the Sections that make them up, is the notion that all of the

different types of construction are addressed equally. Individual Sections with related items are grouped together under the appropriate Divisions within "MasterFormat™".

1. Divisions are not intended to stand alone nor are they intended to correspond to discreet units or "scopes" of work assigned by the Contractor to a single trade or subcontractor.
2. Normally retain first option in paragraph below and delete second.
3. Division 01 - General: Sections in Division 01 apply to the Work of all Sections in the Specifications and include administrative requirements, procedural requirements, temporary facilities and controls, and performance requirements.
    a. Administrative and procedural requirements are those relating to the process of contract administration, the assignment of contractual responsibilities, and the methods of communicating, verifying, and coordinating requirements for quality assurance.
    b. Temporary facilities and controls are those put into place for use only during the period of construction and that will be removed when no longer required for construction operations.
    c. Performance requirements are related to facility and system performance.
4. Division 01 Sections expand on certain of the administrative and procedural provisions in the Conditions of the Contract and apply broadly to the execution of the work of all the other Sections of the Specifications. Administrative and procedural requirements unique to a specific Section are covered in the affected Section. Division 01 Sections cover general requirements for execution of the Work and apply to all Sections in Divisions 02 through 49 thus avoiding repetition throughout the Specifications, and the possibility of conflicts and omissions. This Division 01 concept adheres to the CSI principle of stating information only once and in the right place.

C. Specification Section or Sections: Specification Sections represent construction practices or “work results” that result from the application of skills and procedures to the materials, products, or assemblies.
    1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
    2. Sections are intended to cover one portion of the Project requirements, describing particular materials, products, systems, or assemblies and their installation and particular administrative or procedural requirements. Specific Sections are included in the Project Manual as required to convey the Project requirements.
    3. Sections are not intended to define the work of individual trades and do not necessarily relate to the work accomplished by a single trade or subcontractor. Sections are not intended to stand alone nor are they intended to correspond to discreet units or "scopes" of work assigned by the Contractor to a single trade or subcontractor. Each Section functions with other portions of the Bidding and Contract Documents and each Section relates to the other Sections and to the Drawings to form a cohesive whole.
    4. Specifications address the Contractor, not the subcontractors. The Contractor executes an agreement with the Owner to construct the project and is the only entity responsible to the Owner. Responsibility for construction of the total Project remains with the Contractor regardless of how the work is divided among subcontractors and suppliers.
    5. CSI/CSC's SectionFormat™ provides a uniform approach to organizing Specification text contained in a Project Manual. SectionFormat™ assists in the organization of Specification Sections by establishing a structure consisting of three primary parts. These parts organize text consistently within each Section as follows:
        a. PART 1 GENERAL: Describes administrative, procedural, and temporary requirements unique to each Section. PART 1 is an extension of subjects covered in Division 01 and amplifies information unique to the Section.

b. PART 2 PRODUCTS: Describes materials, products, equipment, fabrications, mixes, systems, and assemblies that are required for incorporation into the Project. Materials and products are included with the quality required.
c. PART 3 EXECUTION: Describes installation or application, including preparatory actions and post-installation cleaning and protection. PART 3 may include site-built assemblies and site-manufactured products and systems.

1.04 SPECIFICATION LANGUAGE

A. The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood is generally used in the Specifications. Requirements expressed in the imperative mood are addressed to the Contractor. The phrase "The Contractor shall…" prior to instructions is frequently omitted for brevity.
a. Example of Imperative Mood: "Install equipment plumb and level."
2. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
a. Example of Indicative Mood: "Equipment shall be installed plumb and level."
b. Example of Subjunctive Mood: "It is essential paint application be performed immediately following surface preparation."
3. Streamlined Form: In the intent of brevity, language used in the Specifications and other Contract Documents is abbreviated and certain words and phrases are often omitted. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context indicates.
a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase to separate the subject and the verb.
b. Words such as modifiers “all,” “any,” and "such" as well as articles "a," “the,” and “an,” may be omitted but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.
c. The word "per" may be used instead of the phrase "as specified in".
d. Example of Streamlined Form: "Equipment: Install plumb and level."

B. Terms used on Drawings to identify products may refer directly to Section titles or to products listed generically in each Section.

C. Listing of products under "Section Includes" paragraph of "Summary" Articles is for the reader's convenience to identify major product included in that Section, and does not serve to limit Work to just those items listed.

D. Schedules and Attachments: Certain Sections have Schedules and Attachments following the End of Section designation. Schedules and Attachments are enforceable as part of the Section by reference to the attachment from within the Section.

1.05 TYPEFACES

A. The typeface font used throughout the Specifications is intended to be ordinary without the use of bold, italics, or underlining. Aside from changes by way of Addenda or other modifications, no other special meaning is attached to the use of bold, italics, or underlining if encountered.
1. Document titles may appear in italics.

2. Website URLs may appear underlined.

B. Changes to Previously Issued Documents and Specifications: Changes to Specifications due to Addenda, Change Orders, Construction Change Directives, or written orders for a minor change in the Work issued by the Architect (ASI's) appear as follows:
   1. Additions: Bold typeface. In PDF format additions appear as Black text.
   2. Deletions: Strikethrough typeface. In PDF format deletions appear as Black text.

1.06 PROJECT MANUAL DATES

A. Refer to the Owner/Contractor Agreement for dates for contractual purposes.

B. Refer to Project Manual Cover Page for issue date of the Project Manual.

C. Dates indicated in the headers on pages throughout the Project Manual are for the Architect's and Owner's internal reference to identify initial issues from subsequent issues and, unless otherwise indicated, have no significance to contractual dates. Dates indicated may or may not relate to issue date of the Project Manual or date of the Contract.

D. Table of Contents identifies dates as indicated in the headers or cover page for each Document and Specification included. As Documents and Specifications change after initial issue, the dates are updated to reflect the current version.

1.07 DIVISION 01 - GENERAL REQUIREMENTS

A. The provisions of the Conditions of the Contract and the Agreement apply broadly to the Work of the Project. Division 01 expands on these provisions, giving additional detail to apply broadly to all other Specification Sections in Divisions 02 through 49, thus avoiding repetition throughout the Specifications and the possibility of conflicts and omissions. The concept of Division 01 adheres to the CSI principle of stating information only once and in the right place. The Specifications and Drawings further expand on Division 01 and provide detailed requirements for specific portions of the Work.
   1. Division 01 - General: Sections in Division 01 include administrative requirements, procedural requirements, temporary facilities and controls, and performance requirements.
      a. Administrative and procedural requirements are those relating to the process of contract administration, the assignment of contractual responsibilities, and the methods of communicating, verifying, and coordinating requirements for quality assurance. Administrative and procedural requirements unique to a specific Section are covered in the affected Section.
      b. Temporary facilities and controls are those put into place for use only during the period of construction and that will be removed when no longer required for construction operations.
      c. Performance requirements are related to permanent facility and system performance.

B. The Contractor shall comply with provisions contained in Division 01 and ensure that each subcontractor, sub-subcontractor, and supplier receives copies of Division 01 and comply with provisions contained therein.

1.08 DRAWING COORDINATION

A. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all.

B. Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or a combination of the following are used on the Drawings to identify materials and products:
   1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections. If terms for products differ between Drawings and Specifications refer uncertainties to Architect for clarification.
   2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and as scheduled.
   3. Brand Names: Occasionally Drawings may identify products by brand or trade names, whether repeated in the Specifications or not.
   4. Delete below if Drawings do not use numbers corresponding to the specification Section numbers.
   5. Keynotes: Materials and products may be identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF DOCUMENT 00 01 13

DOCUMENT 00 31 32 - GEOTECHNICAL DATA

PART 1 - GENERAL

1.01 SUMMARY

A. Document includes general information concerning geotechnical investigations conducted at the site.

1.02 INVESTIGATION

A. Geotechnical investigations were conducted at the site, the results of which can be found in the report.

B. A copy of the report may be obtained from the office of the Architect.

1.03 INTERPRETATION

A. The report is provided only for bidder's information and convenience and is not part of the Contract Documents. Owner and Architect do not warrant the accuracy or extent of the report or locations of the test borings.

B. Opinions expressed in the report are those of the Geotechnical Engineer and represent the Geotechnical Engineer’s interpretation of subsoil conditions, tests, and results of analyses that the Geotechnical Engineer has conducted.

C. The report is based upon the assumption that uniform variation exists in soil properties between borings. Interpretation of the report is bidder's responsibility. Owner and Architect will not be responsible for interpretation of report by bidders.

D. Bidders are urged to examine the report and the site.

E. Additional soil borings or other exploratory operations may be made by bidders at no additional cost to Owner, provided such operations are approved by Owner in advance.

F. Refer to Conditions of the Contract for additional information.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF DOCUMENT 00 31 32

DOCUMENT 00 54 36 - BUILDING INFORMATION MODELING AND DIGITAL DATA PROTOCOL

PART 1 - GENERAL

1.01 SUMMARY

A. Document includes administrative and procedural requirements for transmission or exchange of Digital/Electronic Data for this Project.

B. Related Requirements
   1. Requirements of this Document apply to, and are a component part of, each Section of the Specifications.

1.02 DEFINITIONS

A. Digital/Electronic Data: Information, communications, Drawings, Documents, Specifications, or designs created or stored for the Project in digital or electronic form.

B. Building Information Modeling: An object-oriented building development process involving the generation and management of digital representations of physical and functional characteristics of a facility utilizing 5-D modeling concepts (width, height and depth, time, and cost), information technology and software interoperability to design, construct and operate a building project, as well as communicate its details.

C. Building Information Model (BIM): A shared knowledge resource in digital format containing proprietary data and information about a facility which can be exchanged or networked to support decision-making about the facility from earliest conception through design, construction, occupancy, and beyond. BIM covers geometry, spatial relationships, light analysis, geographic information, quantities, and properties of building components (i.e. manufacturer's details).

D. Confidential Information: Digital Data that the transmitting party has designated as confidential and clearly marked with an indication such as “Confidential” or “Business Proprietary.”

E. File Transfer Protocol (FTP): A standard network protocol used to transfer computer files from one host to another host over a TCP-based network such as the internet. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

F. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.03 TRANSMISSION OF DIGITAL DATA

A. The Owner, Architect, and Contractor (the parties) will transfer or exchange digital data to facilitate execution and administration of the Work.
   1. Contractor shall execute a data licensing agreement in the form at the end of this Section.

B. The transmitting party shall not transmit digital data unless they:
   1. are the copyright owner of the digital data,

2. have permission from the copyright owner to transmit the Digital Data for its use on the Project, or
3. are authorized to transmit confidential information contained in the digital data.

C. The receiving party shall keep confidential information strictly confidential and shall not disclose or share it except to:
1. its employees,
2. those who need to know the content of the confidential information in order to perform services or construction solely and exclusively for the Project, or
3. its consultants and contractors whose contracts include similar restrictions on the use of Confidential Information.

D. No rights in the digital data or in the software used to generate the data are conveyed by the transmitting parties.

E. Unless otherwise granted in a separate license, the receiving party shall not use, modify, or transmit the digital data except for the design and construction of this Project.

1.04 DESIGN TEAM'S CAD FILES

A. Architect and its consultants will furnish Contractor CAD digital data drawing files of portions of the Contract Drawings for use in preparing Shop Drawings and Project Record Drawings.
1. Architect and its consultants make no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
2. Digital Data Software Program: Drawings are available in Architect's and its consultants' current file format only. Conversion to other formats is Contractor's responsibility.

1.05 BIM FILES

A. Architect and its consultants will make available to Contractor BIM digital model files of the Contract Drawings for use in preparing Shop Drawings, Coordination Drawings, and Project Record Drawings.
1. Architect and its consultants make no representations as to the accuracy or completeness of BIM digital model files as they relate to the Contract Drawings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF DOCUMENT 00 54 36

ELECTRONIC MEDIA DISCLAIMER

AGREEMENT TO PROVIDE INFORMATION IN ELECTRONIC FORMAT

PROVIDER: Hobbs + Black Associates, Inc., 100 N. State Street, Ann Arbor, MI 48104

RECIPIENT: *(name, address)* _____

PROJECT: Sparrow Health System, North Tower Addition

PROJECT No. 20-619

AUTHORIZED USE:

Hobbs + Black Associates, Inc. has been asked to provide to _____, hereafter referred to as *the recipient*, electronic format versions of CAD documents for the project.

The use of documents by *the recipient* is limited to _____ (*state the purpose*).

The recipient agrees that the documents shall not be used for any other purpose. *The recipient* further agrees that it will obligate any recipient of the documents to agree in writing to be bound to all of the terms herein as if the recipient in this Agreement. Each recipient will agree to pass on the same contractual obligation to any other recipients permitted under this Agreement.

INSTRUMENTS OF SERVICE:

The documents, whether in hard copy or machine readable form, represents instruments of professional service and shall remain Hobbs + Black's property. As the author of the documents, Hobbs + Black Associates, Inc. retains all proprietary rights, including copyrights embodied therein.

ACCURACY:

Hobbs + Black Associates, Inc. does not represent that all information contained in the documents is complete, noting that there could be subsequent changes to the documents. Furthermore, items shown in the documents may not be to scale.

The recipient agrees to verify all information and dimensions indicated in the electronic documents by comparison to an original printed copy and promptly notify Hobbs + Black Associates, Inc. of any discrepancies.

The recipient acknowledges that anomalies and errors can be introduced into documents when they are transferred or used in an incompatible computer environment. Further, *the recipient* acknowledges and solely accepts the risks associated with and/or the responsibility for any damages to hardware, software or computer systems or networks related to any use of the documents. The documents are being furnished "as is."

Electronic media viruses are ever increasing in complexity and growth. Hobbs + Black Associates, Inc. advises all users to scan any disk received from outside sources with a current anti-virus program. Hobbs + Black Associates, Inc. takes normal precautions to keep our system clean of viruses but, because no system is perfect, occasionally a virus may pass undetected. Hobbs + Black Associates, Inc. will not be responsible for any damage caused by such a virus. If you detect any virus on any media received from Hobbs + Black Associates, Inc., please contact us immediately.

INDEMNIFICATION:

To the fullest extent permitted by law, *the recipient* agrees to indemnify, defend and hold Hobbs + Black Associates, Inc., its officers, directors, shareholders, employees, agents and consultants harmless from and against any and all claims, liabilities, suits, demands, losses, costs and expenses, arising out of any use, reuse, or modification of the documents, except where Hobbs + Black Associates, Inc. is found to be solely liable as between the parties hereto as well as between any other persons, firms or other legal entities for such damages or losses by a court or forum of competent jurisdiction.

Except as provided herein, *the recipient* will not transfer the document or any copy of the document in any form to a third party without the prior written consent of Hobbs + Black Associates, Inc., which may be withheld at Hobbs +

Black's sole and absolute discretion. If *the recipient* fails to perform or observe any of the terms of this Agreement, Hobbs + Black Associates, Inc. may demand and *the recipient* agrees to immediately return the document and any copies thereof.

LOCATION:

This Agreement shall be governed by Michigan law, Washtenaw County.

LIMIT OF LIABILITY:

To the fullest extent permitted by law, and not withstanding any other provision of this Agreement, the total liability, in the aggregate, of Hobbs + Black Associates, Inc., its officers, directors, employees, agents and consultants, to *the recipient* and anyone claiming by, through or under *the recipient* for any injuries, liabilities, claims, losses, expenses, costs of damages of any nature whatsoever arising out of, resulting from or in any way related to the documents or the Use of Documents, including but not limited to the negligence, professional errors or omissions, or breach of contract of Hobbs + Black Associates, Inc., its officers, directors, shareholders, employees, agents or consultants, or any of them, shall not exceed one dollar ($1.00).

Signing this Agreement indicates your agreement to the terms stated above. Unless otherwise explicitly agreed to in writing by both parties, this Agreement shall govern any and all future transfers or use of new documents, to *the recipient* by Hobbs + Black Associates, Inc.

Sincerely, Accepted and Agreed By:

Hobbs + Black Associates, Inc.	(Company Name)
Name:	Name:
Title: Project Architect	Title:
(Signature)	(Signature)
Date:	Date:

HOBBS+BLACK ASSOCIATES INC Architects, Planners & Interior Designers
100 N. State Street Ann Arbor, Michigan 48104 www.hobbs-black.com
P. 734.663.4189 F. 734.663.1770 Ann Arbor | Lansing | Phoenix | Toledo

END OF DISCLAIMER

DOCUMENT 00 60 00 - PROJECT FORMS

1.01 SUMMARY

A. Document identifies administrative forms and pre-printed documents to be used for Project.

B. Related Requirements:
1. Requirements of this Document apply to, and are a component part of, each Section of the Specifications.

1.02 PROCEDURES

A. Use of forms listed at end of this Section and appended thereto is required. Contractor's standard forms containing substantially equivalent information may be used subject to Owner and Architect approval.

B. Complete applicable information on form. Indicate date transmitted and date of required response, as applicable. Attach supporting documentation and additional descriptive information as requested or as necessary.

C. Use a separate form for each submittal, request. Closely related items may be included in a single request only if acceptance of one item requires acceptance of all items in the request.

D. Comply with the requirements of Section 01 6000 for requests for substitution after execution of the Contract.

1.03 ADMINISTRATIVE FORMS

A. Electronic copies of attached forms will be provided upon request.

B. Blank copies of AIA forms and pre-printed documents are not included in this Project Manual but are hereby made a part of the Contract Documents by reference.
1. Copies of AIA standard forms and pre-printed documents may be obtained from the American Institute of Architects at https://www.aiacontracts.org/.

Form No.	Form Title	Section Reference	Copy Included Herein
00 60 00	**Project Forms**		
00 62 11	Submittal Transmittal Form.doc	01 33 00	Yes
00 62 13	Submittals Schedule Form.xlsx	01 32 19	Yes
00 62 32	Comparable Product Request Form.doc	01 62 00	Yes
00 62 33.13	Proposed Products Form.xlsx	01 32 19	Yes
00 62 33.14	Proposed Firestopping Systems Schedule Form.xlsx	07 84 00	Yes
00 62 34.13	LEED V4 Checklist Form	01 81 13	Yes
00 62 34.14	LEED V4 Materials Submittal Form.doc	01 33 29	Yes
00 62 34.15	LEED V4 Emissions Submittal Form.doc	01 33 29	Yes
00 62 34.16	LEED V4 Emissions Limits Table.doc	01 33 29	Yes
00 62 37	Subcontractors and Major Material Suppliers Form (CMc).xlsx	01 31 13	Yes
00 62 76	Application for Payment Form - AIA G-702-1992	01 29 76	By Reference

00 62 76.11	Application for Payment Continuation Sheet Form - AIA G-703-1992	01 29 73 01 29 76	By Reference
00 62 76.16	Consent of Surety to Reduction in or Partial Release of Retainage - AIA Form G-707A-1994	01 29 76	By Reference
00 62 93	Schedule and Log of Required Tests and Inspections Form.xlsx	01 45 23	Yes
00 63 13	Request for Interpretation Form.doc	01 26 13	Yes
00 63 13.13	Request for Interpretation Log Form.doc	01 26 13	Yes
00 63 24	Substitution Request (Pre-Bid) Form (CMc).doc	01 25 00	Yes
00 63 25	Substitution Request Form (During Construction).doc	01 25 00	Yes
00 63 54	Proposal Worksheet Summary Form.xlsx	01 26 00	Yes
00 63 55	Proposal Worksheet Detail Form.xlsx	01 26 00	Yes
00 63 57	Change Order Request (Proposal) Form.doc	01 26 00	Yes
00 65 14	Completion and Correction List Form.xlsx	01 77 00	Yes
00 65 19.13	Affidavit of Payment of Debts and Claims Form - AIA Form G-706-1994	01 29 76	By Reference
00 65 19.16	Affidavit of Release of Liens Form - AIA Form G-706A-1994	01 29 76	By Reference
00 65 19.19	Consent of Surety to Final Payment Form - AIA Form G-707-1994	01 29 76	By Reference
00 65 19.21	Consent of Surety to Reduction in or Partial Release of Retainage - AIA Form G-707A-1994	01 29 76	By Reference

END OF DOCUMENT 00 60 00

NUMBER: **SUBMITTAL TRANSMITTAL FORM**

PROJECT: _____ PROJECT NUMBER: _____

CONTRACTOR: _____ DATE: _____

FROM ORIGINATOR TO CONTRACTOR:

Firm Name: _____ I.D. Num: _____

Address: _____ Phone: _____

Contract for: _____ _____

Sender's Name: _____ _____

Email: _____ Phone: _____

QTY.	REF. / NUM.	TITLE / DESCRIPTION / MANUFACTURER	SPEC. SECTION TITLE AND PARAGRAPH / DRAWING DETAIL REFERENCE

☐ Submitted for review and approval
☐ Complies with contract requirements
☐ No Substitutions involved
☐ Resubmitted for review and approval
☐ Will be available to meet construction schedule
☐ Substitutions involved - Substitution Request attached

Remarks on above submission: _____

_____

_____

_____

SIGNED BY: _____ DATE: _____

FROM CONTRACTOR TO ARCHITECT:

Sender's Name: _____ I.D. Num: _____

Email: _____ Phone: _____

Contractor certifies that:

☐ It is responsible for quantities, weights, and dimensions to be confirmed and correlated at the site; for information that pertains solely to the fabrication processes and to the means, methods, techniques, sequences, and procedures of construction, including safety; and for coordination of the work of all trades.

☐ The products included in the submittals enumerated above are in conformance with information given and the design concept expressed in the Contract Documents.

☐ Deviations from the Contract Documents, if any, have been specifically and prominently identified as such, by highlighting, clouding, encircling, or otherwise specifically identifying the deviations.

SIGNED BY: _____ DATE: _____

RECOMMENDED ACTION FROM ARCHITECT'S CONSULTANTS (NOT FINAL! SEE BELOW):

DISCIPLINE:	REVIEWER:	DATE:	RECOMMENDED ACTION

(continued on next page)

FROM ARCHITECT TO CONTRACTOR: FINAL ACTION

☐ Approved (A)
☐ Approved as Noted (N)
☐ Not Approved - Resubmit (NR)
☐ Revise and Resubmit for record (R)
☐ Action not required (X)

SIGNED BY: _____ DATE: _____

END OF FORM 00 62 11

SUBMITTALS SCHEDULE FORM

Project: _____

Number: _____

Contractor: _____

STATUS:	
O	Required but not yet submitted
S	Submitted for review & approval
A	Approved
N	Approved as Noted
R	Revise and Resubmit
X	Rejected / Resubmit
NR	Not Requested - returned without action

CATEGORIES:	
A	Action
I	Informational
C	Closeout & Maintenance
O	Other
DATES:	Indicate taget or anticipated dates initially. Change to actual dates as Work progresses. Update Schedule monthly.

SECTION NUMBER	SECTION TITLE	FILE NUMBER	STATUS	DESCRIPTION OF ITEM SUBMITTED	SUBCONTRACTOR	CAT.	DATE OF:				
		Section No. with 3-digit number suffix Add alpha for resubmittal	See Status options above			See Category options above	First Submittal	Final Approval Needed	Fabrication	Purchasing	Installation

END OF SCHEDULE 00 62 13

C:\ABA Dropbox\WDEO Shared_WDEO Spec Masters_WDEO Format\Forms & Schedules\all forms\[00 62 13.00_wsx submittals schedule form.xlsx]SUBMITTALS SCHEDULE FORM

COMPARABLE PRODUCT REQUEST FORM

PROJECT: _____ REQUEST NUMBER: _____

TO: _____ A/E PROJECT NO: _____

FROM: _____ DATE: _____

CONTRACT FOR: _____ RE: _____

SECTION NUMBER: _____ SECTION TITLE: _____

PAGE: _____ ARTICLE/PARAGRAPH: _____

SPECIFIED PRODUCT:		PROPOSED PRODUCT:	
MANUFACTURER:		MANUFACTURER:	
TRADE NAME:		TRADE NAME:	
MODEL NO.:		MODEL NO.:	

INSTALLER: _____

Years in Production: ☐ New product; ☐ 1-4 years; ☐ 5-10 years; ☐ More than 10 years

Supporting Data Attached: ☐ Drawings; ☐ Product Data; ☐ Samples; ☐ Tests; ☐ Reports;

☐ Other (list) _____

The Undersigned certifies:

- Proposed product has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed product as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed product will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed product does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the product which subsequently become apparent.

SUBMITTED BY CONTRACTOR:

FIRM: _____

ADDRESS: _____

EMAIL: _____ PHONE: _____

SIGNED BY: _____

A/E's REVIEW AND ACTION

☐ Comparable Product approved - Make submittals in accordance with Division 01 Section "Submittal Procedures" and affected product Sections.

☐ Comparable Product approved as noted - Make submittals in accordance with Division 01 Section "Submittal Procedures."

☐ Comparable Product rejected - Use specified product.

☐ Submit additional information for review.

SIGNED BY: _____ DATE: _____

END OF FORM 00 62 32

PROPOSED PRODUCTS FORM

Project: _____

Number: _____

Contractor: _____

SECTION NUMBER	SECTION TITLE	ITEM DESCRIPTION	MANUFACTURER	TRADE NAME	MODEL	STANDARDS

END OF SCHEDULE 00 62 33.13

C:\ABA Dropbox\WDEO Shared_WDEO Spec Masters_WDEO Format\Forms & Schedules\all forms\[00 62 33.13_wsx proposed products form.xlsx]PROPOSED PRODUCTS FORM

PROPOSED FIRESTOPPING SYSTEMS SCHEDULE

Project: _____ Architect: _____

Number: _____ Date: _____

Contractor: _____ Contract for: _____

Subcontractor: _____ Contract for: _____

The following items require the attention of the Contractor for completion or correction. Submit separate form for each Subcontractor responsible for installing firestopping. Add additional rows as required. Failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the

Design Number (A)	Mfg's I.D. and Manufacturer (B)	Penetrating Item Description: Material, Size, Insulated, Combustible (C)	Annular Space / Opening (D)	Construction (E)	Fire Resistance Rating (F)	F-rating (G1)	T-rating (G2)	L-rating CFM/SF (G3)	W-rating (G4)
Through Penetrations - Horizontal Assemblies									
Through Penetrations - Wall and Partition Assemblies									
Membrane Penetrations - Wall and Partition Assemblies									

Design Number (A)	Mfg's I.D. and Manufacturer (B)	Joint Width Min. / Max. (D)	Adjacent Construction (both sides of joint) (E)	Fire Resistance Rating (F)	F-rating (G1)	T-rating (G2)	L-rating CFM/SF (G3)	W-rating (G4)
Fire-Resistant Joint Systems								

Firestopping Product Manufacturer(s):	

Provide information for proposed firestopping as follows:

(A) Indicate design number or other system designator assigned by FM (AG), ITS (DIR), UL (DIR), UL (FRD), or other testing laboratory acceptable to authorities having jurisdiction.

(B) Indicate manufacturer's system designator, if any. Include reference numbers and drawing numbers, if any.

(C) Identify the various types of penetrating items (i.e. pipe, vent, conduit, cable tray, etc.) and, for piping, indicate if dry (normally empty) or wet (normally filled) type. Include a material description (i.e. metal, plastic, EMT, etc.) and size (length by width or diameter). State whether the penetrating item is externally insulated or not. State whether the penetrating item is combustible or non-combustible.

(D) Indicate size limitations for annular space and/or opening and width limitations for joints.

(E) Identify the various types of construction being penetrated. Horizontal Assemblies include fire-resistance-rated floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies. Wall and Partition Assemblies include fire walls, fire-barrier walls, shaft enclosure walls, fire partitions, smoke-barrier walls, and smoke partitions.

1. Worded description of construction may be omitted if Architect's wall type designator is used (i.e. Wall 3A instead of metal stud & gypsum board).
2. For joints, indicate the types of construction at each side of joint beginning each joint with the following abbreviations:
   a. FF for Floor to Floor joints
   b. FW for Floor to Wall joints
   c. HW for Head of Wall joints
   d. WW for Wall to Wall joints
   e. CW for the Perimeter Fire Barrier System at the intersection of a fire-resistance-rated floor assembly and an exterior curtain wall assembly

(F) Identify the fire resistance rating of the assembly in minutes if less than one hour or hours if one hour or longer as indicated on the Drawings.

(G) System Ratings: Indicate the F-Rating, T-Rating, L-Rating, and W-Rating when installed and tested in accordance with standards specified.

END OF FORM 00 62 33.14

C:\ABA Dropbox\WDEO Shared_WDEO Spec Masters_WDEO Format\Forms & Schedules\all forms\[00 62 33.14_wsx proposed firestopping systems schedule form.xlsx]FIRESTOPPING SYSTEMS SCHEDULE

SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS

Project: _____

_____

Number: _____

Contractor: _____

Architect: _____

A/E Project Number: _____

_____

Contract for: _____

List Subcontractors and Major Material Suppliers proposed for use on this Project. Use additional sheets if necessary.

SECTION NUMBER	SECTION TITLE	FIRM NAME	ADDRESS	PHONE NUMBER	CONTACT

END OF FORM 00 43 36

C:\ABA Dropbox\WDEO Shared_WDEO Spec Masters_WDEO Format\Forms & Schedules\all forms\[00 43 36.00_wsx proposed subcontractors form - Copy.xlsx]SUBS & SUPPLIERS

SCHEDULE AND LOG OF REQUIRED TESTS AND INSPECTIONS FORM

Project: _____

Number: _____

Contractor: _____

RESPONSIBLE ENTITY ACRONYMS
Owner's Testing Lab = OT
Contractor's Testing Lab = CT
Manufacturer's Testing Lab = MT
Special Inspector = SI
Contractor = C
Subcontractor = S
Manufacturer = M

TESTS REQUIRED	S=Source, F=Field, P=Product, E=Environmental
INSPECTIONS REQUIRED	S=Source, F=Field

SECTION NUMBER:	SECTION TITLE	SCHEDULE									LOG			
Section Number	Section Title	Test Required = S, F, P, E	Special Inspection Required = SI	Inspections Required = S, F	Acronym for entity responsible for performing tests and inspections	Description of test / inspection with applicable standard	Number Required	Proposed date(s) of tests performed during construciton period	Test Duration (in days)	Samples to be obtained & submitted to lab	Date test or inspection was conducted	Date test or inspection results were transmitted to Architect	Compliant = C, Noncompliant = N	Name of entity conducting test or inspection
Division 02 – Existing Conditions														
Division 03 – Concrete														
Division 04 – Masonry														
Division 05 – Metals														
Division 06 – Wood, Plastics, And Composites														
Division 07 - Thermal And Moisture Protection														
Division 08 – Openings														
Division 09 – Finishes														
Division 10 – Specialties														
Division 11 – Equipment														
Division 12 – Furnishings														
Division 13 – Special Construction														

SECTION NUMBER:	SECTION TITLE	SCHEDULE									LOG			
Section Number	Section Title	Test Required = S, F, P, E	Special Inspection Required = SI	Inspections Required = S, F	Acronym for entity responsible for performing tests and inspections	Description of test / inspection with applicable standard	Number Required	Proposed date(s) of tests performed during construciton period	Test Duration (in days)	Samples to be obtained & submitted to lab	Date test or inspection was conducted	Date test or inspection results were transmitted to Architect	Compliant = C, Noncompliant = N	Name of entity conducting test or inspection
Division 14 –Conveying Equipment														
Division 21 – Fire Suppression														
Division 22 – Plumbing														
Division 23 – Heating, Ventilating, and Air-Conditioning (HVAC)														
Division 25 – Integrated Automation														
Division 26 – Electrical														
Division 27 – Communications														
Division 28 – Electronic Safety and Security														
Division 31 – Earthwork														
Division 32 – Exterior Improvements														
Division 33 – Utilities														

END OF SCHEDULE 00 62 93

C:\ABA Dropbox\WDEO Shared_WDEO Spec Masters_WDEO Format\Forms & Schedules\all forms\[00 62 93.00_wsx schedule and log of required tests and inspections form.xlsx]SCHEDULE OF TESTS & INSPECTIONS

REQUEST FOR INTERPRETATION FORM

PROJECT:		RFI NUMBER:	
FROM:		DATE:	
RE:		CONTRACT FOR:	

SECTION NUMBER:		TITLE:	
PAGE:		ARTICLE/PARAGRAPH:	
DRAWING NUMBER:		DETAIL REFERENCE:	

Contractor's Request:

☐ Attachments

SIGNED BY: _____ DATE: _____

Architect's Response:

☐ Attachments

RESPONSE FROM:		REC'D:	
TO:		RETURNED:	
SIGNED BY:		DATE:	

END OF FORM 00 63 13

REQUEST FOR INTERPRETATION LOG FORM

PROJECT: ______________________ PROJECT NUMBER: ______________________

OWNER: ______________________ CONTRACTOR: ______________________

RFI NO.	DATE REC'D:	BRIEF DESCRIPTION OF REQUEST	DATE OF RESPONSE	RFP NO.

END OF FORM 00 63 13.13

SUBSTITUTION REQUEST FORM

(During the Subcontract Bidding/Negotiating/Design Stage)

PROJECT: _____ SUBSTITUTION REQUEST NUMBER: _____

TO: _____ A/E PROJECT NO: _____

FROM: _____ DATE: _____

CONTRACT FOR: _____ RE: _____

SECTION NUMBER: _____ SECTION TITLE: _____

PAGE: _____ ARTICLE/PARAGRAPH: _____

PROPOSED SUBSTITUTION: _____

MANUFACTURER: _____ PHONE: _____

MFG. ADDRESS: _____

TRADE NAME: _____ MODEL NO.: _____

INSTALLER: _____ PHONE: _____

INSTALLER ADDRESS: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

Supporting Data Attached: ☐ Drawings; ☐ Product Data; ☐ Samples; ☐ Tests; ☐ Reports;

☐ Other (list) _____

Years in Production: ☐ New product; ☐ 1-4 years; ☐ 5-10 years; ☐ More than 10 years

The Undersigned certifies that except as clearly indicated above:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

SUBMITTED BY CONTRACTOR:

_____

FIRM: _____

ADDRESS: _____

EMAIL: _____ PHONE: _____

SIGNED BY: _____

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Division 01 Section "Substitution Procedures" and affected product Sections.
☐ Substitution approved as noted - Make submittals in accordance with Division 01 Section "Substitution Procedures" and affected product Sections.
☐ Substitution rejected - Use specified product.
☐ Substitution Request received too late - Use specified product.
☐ Submit additional information for review.

SIGNED BY: _____ DATE: _____

END OF FORM 00 63 24

SUBSTITUTION REQUEST FORM
(After the Bidding/Negotiating/Design Stage)

PROJECT:		SUBSTITUTION REQUEST NUMBER:	
TO:		A/E PROJECT NO:	
FROM:		DATE:	
CONTRACT FOR:		RE:	

SECTION NUMBER:		SECTION TITLE:	
PAGE:		ARTICLE/PARAGRAPH:	

PROPOSED SUBSTITUTION:			
MANUFACTURER:		PHONE:	
MFG. ADDRESS:			
TRADE NAME:		MODEL NO.:	
INSTALLER:		PHONE:	
INSTALLER ADDRESS:			

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

☐ Point-by-point comparative technical data attached for both the specified product and the proposed substitution - REQUIRED BY A/E FOR CONSIDERATION

Supporting Data Attached: ☐ Drawings; ☐ Product Data; ☐ Samples; ☐ Tests; ☐ Reports;

☐ Other (list) _____

Years in Production: ☐ New product; ☐ 1-4 years; ☐ 5-10 years; ☐ More than 10 years

Differences between proposed substitution and specified product: (explain thoroughly) _____

Reason for not providing specified item: (explain thoroughly) _____

SIMILAR INSTALLATION:

PROJECT:		ARCHITECT:	
ADDRESS:		ARCHITECT PHONE:	
CITY, ST		DATE INSTALLED:	
OWNER:			
OWNER ADDRESS:		OWNER PHONE:	

Proposed substitution affects other parts of Work: ☐ No; ☐ Yes (explain thoroughly) _____

Cost savings to be realized by Owner, if proposed substitution is approved: _____

Proposed substitution affect on Contract Time: ☐ No Change; ☐ Add; ☐ Deduct _____ days

Manufacturer's warranties of the proposed substitution are:☐ Same; ☐ Different (explain) _____

Submittal constitutes a representation that Contractor has read and agrees to the provisions of Division 01 Section "Substitutions."

The Undersigned certifies that except as clearly indicated above:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.
- Any and all rights to additional payment or time that may subsequently become necessary because of failure of the proposed substitution to produce the indicated results are hereby waived.

SUBMITTED BY CONTRACTOR:

FIRM: _____

ADDRESS: _____

EMAIL: _____ PHONE: _____

SIGNED BY: _____

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Division 01 Section "Substitution Procedures" and affected product Sections.
☐ Substitution approved as noted - Make submittals in accordance with Division 01 Section "Substitution Procedures" and affected product Sections.
☐ Substitution rejected - Use specified product.
☐ Substitution Request received too late - Use specified product.
☐ Submit additional information for review.

SIGNED BY: _____ DATE: _____

END OF FORM 00 63 25

PROPOSAL WORKSHEET SUMMARY

Project:		Change Order Request Number:	
To:		A/E Project No:	
From:		Date:	
Contract for:		Re: (PR#, ASI#, CCD#, etc.)	

Complete and attach Proposal Worksheet Detail for each element of Work.
Enter Worksheet Information below.

ADDITIONS:

Item No.	Ref. No.	Description	Material	Labor	Subtotal
1					$ -
2					$ -
3					$ -
4					$ -
5					$ -
6					$ -
7					$ -
8					$ -
		Subtotal:	$ -	$ -	$ -

DEDUCTIONS:

Item No.	Ref. No.	Description	Material	Labor	Subtotal
1					$ -
2					$ -
3					$ -
4					$ -
5					$ -
6					$ -
7					$ -
8					$ -
		Subtotal:	$ -	$ -	$ -

Ref. No. above refers to Drawing number or Secification Section number.

Subcontractor's Net:	
Subcontractor's OH&P:	
Subcontractor's Bond:	
Subcontractor's Total:	$ -
Contractor's OH&P:	
Contractor's Bond:	
Insurance:	
Tax:	
WORKSHEET TOTAL:	$ -

END OF SCHEDULE 00 63 54

C:\ABA Dropbox\WDEO Shared_WDEO Spec Masters_WDEO Format\Forms & Schedules\all forms\[00 63 54.00_wsx proposal worksheet summary form.xlsx]Summary

PROPOSAL WORKSHEET DETAIL

Project:		Change Order Request Number:	
To:		A/E Project No:	
From:		Date:	
Contract for:		Re: (PR#, ASI#, CCD#, etc.)	

ADDITIONS

Item No.	Item Description	Quantity	UNIT PRICES Materials	UNIT PRICES Labor	SUBTOTALS Materials	SUBTOTALS Labor	TOTAL
1					$ -	$ -	$ -
2					$ -	$ -	$ -
3					$ -	$ -	$ -
4					$ -	$ -	$ -
5					$ -	$ -	$ -
6					$ -	$ -	$ -
7					$ -	$ -	$ -
8					$ -	$ -	$ -
	Subtotal (Enter this number on Worksheet Summary)		$ -	$ -	$ -	$ -	$ -

DEDUCTIONS

Item No.	Item Description	Quantity	UNIT PRICES Materials	UNIT PRICES Labor	SUBTOTALS Materials	SUBTOTALS Labor	TOTAL
1					$ -	$ -	$ -
2					$ -	$ -	$ -
3					$ -	$ -	$ -
4					$ -	$ -	$ -
5					$ -	$ -	$ -
6					$ -	$ -	$ -
7					$ -	$ -	$ -
8					$ -	$ -	$ -
	Subtotal (Enter this number on Worksheet Summary)		$ -	$ -	$ -	$ -	$ -

END OF SCHEDULE 00 63 55

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CHANGE ORDER REQUEST (PROPOSAL)

PROJECT:		CHANGE ORDER REQUEST NUMBER:	
TO:		A/E PROJECT NO:	
FROM:		DATE:	
CONTRACT FOR:		RE:	

This Change Order Request (C.O.R.) contains an itemized quotation for changes in the Contract Sum and Contract Time in response to proposed changes to the Contract Documents based on select one _____.

Description of Proposed Change:

Attached supporting information from: ☐ Subcontractor ☐ Supplier ☐ _____ ☐ _____

Reason For Change:

Does Proposed Change involve a change in Contract Sum? ☐ No ☐ Yes select one $_____

Does Proposed Change involve a change in Contract Time? ☐ No ☐ Yes select one _____days.

Attached pages: ☐ Proposal Worksheet Summary
☐ Proposal Worksheet Detail(s)

SIGNED BY: _____ DATE: _____

END OF FORM 00 63 57

COMPLETION AND CORRECTION LIST FORM (A.K.A. PUNCH LIST)

Project: _____ Architect: _____

Number: _____ Date of Site Visit: _____

Contractor: _____ Contract for: _____

The following items require the attention of the Contractor for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

ITEM NUMBER	ROOM NUMBER	LOCATION (EXT / FLOOR / AREA)	DESCRIPTION OF INCOMPLETE OR DEFECTIVE ITEM	DATE CORRECTED/ COMPLETED	DATE VERIFIED BY A/E

END OF FORM 00 65 14

C:\ABA Dropbox\WDEO Shared_WDEO Spec Masters_WDEO Format\Forms & Schedules\all forms\[00 65 14.00_wsx completion and correction list form.xlsx]COMPLETION AND CORRECTION LIST

DOCUMENT 00 71 00 - CONTRACTING DEFINITIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Document establishes a common basis for understanding terminology As used in the Specifications. It is based on industry standards published by The American Institute of Architects (AIA) and The Construction Specifications Institute/Construction Specifications Canada (CSI/CSC).

B. Related Requirements:
   1. Requirements of this Document apply to, and are a component part of, each Section of the Specifications.

1.02 DEFINITIONS

A. Basic Definitions: Terms not otherwise defined in the Agreement between the Owner and Contractor have the same meaning as those defined in AIA Document A201™ - 2017 General Conditions of the Contract for Construction and in the 2015 Michigan Building Code.

B. Project Manual: The volume or volumes containing the written requirements for the Work, consisting of Procurement Requirements, Contracting Requirements, and Specifications as identified in a Table of Contents.

C. Procurement Requirements (in Division 00 of the Project Manual): Documents describing established procedures for preparing and submitting bids or proposals including, but not limited to, the solicitation, the instructions for procurement, available information, and procurement forms and supplements, if any.
   1. Procurement Requirements are not Specifications.
   2. Procurement Requirements are not part of the Contract Documents unless otherwise expressly stated elsewhere in the Contract Documents.

D. Contracting Requirements (in Division 00 of the Project Manual): Legal documents that describe contractual requirements defining the processes, rights, responsibilities, and relationships of the parties to the Contract.
   1. Contracting Requirements are not Specifications.
   2. Contracting Requirements are part of the Contract Documents unless otherwise expressly stated elsewhere in the Contract Documents.

E. Drawings: The graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

F. Specifications (in Divisions 01 through 49 of the Project Manual): That portion of the Contract Documents consisting of the written requirements for products, materials, equipment, systems, standards and workmanship for the Work, and performance of related services including maintenance and operation, and requirements for administration and performance of the Work.

G. Conformed Documents (commonly called as “Issued For Construction” documents): The Contract Documents as defined in the Agreement issued prior to start of construction incorporating Addenda issued during the bidding or negotiation process and accepted Alternates.

H. As-Designed Conformed Record Drawings: The Conformed Documents as defined above issued at the end of construction including Modifications issued during construction. Does not include the Contractor's mark-ups which will be submitted as separate Project Record Documents by the Contractor.

I. Project Record Documents: (commonly, but erroneously, called "As-Builts"): The Project Record Drawings and Specifications as specified in Div. 01 Section "Execution and Closeout Requirements" and maintained, prepared, and submitted by the Contractor. The Architect is not responsible for the accuracy or completeness of the Project Record Drawings unless otherwise required in the Owner-Architect Agreement.

1.03 PARTIES TO THE OWNER/CONSTRUCTION MANAGER AS CONSTRUCTOR CONTRACT

A. This Project is being constructed under a Construction Management contract between the Owner and the Construction Manager where the Construction Manager is the Project's constructor or builder as defined in the Owner/Construction Manager as Constructor (CMc) Agreement and the Conditions of the Contract.

G. Owner: As used in the Specifications, the term "Owner" means the Owner or the Owner's authorized representative and includes other design professionals, contractors, and entities under direct contract with the Owner, separate from the Architect and Contractor.

H. Construction Manager as Constructor (CMc): The Contractor has been retained by the Owner in the role of "Construction Manager as Constructor" or "Construction Manager at Risk". As used in the Specifications, the term "Contractor" means the Construction Manager or the Construction Manager's authorized representative.

I. Architect: The role of the Architect is defined the in the Owner/Architect Agreement and the Conditions of the Contract. As used in the Specifications, the term "Architect" means the Architect or the Architect's authorized representative and includes design professionals under direct contract with the Architect to design designated portions of the Project.

END OF DOCUMENT 00 71 00

SECTION 01 11 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Project description.

B. Related Requirements
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 PROJECT DESCRIPTION

A. Work of this Project is defined by the Contract Documents and consists of the following:
   1. Construction of a new two story facility to house public health and environmental science laboratories and support spaces.
   2. Facility Construction Work (Divisions 02-19) includes comprehensive interior and exterior building construction.
   3. Facility Services Work (Divisions 20-29) includes comprehensive fire suppression, plumbing, HVAC, integrated automation, electrical, communications, and electronic safety and security.
   4. Site and Infrastructure Work (Divisions 30-39) includes exterior site construction including earthwork, exterior improvements, and utilities.

B. Type of Contract: The Project will be constructed under a single prime contract between the Owner and Construction Manager as Constructor (CMc or CM at Risk).

C. Project is designed to obtain LEED Silver certification based on U.S. Green Building Council's (USGBC) Leadership in Energy & Environmental Design (LEED) v4 (Version 4) Rating System as follows and as specified in Division 01 Section "Sustainable Design Requirements."
   1. USGBC's "LEED for Building Design and Construction" (BD+C): New Construction & Major Renovation.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 11 00

SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for Alternates and a Schedule of Alternates required.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Owner-Contractor Agreement: Alternates accepted by Owner for incorporation into the Work.
   3. Individual Specification Sections.

1.02 DEFINITIONS

A. Alternate: An amount proposed by Contractor for certain work defined in the Contract Documents that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
   1. Alternates described in this Section are part of the Work only if accepted by Owner and enumerated in the Agreement.
   2. The cost or credit for each Alternate is the net addition to or deduction from the Contract Sum to incorporate Alternate into the Work. No other adjustments are made to the Contract Sum.

1.03 PRICE AND PAYMENT PROCEDURES

A. Certain designated items are specified as Alternates in the Contract Documents. Provide Alternate costs for inclusion in Contract Sum if accepted by Owner.
   1. The costs for each Alternate shall include the costs of related coordination, modification, or adjustment.
   2. Include as part of each Alternate such miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of the Alternate.

B. Alternates will be accepted or rejected at the sole option of Owner. Contract Sum and Contract Time will be adjusted to reflect accepted Alternates.

C. Immediately following Contract award, notify each party involved, in writing, of the status of each Alternate. Indicate if Alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to Alternates.

D. Execute accepted Alternates under the same conditions as other work of the Contract.

E. Revise or adjust affected adjacent work as required to integrate work of accepted Alternates into Project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES

A. Following is a brief summary list of required Alternates. Refer to Drawings and individual Specification Sections for additional requirements for each Alternate.

B. Alternate No. 1: [Brief descriptive title for Alternate item]
   1. Base Bid: [Describe what should be included in the Base Bid][as indicated on Drawings][and][as specified in Division [Number] Section "[Title]."
   2. Alternate Bid: [Describe what should be included in the Alternate Bid][as indicated on Alternate Drawings][and][as specified in Division [Number] Section "[<insert title as required>]."

END OF SECTION 01 23 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Div. 01 Section "PRODUCT REQUIREMENTS" for requirements for submitting comparable product submittals for products by listed manufacturers or, where permitted, by manufacturers not listed.
   3. Div. 02 through 49 Sections for specific requirements and limitations on substitutions.

1.02 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

B. Substitutions (During the Bidding/Negotiating/Design Stage): Changes proposed by Contractor or Contractor's subcontractor, during the design process, to use manufacturers, products, or methods of construction different from those required by the Contract Documents.

C. Substitutions (After the Bidding/Negotiating/Design Stage): Changes proposed by Contractor, after award of the Contract for Construction, to use manufacturers, products, or methods of construction different from those required by the Contract Documents.

D. Substitutions for Cause: Changes proposed by Contractor that are required, through no fault of Contractor, due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

E. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner and which will benefit Owner.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Do not substitute Products unless a substitution request has been approved by Architect.

B. Substitutions During Design: Substitutions requests will be considered if received in a timely manner prior to issuance of final Construction Documents and if proposed product meets the requirements for "Comparable Products" in Div. 01 Section "PRODUCT REQUIREMENTS."

C. Substitutions for Cause: Substitutions requests for cause will be considered only due to non-availability of a specified Product through no fault of Contractor. Notify Architect in writing immediately on discovery of need for change.
   1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Requested substitution provides sustainable design characteristics that specified product provided.
c. Substitution request is fully documented and properly submitted.
d. Requested substitution will not adversely affect Contractor's construction schedule.
e. Requested substitution has received necessary approvals of authorities having jurisdiction.
f. Requested substitution is compatible with other portions of the Work.
g. Requested substitution has been coordinated with other portions of the Work.
h. Requested substitution provides specified warranty.
i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

D. Substitutions for Convenience: Architect will consider substitution requests for convenience if received within 60 days after the latter of award of Contract or commencement of Work.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the conditions listed above for Substitutions for Cause and the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
2. Where Products are specified and followed by the statement "Substitutions not permitted" or "Substitutions not allowed": Substitutions will not be considered.

E. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a Request for Substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

F. Architect will notify Contractor of approval or rejection of each Substitution Request. Approved Substitutions will be incorporated into Contract by Change Order, Construction Change Directive, or Architect's Supplemental Instructions.

1.04 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.05 ACTION SUBMITTALS

A. Substitution Requests: Document specified product and proposed substitution with complete data.
1. Form: Use attached "Substitution Request Form" or Contractor’s standard with equivalent information.
a. Substitutions During Design: Use form subtitled "During the Bidding/Negotiating/Design Stage."
b. Substitutions for Cause or Convenience: Use form subtitled "After the Bidding/Negotiating/Design Stage."

2. Number of Copies: Submit electronically in Adobe PDF format.
3. Submit sample, if requested.

B. Burden of proof for substantiating compliance of proposed substitution with Contract Document requirements remains with Contractor.

C. Substitutions will not be considered if:
1. They are indicated or implied on Shop Drawings or other submittals without submittal of a substitution request.
2. Approval will require substantial revision of Contract Documents without additional compensation to Architect.

1.06 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 ATTACHMENTS

A. Substitution Request Form (During the Subcontract Bidding/Negotiating/Design Stage). MS Word electronic file available upon request.

B. Substitution Request Form (After the Bidding/Negotiating/Design Stage). MS Word electronic file available upon request.

END OF SECTION 01 25 00

SECTION 01 26 13 - REQUESTS FOR INTERPRETATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Requests for Interpretation (RFI's).

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 DEFINITIONS

A. Request for Interpretation (RFI): Request from Contractor seeking interpretation or clarification of Contract Documents not involving Substitutions or changes to Contract Sum or Contract Time.
   1. RFI's constitute a request for information only.

1.03 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.04 ACTION SUBMITTALS

A. Contractor-Initiated Request for Interpretation:
   1. If Contract Documents are not understood Contractor, Contractor may request interpretation or clarification by submitting an RFI to Architect.
   2. Form: "Request for Interpretation Form" or Contractor's standard with equivalent information.
   3. Number of Copies: Submit electronically in Adobe PDF format.

B. Describe item for which interpretation is sought and indicate date when response is required to avoid impact on Construction Schedule and Construction Cost.
   1. Number RFI's sequentially throughout Project.
   2. When RFI's require submittal of drawings, follow submittal procedures specified for Shop Drawings in Div. 01 Section "SUBMITTAL PROCEDURES."
   3. Review and sign RFI's submitted by Subcontractors, Sub-Subcontractors, or Suppliers prior to submittal to Architect.

C. Do not submit RFI's:
   1. To request approval of Substitutions; refer to Div. 01 Section "SUBSTITUTION PROCEDURES."
   2. To request changes known to include changes to Contract Sum or Contract Time; refer to Div. 01 Section "CONTRACT MODIFICATION PROCEDURES."
   3. To request approval of submittals; refer to Div. 01 Section "SUBMITTAL PROCEDURES."

D. Maintain log of RFI's showing RFI number and current status of each RFI and submit with each Application for Payment.

1. Form: "Request for Interpretation Log Form" or Contractor's standard with equivalent information.

E. Allow minimum 7 days for Architect's review and response to each RFI.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 ATTACHMENTS

A. Request for Interpretation Form - MS Word electronic file available upon request.

B. Request for Interpretation Log Form - MS Word electronic file available upon request.

END OF SECTION 01 26 13

SECTION 01 31 13 - PROJECT COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative provisions for coordinating construction operations.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.03 INFORMATIONAL SUBMITTALS

A. Submit the following not less than 7 days prior to due date for initial Application for Payment.
   1. List of Contractor's key staff assignments. Include addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Identify individuals and their duties and responsibilities.
   2. List of Contractor's principal consultants. Include addresses and telephone numbers, including office and cellular telephone numbers and e-mail addresses. Identify firms, key individuals, and their responsibilities.
   3. List of subcontractors and major material suppliers.
      a. Form: "Proposed Subcontractors Form" or Contractor’s standard with equivalent information.

B. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Div. 01 Section "SUBMITTAL PROCEDURES."

1.04 CLOSEOUT SUBMITTALS

A. Submit original composite coordination drawings as part of Project Record Documents specified in Div. 01 Section "CLOSEOUT PROCEDURES."

1.05 PROJECT COORDINATION

A. Coordinate construction operations including scheduling, submittals, and work of various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
   1. Schedule construction operations in sequence required to obtain the best results, to avoid conflicts and to ensure orderly progress of the Work.
   2. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   3. Coordinate layout and installation of work of the various Sections with interfacing and adjoining work and other Sections affecting or affected by work of each Section for proper sequencing of each installation.
   4. Ensure best possible weather resistance, durability of the work, and protection of materials and finishes.
   5. Furnish setting drawings, diagrams, templates and installation instructions to other Sections.

6. Upon request, check shop drawings of other Sections, to confirm that adequate provisions are made for proper location and installation of work of this Section.
7. Furnish inserts and anchoring devices which need to be preset and built into structure to appropriate trade. Supply on timely basis to avoid delay in Work.
8. Instruct other trades of proper location and position.
9. Make adequate provisions to accommodate items scheduled for later installation.

B. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

C. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.

D. Conduct coordination meetings with trades providing mechanical, plumbing, fire protection, electrical and similar work.
1. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
2. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

E. Coordinate space requirements and installation of mechanical and electrical items that are indicated diagrammatically on Drawings.
1. Follow routing shown as closely as practical; place runs parallel with building lines.
2. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, service and repairs.

F. In finished areas, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.

G. Coordinate completion and clean up of work of the various Sections in preparation for Substantial Completion.

H. After Owner occupancy, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents to minimize disruption of Owner's activities.

1.06 COORDINATION DRAWINGS

A. Coordination Drawings: Prepare coordination drawings as required in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Coordinate the addition of trade-specific information to the coordination drawings by multiple subcontractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
2. Content: Prepare Project-specific coordination drawings, drawn accurately to a scale large enough to indicate and resolve conflicts using applicable drawings as a basis. Do not base coordination drawings on standard printed data. Include floor plans, reflected

ceiling plans, elevations, sections, and details as applicable on which the following items are indicated and coordinated with each other, based on input from installers of the items involved:

a. Functional and spatial relationships of components of architectural, structural, civil, plumbing, mechanical, electrical, and other systems.
b. Ceiling suspension assembly members.
c. Items penetrating finished ceiling, including the following:
    1) Lighting fixtures.
    2) HVAC ductwork, outlets, and inlets.
    3) Speakers.
    4) Sprinklers.
    5) Smoke detectors.
    6) Access panels.
d. Plenum fire, smoke, and acoustical barriers.
e. Structural members to which suspension systems will be attached.
f. Method of attaching hangers to building structure.
g. Surface-mounted items including special moldings.
h. Relationship of mechanical, plumbing, fire protection, and electrical components with beams, columns, ceilings and walls.
i. Space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
j. Location and size of access doors required for access to concealed dampers, valves, and other controls. Include size and location of initial access modules for acoustical tile.
k. Required installation sequences.
l. Dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Digital Data Files: Prepare coordination digital data files according to the following requirements:
    1. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in preparing coordination digital data files.
        a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
        b. Digital Data Software Program: Drawings are available in Architect's standard format.
        c. Contractor shall execute a data licensing agreement in the form of agreement included in Project Manual..
    2. BIM File Incorporation: Develop and incorporate coordination drawing files into Building Information Model established for Project.
        a. Perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification of design requirements by Architect.
    3. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
    4. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.

C. Resolve conflicts between trades, prepare composite coordination drawings and obtain signatures on original composite coordination Drawings.

D. When conflicts cannot be resolved:
   1. Cease work in areas of conflict and request clarification prior to proceeding.
   2. Prepare drawings to define and to indicate proposed solution.
   3. Submit drawings for approval when actual measurements and analysis of Drawings and Project Manual indicate that various systems cannot be installed without significant deviation from intent of Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 31 13

SECTION 01 31 23 - PROJECT WEB SITE

1.01 SUMMARY

A. Section includes administrative and procedural requirements for establishing and administering a Project Web Site for use during the construction stage of the Project.

Related Requirements:

Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 CONTRACTOR'S PROJECT WEB SITE

A. A project Web site administered by Contractor will be used for purposes of managing communication and documents during the construction stage.

B. Provide, administer, and use Project Web Site for purposes of hosting and managing project communication and documentation until Final Completion. Project Web Site shall include the following functions:

1. Project directory.
2. Project correspondence.
3. Meeting minutes.
4. Contract modifications forms and logs.
5. RFI forms and logs.
6. Task and issue management.
7. Photo documentation.
8. Schedule and calendar management.
9. Submittals forms and logs.
10. Payment application forms.
11. Drawing and specification document hosting, viewing, and updating.
12. Online document collaboration.
13. Reminder and tracking functions.
14. Archiving functions.

C. Provide up to sufficient Project Web site user licenses for use of the Owner, Architect, and Architect's consultants. Provide software training at Architect's office for Project Web site users.

D. On completion of Project, provide one complete archive copy of Project Web site files to Owner and to Architect in a digital storage format acceptable to Architect.

E. Provide Procore Project Web site software packages under their current published licensing agreements:

F. Contractor, subcontractors, and other parties granted access by Contractor to Project Web site shall execute a data licensing agreement in the form included in this Project Manual.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 31 23

SECTION 01 32 19 - SUBMITTALS SCHEDULE PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for Submittals Schedule.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Div. 01 Section "SUBMITTAL PROCEDURES."

1.02 ACTION SUBMITTALS

A. Submit a Submittals Schedule prior to initial Application for Payment.

B. Submit a Proposed products list with Submittals Schedule.

1.03 SUBMITTALS SCHEDULE

A. Promptly after Contract award, submit a comprehensive Submittals Schedule showing submittals proposed for Project as required by the Contract Documents.
   1. Form: Arrange in a tabular format in per the attached Submittals Schedule.
   2. Order: Arrange in chronological order by dates required by and coordinated with Contractor’s construction schedule
   3. Include:
      a. Submittals required by each Section.
      b. Time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates.
      c. Additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
   4. Coordinate the Submittals Schedule with the list of subcontracts, the schedule of values, and the Contractor's construction schedule.
   5. Initial Submittal: Submit the schedule concurrently with the startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of a long lead time for manufacture or fabrication.
   6. Final Submittal: Submit the Submittals Schedule concurrently with the first complete submittal of the Contractor's construction schedule.

B. Update schedule monthly as necessary to maintain a current Submittals Schedule. Show submittals sent and their status.

C. If the Contractor fails to submit a Submittals Schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

1.04 PROPOSED PRODUCTS LIST

A. Along with Submittals Schedule, include a complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Form: Arrange in a tabular format per the attached Proposed Products List.

B. For products specified only by reference standards, identify proposed manufacturer, trade name, model or catalog designation, and reference standards.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 ATTACHMENTS

A. Submittals Schedule. Microsoft Excel electronic file available upon request.

B. Proposed Products List. Microsoft Excel electronic file available upon request.

END OF SECTION 01 32 19

SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Administrative and procedural requirements for construction photographs and video recordings.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 REFERENCES

A. Reference Standards: Perform Work per standards specified and as follows unless modified by requirements in the Contract Documents.
   1. Make available via internet access or maintain on site a copy of each standard affecting the Work of this Section.
   2. U.S. Green Building Council (USGBC) - Leadership in Energy and Environmental Design (LEED):
      a. USGBC-LEED v4 for Building Design and Construction (BD+C).

1.03 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.04 INFORMATIONAL SUBMITTALS

A. Key Plan: For Project site and building interiors with notation of vantage points marked for location and direction of each photograph or video recording. Indicate elevation or story of construction.

B. General: For each photograph or recording provide the following information:
   1. Name of Project.
   2. Orientation of view.
   3. Date and time taken.
   4. Sequential photograph or recording number.
   5. Name of photographer.

C. Digital Photographs: Submit image files within three days of taking photographs.

D. Video Recordings: Submit recordings within three days of making recording.

E. Submit complete set of each type of digital file with Project Record Documents.

1.05 QUALITY ASSURANCE

A. Photographer/Videographer Qualifications: An individual familiar with digital photography/videography and capable of taking photographs/videos resulting in sharp images. Photographer may be project superintendant or his appointee.

1.06 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

A. Digital Photo Images: Provide images in JPG format, without subsequent editing, produced by a digital camera with minimum sensor size of 10 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.
   1. Identification: Provide the following information with each image description in file metadata tag:
      a. Name of Project, Architect, and Contractor.
      b. Date photograph was taken.
      c. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
      d. Unique sequential identifier keyed to accompanying key plan.

B. Digital Video Recordings: Provide high-resolution, digital video in format acceptable to Architect.
   1. Identification: With each submittal, provide the following information:
      a. Name of Project, Architect, and Contractor.
      b. Date video recording was recorded.
      c. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
      d. Weather conditions at time of recording.

PART 3 - EXECUTION (NOT USED)

3.01 CONSTRUCTION PHOTOGRAPHS

A. Provide factual presentation using correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
   1. Take photographs from vantage points and in sufficient quantity to show status of construction and progress since last photographs were taken. Architect may direct vantage points to use.
   2. At successive periods of photography, take photographs from same overall view as previously taken.
   3. Take periodic monthly photographs to coincide with the cutoff date associated with each Application for Payment. Select vantage points .
   4. Maintain key plan to identify location of each photograph.

B. Provide the following photographs:
   1. Aerial: One aerial photograph of site at beginning and completion of work at site. Verify vantage direction with Architect.
   2. Preconstruction: Before starting construction, take photographs of Project site and surrounding properties including existing buildings, adjoining construction, site improvements, and finish surfaces whether on or adjoining Project site, to show existing conditions.
      a. Include items to remain during construction.
      b. Include photos of preexisting conditions that might be misconstrued as damage caused by construction activities.

c. Record settlement or cracking of adjacent structures, pavements, and improvements.
d. Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.
e. Include protection efforts by Contractor.

3. Periodic Project Exterior: Photograph project exterior from views corresponding to Architect's primary elevation views at each specified time; views as directed by Architect.
4. Periodic Project Interior: After interior finish work is commenced, take additional photographs of interior sufficient to show each wall of major spaces.
5. As specified in individual Sections.
6. Emergency Situations: Take photographs within 24 hours of event and submit immediately.
7. Final Completion exterior and interior. Do not include date stamp.
8. Additional: As directed by Architect. Circumstances that could require additional photographs include, but are not limited to, the following:
   a. Special events planned at Project site.
   b. Immediate follow-up when on-site events result in construction damage or losses.
   c. Photographs to be taken at fabrication locations away from Project site.
   d. Substantial Completion of a major phase or component of the Work.
   e. Extra record photographs at time of final acceptance.
   f. Owner's request for special publicity photographs.

3.02 LEED CONSTRUCTION PROGRESS PHOTOS

A. Provide a representative collection of dated digital jpg photos (max 1 Mb per photo) of construction progress, including:
   1. Photos of site work (excavation, landscaping etc).
   2. Photos of foundations.
   3. Photos of main building structure.
   4. Photos of envelope work.
   5. Photos of interior fit-up.
   6. Photos of interior finishes.

3.03 LEED COMPLETED BUILDING PHOTOS

A. Provide dated digital jpg photos (max 1 Mb per photo) of completed building, including:
   1. Photos of each exterior building elevation
   2. Photos of primary entrance to the building
   3. Photos of all typical spaces
   4. Photos of typical landscaping

3.04 LEED PREREQUISITE AND CREDIT PHOTOS

A. Provided dated digital jpg photos (max 1 Mb per photo) of features specific to individual LEED prerequisites and credits, including:
   1. LTc8 - If drawings with signage details can be provided, photos are not required
   2. LTc8 - Photographs of signage or pavement marking for preferred (green vehicle) parking spaces.
   3. LTc8 - Photographs of signage or pavement marking for electric vehicle charging spaces.
   4. LTc8 - Photographs of signage indicating discounted parking rate for green vehicles.
   5. SSp1 - Photos of Erosion and Sedimentation control measures. Label each photo with date and specific ESC measure. Include photos of any corrective action taken. Photos should be taken at regular intervals from site clearing/demolition through to excavation

and construction completion, and show all areas of the site covered in the plan. Refer to Div. 01 Section "TEMPORARY EROSION AND SEDIMENT CONTROL."

6. EQp2 - Photos of signage communicating exterior smoking policy
7. EQc3 - Photos of IAQ measures as specified in Div. 01 Section "SUSTAINABILITY CERTIFICATION PROCEDURES."

3.05 ADDITIONAL LEED PHOTOS

A. Provide other photos as requested by Project Sustainability Consultant to document sustainable design and construction.

3.06 CONSTRUCTION VIDEO

A. Recording: Mount camera on tripod before starting recording unless otherwise necessary to show area of construction. Display continuous running time and date. At start of each video recording, record weather conditions from local newspaper or television and the actual temperature reading at Project site.

B. Provide the following video recordings:
   1. Preconstruction: Before starting construction, record video recording of Project site and surrounding properties including existing buildings either on or adjoining Project site to show existing conditions.
      a. Include items to remain during construction.
      b. Include videos of preexisting conditions that might be misconstrued as damage caused by construction activities.
      c. Include protection efforts by Contractor.
   2. As specified in individual Sections.
   3. Demonstration And Training: As specified in Div. 01 Section "DEMONSTRATION AND TRAINING."

C. Narration: Describe scenes on video recording by audio narration by microphone while recording or by dubbing audio narration off-site later.
   1. Begin each video recording with name of Project, Contractor's name, videographer's name, Project location, date and time of starting recording.
   2. Describe vantage point, location, direction (by compass point), and elevation or story of construction.
   3. Include description of items being viewed, recent events, and planned activities.
   4. End each video recording with time of ending recording.

END OF SECTION 01 32 33

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for processing submittals during the construction stage of the Project.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 DEFINITIONS

A. Refer to Div. 01 Section "DEFINITIONS" for additional defined terms.

B. Submittals: Written and graphic information and physical samples to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals.

C. Action Submittals: Submittals specified in individual Specification Sections that require Architect's responsive action.
   1. Action Submittals include, but are not limited to:
      a. Product data, shop drawings, and samples.
      b. Coordination drawings, setting drawings, and schedules.
      c. Other items not specifically identified as Informational, Closeout, or Maintenance.

D. Informational Submittals: Submittals specified in individual Specification Sections that do not require Architect's responsive action except to require resubmission of incomplete or incorrect information including, but not limited to:
   1. Informational Submittals include, but are not limited to:
      a. Certificates.
      b. Delegated design data and calculations.
      c. Test and evaluation reports including research and test reports performed off site.
      d. Approvals by authorities having jurisdiction.
      e. Manufacturers’ instructions.
      f. Mockup material list.
      g. Sample warranties.
      h. Quality control submittals including source and field test reports, results of special tests, special inspections, field tests, and field inspections.
      i. Manufacturer reports.
      j. Surveys.
      k. Sustainable design (LEED) submittals.
      l. Special procedures.
      m. Qualification statements.
      n. Meeting minutes.

E. Closeout and Maintenance Submittals: Submittals specified in individual Specification Sections that do not require Architect's responsive action except to require resubmission of incomplete or incorrect information including, but not limited to:
   1. Closeout Submittals include, but are not limited to:

a. Maintenance contracts.
b. Final site survey.
c. Operation and maintenance data.
d. Bonds.
e. Warranty documentation.
f. Record documentation.
g. Sustainable design (LEED) closeout documentation.
h. Software.

2. Maintenance Submittals include, but are not limited to:
   a. Spare parts.
   b. Extra stock (attic stock) materials.
   c. Tools.

F. Deferred Submittals: Those portions of the design that are not submitted at the time of the building permit application and that are to be submitted to the building official within a specified period after award of Contract but prior to beginning affected work.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Refer to Div. 00 Document "BUILDING INFORMATION MODELING AND DIGITAL DATA PROTOCOL" for administrative and procedural requirements for incorporating submittal drawing files into Building Information Model Data for this Project.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate transmittal of related items so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
   2. Where products from more than one Section function as an assembly, group and transmit submittals concurrently.
   3. Submit action submittals for each Section as a single group. Architect will not review incomplete submittals without prior authorization to transmit partial submittals.
   4. Submit action submittals and informational submittals required by the same Specification Section concurrently except those items that naturally must occur during construction. Separate action submittals from informational submittals into separate packages under separate transmittals. Submit informational items that naturally must occur during construction (such as source and field test reports, quality control submittals, manufacturer reports, surveys, and meeting minutes) promptly as they occur.
   5. Except in instances where documentation is dependent on actual shipments, batches, or lots transported to Project, transmit sustainable design submittals concurrently with submittals for review.
   6. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of completed Work.

C. Scheduling: Plan timing for submittals to expedite the Project.
   1. Submittal Timing:
      a. Transmit Action and Informational Submittals allowing time required for review, including time for resubmittals, ordering, manufacturing, fabrication, and delivery.
      b. Submit Product Data before or concurrent with Samples.
      c. Transmit Closeout and Maintenance Submittals prior to date established for Substantial Completion.
   2. Review and Processing Time: Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to

transmit submittals enough in advance of the Work to permit processing, including resubmittals.

a. Initial Review: Allow 14 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
   1) Unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

b. Consultant review is required where Architect's consultants prepared design drawings and specifications. Architect's consultants are identified in Div. 00 Document "PROJECT DIRECTORY" and on Drawings.
   1) Sequential Consultant Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
   2) Concurrent Consultant Review: Where simultaneous review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 14 days for review of each submittal.
      a) Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants.
      b) Submittals will be returned by consultants to Architect before being returned to Contractor.

c. Resubmittal Review: Allow 14 days for review of each resubmittal.

3. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

1.04 ACTION SUBMITTALS

A. Submit a comprehensive schedule of all submittals required by the Contract Documents in accordance with Div. 01 Section "SUBMITTALS SCHEDULE."

1.05 SUBMITTAL FILE FORMAT

A. File Preparation Format: Prepare items in the following format(s):
   1. Drawing Files: Use same digital data software program, version, and operating system as original Drawings.
   2. Text Files: Use DOC, DOCX, RTF, or TXT of a version compatible software allowing file exchange with Microsoft Office Word without special add-on software other than freely available convertors.

B. File Submittal Format: Post items in the following format(s):
   1. Submit files in Portable Data File (PDF) format and in format same as file preparation format.
      a. Name each indexed document file in composite electronic index with applicable item name. Include on transmittal a complete electronically linked directory of document files.
      b. Enable inserted reviewer Comments on initial and draft submittals.
      c. Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
      d. Enable bookmarking of individual documents based on file names. Name document files to correspond to item submitted.

1.06 SUBMITTAL PREPARATION

A. File Number: Number each submittal with Project Manual Section number and a sequential 3-digit number within each section (e.g. 051200-001 or 074213.23-001). Number resubmittals with original number adding a sequential alphabetic suffix (e.g. 051200-001-A).

B. Identification:
   1. Place a permanent label or title block on each submittal item for identification with the following information:
      a. File number.
      b. Project name.
      c. Date.
      d. Name of Architect.
      e. Name of Contractor.
      f. Name of subcontractor.
      g. Name of supplier and manufacturer.
      h. Indicate which entity above prepared the submittal.
   2. Label samples with manufacturer's name, material description, color, pattern, designation indicated on Drawings and in schedules, if any, and pertinent information to distinguish the sample.
   3. Provide two spaces approximately 3 by 5 inches for Contractor's and Architect's approval stamps. Locate on a cover sheet for Product Data and other paperwork, beside the title block on shop drawings, and on a durable label(s) attached to samples.
   4. For electronic submittals, provide means for insertion to permanently record Contractor's and Architect's review and approval markings and action taken.

C. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

1.07 ELECTRONIC DOCUMENT PROCESSING SERVICE

A. To expedite the electronic review process, process all documents for Contract administration in electronic (PDF) format through a web-based software service. Documents sent via email, file transfer protocol (FTP), or in paper format will not be accepted, with the exception of physical samples and color selection charts.
   1. All other submittal and document transmission procedures specified in individual Specification Sections apply.

B. Web-based software service shall be cloud based (no hardware required) with unlimited user accounts and shall be capable of receiving, logging, and storing documents, providing electronic stamping and signatures, and notifying addressees via email.
   1. Include the cost of the service in the Contract Sum.
   2. Contractor and Architect are required to use this service. Provide functionality and access to data for all project team members including subcontractors, suppliers, and Architect's consultants at no cost to the individual users.
   3. Users of the service shall maintain an email address and internet access, and shall obtain PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   4. Initiation and Termination of Service: Initiate service within 7 days after award of Contract. Architect will determine when to terminate the service for the Project and

5. At the completion of the Project export all data to an offline archive for Owner's archival use.

C. Submittal Service: As acceptable to the Architect and Owner.

D. Training: Arrange for one, one-hour, web-based training session for participants, with representatives of Architect, Owner, and Contractor participating; further training is the responsibility of individual users of the service.

1.08 SUBMITTAL TRANSMITTAL

A. Transmittal:
1. Electronic Transmittal Form: Use electronic form provided by electronic document processing service containing information equivalent to attached "SUBMITTAL TRANSMITTAL FORM".
   a. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
   b. For sample submittals, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
   c. Metadata: Include the following information as keywords in the electronic submittal file metadata:
      1) Project name.
      2) Number and title of appropriate Specification Section.
      3) Manufacturer name.
      4) Product name.
   d. Submit electronic submittals via electronic document processing service.
   e. Architect will return annotated file to Contractor.
2. Include the following additional information:
   a. Indicate location(s) where product is to be installed.
   b. Other necessary identification.

PART 2 - PRODUCTS

2.01 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals required are indicated in individual Specification Sections.

2.02 ACTION SUBMITTALS

A. Product Data includes, but is not limited to, manufacturer's standard illustrations, schedules, performance charts, instructions, brochures, diagrams and other information.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy to identify applicable products, models, options, colors, finishes, and other data specifically indicating features that will be included for Project.
3. Highlight, cloud, or otherwise clearly identify options requiring selection by Architect.
4. Supplement manufacturers' standard data to provide information unique to this Project.
5. Include the following information, as applicable:
   a. Material descriptions.
   b. Standard construction details.

c. Dimensions of individual components and profiles.
d. Fabrication methods.
e. Hardware components.
f. Finish descriptions.
g. Rated capacities.
h. Shipping, installed, and operating weights.
i. Specialties furnished.
j. Accessories.
k. Required coordination requirements.
l. Availability and delivery time information.

6. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams showing factory-installed power, signal, and control wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Operating instructions.
   e. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
7. For products specified by descriptive, performance, or reference standard method of specifying, include data to substantiate compliance of proposed Product with specified requirements for product. Refer to Div. 01 Section "PRODUCT SELECTION OPTIONS."

B. Shop Drawings include, but are not limited to, drawings, diagrams, schedules and other data, specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor.
   1. Present information in clear and thorough manner.
   2. Draw accurately to scale.
   3. Identify details by reference to sheet and detail numbers or room number shown on Drawings.
   4. Include the following information, as applicable:
      a. Plans, elevations, sections, details, installation details, and attachments to other work.
      b. Typical layout including basic placement drawings and dimensions.
      c. Indicate maximum dynamic, static, thermal expansion, and other loads imposed on building structure, including components and cladding, at points of support.
      d. Indicate maximum and average power demands for motorized equipment.
      e. Joinery details.
      f. Expansion provisions.
      g. Thermal-break details.
      h. Operational clearances.
      i. Flashing and drainage details.
      j. Weather-stripping details.
      k. Air/vapor and weather barrier interface.
      l. Hardware.
      m. Operators: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
      n. Wiring Diagrams: Power, signal, and control wiring.
      o. Detail drawings of special accessory components not included in manufacturer's product data.
      p. Required coordination requirements.
      q. Notation of dimensions established by field measurement.
      r. Seal and signature of design professional if specified.

5. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
6. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches .

C. Samples: Samples illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.
1. Samples are full-size physical units or samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following:
   a. Partial sections of manufactured or fabricated components.
   b. Small cuts or containers of materials.
   c. Complete units of repetitively used materials.
   d. Swatches showing color, texture, and pattern.
   e. Color range sets.
   f. Components used for independent testing and inspection.
2. Submit samples of exposed products and surfaces in each color and texture specified.
3. Submit assembly samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices.
4. Number of Samples:
   a. Samples for Initial Selection: Unless otherwise specified in individual specifications, submit two sets of manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, finishes, and patterns available. Indicate which color selections, if any, affect pricing and to what effect. Architect will return one set to Contractor with choices selected.
   b. Samples for Verification: Unless otherwise specified in individual specifications, submit two sets of full-size units or Samples of size indicated. Architect will notify Contractor of rejection of samples or will return two approved sets to Contractor.
      1) Submit one Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of three units illustrating range or limits of variations to be expected in finished work.
5. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

D. Coordination Drawings: Comply with requirements specified in Div. 01 Section "PROJECT COORDINATION."

E. Setting Drawings: As required in individual Specification Sections, prepare setting drawings and templates. Deliver to Project site in time for installation. Include directions and installation instructions for:
1. Anchorages, including sleeves, inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.

2. Anchorages installed as part of the work of other Sections.
3. Cutouts required in other work.
4. Mounting hole templates.

F. Product Schedules: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product. Use same designations indicated on Drawings or, if none is indicated, use designations assigned by Contractor.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.

2.03 INFORMATIONAL SUBMITTALS

A. Certificates and Certifications Submittals: Affirmations that the work is in accordance with the Contract Documents as required in individual Specification Sections. Prepare written statements or affirmations that include signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
1. Provide a digital signature with digital certificate on electronically submitted certificates and certifications.
2. When a notarized statement is specified, provide on original paper copy certificates and certifications.
3. Delegated Design Certificates: Prepare written statements by a licensee confirming responsibility for the work and attesting that the work prepared meets the specifications, as well as conforming to governing codes applicable at the time the work was prepared, and conforms to the prevailing standards of practice.
4. Manufacturer's Certificates: Prepare written statements on Manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents.
5. Fabricator's Certificates: Prepare written statements on Manufacturer's company letterhead certifying that fabricator complies with requirements in the Contract Documents and, where required, is authorized, trained, approved, certified, licensed, or otherwise qualified by manufacturer for this specific Project.
    a. Include evidence of experience where required.
6. Installer's Certificates: Prepare written statements on Manufacturer's company letterhead certifying that installer complies with requirements in the Contract Documents and, where required, is authorized, trained, approved, certified, licensed, or otherwise qualified by manufacturer for this specific Project.
    a. Include evidence of experience where required.
7. Contractor Certificates: Prepare written statements on Contractor's letterhead certifying that products are installed in accordance with Contract Documents.
8. Contractor's Sustainability Standards Certifications: Contractor's certification that products and construction operations comply with sustainability requirements.
9. Product and Material Certificates: Prepare written statements on manufacturer's or supplier's letterhead certifying that product or material complies with requirements in the Contract Documents including specified referenced standards.
    a. Include certification from manufacturer that products furnished for Project meet or exceed specified sustainability requirements.
    b. Include certification from supplier that wood products furnished for Project meet or exceed specified sustainability requirements.
        1) Include evidence that wood product manufacturer is certified for chain of custody by an FSC-accredited certification body.

10. Welding Certificates: Submit written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified. Qualify procedures and personnel according to the following as applicable to material being welded:
    a. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
    b. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
    c. AWS D1.3, "Structural Welding Code - Sheet Steel."
    d. AWS D1.6, "Structural Welding Code - Stainless Steel."
11. Seismic Certificates: For specified systems, equipment, accessories, and components, from manufacturer.
    a. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
12. Inspection Certificates: Obtain and submit inspection and acceptance certificates and operating permits, where applicable, from governing authorities.
13. Certificates of Compliance: Submit written certification that products and procedures are approved or acceptable to authorities having jurisdiction.
14. Manufacturer's Field Representative Certificates: Prepare written statements on manufacturer's letterhead certifying that products are installed in accordance with Contract Documents and manufacturer's written instructions.

B. Delegated-Design Submittal: See Div. 01 Section "DELEGATED DESIGN REQUIREMENTS."

C. Test and Evaluation Reports: As required in individual Specification Sections, prepare and submit certified written reports of tests and inspections of standard or, if specified, special products and materials that are performed off-site, e.g., laboratory or manufacturer's facilities. Submit on testing agency's standard form, indicating and interpreting test results for compliance with requirements in the Contract Documents.
    1. Research Reports: For products or materials from ICC-ES or other model code organization acceptable to authorities having jurisdiction, showing results of evaluation for compliance with building code in effect for Project.
    2. Preconstruction Test Reports: For products performed prior to construction.
    3. Compatibility and Adhesion Test Reports: Performed on products proposed for use. Include written recommendations for primers and substrate preparation needed for adhesion.
    4. Laboratory Test Reports: Based on evaluation of comprehensive tests performed under laboratory conditions by a qualified testing agency or, where permitted, performed by manufacturer and witnessed by a qualified testing agency for product, formulation, system.
    5. Product and Material Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or, where permitted, performed by manufacturer and witnessed by a qualified testing agency for current products. Include written results of testing required to verify compliance with Performance Criteria and Design Criteria articles.

D. Approvals by Authorities Having Jurisdiction (AHJ): Written statements or affirmations on AHJ's letterhead that products and procedures are approved or acceptable to authorities having jurisdiction

E. Manufacturers' Instructions: Printed installation instructions. Indicate by transmittal that copies of instructions and recommendations have been distributed to installer.

F. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, supply sources, and other information as required to identify materials used. Include mix proportions for mortar and source of aggregates.
   1. Neither receipt of list nor approval of mockups constitutes approval of deviations from the Contract Documents contained in mockups unless Architect approves such deviations in writing.

G. Sample Warranty: Sample of standard and special warranties prepared by manufacturer and installer and incorporating terms and conditions as specified.

H. Quality Control Submittals:
   1. Source Quality Control Submittals: Submit written results of tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
   2. Field Quality Control Submittals: Submit written results of tests and inspections that are performed on-site for installation of the Work and for completed Work.
      a. Include special inspection reports for tests and inspections conducted by a qualified testing agency or special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections

I. Manufacturer Reports: Manufacturer's field surveillance and inspection reports of work in progress and as installed to verify compliance with requirements.

J. Surveys: Show elevations and locations of site elements and major members as work progresses. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.
   1. Show existing conditions of the work site, including topography, existing buildings and infrastructure, and underground infrastructure whenever possible (measuring invert elevations and diameters of sewers at manholes);
   2. Show property corners, limit of work and location of temporary construction aids including office trailers and storage sheds.
   3. Show benchmarks and control points that will guide construction of new structures.

K. Sustainable Design LEED Submittals: As required in individual Specification Sections.
   1. Refer to Div. 01 Section "SUSTAINABLE DESIGN REPORTING" for additional LEED submittal requirements to verify compliance.
   2. Sustainable Design LEED submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED requirements.
   3. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
   4. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements for the following items. Exclude cost of labor and equipment to install products.
      a. Salvaged, refurbished, and reused products.
      b. Products with recycled material content.
      c. Regional products.
      d. Rapidly renewable products.
      e. Certified wood products.

L. Special Procedure Submittals: As required in individual Specification Sections.

M. Qualification Statements: Per Div. 01 Section "QUALITY ASSURANCE."
   1. Qualification Data: Prepare written information that demonstrates capabilities, experience, qualifications, and years of experience for firm or person. Include list of

completed projects having similar scope of Work identified by name, location, date, reference names, and phone numbers.

2. Submit manufacturer's approval of applicator, fabricator, or installer where required.

N. Meeting Minutes: Record significant discussions, responsibilities, personnel assignments, and agreements achieved. Distribute meeting minutes to Owner, Architect, attendees, and other concerned parties within three days of the meeting.

2.04 CLOSEOUT SUBMITTALS

A. Maintenance Contracts: Submit properly executed continuing maintenance contract.
1. Initial Submittal: Submit draft copy of each contract at least 30 days prior to requesting inspection for Substantial Completion. Architect will indicate if general scope and content of contract are acceptable. Correct or revise each contract to comply with Architect's comments.
2. Final Submittal: Submit each maintenance contract in final form prior to requesting inspection for Final Completion.

B. Final Site Survey (As-Built): Submit survey recording details about structures completed upon the property. Identify and note new improvements and structures on the property, showing whether the location and elevation of the completed structures conforms to local regulations. Show final elevations and locations of site elements and major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.

C. Operation and Maintenance Data: Submit data for products, materials, systems, subsystems, and equipment to include in operation and maintenance manuals.
1. Refer to Div. 01 Section "OPERATION AND MAINTENANCE DATA" for additional requirements.

D. Bonds: Submit properly executed bonds.

E. Warranty Documentation: Submit properly executed final warranties.

F. Record Documentation: Submit properly annotated Record Documents, with dimensions to include in Project Record Documents. Include final update of Building Information Model (BIM).

G. Sustainable Design Closeout Documentation: Submit information unavailable or unknown until Project completion.

H. Software: Submit special software required, fully registered and operational. Include the following:
1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

2.05 MAINTENANCE MATERIAL SUBMITTALS

A. Maintenance material submittals as required in individual Specification Sections, are for information and do not require Architect’s responsive action except to require resubmission of incomplete or missing items.

B. Spare Parts: Manufacturer's recommended spare parts in quantities specified.

C. Extra Stock Materials: Furnish extra materials described in individual Specification Sections that match products installed, including lot numbers, and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Furnish extra materials in quantities specified.

D. Tools:
   1. Provide special tools and devices required for the proper operation or maintenance of systems and equipment furnished.
   2. Provide maintenance tools supplied by product manufacturer.
   3. Label body of tools with identifying tool name and purpose.

PART 3 - EXECUTION

3.01 CONTRACTOR'S REVIEW AND ACTION

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents.

B. Action Submittals: Stamp each submittal with Contractor’s approval stamp, dated, signed or initialed certifying that:
   1. Submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
   2. Products, field dimensions, and adjacent construction have been or will be verified as accurately indicated.
   3. Information has been coordinated with requirements of Work of the Contract.
   4. Approval Stamp Marking:
      a. If submittals comply with the Contract Documents as submitted mark them "Approved."
      b. If submittals require minor corrections or revisions make marks to indicate corrections or revisions required and mark them "Approved as Noted."
      c. If submittals require numerous corrections or revisions to be approved, mark them "Revise / Resubmit" and return to the originator for correction.
      d. If submittals do not comply with the Contract Documents, mark them "Rejected / Resubmit" and return to the originator for correction.

C. Informational Submittals: Stamp each submittal with Contractor’s approval stamp, dated, signed or initialed certifying that:
   1. Submittal has been reviewed and checked for compliance with the Contract Documents.
   2. Information is complete and accurate.
   3. Approval Stamp Marking:
      a. If submittals comply with the Contract Documents as submitted mark them "Approved" and "For Information Only."
      b. If submittals require minor corrections or revisions make marks to indicate corrections or revisions required and mark them "Approved as Noted" and "For Information Only."
      c. If submittals require numerous corrections or revisions to be approved, mark them "Revise / Resubmit" and return to the originator for correction.
      d. If submittals do not comply with the Contract Documents, mark them "Rejected / Resubmit" and return to the originator for correction.

D. Transmit only submittals marked "Approved" or "Approved as Noted" to Architect.
   1. Submittals may be rejected by the Architect for not complying with requirements.

E. Closeout and Maintenance Submittals: Identify as specified elsewhere.

3.02 ARCHITECT'S REVIEW AND ACTION

A. Action Submittals: Architect will only review submittals marked "Approved" or "Approved as Noted" by the Contractor. Unmarked submittals will be returned by the Architect without action.
   1. Incomplete submittals not previously authorized are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
   2. Submittals not required by the Contract Documents will be returned or discarded by the Architect without action.

B. Action Submittals: Architect will apply Architect's approval stamp, dated, signed or initialed certifying that:
   1. Submittal was reviewed for conformance with information given and the design concept expressed in the Contract Documents.
      a. The Architect's review of submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents.
      b. The Architect's review shall not constitute approval of safety precautions.
      c. Unless otherwise specifically stated by the Architect, the Architect's review shall not constitute approval of any construction means, methods, techniques, sequences or procedures.
      d. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.
   2. Approval Stamp Marking:
      a. If submittals comply with the Contract Documents as submitted the Architect will mark them "Approved."
      b. If submittals require minor corrections or revisions the Architect will make marks to indicate corrections or revisions required and mark them "Approved as Noted."
      c. If submittals require numerous corrections or revisions to be approved, the Architect will mark them "Revise / Resubmit" and return to the Contractor for correction.
      d. If submittals do not comply with the Contract Documents, the Architect will mark them "Rejected / Resubmit" and return to the Contractor for correction.

C. Informational, Closeout and Maintenance Submittals: Architect will review submittals but will not return nor respond concerning them unless they do not comply with requirements. Architect will forward each submittal to appropriate party.

3.03 CONTRACTOR'S FOLLOW-UP

A. Resubmittals: Revise and resubmit submittals when required; cloud or otherwise clearly identifying changes made since previous submittal.
   1. Make resubmittals in same form and number of copies as initial submittal.
   2. Note date and content of previous submittal.
   3. Change file number by adding an alphabetic suffix.
   4. Resubmit until Architect's action stamp indicates approval.

B. Distribution: Furnish copies of final approved submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms. Instruct parties to promptly report any inability to comply with provisions.

C. Use for Construction: Perform Work in accordance with approved submittals. Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

D. Project Record Documents: Annotate and retain one copy of each submittal in Project Record Document file. When both electronic and paper formats are required, retain a copy of each format. Retain one returned sample set as a Project Record sample.

END OF SECTION 01 33 00

SECTION 01 35 75 - DELEGATED DESIGN REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes provisions for assigning (delegating) design of certain building components to the Contractor.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Div. 02-49 Sections specify components of the Work for which design requirements are delegated to the Contractor.

1.02 DEFINITIONS

A. Delegated Design Work: Design services specifically assigned to Contractor to be completed by a qualified design professional retained by the Contractor for certain ancillary building components or systems required for the Work to satisfy design and performance criteria established by the Contract Documents.
   1. Delegated Design does not include professional services the Contractor needs to fulfill its responsibilities under the Contract including, but not limited to, construction means, methods and sequence.

B. Delegated Design Documents: Documentation necessary to show complete scope of delegated design work, prepared by or under the direct supervision and control of the design professional responsible for the subject work.

C. Engineering Services: Those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

D. Building Components: Includes, but is not limited to, systems, assemblies, manufactured units, equipment, mixes, and materials.

E. Deferred Submittal Items: Those portions of the design that are not submitted by the Architect at the time of the building permit application and that are to be submitted to the building official after construction begins but prior to installation of affected work.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Contractor Responsibilities: Provide professional design and engineering services, including certifications, when delegated design work is specified.
   1. Engage a qualified design professional to design designated ancillary building components or systems using performance requirements and design criteria indicated.
   2. Prepare and submit documents for deferred submittal, signed and sealed by the qualified design professional, as required for approval by authorities having jurisdiction for each delegated design item. Submit in a timely manner to avoid delaying the Work.
   3. Except for field quality assurance testing specified to be performed by the Owner, provide laboratory and field tests to establish performance characteristics of delegated design work at no additional cost to the Owner.
   4. Verify necessary approval of authorities having jurisdiction has been obtained prior to fabrication or installation of delegated design work.

B. Architect's Responsibilities: Review and coordinate submittal documents prepared by Contractor's design professional and forward deferred submittals to authorities having jurisdiction for approval.
   1. Architect's review of delegated design documents is only to verify the deferred design component is in general conformance and compatibility with the Contract Documents and the overall Project design intent and can be integrated into the Project. Neither Architect nor Architect's consultants will verify calculations are correct.
   2. Architect's review shall neither lessen nor shift the responsibility from the Contractor or its subcontractors, to the Architect or the Owner or their consultants.
   3. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the delegated design services provided as demonstrated by the seal and signature of the design professional providing the service.

1.04 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.04 ACTION SUBMITTALS

A. Delegated-Design Documents: For building components indicated to comply with performance requirements and design criteria, include documents specified in individual Sections, signed and sealed by the qualified design professional responsible for their preparation:
   1. Design Data: Include the following:
      a. Engineering Analysis Data: Written and graphic information, including, but not limited to, performance and design criteria and list of applicable codes and regulations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
      b. Show compliance with design and performance requirements.
      c. Calculations are not required unless specifically requested by Architect.
      d. Additional data sufficient to show the correctness of the documentation including compliance with building code in effect with state amendments, if any, and other regulations of authorities having jurisdiction.
   2. Design Calculations: Include the following:
      a. Engineering calculations for structural forces and loads of building components applied to building structure and other construction.
      b. Show reactions associated with connections.
   3. Shop Drawings: Include the following:
      a. Show component members, dimensions, connections, and materials used.
      b. Details, fabrication and assembly information.
      c. Indicate how building component is attached to the main structure.
      d. Demonstrate coordination with supporting work and other components to be integrated with delegated design work.
   4. For pressure-equalized rain screen assemblies, provide diagram of pressure equalized compartments and tabulation of pressure differential on the face of the panel system at the center of each compartment.

1.05 INFORMATIONAL SUBMITTALS

A. Certificates: Per Div. 01 Section "SUBMITTAL PROCEDURES" and as follows:
   1. Delegated design certificate.
   2. Other certifications as required by individual Sections of these Specifications.

B. Submit a list of entities the Contractor has or will engage to perform delegated design work. Include field of specialty with names and contact information for design professionals.

1.06 QUALITY ASSURANCE

A. Qualifications:
   1. Design Professional Qualifications: Professional engineer experienced in providing design and engineering services of the kind indicated and who is licensed or registered in jurisdiction in which Project is located who assumes responsibility for the following:
      a. Preparation of comprehensive engineering design and analysis data.
         1) Data may be based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project, unless otherwise indicated.
      b. Preparation of engineering calculations.
      c. Preparation of shop drawings and other submittals.
      d. Testing program development.
      e. Review and corroborate comments from Architect and other reviewers on delegated-design submittals and address required changes in their design.

PART 2 - PRODUCTS

2.01 PERFORMANCE CRITERIA

A. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
   1. Do not modify intended performance characteristics, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

B. Comply with applicable provisions of referenced standards:

C. Where design of building components is delegated to the Contractor the Contract Documents establish design and performance criteria the work must satisfy. Refer questions about required criteria to the Architect.
   1. Drawings are diagrammatic and broadly indicate layout, features, and major components required, but do not cover complete details of design and construction, and do not purport to identify nor solve problems of thermal or structural movement, anchorage, or moisture disposal. Requirements shown by details are intended to establish basic dimensions, visible lines and profiles of members. Final resolution of details is delegated to the Contractor.
   2. In addition to requirements shown or specified, comply with applicable provisions of building code, trade association standards, and authorities having jurisdiction for design, materials, fabrication, and installation of component parts.
   3. Include necessary modifications to meet specified requirements and maintain visual design concepts.
   4. Design elements to accommodate expansion and contraction due to structural movement, movement within system, movement between system and perimeter framing components, dynamic loading and release of loads, and deflection of structural support framing, without detriment to appearance or performance, without damage to system or components, and without damage to building component.
   5. Design building components and provide clearances that will allow for installation tolerances, and expansion and contraction of adjacent materials, and sealant manufacturer's recommended joint design where required.

6. Design assemblies to be free from vibration harmonics, rattles, and noise due to thermal and structural movement, and wind pressure.
7. Design attachments to accommodate anticipated movement with no possibility of loosening, weakening, or fracturing connections between adjoining system components or between system components and building structure.
8. Design anchors, fasteners and braces to be structurally stressed not more than 50% of allowable stress when maximum loads are applied.
9. Provide concealed fastening wherever possible.
10. Do not assume sealants, and interior finishes contribute to framing member strength, stiffness, or lateral stability.

D. Structural Performance Requirements: Provide building components, including anchorages, capable of withstanding, without failure, the effects of gravity and applied loads and stresses within limits and under conditions indicated determined according to applicable code requirements. If design loads are not indicated on Drawings, perform delegated design based on the following:
1. Soil and Hydrostatic Pressure Loads: Provide below-grade structures capable of withstanding the effects of soil and hydrostatic pressure loads determined according to ASCE 7, "Minimum Design Loads and Associated Criteria for Buildings and Other Structures."
2. Design Wind Loads: Provide building components capable of withstanding the effects of wind loads applicable to Project as determined from basic wind speed indicated in miles per hour at 33 feet above grade based on mean roof heights above grade indicated on Drawings, according to ASCE 7, "Minimum Design Loads and Associated Criteria for Buildings and Other Structures."
3. Snow Loads: Provide building components capable of withstanding the effects of snow loads, including drifting snow, determined according to ASCE 7, "Minimum Design Loads and Associated Criteria for Buildings and Other Structures."
4. Rain Loads: Provide building components capable of withstanding the effects of rain loads determined according to ASCE 7, "Minimum Design Loads and Associated Criteria for Buildings and Other Structures."
5. Seismic Performance: Provide building components capable of withstanding the effects of earthquake motions determined according to ASCE 7, "Minimum Design Loads and Associated Criteria for Buildings and Other Structures."
    a. The term "withstand" means "the unit or system will remain in place without separation of any parts when subjected to the seismic forces specified and, where required by individual Sections, the unit or system will be fully operational after the seismic event."
    b. Component Importance Factor is 1.0.
    c. Story Drift: Building components including supports and connections shall accommodate the difference in lateral deflection between two adjacent stories
6. Ice Loads: Provide building components capable of withstanding the effects of ice loads determined according to ASCE 7, "Minimum Design Loads and Associated Criteria for Buildings and Other Structures."

E. Deflection Limit: Do not exceed limits specified. In no case shall deflection be sufficient to cause permanent set, cracking or other damage to the building component or assemblies adjacent to or connect to it.

F. Thermal Performance Requirements:
1. Provide building components that allow for thermal movements and stresses resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, reduction of performance, and other detrimental effects.

Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
a. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
2. Do not transmit thermal movement from exterior components to other building elements

2.02 DESIGN REQUIREMENTS

A. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

B. Complete design of building components, including but not limited to modifications to standard components, shall be considered within the design delegated by the Contract Documents and shall not be used as a basis for claims or modification to the Contract.

C. Exterior Cladding:
1. Assemblies forming the exterior cladding and enclosure of the building shall function in concert with other components of the total building envelope to provide a contiguous, weather-tight, thermally efficient enclosure. Provide air-barrier, insulation, flashing and other components appropriate for each assembly. At a minimum each assembly and the overall integrated exterior enclosure shall achieve the following.
a. Provide thermal efficiency by resisting heat loss and heat gain within the specified performance criteria.
b. Prevent migration of air through the assembly except as controlled by window and door apertures.
c. Effectively control and collect water within the assembly and drain it to the building exterior.
d. Provide for control of water regardless of the source, whether due to environmental conditions, condensation, migration of water from other assemblies or other sources.
e. Integrate water control features within each cladding assembly and with other types of cladding to establish an effective, contiguous system throughout the exterior envelope of the building.
2. Coordinate cladding assemblies with supporting building structure and attachments to accommodate deviations due to the combination of allowed fabrication and erection tolerances. Identify and accommodate interferences resulting from the maximum tolerance range on shop drawings for the system.
a. Accommodate standard industry dimensional tolerances for building frame and other adjacent construction and comply with specified tolerance where they are more restrictive.
3. Unless otherwise required, exterior cladding shall be a pressure-equalized rain-screen cavity design and shall incorporate a weather-resistant air barrier. Size and configure compartments within rain-screen assemblies to ensure pressure within any compartment is equal to the exterior condition at all times, provide ventilation and drainage of compartments to ensure pressure equalization and allow the controlled drainage of water entering or occurring within the cavity assembly.
a. Where Div. 07 "Air-Barrier" Sections specify vapor impermeable barriers, the cladding air barrier shall also serve as a barrier to the transmission of water vapor at a rate equivalent to the specified membrane air-barrier.

PART 3 - EXECUTION

3.01 SCHEDULE

A. The following Sections specify components of the Work for which design requirements are delegated to the Contractor.
   1. Div. 01 Section "MOCKUPS"
   2. Div. 04 Section "EXTERIOR STONE CLADDING"
   3. Div. 05 Section "COLD FORMED METAL FRAMING"
   4. Div. 05 Section "METAL FABRICATIONS"
   5. Div. 05 Section "METAL STAIRS"
   6. Div. 05 Section "ALTERNATING TREAD LADDERS"
   7. Div. 05 Section "METAL RAILINGS"
   8. Div. 05 Section "DECORATIVE METAL RAILINGS"
   9. [Div. 06 Section "HEAVY TIMBER CONSTRUCTION"]
   10. Div. 06 Section "CROSS-LAMINATED TIMBER WALL PANELS"
   11. [Div. 07 Section "INSULATED METAL WALL PANELS"]
   12. [Div. 07 Section "WOOD COMPOSITE MATERIAL WALL PANELS"]
   13. [Div. 07 Section "METAL COMPOSITE MATERIAL WALL PANELS"]
   14. Div. 08 Section "OVERHEAD COILING DOORS"
   15. [Div. 08 Section "ALL-GLASS ENTRANCES AND STOREFRONTS"]
   16. [Div. 08 Section "SLIDING AUTOMATIC ENTRANCES"]
   17. Div. 08 Section "ALUMINUM-FRAMED STOREFRONTS"
   18. Div. 08 Section "GLAZED ALUMINUM CURTAIN WALLS"
   19. Div. 08 Section "GLAZING"
   20. Div. 08 Section "FIXED LOUVERS"
   21. Div. 09 Section "NON-STRUCTURAL METAL FRAMING"
   22. [Div. 09 Section "LINEAR METAL CEILINGS"]
   23. [Div. 10 Section "POST AND PANEL/PYLON SIGNAGE"]
   24. [Div. 10 Section "OPERABLE PANEL PARTITIONS"]
   25. [Div. 10 Section "METAL WALKWAY COVERS"]
   26. [Div. 10 Section "GROUND-SET FLAGPOLES"]
   27. [Div. 10 Section "ROOF TOP EQUIPMENT SCREENS"]
   28. Div. 12 Section "LABORATORY CASEWORK"

B. In addition to requirements for seismic bracing of mechanical, plumbing, electrical, and similar items, design and provide seismic bracing and otherwise secure items subject to displacement, movement and over-turning due to seismic forces which could create a life safety hazard either by direct injury or indirectly by blocking exit paths or creating other hazards. Such items include, but are not limited to, the following.
   1. Architectural woodwork, casework, and similar items mounted to walls and weighing more than 20 pounds.
   2. Free standing and supported architectural woodwork, shelving, casework, and similar items taller than 6 feet.
   3. Appliances such as refrigerators, freezer and countertop items.

END OF SECTION 01 35 75

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes reference standards as used in the Specifications.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 DEFINITIONS

A. Reference Standards: Standards and regulations as published by construction industry organizations and trade associations; code agencies; federal, state, and local government agencies; and other authorities having jurisdiction.

1.03 REFERENCE STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, perform Work according to specified construction industry standards.
   1. Specified standards are made a part of the Contract Documents by reference.
   2. Copies of specified standards are not bound with the Contract Documents but have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced.
   3. Nothing contained in referenced standards shall be construed as relieving the Contractor of its primary responsibility for performing the Work indicated nor shall the contractual relationship of the parties to the Contract be altered by reference standards.
   4. Should specified standards conflict with Contract Documents, request clarification from Architect before proceeding.
   5. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

B. Copies of Standards: Each entity engaged in construction on Project shall be familiar with industry standards applicable to its construction activity. Contractor’s supervisory personnel shall be thoroughly familiar with applicable standards as they apply to the Project.
   1. Copies of standards are needed to perform required construction activity. Obtain copies directly from publication source.
   2. Maintain on Site a copy of each standard affecting the Work for reference by Contractor, workers, testing agency personnel, Owner, and the Architect. Copies may be either printed publications or readily accessible electronic versions.

1.04 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations and Trade Associations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations Directory."

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated on the website of the state or local authorities having jurisdiction.

B. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated on the government website https://www.usa.gov/federal-agencies.

C. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated on the state website as defined by the State authorities having jurisdiction.
   1. https://www.michigan.gov.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 42 00

SECTION 01 42 16 - DEFINITIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes definitions of terms as used in the Specifications.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. General provisions of the Contract, including General and Supplementary Conditions.
   3. Div. 00 Document "Contracting Definitions" for definitions of terms as used in the Contracting Documents.

1.02 DEFINITIONS

A. Basis-of-Design (BoD) Product: See Div. 01 Section "PRODUCT SELECTION OPTIONS."

B. Delegated Design: See Div. 01 Section "DELEGATED DESIGN REQUIREMENTS."

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Furnish: To supply and deliver to Project site, ready for installation. Purchasing, shipping, transporting, receiving, unloading, unpacking, handling, and storing prior to installation are implied in the term "furnish."

E. Install: To place in position for service or use. Assembling, erecting, finishing, adjusting, cleaning, and protecting after installation are implied in the term "install."

F. Per: "In accordance with" (example: Install per manufacturer's instructions); or "for each" (example pounds per square foot).

G. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

H. Product: See Div. 01 Section "COMMON PRODUCT REQUIREMENTS."

I. Provide: To furnish and install, complete and ready for intended use.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF DOCUMENT 01 42 16

SECTION 01 43 00 - QUALITY ASSURANCE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for quality-assurance.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Div. 01 Section "CONTRACTOR QUALITY CONTROL."
   3. Div. 01 Section "TESTING AND INSPECTING SERVICES."
   4. Facility Construction and Facility Services Subgroup Sections (Div. 02-49) contain specific quality-assurance activities to be performed.
      a. Specified quality-assurance activities do not limit Contractor's other quality-assurance procedures that facilitate compliance with the Contract Document requirements.
      b. Requirements for Contractor to provide quality-assurance services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.

1.02 REFERENCES

A. Definitions:
   1. Quality-Assurance: Proactive activities to assure the quality of construction performed before and during execution of the Work.
   2. Installer / Applicator / Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
      a. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
   3. Experienced:
      a. When used with an firm or entity, "experienced" means having been in business under the current organizational structure for a minimum of five years; having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project in the past five years; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
      b. When used with an individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project in the past five years; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Referenced Standards:
   1. Perform Work according to specified standards.
   2. If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
1. Coordinate sequence of activities to accommodate required quality-assurance activities with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate inspecting.
a. Schedule times for inspections and similar activities.
2. Coordinate layout and installation of work of the various Sections with interfacing and adjoining work and other Sections affecting or affected by work of each Section for proper sequencing of each installation.
3. Ensure best possible weather resistance, durability of the work, and protection of materials and finishes.
4. Furnish setting drawings, diagrams, templates and installation instructions to other Sections.
5. Upon request, check shop drawings of other Sections, to confirm that adequate provisions are made for proper location and installation of work of this Section.
6. Furnish inserts and anchoring devices which need to be preset and built into structure to appropriate trade. Supply on timely basis to avoid delay in Work.
1. Instruct other trades of proper location and position.

1.03 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.04 INFORMATIONAL SUBMITTALS

A. Permits, Licenses, and Certificates: Submit copies of permits, licenses, certifications, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

B. Reports, General: Prepare and submit certified written reports documenting manufacturer's or factory's representative's tests and inspections specified in other Sections. Include the following:
1. Date of issue.
2. Project title and number.
3. Dates and locations of samples and tests or inspections.
4. Description of the Work and test and inspection method.
5. Identification of product and Specification Section.
6. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
7. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
8. Statement whether conditions, products, and installation will affect warranty.
9. Name, address, telephone number and signature of representative making report.
10. Other required items indicated in individual Specification Sections.

C. Manufacturer's Technical Representative's Field Reports: In addition to general items above include the following:
1. Statement on condition of substrates and their acceptability for installation of product.
2. Statement that products at Project site comply with requirements.
3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
4. Results of operational and other tests and a statement of whether observed performance complies with requirements.

D. Factory-Authorized Service Representative's Reports: In addition to general items above include the following:
   1. Statement that equipment complies with requirements.
   2. Results of operational and other tests and a statement of whether observed performance complies with requirements.

E. Qualification Statements: When required by individual Specification Sections, submit verification of required qualifications. Include list of completed projects having similar scope of Work identified by name, location, date, reference names, and phone numbers.

1.05 QUALITY ASSURANCE

A. Qualifications: Qualifications below establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
   1. Manufacturer Qualifications: Company experienced and specializing in manufacturing products or systems comparable to those indicated for this Project and whose products have a record of successful in-service performance, as well as sufficient production capacity to produce required units.
   2. Supplier Qualifications: Company with warehousing facilities capable of providing new and replacement parts and supplies to meet Contractor's Construction Schedule, and with staff knowledgeable about Products supplied and available during the course of the Work for consultation on issues that may arise during construction..
   3. Fabricator Qualifications: Company experienced and specializing in producing products comparable to those indicated for this Project and with a record of successful in-service performance, as well as sufficient skilled, experienced staff and production capacity to produce required units.
   4. Installer / Applicator / Erector Qualifications: A firm or individual experienced and specializing in installing, applying, or erecting work comparable in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
      a. Maintain sufficient experienced, trained staff to install Products according to specified requirements.
      b. Where required by individual Specification Sections, firm or individual shall be an authorized representative of manufacturer; an employer of workers trained and approved by manufacturer; a firm acceptable to manufacturer; or a firm or individual certified, licensed, or otherwise qualified by manufacturer for installation and maintenance of Products specified. A manufacturer's willingness to sell its materials to a firm or individual engaged by Contractor does not in itself confer qualification on the buyer.
      c. In addition to installing specified products, installer's responsibilities include:
         1) Preparation of schedules when specified.
         2) Providing delegated design services when specified.
   5. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
      a. Requirements of authorities having jurisdiction supersede requirements for specialists.
   6. Welder Qualifications: AWS certified within past 12 months for each type of weld required. Qualify procedures and personnel according to the following as applicable:
      a. AWS D1.1, "Structural Welding Code--Steel."
      b. AWS D1.2, "Structural Welding Code--Aluminum."
      c. AWS D1.3, "Structural Welding Code--Sheet Steel."
      d. AWS D1.4, "Structural Welding Code--Reinforcing Steel."

7. Design Professional Qualifications: See Div. 01 Section "DELEGATED DESIGN REQUIREMENTS."
8. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
9. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Div. 01 Section "SUBMITTAL PROCEDURES."

C. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

D. Associated Services: Cooperate with manufacturer's and factory's representatives performing required inspections, and similar quality-assurance services, and provide reasonable auxiliary services as requested. Notify manufacturers and factories sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.

E. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 REPAIR AND PROTECTION

A. General: On completion of quality assurance activities, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with Div. 01 Section "CUTTING AND PATCHING."

B. Protect construction exposed by or for quality-assurance service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-assurance services.

END OF SECTION 01 43 00

SECTION 01 43 36 - FIELD SAMPLES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for field samples.

B. Related Requirements:
1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
2. Div. 01 Section "MOCKUPS."
3. Div. 02 through 49 Sections specify requirements for field samples including products and installation requirements.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
1. Coordinate installation schedule with construction progress to avoid delaying the Work.
2. Notify Architect seven days in advance of dates and times when field samples will be applied, unless other timing is specified or agreed upon in advance.
3. Obtain Architect's review and written approval of field samples before starting final work.

B. Definitions:
1. Field Samples: Full-size sample field applications of finishes on-site, or at designated off-site location, in advance of final work as a benchmark to allow the Architect an opportunity to view and approve qualities of materials and execution, approve final colors, and establish the standard by which the Work will be judged.

C. Preinstallation Meetings: Conduct meeting at Project site to comply with requirements in Div. 01 Section "PROJECT MANAGEMENT AND COORDINATION."
1. Convene minimum two weeks prior to purchasing materials for field samples.
2. Attendance Required: Architect, Owner, Contractor, and installers involved in field samples.
3. Review methods and procedures including, but not limited to, the following:
a. Review and finalize construction schedule and verify availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays.
b. Review required inspecting procedures.
c. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.
d. Review preparation and other requirements for installing work.
e. Discuss and agree upon quality control procedures.
f. Review coordination required with affected Sections.

1.03 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.04 ACTION SUBMITTALS

A. Timing of Submittals: Do not begin construction of field samples until submittals required for component materials included in the field samples have been submitted and approved for use in the Project.

B. Product Data: For each type of product incorporated into field samples .

1.05 INFORMATIONAL SUBMITTALS

A. Schedule: Prepare a schedule to indicate dates when work on field samples will begin, and when completed field samples will be ready for inspection and verification.

1.06 QUALITY ASSURANCE

A. Employ supervisory personnel who will oversee field samples construction. Employ workers that will be employed during the construction at Project.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Refer to Div. 02 through 49 Sections for specific field sample materials required.

PART 2 - EXECUTION

2.01 INSTALLATION

A. Before installing portions of the Work requiring field samples, provide field samples for each substrate and finish required to comply with the following requirements:
   1. Provide field samples of sizes and configurations indicated or, if not indicated, of sizes and configurations to adequately demonstrate capability of products to comply with performance requirements.
   2. Locate field samples where indicated or, if not indicated, where directed.
   3. Install or apply samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated.
   4. Apply field samples using personnel, products, and methods of construction indicated for the completed Work.
   5. Demonstrate the proposed range of aesthetic effects and workmanship.
   6. Duplicate finish and quality of approved sample submittals.

2.02 FIELD QUALITY CONTROL

A. Inspection of Workmanship: Architect and Owner will inspect field samples to:
   1. Verify selections made under Sample submittals.
   2. Verify aesthetic effects.
   3. Identify deficiencies in workmanship.
   4. Approval of field samples is for features and aspects specified including aesthetic qualities and workmanship.
      a. Approval of field samples is also for other material and construction qualities specifically approved by Architect in writing.
      b. Approval of field samples does not constitute approval of deviations from the Contract Documents contained in field samples, unless such deviations are specifically approved by Architect in writing.

B. Correction of Deficiencies: Where deficiencies in workmanship are noted, perform corrective actions as required to bring work into compliance with standards of workmanship established by Contract requirements and to obtain Architect's and Owner's approval of field samples.

2.03 REPAIR AND PROTECTION

A. Protect field samples from damage for the remainder of the construction period or until no longer needed.

B. Protect field samples subject to damage from the elements with weather-resistant coverings, vented to prevent condensation damage.

C. Repair damaged field samples at no additional cost to Owner.

2.04 FINAL DISPOSITION OF FIELD SAMPLES

A. Where specifically specified, approved field samples may become part of the completed Work if undisturbed at time of Substantial Completion.
   1. Prior to Substantial Completion, repair damage to field samples designated to remain and restore substrates and finishes.
   2. Clean component materials as specified in individual Specification Sections.

B. When directed by the Architect, demolish and remove temporary field samples in their entirety and lawfully dispose of materials off-site according to Div. 01 Section "CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL". Restore portion of Project site disturbed by construction of temporary field samples to condition indicated for final site work.

END OF SECTION 01 43 36

SECTION 01 43 39 - MOCKUPS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for the following:
   1. Mockups.
   2. Integrated exterior mockup.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Div. 01 Section "QUALITY ASSURANCE."
   3. Div. 01 Section "FIELD SAMPLES."
   4. Div. 01 Section "CONTRACTOR QUALITY CONTROL."
   5. Div. 01 Section "TESTING AND INSPECTING SERVICES."
   6. Div. 02 through 49 Sections specify components for mockups including products and installation requirements.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate fabrication and installation schedule with construction progress to avoid delaying the Work.
   2. Notify Architect 7 days in advance of dates and times when mockups will be constructed, unless other timing is specified or agreed upon in advance.
   3. Obtain Architect's review and written approval of mockups before starting final work, fabrication, or construction.
      a. Allow seven days for initial review and each re-review of each mockup.

B. Definitions:
   1. Mockups: Full-size installation of physical assemblies consisting of multiple systems and products constructed on-site, or at designated off-site location, in advance of final work to allow the Architect an opportunity to view and approve qualities of materials and execution and establish the standard by which the Work will be judged. Mockups are not Samples. Mockups are also for the following purposes:
      a. To ensure understanding and coordination of required construction for testing where required and for observation.
      b. To verify selections made under Sample submittals.
      c. To demonstrate aesthetic effects.
      d. To review coordination, testing, or operation.
      e. To show interface between dissimilar materials.
      f. To demonstrate compliance with specified installation tolerances.
   2. Field Mockups: Constructed on-site.
   3. Integrated Mockups: Full-size, physical assemblies of portions of building consisting of multiple products, assemblies, and subassemblies constructed to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances
   4. Integrated Exterior Mockup: Portions of the exterior envelope that are constructed separately from the building but on Project site.

C. Preinstallation Meetings: Conduct meeting at Project site to comply with requirements in Div. 01 Section "PROJECT MANAGEMENT AND COORDINATION."
   1. Convene minimum two weeks prior to purchasing materials for mock-up.
   2. Attendance Required: Architect, Owner, Contractor, installers, and trades directly involved in construction of mockup.
   3. Review methods and procedures including, but not limited to, the following:
      a. Review and finalize construction schedule and verify availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays.
      b. Review structural load limitations.
      c. Review required inspecting, testing, and certifying procedures.
      d. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.
      e. Review preparation and other requirements for installing work.
      f. Discuss and agree upon quality control procedures.
      g. Review coordination required with affected Sections.

1.03 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.03 ACTION SUBMITTALS

A. Timing of Submittals: Do not begin construction of integrated mockups until submittals required by other Sections of these Specifications for component materials included in the mockup have been submitted and approved for use in the Project.

B. Product Data: For each type of product incorporated into integrated mockups.

C. Shop Drawings: For integrated mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
   1. Indicate manufacturer and model number of individual components.
   2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.04 INFORMATIONAL SUBMITTALS

A. Delegated-Design Submittal: For integrated exterior mockup as indicated to comply with performance requirements and design criteria, include the following signed and sealed by the qualified professional engineer responsible for their preparation:
   1. Design data. Include the following:
   2. Engineering analysis data.

B. Schedule: Prepare a schedule to indicate dates when work on mockups will begin, when each trade will be installing their portion of the mockup, and when completed mockup will be ready for inspection, testing, and verification.

C. List of Materials Used in Constructing Integrated Mockups: List generic product names together with manufacturers, manufacturers' product names, supply sources, and other information as required to identify materials used. Include mix proportions for mortar and source of aggregates.
   1. Neither receipt of list nor approval of mockups constitutes approval of deviations from the Contract Documents contained in mockups unless Architect approves such deviations in writing.

D. Preconstruction test reports.

1.05 QUALITY ASSURANCE

A. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.

PART 2 - PRODUCTS

2.01 PERFORMANCE / DESIGN CRITERIA

A. Delegated Design: Engage a qualified professional engineer, as defined in Div. 01 Section "DELEGATED DESIGN REQUIREMENTS," to design integrated exterior mockup support structure, using performance requirements and design criteria indicated.

2.02 MATERIALS, GENERAL

A. Refer to Div. 02 through 49 Sections for specific materials and construction methods required.

2.03 INTEGRATED EXTERIOR MOCKUP MATERIALS

A. Products utilized in the construction of the integrated exterior mockup as indicated on Drawings are specified in Div. 02-49 and include but are not limited to the following:
    1. Concrete foundation and slab edge including:
        a. Foundation waterproofing.
        b. [Drainage board.]
        c. [Cover board.]
        d. [Subdrain piping and fill].
        e. Backfill.
    2. Concrete building structure including:
        a. Column.
        b. Elevated floor slab edge[with beam].
        c. Each type of embedded and surface attached anchor used to support building façade elements.
    3. [CMU][and][Cold-formed-metal stud framing] backup wall including:
        a. [Vertical CMU core reinforcing and grouting.]
        b. [Horizontal CMU joint reinforcing.]
        c. [Exterior sheathing.]
        d. Air barrier membranes including:
            1) Each type perimeter termination with tie-ins to roofing system and foundation [damproofing][and][waterproofing].
            2) Typical through-wall penetrations including the following items to show how they are to be sealed.
                a) Structural items such as support frames, angles, and bracing,
                b) Mechanical and plumbing items such as through-wall pipe penetrations, overflow roof and fire sprinkler drains, and hose bibbs.
                c) Electrical items such as light fixtures, device boxes, and conduits.
            3) Flashing assemblies.
        e. Wall insulation.
        f. Veneer anchors and ties.
        g. [Add other wall elements as required.]
    4. [Face brick][and][stone] veneer assemblies including:
        a. Loose lintels[and shelf angles]
        b. Weep holes and vents.
        c. Flashings and cavity drainage material.
        d. Mortar jointing.

e. Sealant filled control joints.
f. [Add other masonry elements as required.]

5. Stone panels including:
   a. Support and anchoring devices.
   b. Sealant filled joints.
6. EIFS [walls][and][soffits] showing specified color and finish including:
   a. Full depth assembly down to sheathing.
   b. [Reveals][and][protruding features.]
7. Metal wall panel [and soffit] assemblies including:
   a. Typical [three- and] four-way joint intersections.
   b. Terminations at edges and dissimilar materials.
8. Metal roof panels including:
   a. Roof deck.
   b. [Insulation].
   c. Underlayment[and slip sheet].
   d. Panel-to-panel seams.
   e. Eave edge termination.
   f. Penetration closure.
   g. [Cricket.]
   h. [Snow guards.]
9. Membrane roofing including:
   a. Typical termination at parapets.
   b. Typical seam extending from flat roof and turning up parapet.
   c. [Roof divider.]
   d. [Expansion joint with cover.]
   e. Small round [and grouped] penetration.
   f. [Curbed opening.]
   g. [Add other elements for roofing as required.]
10. Sheet metal flashing and trim including:
    a. [Gutters][and][downspouts].
    b. [Parapet scupper.]
    c. [Conductor head.]
    d. [Downspout boot.]
    e. Head, jamb, and sill flashing for fenestration and frames.
    f. Flashing, counterflashing, and flashing receivers.
    g. [Add other elements for steep slope roofing as required.]
11. Roof and wall specialties and accessories including:
    a. Copings.
    b. [Gravel stops.]
    c. [Fascia.]
    d. [Reglets.]
12. Sealant filled joints between dissimilar materials.
13. Building expansion joint extending up wall [and over parapet] [and onto roof].
14. Corner portion of aluminum [storefront][and][curtain wall] assemblies.
15. [Plaster][Stucco] showing specified color and finish including:
    a. Corner bead.
    b. Each type edge termination.
    c. Control joint including four-way intersection.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Before installing portions of the Work requiring mockups, provide mockups for each form of construction and finish required to comply with the following requirements:
   1. Provide mockups of sizes and configurations indicated or, if not indicated, of sizes and configurations to adequately demonstrate capability of products to comply with performance requirements.
   2. Locate integrated exterior mockups where indicated or, if not indicated, where directed. Location shall be in close proximity to the building in same basic orientation taking into account natural light, shading, and accessibility.
   3. Construct in-place mockups in location and of size indicated or, if not indicated, as directed by Architect.
   4. Construct mockups using personnel, products, and methods of construction indicated for the completed Work.
   5. Demonstrate the proposed range of aesthetic effects and workmanship.
   6. Obtain Architect's approval of mockups before beginning corresponding work, fabrication, or construction.
      a. Allow seven days for initial review and each re-review of each mockup.

3.02 INTEGRATED EXTERIOR MOCKUP CONSTRUCTION

A. Construct freestanding integrated exterior mockup of typical exterior walland roof edge construction, full thickness, as indicated on Drawings and according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

B. Construct integrated exterior mockup prior to beginning installation of foundations and structural steel framework for building, to illustrate each form of construction and finish required. Comply with the following requirements, using materials indicated for the completed Work:

C. Coordinate installation of exterior envelope materials, products. assemblies, and sub-assemblies along with supporting materials. Construct integrated exterior mockup using details indicated on the Drawings.

D. Construct integrated exterior mockup to demonstrate installation and assembly of exterior wall facing, supporting substrates, fenestration, crack and joint treatment between differing materials, air barrier materials and accessories including sealing of transitions, terminations, and penetrations of air barrier assembly. Include in mockup samples of transition membrane tie-ins from air barrier to roofing system and foundation waterproofing.
   1. Step back overlying façade materials to expose and exhibit a portion of each underlying material and process in the wall assembly. The intent is to be able to view each element in the wall construction for evaluation.
   2. Step back each material and process at least 6 inches to show bare sheathing and each air barrier coat, and other applied finishes, in wall build-up.

E. Clean one half of exposed surfaces of exterior [brick][and][stone] as directed. Use specified cleaning methods and materials to demonstrate final appearance.

3.03 FIELD QUALITY CONTROL

A. Testing and Inspecting of Mockups: Where testing agency is indicated to perform preconstruction testing of mockups and where Architect or others are indicated to inspect mockups, comply with the following:
   1. Contractor responsibilities include the following:
      a. Furnish incidental labor and facilities:
         1) To provide access to mockups to be tested and inspected, including lifts and hoists as required.
         2) To facilitate testing and inspecting.
         3) To protect mockups during construction in an undisturbed condition as a standard for judging the completed Work.
      b. When testing and inspecting is complete:
         1) Maintain temporary integrated mockups until notified they are no longer required, then demolish and remove debris from Site.
         2) Approved in-place mockups may become part of the completed Work if undisturbed at time of Substantial Completion
         3) Dispose of product and material test specimens and assemblies when no longer needed; do not reuse products on Project.
   2. Testing Agency Responsibilities: See Div. 01 Section "TESTING AND INSPECTION SERVICES."

B. Testing and inspecting of completed mockup will take place in successive stages as construction proceeds, as specified in other Sections of these Specifications. Do not proceed with installation of subsequent portions of the mockup until test results for previously completed portions show compliance with requirements.
   1. Other Sections of these Specifications establish tests required for mockup components.

C. Inspection of Workmanship: Architect and Owner will inspect mockups during and after construction to identify deficiencies in workmanship in addition to testing and inspection specified.
   1. Approval of mockups is for features and aspects specified including aesthetic qualities and workmanship.
      a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
      b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.

D. Correction of Deficiencies: Where deficiencies in workmanship are noted, perform corrective actions as required to bring work into compliance with standards of workmanship established by Contract requirements and to obtain Architect's and Owner's approval of integrated exterior mockup.

3.04 REPAIR AND PROTECTION

A. Repair and protection of mockups are Contractor's responsibility, regardless of the assignment of responsibility for testing and inspection services.

B. Protect mockups from damage for the remainder of the construction period or until no longer needed.

C. Protect mockups subject to damage from the elements with weather-resistant coverings, vented to prevent condensation damage.

D. Repair damaged mockups at no additional cost to Owner.

3.05 FINAL DISPOSITION OF MOCKUPS

A. Where specifically specified, approved mockups may, if undisturbed at time of Substantial Completion, become part of the completed Work and serve as a standard for judging quality of other similar completed units of work.
   1. Prior to Substantial Completion, repair damage to mockups designated to remain and restore substrates and finishes.
   2. Clean component materials as specified in individual Specification Sections.

B. When directed by the Architect, demolish and remove temporary mockups in their entirety and lawfully dispose of materials off-site according to Div. 01 Section "CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL". Restore portion of Project site disturbed by construction of the integrated exterior mockup to condition indicated for final site work.

END OF SECTION 01 43 39

SECTION 01 45 16.13 - CONTRACTOR QUALITY CONTROL

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for Contractor quality control.

B. Related Requirements:
1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
2. Div. 01 Section "QUALITY ASSURANCE."
3. Div. 01 Section "TESTING AND INSPECTING SERVICES" for testing agency qualifications and responsibilities.
4. Facility Construction and Facility Services Subgroup Sections (Div. 02-49) contain specific quality-control activities to be performed.
    a. Specified quality-control activities do not limit Contractor's other quality-control procedures that facilitate compliance with the Contract Document requirements.
    b. Requirements for Contractor to provide quality-control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.

1.02 REFERENCES

A. Definitions:
1. Contractor Quality-Control: Reactive activities performed by the Contractor to evaluate completed activities and elements for conformance with requirements. Services do not include contract enforcement activities performed by Architect.

1.03 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.04 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan. Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit prior to initial application for payment.
1. Contractor's inspection reports. Submit monthly with applications for payment.
2. Remedial Action Plan: When Contractor's inspection indicates work deviates from the Contract Documents or is nonconforming or defective, submit work plan indicating types of corrective actions to be taken to bring defective and nonconforming work into compliance with requirements.
3. Testing and Inspecting: With quality-control plan, include the Schedule and Log of Tests and Inspections Required specified in Div. 01 Section "TESTING AND INSPECTING SERVICES."

B. Code Compliance Research Reports: As specified in individual Specification Sections from one of the following showing compliance with building code in effect for Project:
1. ICC-ES.
2. UL.
3. Intertek.
4. Uniform ES.

5. Other evaluation service complying with ANSI ISO/IEC 17065:2012 and acceptable to authorities having jurisdiction.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
   1. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
   2. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.

D. Qualification Data: For Contractor's quality-control personnel and personnel responsible for submittal review.

1.05 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan: Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities.
   4. Format: Acceptable to Architect.
   5. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process.
   6. Continuous Inspection of Workmanship: Describe process for Contractor's continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
   7. Monitoring and Documentation: Maintain Contractor's inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.05 QUALITY ASSURANCE

A. Contractor's Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
   1. Project quality-control manager may also serve as Project superintendent.

1.06 QUALITY CONTROL

A. Contractor Responsibilities: Perform quality-control activities required to verify that the Work complies with requirements, whether specified or not.
   1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
   2. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report of each quality-control service with copies to Owner and Commissioning Authority.
      a. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 45 16.13

SECTION 01 45 23 - TESTING AND INSPECTING SERVICES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for obtaining services of independent testing laboratories and agencies to perform specified testing and inspecting including special inspections.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Div. 01 Section "QUALITY ASSURANCE."
   3. Div. 01 Section "CONTRACTOR QUALITY CONTROL."
   4. Div. 01 Section "MOCKUPS."
   5. Individual Specification Sections in Div. 02 through 49 contain specific tests and inspections to be performed.
      a. Specified tests and inspections do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
      b. Requirements for Contractor to provide tests and inspections required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.

1.02 PAYMENT PROCEDURES

A. When explicitly assigned to Owner, Owner will employ and pay for services of an independent testing laboratory to perform specified laboratory and field testing and inspecting.

B. Unless explicitly assigned to Owner, Contractor shall employ and pay for services of an independent testing laboratory to perform specified laboratory and field testing and inspecting.
   1. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

C. Regardless of whether original tests or inspections were Contractor's responsibility, Contractor shall pay for following:
   1. Additional samples and tests required for Contractor’s convenience beyond those specified. Costs will not be reimbursed by the Owner.
   2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents.When Owner pays for testing and inspecting services, costs for retesting and reinspecting will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

D. Regardless of other requirements for payment, Owner will pay for following:
   1. Tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded. When Contractor pays for testing and inspecting services, the Contract Sum will be adjusted by Change Order to cover costs for such additional testing and inspecting.
   2. Tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

E. Owner will employ and pay for services of a Special Inspector to perform special tests and inspections required by applicable codes and authorities having jurisdiction.

F. Employment of an independent testing laboratory and Special Inspector shall in no way relieve Contractor of its obligations to perform work in accordance with Contract Documents.

1.03 REFERENCES

A. Definitions:
1. Special Inspector: As defined in the IBC.
2. Testing Laboratory or Testing Agency: A qualified entity engaged to perform specific tests, inspections, or both. As used in the Specifications, the terms Testing Laboratory and Testing Agency are synonymous.
3. Laboratory Testing: Tests and inspections performed off-site under controlled laboratory conditions, to verify performance or compliance with specified criteria.
4. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
5. Product Testing: Tests and inspections performed on manufacturer's standard products and materials to establish product performance and compliance with specified requirements.
6. Source Quality-Control Testing: Tests and inspections on products and materials proposed for use in this Project performed at the source, e.g., plant, mill, factory, or shop.
7. Field Quality-Control Testing: Tests and inspections that are performed on-site after installation of the Work and for completed Work.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preconstruction Meetings: Conduct at Project site per Div. 01 Section "PROJECT MEETINGS" minimum one week prior to commencing work of this Contract.
1. Discuss and agree upon required testing and inspection services, affected parties, division of responsibilities, and other activities impacted by required testing and inspection services.

B. Coordination:
1. Coordinate sequence of activities to accommodate required quality-control activities with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
a. Schedule times for tests, inspections, obtaining samples, and similar activities.
2. Cooperate with the Testing Laboratory to facilitate performance of work.

1.05 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.06 INFORMATIONAL SUBMITTALS

A. Statement of Responsibility for Special Inspections: Submit a written statement of responsibility containing acknowledgement of awareness of the special requirements contained in the statement of special inspections. Obtain similar written statements of responsibility from each subcontractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections. Submit to Architect with copies to Owner and building official prior to the commencement of work on the system or component.

B. Schedule of Required Tests and Inspections: Prepare a comprehensive list of tests and inspections required to be performed, including those to be performed by Contractor, subcontractors, Owner, Commissioning Authority, independent laboratories, special inspector, and authorities having jurisdiction. Submit prior to initial application for payment. Coordinate with Contractor's construction schedule. Include Contractor's Quality-Control Plan specified in Div. 01 Section "CONTRACTOR QUALITY CONTROL."
   1. Form: Arrange in a tabular format in per the attached "SCHEDULE AND LOG OF REQUIRED TESTS AND INSPECTIONS FORM." Highlight or otherwise mark Contractor-elected tests and inspections.
   2. Distribution: Distribute schedule to Owner, Architect, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

C. Test and Inspection Log: Prepare and maintain a record of tests and inspections performed in tabular form. Submit monthly updates with applications for payment.
   1. Form: Add additional information to "SCHEDULE AND LOG OF REQUIRED TESTS AND INSPECTIONS FORM."
   2. Highlight or otherwise mark noncompliant work and work Architect has indicated as nonconforming or defective. Add additional lines for retesting and reinspection required.
   3. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and Commissioning Authority's reference during normal working hours.

D. Remedial Action Plan: When test results indicate work deviates from the Contract Documents and when inspections indicate work is nonconforming or defective, submit work plan indicating types of corrective actions to be taken to bring defective and nonconforming work into compliance with requirements.

E. Contractor's Testing Agencies: Prepare a list of each testing and inspecting entity retained by Contractor with name, address, phone, and contact person.

F. Qualification Statements: For testing agencies and special inspectors retained by Contractor to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
   1. Include years of experience and list of completed projects having similar scope of Work identified by project name, location, date, reference names of owner and contractor involved with phone numbers.

1.07 QUALITY ASSURANCE

A. Testing Laboratory Qualifications: Qualified according to ISO/IEC 17025, ASTM E 329, and E 699 with the experience and capability to conduct testing and inspecting indicated and meeting the following, with additional qualifications specified in individual Sections, and, where required, that is acceptable to authorities having jurisdiction.
   1. Accredited by one or more of the following:
      a. ICC-ES for preconstruction testing indicated.
      b. International Accreditation Service (IAS), a Mutual Recognition Arrangement (MRA) and subsidiary of ICC and signatory to ILAC.
      c. International Laboratory Accreditation Cooperation (ILAC) operating in accordance with ISO/IEC 17011.
      d. National Voluntary Laboratory Accreditation Program (NVLAP) a NIST program according to CFR, Title 15, Part 285 and ISO/IEC 17025.
      e. Nationally Recognized Testing Laboratory (NRTL) according to 29 CFR 1910.7.
      f. InterNational Electrical Testing Association (NETA).

2. Licensed or otherwise authorized to operate in State in which project is located.
3. Meet requirements of ASTM C 1021, C 1077, C 1093, C 1222, D 3666, D 3740, E 329, E 543, and E 699 as appropriate to services performed.
4. When employed by the Contractor, laboratory shall be acceptable to the Owner

B. Special Inspector Qualifications: A qualified person who shall demonstrate, in writing, competence and relevant experience, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection.
   1. The registered design professional in responsible charge and engineers of record involved in the design of the Project may act as Special Inspector provided they meet the qualifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 OWNER RESPONSIBILITIES

A. Where testing and inspecting services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
   2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

3.02 CONTRACTOR’S RESPONSIBILITIES

A. Testing and inspecting services not explicitly assigned to Owner are Contractor’s responsibility.
   1. Engage a qualified testing agency to perform specified tests.
      a. Preconstruction and product testing may, where permitted, be performed by the manufacturer and witnessed by a qualified testing agency.
   2. Notify Laboratory sufficiently in advance of operations to allow for Laboratory assignment of personnel and scheduling of tests.
      a. When tests or inspections cannot be performed after such notice due to Contractor’s negligence, reimburse Owner for Laboratory personnel and travel expenses incurred.
   3. Comply with requirements of authorities having jurisdiction.

B. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Provide the following:
   1. Access to the Work and to manufacturer's operations where work is being fabricated or produced.
   2. Incidental labor and facilities necessary to facilitate tests and inspections.
   3. Adequate quantities of representative samples of materials, test specimens, and assemblies that require testing and inspecting. Assist agency in obtaining samples. Deliver in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work. Copy Architect with transmittal for each shipment.
   4. Facilities for safe storage and field curing of test samples at site or at source of product to be tested.
   5. Delivery of samples to testing agencies.

6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

C. Test Assemblies: Construct test assemblies of mockups and proposed in-place systems per Div. 01 Section "MOCKUPS."

D. Non-Conforming Work: Tested work will be considered defective if it does not pass tests and inspections.
1. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
2. Remove and replace work with deficiencies which cannot be corrected.
3. Additional testing and inspecting performed to determine compliance of replaced or additional work with specified requirements will be at Contractor's sole expense.

E. Repair and Protection: Regardless of whether original tests or inspections were Contractor's responsibility, on completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Div. 01 Section "CUTTING AND PATCHING."
2. Protect construction exposed by or for quality-control service activities.
3. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for testing and inspecting services.

F. Reports:
1. Maintain log at Project site copies of test and inspection reports indicating approved and rejected results.
2. Furnish copies of product test reports to affected parties as required.

3.03 LABORATORY DUTIES

A. Cooperate with Architect and Contractor; provide qualified personnel after due notice.

B. Perform inspections, sampling, and testing of materials and methods of construction specified under Performance Criteria, Design Criteria, Source Quality Control, and Field Quality Control articles as specified in individual Specification Sections to verify compliance with specified requirements:
1. Comply with specified standards.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Ascertain compliance or noncompliance of materials with requirements of Contract Documents.

C. Promptly notify Architect and Contractor of observed irregularities or deficiencies of Work or products.

D. Test and Inspection Reports: Prepare and promptly submit a certified written report of results of each test performed to Architect with copies to Owner, Commissioning Authority, and Contractor. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct. Each report shall include:

1. Project title and number.
2. Date issued.
3. Testing laboratory name, address, and telephone number.
4. Name of technician or inspector and signature of individual in charge.
5. Date and time of sampling or inspection.
6. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
7. Date of test.
8. Identification of product and Specification Section number and title.
9. Location of sample or test in project.
10. Description of test and inspection methods.
11. Identification of applicable standards.
12. Identification of test and inspection methods.
13. Unique characteristics of each test and inspection.
14. Complete results of test or inspection indicating compliance or noncompliance with Contract Documents.
15. Interpretation of test results. State in each report whether tested and inspected work complies with or deviates from the Contract Documents. Include recommendations for retesting and reinspecting.

E. Retest non-conforming work after deficiencies have been corrected.

F. Perform additional tests when required by Architect or Contractor.

G. Laboratory is not authorized to:
1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of work.
3. Perform any duties of Contractor.

3.04 SPECIAL INSPECTOR DUTIES

A. Cooperate with Architect and Contractor; provide qualified personnel after due notice.

B. Perform specified special tests and inspections required by applicable codes and authorities having jurisdiction as the responsibility of Owner.
1. Verify that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
2. Notify Architect, Commissioning Authority, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submit a certified written report of each test, inspection, and similar quality-control service to Architect with copies to Owner, Commissioning Authority, Contractor, and authorities having jurisdiction.
4. Interpret tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Retest and reinspect corrected work.
6. Submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.

3.05 ATTACHMENTS

A. Schedule and Log of Tests and Inspections Required. MS Excel electronic file available upon request.

END OF SECTION 01 45 23

SECTION 01 61 00 - COMMON PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general requirements common to products.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Division 01 Section "Substitution Procedures."
   3. Division 01 Section "Product Selection Options."

1.02 DEFINITIONS

A. Product: Includes materials, systems, equipment and terms of similar intent for items incorporated into the Work, whether purchased for Project or taken from previously purchased stock.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Basis-of-Design (BoD) Product: Named product upon which Drawings and Specifications are based.

PART 2 - PRODUCTS

2.01 PERFORMANCE / DESIGN CRITERIA

A. Surface-Burning Characteristics: When required by individual Specification Sections determine surface-burning characteristics by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.02 PRODUCTS, GENERAL

A. Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
   1. Provide standard products, if available, unless custom products or nonstandard options are specified. Provide standard products of types that have been produced and used successfully in similar situations on other projects.
   2. Provide each product as complete unit, including accessory items necessary for proper operation or function.
   3. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
   4. Obtain each color, grade, finish, type, and variety of product and material from one source with resources to provide products and materials of consistent quality in appearance and physical properties.
   5. Provide interchangeable components by the same manufacturer for identical items.
   6. Apply applicable labels and seals of testing agency.

B. Product Options: When specified in individual Specification Sections, Drawings are based on the specific basis-of-design products indicated.
   1. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
   2. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
   3. Products and manufacturers identified by manufacturer's designations in legends and schedules for exterior and interior finish materials, whether on Drawings or in Specifications, establish requirements for product quality in terms of appearance, construction, and performance.
   4. Do not modify intended aesthetic effects or performance characteristics, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

C. Do not use products containing asbestos or other known hazardous materials.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 61 00

SECTION 01 62 13 - PRODUCT SELECTION OPTIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project including Contractor's options for product selection.

B. Related Requirements:
1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
2. Div. 01 Section "ALTERNATES" for selection of products under an alternate.
3. Div. 01 Section "SUBSTITUTION PROCEDURES."
4. Div. 01 Section "REFERENCES" for applicable industry standards for products specified by reference standards.

1.02 DEFINITIONS

A. Basis-of-Design (BoD) Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "Basis-of-Design," including make or model number or other designation, to establish the salient characteristics related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification. Drawings and Specifications indicate sizes, profiles, dimensions, details, and other characteristics that are based on the BoD product named.

B. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

1.03 SUBMITTALS, GENERAL

A. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

1.04 ACTION SUBMITTALS

A. Basis-of-Design Product Specification Submittal: Show compliance with requirements.
1. Form: Use attached Div. 00 Form "SUBMITTAL TRANSMITTAL FORM" or Contractor’s standard with equivalent information.

B. Comparable Product Request: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Identify differences between BoD product and proposed product. Identify dimensional differences that may affect other surrounding construction.
1. Form: Use attached Div. 01 Form "COMPARABLE PRODUCT REQUEST FORM" or Contractor’s standard with equivalent information.
2. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

a. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
b. Evidence that the proposed product is comparable based on detailed comparison of significant, salient qualities of proposed product with those named in the Specifications. Significant qualities include, but are not limited to, attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
c. Evidence that proposed product provides specified warranty.
d. Submit list of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
e. Submit Samples where none are specified, if requested.

PART 2 - PRODUCTS (NOT USED)

2.01 METHODS OF SPECIFYING PRODUCTS

A. Descriptive: Specifies a detailed description of the salient characteristics, physical properties, and workmanship required for the proper installation of a product or material without using proprietary names.

B. Performance: Specifies the required results, the criteria by which the performance will be judged, and the method by which it can be verified.

C. Reference Standard: Specifies product or processes by established nationally recognized product and material standards rather than individually written product or installation criteria.

D. Proprietary: Specifies brand name, model number, or unique characteristic, and other proprietary information.
1. Closed proprietary specifications do not allow for use of unnamed products or manufacturers or for substitutions.
2. Open proprietary specifications allow for requests to use comparable products by unnamed products or manufacturers with Architect's approval.

2.02 PRODUCT SELECTION, GENERAL

A. Provide products complying with requirements specified in individual Specification Sections.

B. Manufacturers: When individual Specification Sections include a list of names of manufacturers provide compliant products by a listed manufacturer.
1. If a listed manufacturer does not manufacture a compliant product, obtain compliant products from other listed manufacturers or, when permitted, from other manufacturers of compliant comparable products or, when permitted, submit "Substitution Request" for non-specified manufacturers or products.
2. Listing a manufacturer by name does not imply said manufacturer's noncompliant product will be acceptable merely because the manufacturer's name was included in a list nor does it relieve Contractor of obligations under requirements of the Contract Documents.
3. Manufacturer Source Limitations:
a. Unless otherwise specified, obtain primary products specified in individual Specification Sections through one source from a single manufacturer who is capable of showing prior successful production of units similar to those required for entire Project, unless otherwise acceptable to Architect.
b. Unless otherwise specified, furnish secondary products only of type and from source recommended by manufacturer of primary materials.

C. Products: When individual Specification Sections, include a list of names of products provide one of the products listed provided said product is in compliance with Contract Documents.
   1. If a listed product does not comply with specified requirements, provide a compliant product selected from other products listed or, when permitted, provide compliant comparable product or, when permitted, submit "Substitution Request" for non-specified products.
   2. Listing a product by name indicates a belief the product was compliant at the time the Specifications were written. Noncompliant products will not be acceptable merely because the product name was included in a list nor does it relieve Contractor of obligations under requirements of the Contract Documents.
   3. Where products are accompanied by the term "as selected," Architect will make selection.

D. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

E. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

F. Comply with requirements of Div. 01 Section "SUBSTITUTION PROCEDURES" to obtain approval for use of substitute products where permitted.

2.03 PRODUCT SELECTION OPTIONS

A. Descriptive: Products specified by description only:
   1. Select any Product meeting the specified characteristics.

B. Performance: Products specified by performance requirements only:
   1. Select any Product capable of meeting the specified performance requirements.

C. Reference Standard: Products specified by reference standard only:
   1. Select any Product meeting the specified standard.

D. Closed Proprietary Method: Products specified without provision for Comparable Products or Substitutions.
   1. Products specified by naming a single product, manufacturer or source (sole source):
      a. Provide the named product or a product by the named manufacturer or source that complies with requirements.
   2. Products specified by naming two or more products, manufacturers or sources:
      a. Provide any of the named products or any product by the named manufacturers or sources that complies with requirements.
   3. Comparable Products and Substitutions for Contractor's convenience will not be considered.

E. Open Proprietary Method: Products specified with provision for Comparable Products or Substitutions.
   1. Products specified by naming one or more products, manufacturers or sources and accompanied by the phrase "include, but are not limited to":
      a. Provide any of the named products or any product by the named manufacturers or sources that complies with requirements.
   2. Products specified by naming one or more products, manufacturers or sources and accompanied by the term "or equal," "or approved equal," "or other approved," "or equivalent," or similar wording:

a. Provide any of the named products or any product by the named manufacturers or sources that complies with requirements.

3. Comparable Products will be considered. Submit Div. 01 Form "COMPARABLE PRODUCT REQUEST FORM" for consideration of an unnamed product.
4. Substitutions will be considered. Refer to Div. 01 Section "SUBSTITUTION PROCEDURES" for provision regarding Substitutions for Contractor's convenience.
5. The specified Product establishes the required standard of quality.

F. Products specified by naming a Basis of Design product or manufacturer/source:
1. Closed Proprietary BoD Specification: Provide the specified product unless comparable products are allowed.
2. Open Proprietary BoD Specification: Provide the BoD product or any product by the named manufacturers or sources that complies with requirements. Submit Div. 01 Form "COMPARABLE PRODUCT REQUEST FORM" for consideration of an unnamed product. The specified Product establishes the required standard of quality.

G. Products specified to "match Architect's sample":
1. Provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
2. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Div. 01 Section "SUBSTITUTION PROCEDURES" for proposal of product.

H. Products specified using the phrase "as selected by Architect " or similar phrase:
1. Provide a product that complies with requirements. Architect will select color, gloss, pattern, density, texture, and other available characteristics and options.
2. When selection is specified from manufacturer's "full range," selection will be made from both standard and premium items. If not otherwise specified selection will be made from standard items only.

PART 3 - EXECUTION

3.01 ATTACHMENTS

A. COMPARABLE PRODUCT REQUEST FORM. MS Word electronic file available upon request.

END OF SECTION 01 62 13

SECTION 01 64 00 - OWNER FURNISHED PRODUCTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for Owner furnished Products.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 DEFINITIONS

A. OFOI (Owner-Furnished, Owner Installed): Owner-Furnished Products for Installation by Owner.

B. OFCI (Owner-Furnished, Contractor Installed): Owner-Furnished Products for Installation by Contractor.

C. OFCC (Owner-Furnished, Contractor Connected): Owner-Furnished Products Set in Place by Owner for Final Connection to Building Services by Contractor.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate Work to receive Owner-furnished products.
   1. Check Owner-furnished product submittals to confirm that adequate provisions are made for proper location and installation of Owner-furnished products.
   2. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in individual Sections to ensure that Owner-furnished products can be supported and installed as indicated.

1.04 OWNER FURNISHED PRODUCTS, GENERAL

A. Owner will furnish products indicated. The Work includes providing support as described herein.

B. Owner's Responsibilities:
   1. Furnish to Contractor the earliest possible delivery date for Owner-furnished products.
   2. Arrange for and deliver necessary Shop Drawings, Product Data, Samples, and other Submittals to Contractor.
   3. Arrange and pay for product delivery to site, in accordance with Contractor's Construction Progress Schedule.
   4. Deliver supplier's bill of materials to Contractor.
   5. Inspect deliveries jointly with Contractor; record shortages, damage, and defective items.
   6. Submit claims for transportation damage.
   7. Arrange for replacement of damaged, defective, and missing items.
   8. If Owner-furnished products require storage on site prior to installation, Owner will arrange for initial protective wrappings and coverings to be installed.
   9. Arrange and pay for required testing and inspections of Owner-furnished products.
   10. Arrange for manufacturers' warranties, service, and inspections, as required.
   11. Deliver to Contractor for installation brackets, special reinforcing, and inserts and anchoring devices from product manufacturers which need to be preset and built into structure.

C. Contractor’s Responsibilities:
1. Using Owner-furnished delivery dates, designate delivery dates for Owner-furnished products in Contractor's Construction Progress Schedule.
2. Review Shop Drawings, Product Data and Samples. Submit to Architect noting discrepancies or anticipated problems in use of product.
3. Receive and unload products at site.
4. Inspect deliveries jointly with Owner.
5. Store and handle products at site, including uncrating and storage.
6. Protect products from exposure to elements and from damage including damage to protective wrappings and coverings until time of installation by Owner.
7. Install Owner-furnished brackets, special reinforcing, and inserts and anchoring devices which need to be preset and built into structure to receive Owner-furnished products.
8. Provide wood blocking and basic reinforcement concealed within other construction to receive Owner-furnished products.
9. Assemble, install, connect, adjust, and finish products, as stipulated in respective specification section.
10. Repair or replace items damaged by Contractor.

1.05 OWNER-FURNISHED PRODUCTS FOR INSTALLATION BY OWNER (OFOI):

A. Owner's Responsibilities:
1. Handling and installation operations required to incorporate products into the Work.

B. Contractor's Responsibilities:
1. Provide access to the Work for installer.
2. Provide incidental labor and facilities necessary to facilitate installation by Owner.
3. Protect installed Owner-furnished products from damage during construction operations.

C. Items to be Owner-Furnished and Installed:
1. Furniture and furnishings.
2. Movable cabinets.
3. Small office equipment.
4. Small appliances without plumbing or ventilating connections with plug-in electrical connectors.
5. Loose rugs.
6. Artwork.
7. Items indicated OFOI on Drawings.

1.06 OWNER-FURNISHED PRODUCTS FOR INSTALLATION BY CONTRACTOR (OFCI):

A. Contractor's Responsibilities:
1. Handling and installation operations required to incorporate Owner-furnished products into the Work.
2. When Owner-furnished products are stored in other than final location, transport products to final location.
3. Install products in accordance with manufacturer's printed instructions, State and Municipality standards, and approved submittals.
4. Install and anchor products securely in place with vertical elements plumb, horizontal elements level, square, and free from warp or twist while maintaining dimensional tolerances and alignment with surrounding construction.

B. Items to be Owner-Furnished for Installation by Contractor:
1. Items indicated OFCI on Drawings.

1.07 OWNER-FURNISHED PRODUCTS SET IN PLACE BY OWNER FOR FINAL CONNECTION TO BUILDING SERVICES BY CONTRACTOR (OFCC):

A. Owner's Responsibilities:
1. Handling and installing operations required to set products in place in the Work.

B. Contractor's Responsibilities:
1. Making final plumbing, mechanical, electrical, and similar connections to building services as required in accordance with manufacturer's printed instructions, State and Municipality standards, and approved submittals.

C. Items to be Owner-Furnished Products Set in Place by Owner for Final Connection to Building Services by Contractor :
1. Appliances and equipment requiring hard-wiring, plumbing, or ventilating connections to building systems.
2. Items indicated OFCC on Drawings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Per Div. 01 Section "EXAMINATION AND PREPARATION" and as follows:

B. Verification of Conditions:
1. Examine walls, floors, roofs, and surfaces for suitable conditions where Owner-furnished products will be installed.
2. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work.
3. Examine Owner furnished products before installation. Notify Owner if damage is discovered which was not discovered at time of delivery.
4. Examine roughing-in for utility systems to verify actual locations of utility connections before equipment installation.
5. Verify conditions and surfaces are ready to receive Owner-furnished products, field measurements are as indicated on approved submittals, and conditions conform to requirements of the manufacturer.

3.02 SYSTEMS STARTUP

A. Per Div. 01 Section "STARTING AND ADJUSTING" for OFCI equipment.

3.03 ADJUSTING

A. Per Div. 01 Section "EXECUTION" for OFCI and OFCC items.

3.04 CLEANING

A. Per Div. 01 Sections "PROGRESS CLEANING" and "FINAL CLEANING."

3.05 PROTECTION

A. Per Div. 01 Section "EXECUTION" and as follows:

B. Delay installing fabric covered and similar items to prevent soiling. Install such items immediately prior to Substantial Completion of Project.

END OF SECTION 01 64 00

SECTION 01 65 13 - PRODUCT DELIVERY AND STORAGE REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for delivery, storage, handling, and protection of products.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 GENERAL

A. Deliver, store, and handle products using means and methods that will prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, and other causes, including loss, theft and vandalism. Comply with manufacturer's written instructions.

1.03 DELIVERY AND HANDLING

A. Schedule delivery to avoid delaying the Work and to minimize long-term storage at Project site, to prevent overcrowding of construction and storage spaces, and to avoid conflict with Work and adverse conditions at site.

B. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

C. Deliver products to Project site in an undamaged condition in manufacturer's original, undamaged packaging with seals unbroken, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   1. Delay delivery of products subject to damage from construction operations until time needed.

D. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged, properly protected, and quantities are correct. Note damage discovered and make arrangements for restitution with shipper. Return products with severe damage and obtain replacements.

E. Protect materials, including finishes, during handling and installation to prevent damage.

F. Provide appropriate equipment and personnel to handle products.

G. Protect materials and finishes during handling and installation to prevent damage.

1.04 STORAGE AND PROTECTION

A. Store products on site unless prior written approval to store off site has been obtained from Owner.

B. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, weather-protection, and other requirements for storage.

C. Arrange storage areas to permit access for inspection and measurement of quantity or counting of units.
   1. Periodically inspect stored products to verify that products are undamaged and in acceptable condition and manufacturer's seals and labels remain intact and legible.

D. Store materials within temperature and humidity conditions as recommended by manufacturer.

E. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation. Protect from weather, direct sunlight, construction activities.

F. Store materials in a manner that will not endanger Project structure.

G. Exterior Storage:
   1. Store fabricated products above ground; prevent soiling and staining.
   2. Cover products subject to deterioration with impervious sheet coverings; provide ventilation to prevent condensation.
   3. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
   4. Store metal items above ground on wood cribbing or dunnage to prevent corrosion and accumulation of mud, dirt and oil.
   5. Store soils and aggregates where grading and other required characteristics can be maintained and contamination avoided.
   6. Store loose granular materials in well drained area on solid surfaces; prevent mixing with foreign matter.
   7. Store materials subject to ultraviolet degradation from sunlight out of direct sunlight.
   8. Protect foam plastics from exposure to sunlight, except to extent necessary for period of installation and concealment.

H. Protect stored products from damage and liquids from freezing.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 65 13

SECTION 01 71 00 - EXAMINATION AND PREPARATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for examination and preparation prior to commencement of operations including, but not limited to, the following:
   1. Examination and acceptance of work in place.
   2. Protection of adjacent construction.
   3. Preparation prior to beginning work.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 INFORMATIONAL SUBMITTALS

A. Written Report: Where required by other Sections, prepare a written report, endorsed by Installer, listing conditions detrimental to performance of the Work. Include the following:
   1. Description of the Work.
   2. List of detrimental conditions, including substrates.
   3. List of unacceptable installation tolerances.
   4. Recommended corrections.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EXAMINATION AND ACCEPTANCE OF WORK IN PLACE

A. Before proceeding with each component of the Work, examine new work in place including substrates, areas, and conditions, with installer or applicator present where indicated, for compliance with requirements.
   1. Examine walls, floors, and roofs for suitable conditions where products and systems will be installed.
   2. Verify maximum moisture content.
   3. Verify installation tolerances.
   4. Verify conditions and surfaces are ready to receive specified work, field measurements are as indicated on Drawings and on approved submittals, and conditions conform to requirements of the manufacturer and fabricator.
   5. Verify compatibility with and suitability of substrates, including maximum moisture content and compatibility with existing finishes or primers.
   6. Examine products and materials before installation. Reject products and materials that are wet, moisture damaged, or mold damaged. Reject products and materials that exceed maximum moisture content.
   7. Verify other conditions affecting performance.
   8. Record observations.

B. Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of utilities, mechanical and electrical systems, both above and below grade, and other construction affecting the Work.

1. Verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish information to local public utilities that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.02 PROTECTION OF ADJACENT CONSTRUCTION

A. Prior to the start of work in an area, protect surrounding areas and surfaces from damage or disfiguration including protection from the elements. Protect against adverse effects of products and procedures on people, adjacent materials, components, vehicles and vegetation.

B. Comply with each product manufacturer's written instructions for protections and precautions.

C. Roofing: When workers or equipment must work on or traverse completed roofing install roofing protection.
1. Loosely lay 1-inch-minimum thick, molded expanded polystyrene (MEPS) insulation over the roofing membrane in areas indicated. Loosely lay nominal 1/2-inch plywood or OSB panels over MEPS. Extend MEPS past edges of plywood or OSB panels a minimum of 1 inch. Place sand bags on corners and edges of plywood panels sufficient to prevent panels from blowing or shifting due to wind. Do not overload roof.
2. Limit traffic and material storage to areas of roofing that have been protected.
3. Maintain temporary protection and leave in place until work and traffic on roofing has been completed. Remove temporary protection when no longer needed.

3.03 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Survey of Existing Conditions: Record existing conditions by use of measured drawings, templates, preconstruction photographs, and preconstruction videotapes per Division 01 Section "Photographic Documentation."

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for interpretation to Architect according to requirements in Division 01 Section "Project Management and Coordination."

E. Surface and Substrate Preparation: Comply with manufacturer's written recommendations for preparation of substrates to receive subsequent work.

END OF SECTION 01 71 00

SECTION 01 71 23 - FIELD ENGINEERING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for field engineering and surveying.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 INFORMATIONAL SUBMITTALS

A. Qualification Data: For surveyor.

B. Certificates: Signed by surveyor certifying that location and elevation of improvements are in conformance with Contract Documents.

1.03 CLOSEOUT SUBMITTALS

A. Certified Surveys: Submit two copies signed by surveyor or professional engineer.

B. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.04 QUALIFICATIONS

A. Surveyor: One of the following who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated:
   1. Professional land surveyor, licensed in jurisdiction in which project is located.
   2. Registered professional engineer, licensed or registered in jurisdiction in which project is located.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 FIELD ENGINEERING SERVICES, GENERAL

A. Provide and pay for field engineering services required for Project including, but not limited to:
   1. Site survey work using accepted surveying practices.
   2. Lay out the Work.
   3. Prepare certified survey.
   4. Prepare final property survey.
   5. Other professional engineering services specified or required to execute Contractor’s construction methods.

3.02 INITIAL SITE SURVEY REQUIREMENTS

A. Identification: Drawings indicate existing benchmarks, horizontal and vertical control points, and property corners for Project.

B. Reference Points: Locate, verify, and protect existing benchmarks, control points prior to beginning Work; preserve permanent reference points during construction.
   1. Verify property corners, easements, building setbacks, and horizontal control dimensions with information contained in Contract Documents.
   2. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
   3. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Site, referenced to survey control points.
   1. Comply with authorities having jurisdiction for type and size of benchmark.
   2. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
   3. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
   4. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Promptly notify Architect of any errors or discrepancies noted; await instructions prior to proceeding with Work.

3.03 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General:
   1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
   2. Stake property corners, limit of work and location of temporary construction aids including office trailers and storage sheds.
   3. Establish limits on use of Project site.
   4. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
   5. Inform installers of lines and levels to which they must comply.
   6. Check the location, level and plumb, of every major element as the Work progresses.
   7. Notify Architect when deviations from required lines and levels exceed allowable tolerances.

C. Site Improvements: Locate and lay out, by instrumentation, site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
   1. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column locations and column grids, and floor elevations, and other controlling dimensions including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

3.04 CERTIFIED SURVEY REQUIREMENTS

A. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.

3.05 FINAL PROPERTY SURVEY REQUIREMENTS

A. Final Property Survey: Show significant features (real property) for Project. Include on the survey a certification, signed by surveyor or professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
   1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point of beginning.

3.06 RECORDS

A. Record Log: Maintain accurate log of layout control and survey work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

B. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "Property Survey."

END OF SECTION 01 71 23

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Installation of the Work.
   2. Coordination of Owner-installed products.
   3. Protection of installed construction.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 REFERENCES

A. Reference Standards:
   1. Perform Work according to specified standards.
   2. Obtain and maintain on-site copies of each specified standard as well as manufacturer's written recommendations and instructions for installation of the various products and equipment
      a. Make standards and instructions available to trades to ensure work is performed according to the various specified standards.
      b. Make standards and instructions available to Architect, Owner, inspecting and testing personnel, and authorities having jurisdiction for review and verification purposes.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate Work of the various Sections for proper installation timing and interface.
   1. Coordinate layout and installation of work of the various Sections with interfacing and adjoining work and other Sections affecting or affected by work of other Sections for proper sequencing of each installation.
   2. Ensure best possible weather resistance, durability of the work, and protection of materials and finishes.
   3. Furnish setting drawings, diagrams, templates and installation instructions to other Sections.
   4. Upon request, check shop drawings of other Sections, to confirm that adequate provisions are made for proper location and installation of work of each Section.
   5. Furnish inserts and anchoring devices which need to be preset and built into structure to appropriate trade. Supply on timely basis to avoid delay in Work.
   6. Instruct other trades of proper location and position.

B. Preinstallation Meetings: When required by the various Sections, conduct preinstallation meetings at Project site whenever possible. Comply with requirements in Div. 01 Section "PROJECT MEETINGS."
   1. Convene meetings sufficiently in advance of beginning work of the various Sections as specified.

2. Attendance: Require attendance by installer of work of each Section and other parties directly affecting or affected by work of each Section. Notify Architect and Owner of meeting times and locations.
3. Review methods and procedures related to work of the various Sections including, but not limited to:
    a. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    b. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
    c. Review structural load limitations.
    d. Review required inspecting, testing, and certifying procedures.
    e. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.
    f. Review preparation and other requirements for installing work of Section involved.
    g. Discuss and agree upon quality control procedures.
    h. Review coordination required with other Sections.

C. Scheduling: Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.04 SUBMITTALS

A. Submit items specified in the various Sections. Process and transmit in accordance with Div. 01 Section "SUBMITTAL PROCEDURES."

B. Manufacturer's Standards: Where compliance with manufacturer's standards is required, submit printed installation instructions. Indicate by transmittal that copies of instructions and recommendations have been distributed to installer.

C. Sample Warranty: Where warranties are specified, submit samples of warranties prior to beginning work.

1.05 QUALITY ASSURANCE

A. Qualifications, General:
1. Manufacturer Qualifications: Obtain products from companies specializing in manufacturing Products specified and whose products have a record of successful in-service performance.
2. Fabricator Qualifications: Engage companies specializing in fabricating Products specified and with a staff of skilled workers experienced in fabricating Products specified.
3. Installer Qualifications: Engage companies specializing or experienced in installing Products specified and comparable in material, design, and extent to that indicated for this Project, and whose work has a record of successful in-service performance.
    a. When specified, installing company shall be an authorized representative of manufacturer; acceptable to manufacturer; or certified, licensed, or otherwise qualified by manufacturer for installation and maintenance of products specified.
        1) A manufacturer's willingness to sell its materials to Contractor or to an installer engaged by Contractor does not in itself confer qualification on the buyer.
    b. Staff: Maintain sufficient experienced, trained staff to install Products according to specified requirements. When specified, workers shall be trained and approved by product manufacturer.

4. Welder Qualifications: AWS certified within past 12 months for each type of weld required.

B. Certifications: When required by the various Sections, submit certification from specified source stating products furnished for Project and their installation meet or exceed specified requirements.

C. Mockups and Field Samples: When required by the various Sections, prepare sample installations of each type of product as specified, including accessories, to verify product selections and as a benchmark to demonstrate aesthetic effects and set quality standards for materials and execution. Duplicate characteristics of approved sample submittals.
1. See Div. 01 Section "MOCKUPS" for additional requirements.
2. Location: As indicated on Drawings or, if not indicated, as directed by Architect.
3. Size: As specified or, if not specified, as directed by Architect.
4. Install mockups and field samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated.
5. Maintain mockups and field samples during construction in an undisturbed condition as a standard for judging the completed Work.
6. Approval of mockups and field samples is also for other material and construction qualities specifically approved by Architect in writing.
7. Approval of mockups and field samples does not constitute approval of deviations from the Contract Documents contained in mockups and field samples, unless such deviations are specifically approved by Architect in writing.
8. Unless specified to be removed when no longer needed, approved mockups and field samples may become part of the completed Work if undisturbed at time of Substantial Completion.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Per Div. 01 Section "PRODUCT DELIVERY AND STORAGE REQUIREMENTS."

1.07 FIELD CONDITIONS

A. Ambient Conditions:
1. Comply with manufacturer's written requirements for maintenance of substrate and ambient temperatures, humidity, ventilation, lighting, and other conditions required to properly execute and protect the Work.
2. Proceed with installation only when existing and forecasted weather conditions permit work to be performed according to manufacturers' written instructions and warranty requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. See Div. 01 Section "PRODUCT SELECTION OPTIONS."

B. Substitution Limitations: Comply with provisions of Div. 01 Section "SUBSTITUTION PROCEDURES."

C. Source Limitations:
1. Obtain like primary products through one source from a single manufacturer who is capable of showing prior successful production of units similar to those required for entire Project, unless otherwise acceptable to Architect.

2. Furnish secondary products only of types and from sources recommended by manufacturer of primary materials.
3. Provide each product as complete unit, including accessory items necessary for proper operation or function.
4. Obtain each color, grade, finish, type, and variety of product from one source with resources to provide products of consistent quality in appearance and physical properties.

2.02 MATERIALS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Regulatory Requirements: Where specified comply with the following:
1. Accessibility Requirements: Ensure components comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.
2. Flammability: Ensure flammable components comply with applicable portions of local, state, and federal codes, laws, and ordinances for flame spread and smoke developed indices.
3. Label: Ensure listed and labeled materials bear UL or other approved agency Classification Marking on bundle, package or container indicating that materials have been produced under UL's or other approved agency's Classification and Follow-Up Service.

2.03 FABRICATION

A. Field Measurements: Where work is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabricating subsequent work. When Shop Drawings are specified, show recorded measurements thereon.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish required dimensions to accept work of the various Sections and proceed with fabricating work without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
2. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

B. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Install and anchor products securely in place with vertical elements plumb, horizontal elements level, square, and free from warp or twist while maintaining dimensional tolerances and alignment with surrounding construction.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products and installation materials that are not considered hazardous.

K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
1. Theft or vandalism.
2. Excessively high or low temperatures.
3. Excessive weathering.
4. Thermal shock.
5. Excessively high or low humidity.
6. Pollution and air contamination.
7. Water or ice.
8. Improper shipping or handling.
9. Unprotected storage.
10. Excessive static or dynamic loading.
11. Excessive internal or external pressures.
12. Chemicals and solvents.
13. Light.

14. Radiation.
15. Puncture.
16. Abrasion.
17. Heavy traffic.
18. Soiling, staining, and corrosion.
19. Bacteria.
20. Rodent and insect infestation.
21. Combustion.
22. Electrical current.
23. High-speed operation.
24. Improper lubrication.
25. Unusual wear or other misuse.
26. Contact between incompatible materials.
27. Destructive testing.
28. Misalignment.

3.02 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction personnel.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
   1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
   2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.03 FIELD QUALITY CONTROL

A. Site Access: Provide access to Project site for
   1. Architect's and Owner's personnel to view work in progress and completed work.
   2. Independent testing and inspecting agency personnel including special inspectors to inspect and test elements of the Work at appropriate times.
   3. Manufacturer's representatives to view handling, installation/application, protection and cleaning of their products.

3.04 ADJUSTING

A. Comply with Div. 01 Section "STARTING AND ADJUSTING" for starting and adjusting operating products, systems and equipment.

B. Repair or replace discolored and defective finishes.

C. Repair, replace, or restore new work damaged by construction operations to original condition.

D. Repair, replace, or restore work damaged by construction operations to satisfaction of Architect and Owner.

E. Comply with Div. 01 Section "CUTTING AND PATCHING" for repairs.

3.05 CLEANING

A. See Div. 01 Sections "PROGRESS CLEANING" and "FINAL CLEANING."

3.06 PROTECTING INSTALLED CONSTRUCTION

A. Comply with manufacturer's written instructions for temperature and relative humidity.

B. Remove and replace installed products or materials that are wet and cannot be dried without damage or staining. Remove and replace installed products or materials that are moisture damaged or mold damaged.

C. Upon completion of work of the various Sections including associated work, obtain advice from installers for recommended or required procedures for surveillance and protection of installed products during remainder of construction period.

D. Institute protective measures and other precautions required to assure that installed products will be without damage or deterioration, other than normal weathering, at time of Substantial Completion.

E. If, despite protection, damage or deterioration occurs, cut out and remove damaged and deteriorated products/materials and replace with new products/materials to produce installations with repaired areas indistinguishable from original work.

F. Engage original installer to repair or replace deteriorated or defective work found at time of final inspection to Owner's and Architect's satisfaction. Repair damage which occurred subsequent to installation and prior to final inspection at no cost to the Owner. Restore the Work to a condition free of damage and deterioration at time of Substantial Completion.

END OF SECTION 01 73 00

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements and limitations for cutting and patching of work.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
   1. Drilling holes to install fasteners and similar operations are not considered to be cutting and patching.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard sizes.

1.05 INFORMATIONAL SUBMITTALS

A. Submit written request in advance of executing cutting or alteration. Include in Request:
   1. Project identification.
   2. Description of work affected.
   3. Alternatives to cutting and patching, if any.
   4. Cutting and patching plan.
   5. Contractor-initiated Change Order Request if reason necessitating cutting and patching was beyond Contractor's control.
   6. Written permission of separate contractor(s) whose work will be affected.

B. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
   1. Dates: Indicate when cutting and patching will be performed.
   2. Description of proposed work:

a. Describe reason for cutting and patching indicating why it cannot be avoided.
b. Describe extent or scope of each occurrence of cutting and patching.
c. Indicate if work to be cut is that of Owner or separate contractor and its effect on work by others.
d. If cutting may disturb hazardous material describe mitigation procedures to be followed.
e. If cutting involves hotwork (torch cutting, welding, etc.) describe fire protection procedures to be followed
f. Subcontractor and trades to execute cutting and patching.
g. Equipment proposed to be used for cutting.
h. Products proposed to be used for patching.
i. Extent of refinishing.

3. Effect on or Changes to In-Place Construction: Describe anticipated results. Include changes to the following:
   a. Building appearance and other significant visual qualities of sight exposed elements.
   b. Structural integrity of structural members to remain.
   c. Integrity or effectiveness of weather exposed or moisture resistant elements or systems.
   d. Efficiency, operational life, maintenance, or safety of operational elements.
4. Products: List products to be used for patching and firms or entities that will perform patching work.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. If utility service will be disrupted, indicate estimated time service will be out of operation.
   a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

1.06 QUALITY ASSURANCE

A. Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include, but are not limited to, the following:
   a. Primary operational systems and equipment.
   b. Fire separation assemblies.
   c. Air or smoke barriers.
   d. Fire-suppression systems.
   e. Mechanical systems piping and ducts.
   f. Control systems.
   g. Communication systems.
   h. Fire-detection and -alarm systems.
   i. Conveying systems.
   j. Electrical wiring systems.
   k. Operating systems of special construction.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in

reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
a. Water, moisture, or vapor barriers.
b. Membranes and flashings.
c. Exterior storefront or curtain-wall construction.
d. Sprayed fire-resistive material.
e. Equipment supports.
f. Piping, ductwork, vessels, and equipment.
g. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.07 WARRANTY

A. Existing Warranties: Do not void existing warranties by cutting and patching operations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use preapproved materials that, when installed, will match existing adjacent surfaces to the fullest extent possible with regard to visual effect and functional performance.

PART 3 - EXECUTION

3.01 INSTALLERS

A. Employ skilled workers to perform cutting and patching. Retain a recognized, experienced, and specialized firm to cut and patch the following categories of exposed work. For patching roofing and SFRM, engage a qualified installer approved by the existing surface manufacturer.
1. [Decorative concrete finishes.]
2. [Stonework and stone masonry.]
3. [Ornamental metal.]
4. [Matched-veneer woodwork.]
5. Roofing.
6. [Sprayed fire-resistive materials (SFRM).]
7. [Stucco and ornamental plaster.]
8. [Terrazzo.]
9. [Finished wood flooring.]
10. Carpeting.
11. [Wall covering.]
12. HVAC enclosures, cabinets or covers.

B. For newly installed work, employ original installer or fabricator to perform cutting and patching for:

1. Weather exposed or moisture resistant elements including, but not limited to, waterproofing, air/vapor barriers, and roofing.
2. Sprayed fire-resistive materials.
3. Sight exposed finished surfaces.

3.02 EXAMINATION AND PREPARATION

A. Per Div. 01 Section "EXAMINATION AND PREPARATION" and as follows:

B. Verification of Conditions:
1. Verify that utilities have been disconnected and capped before cutting utility elements. Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
2. Examine condition of work to be cut, including elements subject to movement or damage during cutting and patching.
3. After uncovering work, examine conditions affecting installation of new products or performance of work.
4. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

C. Protect in-place construction during cutting and patching to prevent damage.
1. Cover and protect furniture, furnishings, and equipment that have not been removed.

D. Provide protection from adverse weather conditions for portions of Project that or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being cut.
1. Strengthen or add new supports when required during progress of cutting.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Division 01 Section "Work Restrictions."

3.03 CUTTING AND PATCHING, GENERAL

A. Perform cutting and patching of in-place construction:
1. To provide for installation or performance of other work.
2. To coordinate work.
3. To make several parts fit properly.
4. To provide routine penetrations of nonstructural surfaces for installing piping and conduit.
5. To uncover work, including excavation, to provide for installation of ill timed work.
6. To uncover work for access or inspection.
7. To obtain samples for testing.
8. To permit alterations to be performed.
9. To remove and replace work not conforming to requirements of Contract Documents.
10. For other similar purposes.

B. Subsequently fit and patch as required to restore surfaces to their original condition.

C. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

D. Perform cutting and patching using methods least likely to damage construction to remain or adjoining construction, to prevent damage to other work, and provide proper surfaces to receive repairs and new work.

3.04 CUTTING, GENERAL

A. Cut in-place construction using methods least likely to damage elements retained or adjoining construction. When possible, review proposed procedures with original installer; comply with original installer's written recommendations.
   1. When possible, cut or drill from exposed or finished side into concealed surfaces to avoid damage to finished surfaces. When cutting must occur from exposed or finished side, apply protective masking to prevent tools from scratching or otherwise marring finished surfaces.
   2. Neatly finish ends, edges, and other cut surfaces to receive new construction to dimensions indicated with adjoining surfaces square and true.
   3. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use. Neatly cut and trim openings and holes plumb, square, and true to dimensions required.
   4. Tools: When cutting close to construction to remain, use hand tools or small power tools designed for sawing or grinding to minimize disturbance of adjacent surfaces. Do not use hammering and chopping tools near construction to remain.
   5. Cutting Torches: Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations. Maintain adequate ventilation when using cutting torches.

3.05 PROCEDURES FOR CUTTING SPECIFIC MATERIALS

A. Concrete: Use hand-held, power-driven or hydraulic saws with diamond blades specifically design for concrete cutting.

B. Masonry: Cut using power-driven saws with diamond blades specifically design for masonry cutting.

C. Steel: Cut heavy sections using cutting torches. Cut gage-metals and thin pipe and tubing power-driven saws with blades specifically design for material being cut.

D. Finished Wood: Cut using power-driven or hand saws. Use sharp, carbide-tipped blades specifically design for finished use with material being cut.

E. Plastic : Cut using power-driven saws. Use sharp, carbide-tipped blades with small teeth specifically design for finished use with material being cut.

F. Metal Panels: Cut using power-driven saws. Use blades specifically design for metal cutting.

G. Mechanical and Electrical Services: Cut pipe or conduit using power-driven or hand saws. Thread ends of piping as required to receive threaded caps. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

H. Excavating and Backfilling: See Division 31 Section "EARTHWORK."

3.06 PATCHING

A. Verify construction operations and inspections which necessitated cutting are complete prior to proceeding with patching.

B. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances, and finishes.

C. Restore work that has been cut or removed; install new products to provide completed Work in accordance with requirements of Contract Documents.

D. Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
   1. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
      a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
      b. Restore damaged pipe covering to its original condition.
      c. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
   2. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
   3. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

E. Floors, Walls, and Ceilings: Where the removal of flooring, walls, or ceilings extends one finished area into another, patch and the repair floor, wall, and ceiling surfaces to provide an even surface of uniform finish, color, texture, and appearance. If necessary, remove in-place finishes and coverings and replace with new materials, to achieve a uniform appearance.
   1. Where adjacent floor, wall, and ceiling surfaces are significantly misaligned, request a decision from Architect for means to make adjustments such as floor ramping, trim, bulkheads, etc. to mitigate appearance of misalignment.
   2. Re-hang or adjust adjoining edges of suspended ceilings as necessary to provide an even plane surface of uniform appearance.
   3. Where patching painted surfaces, prepare substrates and, over patches, apply primer and intermediate paint coats appropriate for substrates. Apply final paint coats over the entire unbroken surface containing patches. Provide additional coats as required to ensure patches blend with adjacent surfaces.

F. [Patching of Sprayed Fire-Resistive Materials (SFRMs):
   1. SFRM Product: Match existing, to maintain the existing fire resistance rating.
   2. Installer Qualifications: A qualified installer approved by the SFRM manufacturer to install manufacturer's products.
   3. Examine the existing SFRM system and the extent of damage or removal caused by new work or otherwise.
   4. Coordinate the installation of new anchors and fasteners, as for suspended ceilings, partition framing, and the installation of mechanical and electrical work. Patch the SFRM system after the completion of such work.
   5. Apply new SFRM and accessories, to restore the fire resistance ratings.]

3.07 CLEANING

A. Per Div. 01 Sections "PROGRESS CLEANING" and "FINAL CLEANING" and as follows:

B. Clean adjoining surfaces soiled due to cutting and patching work.

3.08 REFINISHING

A. Refinish entire surfaces as necessary to provide an even finish:
   1. Continuous surfaces: To nearest intersections.
   2. Assembly: Refinish entirely.

END OF SECTION 01 73 29

SECTION 01 74 13 - PROGRESS CLEANING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements for progress cleaning while construction is in progress.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Division 01 Section "Final Cleaning."

1.02 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. Cleaning Agents: Use cleaning materials and agents specifically recommended by manufacturer or fabricator of the surface to be cleaned. If specific cleaning materials are not recommended, use cleaning materials and agents that are not hazardous to health or property and that will not damage exposed, finished surfaces.
   1. Use products that comply with Green Seal GS-37 or GS-53.

PART 3 - EXECUTION

3.01 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
   1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
   2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
      a. Use containers intended for holding waste materials of type to be stored.
   4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Immediately upon completion of installation of products, clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

B. Waste Disposal: See Division 01 Section "Construction Waste Management and Disposal."

END OF SECTION 01 74 13

SECTION 01 74 23 - FINAL CLEANING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements for final cleaning prior to Substantial Completion.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Division 01 Section "Progress Cleaning."

1.02 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

1.03 INFORMATIONAL SUBMITTALS

A. Qualification Statements for HVAC System Cleaner.

1.04 QUALITY ASSURANCE

A. Qualifications: In addition to qualifications per Div. 01 Section "QUALITY ASSURANCE":
   1. HVAC System Cleaner: NADCA Certified ASCS technicians.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
   1. Use products that comply with Green Seal GS-37 or GS-53.

PART 3 - EXECUTION

3.01 FINAL CLEANING

A. General: Perform final cleaning.
   1. Employ experienced workers or professional cleaners for final cleaning.
   2. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
   3. Do not use materials or methods which may damage finished surfaces or surrounding construction.
   4. Clean products and finished surfaces per written instructions of product and finished surface manufacturers.
   5. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program.

B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
   1. Project Site:
      a. Clean site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
      b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
      c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
      d. Remove tools, construction equipment, machinery, and surplus material from Project site.
      e. Remove snow and ice to provide safe access to building.
   2. Building Exterior:
      a. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
      a. Clean transparent materials, including glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish glass, taking care not to scratch surfaces.
      b. Remove labels and protective coatings and coverings that are not permanent.
   2. Building Interior:
      a. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
      b. Sweep concrete floors broom clean in unoccupied spaces.
      c. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
      d. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
      e. Remove labels that are not permanent.
      f. Remove dust from accessible surfaces.
   3. Equipment, General:
      a. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
   4. Fire Protection and Plumbing Equipment:
      a. Clean exposed piping and hangers free of dirt, oils, and other contaminants.
      b. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
   5. HVAC Equipment:
      a. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
      b. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
      c. Clean HVAC system in compliance with NADCA Standard 1992-01 "Mechanical Cleaning of Non-Porous Air Conveyance System Components". Provide written report on completion of cleaning.
   6. Electrical Equipment:
      a. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.

B. Leave Project clean and ready for occupancy.

C. Waste Disposal: See Division 01 Section "Construction Waste Management and Disposal."

END OF SECTION 01 74 23

SECTION 01 75 00 - STARTING AND ADJUSTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements for starting and adjusting operating products, systems and equipment.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 QUALITY ASSURANCE

A. Start-Up Personnel Qualifications: Factory-authorized service representative, equipment manufacturer's representative, or installer authorized in writing by equipment manufacture to perform startup procedures.
   1. When specified in individual specification Sections, require manufacturer to provide factory-authorized service representative to be present at site to inspect, check, and approve equipment or system installation prior to startup, and to supervise placing equipment or system in operation.

1.03 STARTING OF SYSTEMS

A. Notify Owner and Architect at least 7 days prior to startup of each system or piece of equipment.

B. Prior to beginning startup verify that:
   1. Equipment is free of latent manufacturing and installation defects.
   2. Lubrication has been performed.
   3. Drive rotation, belt tension, control sequences, tests, meter readings, and electrical characteristics are within manufacturer's requirements.
   4. Utility connections and support components are complete and tested.

C. Perform start-up under supervision of qualified personnel in accordance with manufacturers' instructions.
   1. Complete installation and startup checks according to manufacturer's written instructions.
   2. Perform functional field tests test to verify that the system and components have been properly installed and are functioning properly.

1.04 ADJUSTING

A. Adjust operable and moving parts to ensure smooth and unhindered operation.

B. Perform final lubrication as recommended by manufacturer.

C. Repair or replace units which cannot be adjusted to operate properly as intended for the application.

D. Repair, replace, or restore previously installed work damaged by work of individual Specification Sections to original condition. Obtain approval of the Architect and Owner for repaired work.

E. Final Adjustment: Wherever installation and startup is completed more than one month prior to Substantial Completion, return to the work during the week prior to Substantial Completion acceptance or occupancy, and make final check and adjustment of operable items.
   1. Clean operating items as necessary to restore proper function and finish.
   2. Make necessary adjustments to compensate for final operation of heating and ventilating equipment.

F. Occupancy Adjustments: When specified in individual specification Sections, return to the work within one year from date of Substantial Completion and prior to the end of the correction period.
   1. Provide on-site assistance in adjusting system to suit actual occupied conditions.

G. Submit written report that equipment or system has been properly installed and is functioning correctly.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 75 00

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 ACTION SUBMITTALS

A. Completion and Correction List (a.k.a. Punch List): Comprehensive list of items to be completed or corrected prior to final payment.
   1. Submit prior to requesting initial inspection for Substantial Completion.
   2. Form: Arrange in a tabular format in per the attached "Completion and Correction List Form." MS Excel electronic file available upon request.
   3. Organization of List: Include areas affected by construction operations. If necessary, include areas disturbed by Contractor that are outside the limits of construction.
      a. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
      b. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   4. Submit list of incomplete items in MS Excel electronic file format. Architect will add additional items identified by Architect and return annotated file.

1.03 CLOSEOUT SUBMITTALS

A. Submit the following as specified in individual Specification Sections a minimum of 10 days prior to requesting inspection for Substantial Completion:
   1. Operation and Maintenance Data.
   2. Warranties.
   3. Project Record Documents.
   4. Spare Parts and Extra Stock Materials.
   5. Documentation specified in Div. 01 Section "SUSTAINABLE DESIGN CLOSEOUT DOCUMENTATION."
   6. Properly executed continuing maintenance contracts.
   7. Closeout submittals specified in other Specification Sections, including final completion construction photographic documentation, test/adjust/balance records, demonstration and training video recordings, damage or settlement surveys, property surveys, and similar final record information.
   8. Changeover information related to Owner's occupancy, use, operation, and maintenance.

B. Submit the following prior to requesting inspection for Final Completion:
   1. Affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner’s property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied.
   2. Certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner.

3. Written statement that Contractor knows of no substantial reason that insurance will not be renewable to cover the period required by the Contract Documents.
4. Consent of Surety, if any, to final payment.
5. Final releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract.
6. Certificate of Occupancy from authorities having jurisdiction.
7. Written certification that Contract Documents have been reviewed, Work has been inspected, and that Work, including punch list work, is complete in accordance with the Contract Documents.
8. Submit final Application for Payment showing original Contract Sum, adjustments, previous payments, retainage withheld from previous payments, and sum remaining due.

1.04 SUBSTANTIAL COMPLETION PROCEDURES

A. Complete the following as specified in individual Specification Sections prior to requesting inspection for Substantial Completion:
   1. Terminate and remove the following temporary items:
      a. Temporary Utilities.
      b. Construction Facilities.
      c. Temporary Construction.
      d. Construction Aids.
      e. Vehicular Access and Parking.
      f. Temporary Barriers and Enclosures.
      g. Temporary Controls.
      h. Project Identification.
   2. Remove mockups not indicated to remain, construction tools, and similar items.
   3. Final cleaning.
   4. Touchup painting and otherwise repair and restore marred exposed finishes to eliminate visual defects.
   5. Starting and adjusting and testing of systems and equipment.
   6. Demonstration and training.
   7. Advise Owner of pending insurance changeover requirements.
   8. Make final changeover of permanent locks and deliver keys and keying schedule to Owner.
   9. Advise Owner's personnel of changeover in security provisions.
   10. Advise Owner of changeover in heat and other utilities.

B. Request for Inspection: Submit written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for inspection and tests.

C. Inspection: On receipt of request, Architect will proceed with inspection to determine whether the Work is substantially complete. After inspection Architect will notify Contractor of items, either from Contractor's punch list or additional items identified by Architect, that must be completed or corrected before Certificate of Substantial Completion will be issued.
   1. If the Architect’s inspection discloses any item which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use, Architect will notify Contractor who shall complete or correct such item.
   2. Upon completion of defective work, submit written request for re-inspection to determine Substantial Completion.
      a. Architect will provide up to three inspections for each portion of work. In the event that more than 3 are required, Contractor will back-charge subcontractors to compensate the Architect.

D. When the Work is substantially complete, Architect will prepare the Certificate of Substantial Completion.

1.05 FINAL COMPLETION PROCEDURES

A. Complete items of work from Completion and Correction List, including additional items identified by Architect, prior to requesting inspection for Final Completion.

B. Request for Inspection: Submit written request for inspection to determine Final Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection.

C. Inspection: On receipt of request, Architect will proceed with inspection to determine whether the Work is acceptable under the Contract Documents and the Contract fully performed or notify Contractor of unfulfilled requirements. After inspection Architect will issue a final Certificate for Payment or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Upon completion of defective work, submit written request for re-inspection to determine Final Completion.
      a. Architect will provide up to three inspections for each portion of work. In the event that more than 3 are required, Contractor will back-charge subcontractors to compensate the Architect.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 REPAIR OF INCOMPLETE OR DEFECTIVE ITEMS

A. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
   1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
   2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
      a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
   3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
   4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

3.02 ATTACHMENTS

A. Completion and Correction List. MS Excel electronic file available upon request.

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements for processing operation and maintenance data manuals for products and equipment.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 CLOSEOUT SUBMITTALS

A. Where specified in individual Specification Sections, submit operation and maintenance (O&M) data for provided equipment, products, and systems.
   1. Required content is specified in individual Specification Sections.
   2. Initial Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training.
      a. Submittal Format: Submit or post files in Portable Data File (PDF) format.. Architect will mark any required revisions.
   3. Revise content of manuals as required prior to final submittal.
   4. Final Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training.
      a. Submittal Format: Submit or post files in Portable Data File (PDF) format within 10 days after final inspection.

B. Electronic Document Files:
   1. Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

1.03 OPERATION AND MAINTENANCE DATA

A. Prepare O&M Data for provided equipment, product, or system, defining the importance of system interactions, troubleshooting, and long-term preventive operation and maintenance. Compile, prepare, and aggregate O&M data to include clarifying and updating the original sequences of operation to as-built conditions.
   1. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level.
   2. Bookmark and arrange each submittal by system and subdivide by Specification Section using current version of CSI MasterFormat numbering system
   3. Each manual shall contain:
      a. Project Information: List names, addresses, and telephone numbers of Owner, Architect, and Contractor. For each product and equipment category, identify names, addresses, and telephone numbers of installing subcontractors and suppliers. Include names, addresses, and telephone numbers of Commissioning

Authority and major consultants to the Architect that designed the systems contained in the manuals.
b. Table of Contents and Index.
c. Cross-reference to related systems in other O&M manuals.

B. Contents required in O&M data packages as applicable to system:
1. Directory: Prepare a single, comprehensive directory listing and identifying each category of product, finish, equipment, and system included.
a. List systems and subsystems alphabetical and by CSI MasterFormat number.
b. List equipment for each system alphabetical and by CSI MasterFormat number.
c. Identify each system, subsystem, and piece of equipment with a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."
2. Operating instructions.
a. Significant design criteria.
b. Description and diagrams for operating hardware.
c. Description and operating characteristics for motor operators.
d. Safety precautions and hazards.
e. Operator prestart.
f. Startup, break-in, shutdown, and post-shutdown procedures. Include seasonal and weekend operating procedures.
g. Normal operations.
h. Required sequences for electric or electronic systems.
i. Emergency operations by type of emergency.
j. Operator service requirements.
k. Environmental conditions.
l. Operating log.
3. Preventive maintenance for equipment and systems.
a. Lubrication data.
b. Preventive maintenance plan, schedule, and procedures.
c. Cleaning recommendations.
4. Repair.
a. Troubleshooting guides and diagnostic techniques.
b. Piped system diagrams.
c. Wiring diagrams and control diagrams, including changes made in final work.
d. Repair procedures.
e. Removal and replacement instructions.
f. Spare parts and supply lists.
5. Maintenance instructions for architectural and special finishes and fabrics.
a. Methods for maintaining fabrics and finishes.
b. Cleaning recommendations including recommended cleaning materials.
c. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
d. Safety precautions and hazards.
6. Appendices: Provide information below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:
a. Copies of submittals for each product in manual marked as reviewed and "Approved" or "Approved as Noted" or other similar terms and used for construction.
b. Manufacturer's instructions.
c. Testing and performance data including HVAC balance reports.
d. Certificates.
e. Copies of warranties and bonds.

f. Personnel training requirements.
g. License requirements including inspection and renewal dates.
h. Testing equipment and special tool information.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 78 23

SECTION 01 78 36 - WARRANTIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements for processing warranties for products and equipment.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Sections in Div. 02-49 for requirements for warranties for Work of this Contract.

1.02 DEFINITIONS

A. Contractor's Warranty: Contractual warranty covering the whole of the Work as stipulated in the Conditions of the Contract for Construction.

B. Correction Period: That portion of time beyond the date of Substantial Completion during which the Contractor is obligated to correct defective work.

C. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

D. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner which may either extend the time limit provided by the manufacturer's standard warranty or provide additional rights for the Owner.

E. Installer's Warranty: Written warranty furnished by individual installing subcontractor for installation and workmanship of a particular product.

1.03 INFORMATIONAL SUBMITTALS

A. Submit sample of warranties specified in individual Specification Sections along with other submittals.

1.04 CLOSEOUT SUBMITTALS

A. Where specified in individual Specification Sections, submit executed warranties for provided equipment, products, and systems.
   1. Required warranty terms and conditions are specified in individual Specification Sections. Additional requirements are specified below.
   2. Assemble warranty documents from subcontractors, suppliers, and manufacturers. Ensure that forms have been completed in Owner's name and registered with manufacturer.
   3. Submittal: Submit Warranty Manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training.
      a. Submittal Format: Submit or post files in Portable Data File (PDF) format within 10 days after final inspection. Submit one copy of Warranty Manual in paper format in addition to digital file format.

4. Where commencement of warranties other than date of Substantial Completion is indicated for designated items of Work or when delay in submittal of warranties might limit Owner's rights under warranty, submit warranties on request of Architect.
5. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 15 days after acceptance, listing date of acceptance as start of warranty period.
6. When designated portions of the Work that are completed and occupied or used by Owner during construction period (partial occupancy) submit properly executed warranties within 15 days of completion of designated portions of the Work by separate agreement with Contractor

B. Electronic Document Files:
1. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
2. Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Configure electronic manual to display bookmark panel on opening file.

C. Paper Documents:
1. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
2. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf, post-type or ring binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents.
   a. Identify each binder on front and spine, with printed title "WARRANTIES," Project title or name, subject matter of contents, and indicate CSI MasterFormat number(s) on bottom of spine. Indicate volume number for multiple-volume sets.
3. Dividers: Heavy paper or plastic dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

D. Provide additional copies of each warranty to include in Operation and Maintenance manuals.

1.05 WARRANTIES

A. Warranty Terms and Conditions: Unless otherwise indicated, warranties specified in individual Specification Sections shall stipulate that the party issuing the warranty (manufacturer, installer, or other designated party) agrees to repair or replace components of covered products or assemblies that do not comply with requirements of the Contract Documents or that fail in materials or workmanship within specified warranty period.
1. General Terms and Conditions: As applicable to specified products, failures include, but are not limited to:
   a. Failure of products, assemblies, or systems to meet specified performance requirements.
   b. Defects in material, fabrication or installation.
   c. Structural failures including excessive deflection.
   d. Faulty operation or failure of operating components.
   e. Excessive water leakage or air infiltration for weather exposed components.
   f. Deterioration of materials and finishes beyond normal use or weathering.
2. Specific Warranty Terms and Conditions: See individual Specification Sections for specific content requirements and particular requirements for submitting special warranties.

3. Warranties specified in individual Specification Sections shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Warranty Period: Unless otherwise indicated, warranties shall be in effect for manufacturer's standard length of time but not less than the number of years stipulated in individual Specification Sections beginning from date of Substantial Completion.

C. Warranty Format:
1. Manufacturer's Standard Form: Prepare warranty on manufacturer's standard form modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 78 36

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements for processing Project Record Documents including:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Submittals.
   4. Miscellaneous Record Submittals.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.
   2. Div. 01 Section "CLOSEOUT PROCEDURES" for general closeout procedures.
   3. Div. 01 Section "OPERATION AND MAINTENANCE DATA" for operation and maintenance manual requirements.
   4. Div. 01 Section "WARRANTIES" for warranty manual requirements.

1.02 DEFINITIONS

A. Record Documents: Contractor-maintained copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications marked as Work progresses to indicate field changes and selections made during construction.

1.03 CLOSEOUT SUBMITTALS

A. Preparation: Identify and date each Record Document; include the designation "PROJECT RECORD DOCUMENT" in a prominent location.
   1. Paper Documents: Bind into manageable sets or volumes, each with durable, tear-resistant cover and backing sheets with reinforced binding margin.
   2. Electronic PDF Files: Enable bookmarking of individual documents based on file names. Ensure comment function is enabled.
   3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
   4. Label each set or volume on cover sheets with one of the following titles as appropriate. When more than one set or volume is required, identify by set or volume number with brief indication of volume contents (e.g. "Set 1 of 3 - Architectural Drawings" or "Volume 3 of 3 - MEP Specifications").
      a. "PROJECT RECORD DRAWINGS"
      b. "PROJECT RECORD SPECIFICATIONS"
      c. "PROJECT RECORD SUBMITTALS"
      d. "PROJECT MISCELLANEOUS RECORD SUBMITTALS"
   5. Include the following additional identification on cover sheet:
      a. Project name.
      b. Date.
      c. Index of included documents.
      d. Name of Architect.
      e. Name of Contractor.

6. Initial Submittal: Submit required Record Documents a minimum of 30 days prior to requesting inspection for determining date of Substantial Completion.
    a. Initial Submittal Format: Submit or post files in PDF format..
    b. Architect will indicate whether general scope of content and information, recorded changes, and quality of drafting are acceptable.
    c. Architect will mark any required revisions.
7. Revise content of manuals as required prior to final submittal.
8. Final Submittal: Submit required Record Documents, with required revisions incorporated, in final form at least 5 days before to requesting inspection for Substantial Completion.
    a. Final Submittal Format: Submit or post files in PDF format within 10 days after final inspection.

B. Submit in formats as follows:
1. Record Drawings: Each of the following formats:
    a. Record Prints: Original marked paper prints.
    b. As scanned PDF of original marked paper prints.
    c. Record BIM Digital Model Files.
    d. Record Prints: One paper print from BIM files.
    e. Include newly prepared Record Drawings, if any.
2. Record Specifications:
    a. As originally issued paper copy with all additions, changes, and modifications included.
    b. As scanned PDF of marked-up paper copy.
3. Record Submittals:
    a. Record Samples: As-reviewed physical samples and sample sets marked with any later changes.
    b. As annotated PDF of originally issued Shop Drawings and Product Data.
4. Miscellaneous Record Submittals: Original submittal marked with any later changes.

C. Provide additional copies of reviewed submittals to include in Operation and Maintenance Manuals.

PART 2 - PRODUCTS

2.01 RECORD DRAWINGS.

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up Record Prints.
    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Accurately record information in an acceptable drawing technique.
    c. Record data as soon as possible after obtaining it.
    d. Record and check the markup before enclosing concealed installations.
    e. Cross-reference record prints to corresponding archive photographic documentation.
2. Types of items requiring marking include, but are not limited to, the following:
    a. Field changes of dimension and detail.
    b. Field records for variable and concealed conditions.
    c. Revisions to details shown on Drawings.

d. Details not on original Drawings.
e. Measured depths of foundations in relation to finish floor datum.
f. Measured locations and depths of underground utilities and appurtenances, referenced to permanent surface improvements.
g. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
h. Revisions to routing of piping and conduits.
i. Revisions to electrical circuitry.
j. Actual equipment locations.
k. Duct size and routing.
l. Changes made to original Drawings. Note change type (e.g. Alternate, Construction Change Directive, Change Order, Supplemental Instruction, and similar identification) and number where applicable.
m. Record information on the Work that is shown only schematically.
n. Mark additional important information that was either shown schematically or omitted from original Drawings.

3. Mark Record Prints completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints. Use erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Organize contents according to original Drawings.

B. Record Digital Data Files: Maintain digital data files, including BIM, of the Contract Drawings incorporating new and revised drawings as modifications are issued.
1. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information upon receipt of an acceptable agreement for licensing, use, and protocol for exchange of digital data files.
a. See Div. 00 Section "ELECTRONIC COMMUNICATION PROTOCOLS" for requirements related to use of Architect's digital data files.
b. Architect will provide data file layer information. Record changes in separate layers.
c. Record changes in a manner to differentiate them from the original model.
2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable. Refer instances of uncertainty to Architect for resolution.
3. Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings.
4. Format: Maintain digital data files using same digital data software program, version, and operating system as the original Contract Drawings.
a. Architect's software version is Revit 2020.

C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
3. Organize contents according to original Drawings.

2.02 RECORD SPECIFICATIONS.

A. Record Specifications: Maintain one set of marked-up paper copies of the Contract Specifications incorporating new and revised pages as modifications are issued.
   1. Preparation: Mark each Specification Section to indicate actual Products installed.
   2. Give particular attention where installation varies from that indicated in Specifications, addenda, and contract modifications.
   3. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   4. Organize contents according to Project Manual Table of Contents.
   5. Mark changes and notations to Record Specifications. Highlight products installed and strikeout products not installed.
   6. Mark the Specifications completely and accurately with erasable, red-colored pencil.
   7. Types of changes and notations requiring marking include, but are not limited to, the following:
      a. Manufacturer's name and proprietary product name and model number if not specified.
      b. Record the name of supplier, installer, and other information necessary to provide a record of selections made.
      c. Note Substitutions, Alternates, and product options utilized.
      d. Changes made to original Specifications. Note change type (e.g. Alternate, Construction Change Directive, Change Order, Supplemental Instruction, and similar identification) and number where applicable..

2.03 RECORD SUBMITTALS

A. General: Include only Submittals marked as reviewed and "Approved" or "Approved as Noted" or other similar terms and were used for construction. Do not include submittals that were marked "Revise and Resubmit" or "Rejected" or other similar terms.
   1. Organize contents according to Project Manual Table of Contents.
   2. Note significant changes in products delivered to Project site and changes in manufacturer's written instructions for installation.
   3. Note changes made to original Contract Documents. Note change type (e.g. Alternate, Construction Change Directive, Change Order, Supplemental Instruction, and similar identification) and number where applicable.
   4. Mark any changes to Submittals completely and accurately in a manner to clearly differentiate markings made after review and release for use in construction.

B. Record Product Data: Mark each data sheet to record actual product installed including options, colors, and other selections.

C. Record Shop Drawings: Mark each drawing to record actual construction including field changes of dimension and detail and details not on original Shop Drawings.

D. Record Samples: Mark each sample to record actual product installed including colors, options and other selections. Retain only samples of materials used in the work. Discard samples not installed if loose samples were submitted (i.e. laminate sample chains).
   1. Immediately before date of Substantial Completion, meet with Architect and Owner's personnel at Project site to determine which Samples maintained during the construction period shall be transmitted to Owner for record purposes.
   2. Comply with Architect's instructions for packaging, identification marking, and delivery to Owner's Sample storage space. Dispose of other Samples in the manner specified for disposing surplus and waste materials.

2.04 MISCELLANEOUS RECORD SUBMITTALS

A. Miscellaneous Submittals: Mark each item to record changes required during construction.
   1. Assemble miscellaneous submittals required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
   2. Organize contents according to Project Manual Table of Contents.

PART 3 - EXECUTION

3.01 MAINTENANCE, STORAGE, AND REVISIONS

A. Store Record Documents on site during construction; Store Record Documents separate from documents used for construction. Do not use project record documents for construction purposes.

B. Record changes and revisions to Record Documents concurrent with construction progress. Do not wait until end of Project. Make entries neatly and accurately.

C. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Record Documents for Architect's reference during normal working hours.
   1. Accurately record information in an acceptable drawing technique using personnel proficient at recording graphic information.
   2. Record data as soon as possible after obtaining it.
   3. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
   4. Record and check markup before enclosing concealed installations.

END OF SECTION 01 78 39

SECTION 01 78 40 - SPARE PARTS AND EXTRA STOCK MATERIALS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements for delivering spare parts, extra stock, and maintenance materials to Owner.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 MAINTENANCE MATERIAL SUBMITTALS

A. General: Furnish maintenance materials packaged with protective covering for storage and identified with labels describing contents and including model numbers and other identifying information as applicable. Ensure spare parts and extra stock materials match products installed. Obtain from same product runs and color batches as installed products. Deliver to Project site in location as directed; obtain receipt prior to final payment.

B. Schedule: Prepare and submit schedule of spare parts, extra stock materials and maintenance material items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

C. Time of Submittal: Unless otherwise specified in individual Specification Sections, furnish spare parts and extra stock materials upon completion of associated work, but not less than 10 days prior to requesting inspection for determining date of Substantial Completion.

D. Spare Parts: Furnish spare parts in quantity specified in individual Specification Sections.

E. Extra Stock Materials: Furnish extra materials (attic stock) in quantity specified in individual Specification Sections.

F. Tools: Furnish a complete set of specialized tools for Owner's continued adjustment, maintenance, and removal and replacement of each different or special component furnished
   1. Provide maintenance tools supplied by product manufacturer.
   2. Label body of tools with identifying tool name and purpose.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 78 40

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements for demonstrating operation of systems and equipment and training Owner in operation and maintenance of systems and equipment.

B. Related Requirements:
   1. Requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.02 ADMINISTRATRIVE REQUIREMENTS

A. Coordination:
   1. Provide notification to Owner of dates, times, length of instruction time, and course content.
   2. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
   3. Coordinate content of training modules with content of final O&M manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

B. Pre-instruction Meetings: Conduct meeting at Project site to comply with requirements in Division 01 Section "Project Meetings."
   1. Review locations and other facilities required for instruction.
   2. Review and finalize instruction schedule.
   3. Verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
   4. Review content of instruction.
   5. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.03 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including:
   1. List of training modules.
   2. Learning objective and outline for each training module.
   3. Schedule of proposed dates, times, length of instruction time.
   4. Instructors' names for each training module.
   5. When available, indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

C. Evaluations: Submit participant evaluations for each training module.

D. Qualification Data: For instructor for each training module.

1.04 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
   1. Format: Per Division 01 Section "Photographic Documentation."

B. Training Manual: At completion of training, submit complete training manual(s) for Owner's use in format matching O&M manuals.

1.05 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative experienced in operation and maintenance procedures and training.

PART 2 - PRODUCTS

2.01 INSTRUCTION PROGRAM

A. Program Structure: Individual Specification Sections include requirements for demonstration and training. Develop an instruction program that includes training modules for each system and for equipment not part of a system.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
   1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
      a. System, subsystem, and equipment descriptions.
      b. Performance and design criteria if Contractor is delegated design responsibility.
      c. Operating standards.
      d. Regulatory requirements.
      e. Equipment function.
      f. Operating characteristics.
      g. Limiting conditions.
      h. Performance curves.
   2. Documentation: Review the following items in detail:
      a. Emergency manuals.
      b. Operations manuals.
      c. Maintenance manuals.
      d. Project Record Documents.
      e. Identification systems.
      f. Warranties and bonds.
      g. Maintenance service agreements and similar continuing commitments.
   3. Emergencies: Include the following, as applicable:
      a. Instructions on meaning of warnings, trouble indications, and error messages.
      b. Instructions on stopping.
      c. Shutdown instructions for each type of emergency.
      d. Operating instructions for conditions outside of normal operating limits.
      e. Sequences for electric or electronic systems.
      f. Special operating instructions and procedures.
   4. Operations: Include the following, as applicable:
      a. Startup procedures.
      b. Equipment or system break-in procedures.
      c. Routine and normal operating instructions.

d. Regulation and control procedures.
e. Control sequences.
f. Safety procedures.
g. Instructions on stopping.
h. Normal shutdown instructions.
i. Operating procedures for emergencies.
j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.
7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.
8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.01 DEMONSTRATION AND TRAINING

A. Demonstrate proper operation and maintenance of Products to Owner's personnel at mutually agreed on times at least seven days prior to date of Substantial Completion.

B. For equipment or systems requiring seasonal operation, perform demonstration at start of each season.

C. Conduct demonstration and training on-site in the completed and fully operational facility using the actual equipment in-place.

D. Utilize O&M Manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.

E. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment.

F. Prepare and insert additional data in O&M Manuals when need for additional data becomes apparent during instruction.

END OF SECTION 01 79 00

NEW STATE PUBLIC HEALTH AND ENVIRONMENTAL SCIENCE LAB

DIMONDALE, MI

SCHEMATIC DESIGN
6/16/2023

OWNER

STATE OF MICHIGAN
DTMB
3111 WEST ST. JOSEPH STREET
LANSING, MICHIGAN, 48917
FILE NO.: 171/22186.CAK

ARCHITECTURE

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LANSING OFFICE:
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LANSING, MI, 48912
PHONE: (517) 484-4870

CONTRACTOR

THE CHRISTMAN COMPANY
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DESIGN / PLANNING

CANNON DESIGN
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SUITE 110
CHICAGO, IL 60601
PHONE: (773) 720-2136

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER:

IMEG
201 S ANN ARBOR STREET
SALINE, MI 48176

PHONE: (734) 316-5700

CIVIL ENGINEERING

PEA GROUP
3135 PINE TREE
SUITE D
LANSING, MI 48911

PHONE: (218) 689-9090

SCHEMATIC DESIGN 6/16/2023
DATE ISSUED

DRAWN BY

CHECKED BY

HOBBS + BLACK ARCHITECTS
www.hobbsblack.com

CANNONDESIGN

FILE NO: 171/22186.CAK
INDEX NO: Y23037

PUBLIC HEALTH & ENVIRONMENTAL SCIENCE LAB
DIMONDALE, MI
PROJECT

CONSULTANT

FOR REFERENCE ONLY

NOT FOR CONSTRUCTION

COVER SHEET
SHEET TITLE

22-320
PROJECT NUMBER

G-000
SHEET NUMBER

SCHEMATIC DESIGN 6/16/2023

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G-001	INDEX OF DRAWINGS
G-110	FIRST FLOOR CODE COMPLIANCE PLAN
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G-401	ENERGY DESIGN GOALS

CIVIL

C-0.0	COVER SHEET
C-1.0	BOUNDARY SURVEY
C-1.1	TOPOGRAPHIC SURVEY
C-3.0	OVERALL SITE PLAN
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C-4.0	PRELIMINARY GRADING PLAN
C-6.0	PRELIMINARY UTILITY PLAN
C-7.0	CROWNER DRIVE PLAN AND PROFILE
C-7.1	CROWNER DRIVE PLAN AND PROFILE
C-7.2	DAVIS HIGHWAY/ CROWNER DRIVE INTERSECTION PLAN
C-8.0	NOTES AND DETAILS

STRUCTURE

SK-201	02 LEVEL FRAMING PLAN
SK-202	MAIN ROOF AND PENTHOUSE FLOOR
SK-203	HIGH ROOF FRAMING PLAN
SK-204	CONCEPTUAL EXP JT., BRACING & POUR STRIP PLAN

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SCHEMATIC DESIGN 6/16/2023
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DIMONDALE, MI
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INDEX OF DRAWINGS
SHEET TITLE

22-320
PROJECT NUMBER

G-001
SHEET NUMBER

Autodesk Docs://G07031-MI PH LES Lab/22320-Arch-DTMB State Public Health Environmental Science Lab-2023.rvt
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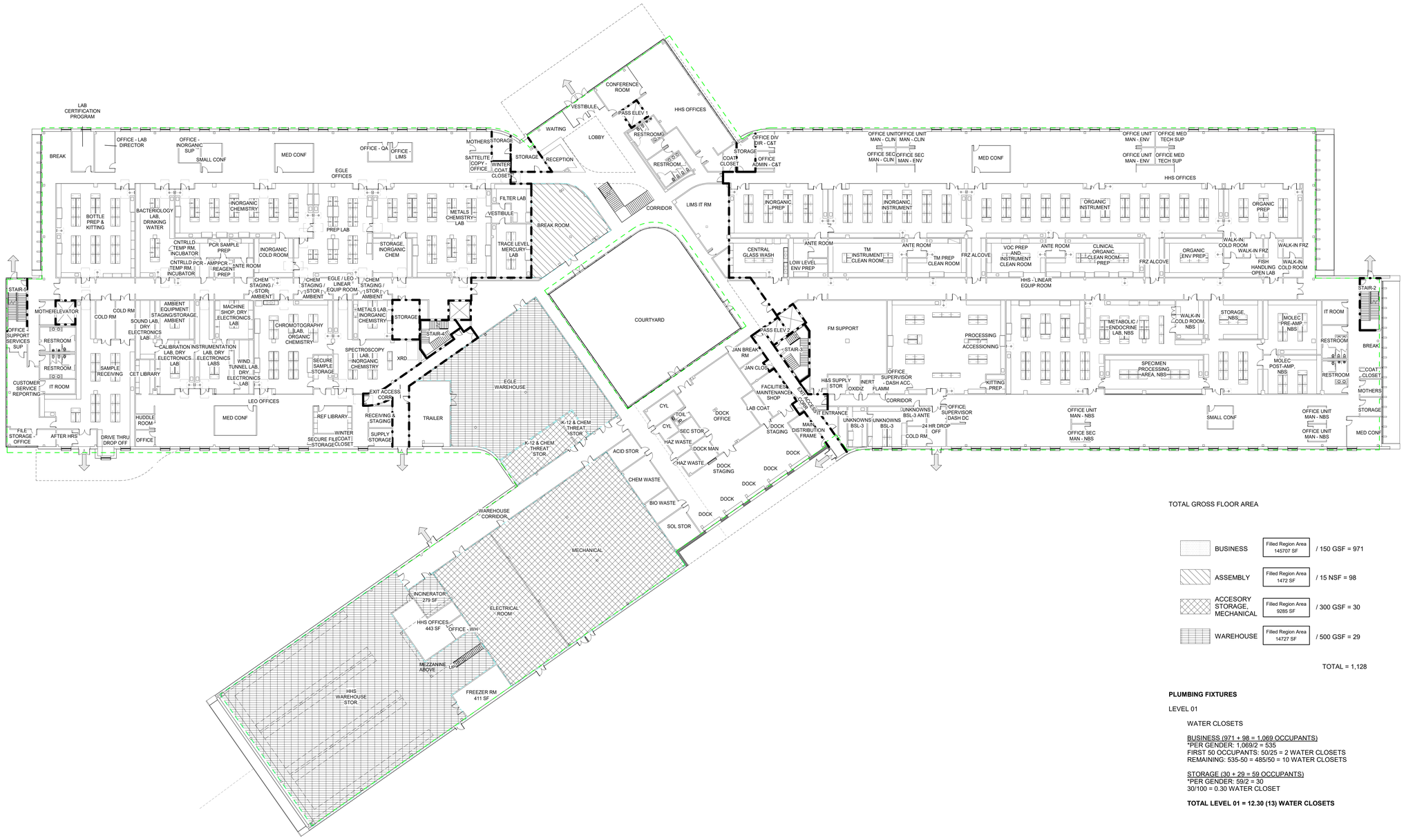

TOTAL GROSS FLOOR AREA

BUSINESS	Filled Region Area 145707 SF	/ 150 GSF = 971
ASSEMBLY	Filled Region Area 1472 SF	/ 15 NSF = 98
ACCESORY STORAGE, MECHANICAL	Filled Region Area 9285 SF	/ 300 GSF = 30
WAREHOUSE	Filled Region Area 14727 SF	/ 500 GSF = 29

TOTAL = 1,128

PLUMBING FIXTURES

LEVEL 01

WATER CLOSETS

BUSINESS (971 + 98 = 1,069 OCCUPANTS)
*PER GENDER: 1,069/2 = 535
FIRST 50 OCCUPANTS: 50/25 = 2 WATER CLOSETS
REMAINING: 535-50 = 485/50 = 10 WATER CLOSETS

STORAGE (30 + 29 = 59 OCCUPANTS)
*PER GENDER: 59/2 = 30
30/100 = 0.30 WATER CLOSET

TOTAL LEVEL 01 = 12.30 (13) WATER CLOSETS

1 LEVEL 01 CODE COMPLIANCE PLAN
1" = 20'-0"

GENERAL NOTES
MAX. PERMITTED EGRESS DISTANCE = 250 FT
1 HR RATING
2 HR RATING
ACCESSIBLE MEANS OF EGRESS AT GRADE
EXIT
FIRE EXTINGUISHER

SCHEMATIC DESIGN 8/16/2023
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FIRST FLOOR CODE COMPLIANCE PLAN
SHEET TITLE

22-320
PROJECT NUMBER

G-110
SHEET NUMBER

Autodesk Docs://22-320 MI PHESL Lab/22320-Arch-DTMB State Public Health & Environmental Science Lab-2023.rvt
8/16/2023 8:58 AM

BUSINESS / 150 GSF = 731

ASSEMBLY Filled Region Area 3352 SF / 15 NSF = 223

ACCESORY STORAGE, MECHANICAL Filled Region Area 1456 SF / 300 GSF = 5

TOTAL = 959

PLUMBING FIXTURES

LEVEL 02

WATER CLOSETS

BUSINESS (731 + 223 = 954 OCCUPANTS)
*PER GENDER: 954/2 = 477
FIRST 50 OCCUPANTS: 50/25 = 2 WATER CLOSETS
REMAINING: 477-50 = 427/50 = 8.54 WATER CLOSETS

STORAGE (5 OCCUPANTS)
*PER GENDER: 5/2 = 2.5
3/100 = 0.03 WATER CLOSET

TOTAL LEVEL 02 = 10.57 (11) WATER CLOSETS

1 / G-120 LEVEL 02 CODE COMPLIANCE PLAN
SCALE - 1" = 20'-0"

GENERAL NOTES
MAX. PERMITTED EGRESS DISTANCE = 250 FT
1 HR RATING
2 HR RATING
ACCESSIBLE MEANS OF EGRESS AT GRADE
EXIT
FIRE EXTINGUISHER

Sheet Size - 36x42

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SECOND FLOOR CODE COMPLIANCE PLAN
SHEET TITLE

22-320
PROJECT NUMBER

G-120
SHEET NUMBER

FOR ALL PROJECT TYPES: [COMPLETE BY **EARLY SCHEMATIC DESIGN**]

GENERAL PROJECT INFORMATION

YEAR OF CONTRACT DOC ISSUANCE	2023		
YEAR OF OCCUPANCY	2025		
NEW CONSTRUCTION OR RENOVATION	NEW CONSTRUCTION		
WHOLE BUILDING OR INTERIOR ONLY	WHOLE BUILDING		
STORIES ABOVE GRADE	2		
STORIES BELOW GRADE	0		
ZIP CODE	48821		
CANNONDESIGN MARKET SECTOR	SCIENCE & TECHNOLOGY		
GROSS BUILDING/PROJECT AREA (GSF)	275,000		
* PRIMARY BUILDING TYPE	Laboratory - recommend use of Labs21	GFA	275,000
* ANCILLARY TYPE 1		GFA	
* ANCILLARY TYPE 2		GFA	
* ANCILLARY TYPE 3		GFA	

* REFER TO THE G0401 SHEET COMPANION FOR SPECIFIC BUILDING TYPE DESIGNATIONS.

FOR NEW CONSTRUCTION, ADDITIONS, AND ALTERATIONS: [COMPLETE BY **EARLY SCHEMATIC DESIGN**]

ENERGY USE INTENSITY (EUI)

ENERGY USE INTENSITY (EUI)	Bm EUI	Target EUI	bEUI	DESIGN EUI
kBTU/SF/YR	340	68	170	TBD
% REDUCTION FROM BmEUI			AIA 2030 CODE REDUCTION	
SOURCE	LABS21	AIA 2030		
EXAMPLE SOURCES	eg. ZEROTOOL (CBECS), PRECEDENT PROJ.	eg. AIA 2030, CLIENT GOAL	eg., DEFAULT ENERGY CODE, PERF. MODEL	eg. CONCEPT MODEL, PERF. MODEL
NEW CONSTRUCTION GFA	275,000	ENVELOPE REPLACEMENT GFA		
ADDITION GFA		MECH SYS REPLACEMENT GFA		
WILL RENEWABLE ENERGY BE ON THE PROJECT?	NO			

FOR INTERIOR ONLY PROJECTS, COMPLETE THE LIGHTING POWER DENSITY TABLE BELOW

1. NEITHER THE BASELINE BUILDING PERFORMANCE, NOR THE PROPOSED BUILDING PERFORMANCE ARE PREDICTIONS OF ACTUAL ENERGY CONSUMPTION OR ENERGY COSTS AND ARE NOT SUITABLE FOR OPERATIONAL BUDGETING OR OTHER DEFINITIVE FINANCIAL PLANNING PURPOSES.
2. THE ACTUAL ENERGY CONSUMPTION AND ENERGY EXPENDITURES OF THE BUILDING WILL DIFFER FROM THESE CALCULATIONS DUE TO VARIATIONS IN OCCUPANCY, BUILDING OPERATIONS, BUILDING MAINTENANCE, WEATHER, ENERGY USES NOT COVERED BY THIS ANALYTICAL PROCEDURE, AND CHANGES IN ENERGY RATES BETWEEN DESIGN OF THE BUILDING AND OCCUPANCY.
3. FOR MORE INFORMATION ON BENCHMARK (Bm) AND BASELINE (b) EUI AND LPD REFER TO THE G0401 SHEET COMPANION.

FOR INTERIOR ONLY PROJECTS: [COMPLETE BENCHMARK AND TARGET BY **EARLY SCHEMATIC DESIGN**]

LIGHTING POWER DENSITY (LPD)

*** LIGHTING POWER DENSITY (LPD)**	Bm LPD	Target LPD	bLPD	DESIGN LPD
W/SF				
% REDUCTION FROM BmLPD				
SOURCE				
EXAMPLE SOURCES	eg. ASHRAE 90.1 2007	eg. 2030 COMMITMENT	eg. CURRENT CODE	eg. CALCULATION
INTERIOR ONLY GSF				

* APPLICABLE TO INTERIOR RENOVATIONS WITH MINIMAL HVAC SCOPE AND MINIMAL (TO NO) ENVELOPE MODIFICATIONS.

FOR ALL PROJECTS: [COMPLETE BY **EARLY SCHEMATIC DESIGN**]

BASIC ENERGY CODE INFORMATION

DOES YOUR PROJECT'S STATE HAVE AN ENERGY CODE? IF NOT, DEFINE YOUR CLIENT'S ENERGY GOALS AND DESCRIBE THEM HERE.	YES
STATE ENERGY CODE STANDARD (INCL. YEAR)	IECC 2015
REFERENCE LINK	
CLIMATE ZONE	5A
ENERGY CODE COMPLIANCE PATH	PERFORMANCE

FOR ALL PROJECTS: [COMPLETE BY **END OF SCHEMATIC DESIGN**]

ENERGY REDUCTION STRATEGIES

DATE OF ENERGY DESIGN WORKSHOP	NO WORKSHOP, STRATEGIES BELOW DISCUSSED DURING DESIGN

LIST TOP 2 ENERGY CONSERVATION MEASURES (ECMs) PER CATEGORY	**ENERGY REDUCTION** (HIGH, MED, LOW)	**PASSIVE OR ACTIVE** -	**SIMULATED** (YES / NO)	**ADOPTED** (YES / NO)
SITE CONDITIONS				
1. REDUCE HEAT ISLAND WITH RESTORED VEGETATION	LOW	PASSIVE		
2.				
MASSING AND ORIENTATION				
1. WWR 40-50%	MED	PASSIVE		
2. REDUCE SHGC OF WEST FACING GLAZING	MED	PASSIVE		
BASIC ENVELOPE ATTRIBUTES				
1. MEET CD RECOMMENDED ASSEMBLY VALUES	HIGH	PASSIVE		
2. SHADING DEVICES @ SOUTH WINDOWS	LOW	PASSIVE		
HVAC / THERMAL COMFORT / PLUMBING				
1. HYBRID GEOTHERMAL SYSTEM	HIGH	ACTIVE		
2.				
LIGHTING / DAYLIGHTING				
1. FLOOR TO CEILING WINDOW FOR MAX DAYLIGHT	MED	PASSIVE		
2.				
PLUG AND PROCESS LOADS				
1.				
2.				
PROGRAM AND OPERATIONS				
1.				
2.				

FOR NEW CONSTRUCTION, ADDITIONS, AND ALTERATIONS WITH ENVELOPE SCOPE: [COMPLETE BY **END OF SCHEMATIC DESIGN**]

WINDOW-TO-WALL RATIO (WWR)

SURFACE	OPAQUE AREA	VISION AREA	SPANDREL AREA	GROSS AREA	[1] WWR (SPANDREL + VISION)	[2] WWR (VISION ONLY)
NORTH WALL SF						
EAST WALL SF						
SOUTH WALL SF						
WEST WALL SF						
TOTAL						
ROOF SF						

AS FENESTRATION SPANDREL AREAS CANNOT MEET THE MINIMUM PRESCRIPTIVE THERMAL PERFORMANCE (MAX. U-VALUE) CODE REQUIREMENT FOR OPAQUE AREAS, ALL PROJECTS WITH A TOTAL BUILDING "WWR (SPANDREL + VISION)" OVER 30% OR 40% WITH DAYLIGHT RESPONSIVE CONTROLS (IECC 2018/2021) MUST FOLLOW THE PERFORMANCE COMPLIANCE PATH AS A CANNONDESIGN QUALITY STANDARD.
NOTE: PERFORMANCE PATH WILL REQUIRE A COMPLIANCE ENERGY MODEL TO INDICATE ENERGY CODE COMPLIANCE TO THE AHJ.

PRESCRIPTIVE ENERGY CODE MAXIMUM WWR FOR WALLS	40%
PRESCRIPTIVE ENERGY CODE MAXIMUM WWR FOR WEST WALL	NOT SPECIFIED
PRESCRIPTIVE ENERGY CODE MAXIMUM SKYLIGHT-TO-ROOF RATIO	N/A

NOTE 1: CALCULATE ((SPANDREL AREA + VISION AREA) / ELEVATION GROSS AREA) x 100. USE FOR CANNONDESIGN REQUIREMENT.
NOTE 2: CALCULATE (VISION AREA / ELEVATION GROSS AREA) x 100. USE THIS FOR PRESCRIPTIVE ENERGY CODE COMPLIANCE.

OPAQUE ASSEMBLY - ENERGY DESIGN PERFORMANCE

FOR NEW CONSTRUCTION, ADDITIONS, AND ALTERATIONS WITH ENVELOPE MODIFICATIONS: [COMPLETE BY **END OF SCHEMATIC DESIGN**] [COMPLETE BY **END OF DESIGN DEVELOPMENT**]

ASSEMBLY	**CD RECOMMENDED ASSEMBLY VALUE**	**DESIGN GOALS (TARGET ASSEMBLY PERFORMANCE)**	**CODE REQUIRED ASSEMBLY PERFORMANCE [1]**	**OPAQUE ASSEMBLY ENERGY DESIGN PERFORMANCE**			**MEETS DESIGN GOALS**
	U-VALUE MAX	**U-VALUE MAX**	**U-VALUE MAX**	**ASSEMBLY 1 U-VALUE**	**ASSEMBLY 2 U-VALUE**	**ASSEMBLY 3 U-VALUE**	**YES / NO**
ROOF	-	-	-	-	-	-	-
INSULATED ABOVE DECK [2]	X.XXX (R-XX)	0.032 (R-32)	0.032 (R-30)				
OPAQUE WALLS	-	-	-	-	-	-	-
STEEL / METAL FRAMED	X.XXX (R-XX)	0.055 (R-19)	U-0.064 (R-13+R-7.5ci)				
CURTAIN WALL SPANDREL	LESS THAN 0.200 (R-5 MIN)	LESS THAN 0.200 (R-5 MIN)	SEE G0401 SHEET COMPANION				
WINDOW WALL SPANDREL	LESS THAN 0.200 (R-5 MIN)	LESS THAN 0.200 (R-5 MIN)	SEE G0401 SHEET COMPANION				
STOREFRONT SPANDREL	LESS THAN 0.200 (R-5 MIN)	LESS THAN 0.200 (R-5 MIN)	SEE G0401 SHEET COMPANION				
MASS (HEAVY & LIGHT)	X.XXX (R-XX)		U-0.09				
WOOD FRAMED AND OTHER	X.XXX (R-XX)						
BELOW GRADE WALLS	X.XXX (R-XX)						

[1] CODE REQUIRED VALUES ARE THE LOWEST LEGAL PERFORMANCE THRESHOLD. THE "DESIGN GOALS (TARGET ASSEMBLY PERFORMANCE)" VALUES AND THE "OPAQUE ASSEMBLY ENERGY DESIGN PERFORMANCE" (YOUR DESIGN) VALUES MUST SURPASS THE "CODE REQUIRED ASSEMBLY PERFORMANCE" AND ARE RECOMMENDED TO BE BETTER THAN OR EQUAL TO THE "RECOMMENDED ASSEMBLY VALUES" PROVIDED ABOVE. DETAILED GUIDANCE ON COMPLETING THE PROCESS AND TABLES ABOVE IS FOUND IN **THE G0401 SHEET COMPANION** ON JIVE.
[2] IN CA TITLE 24, ROOF CONSTRUCTION WITH INSULATION ABOVE DECK FALLS UNDER "WOOD FRAMED AND OTHERS".

FENESTRATION ASSEMBLY - ENERGY DESIGN PERFORMANCE

FOR NEW CONSTRUCTION, ADDITIONS, AND ALTERATIONS WITH ENVELOPE MODIFICATIONS: [COMPLETE BY **END OF SCHEMATIC DESIGN**] [COMPLETE BY **END OF DEVELOPMENT DESIGN**]

ASSEMBLY	**CD RECOMMENDED ASSEMBLY VALUE**			**DESIGN GOALS (TARGET ASSEMBLY PERFORMANCE)**			**CODE REQUIRED ASSEMBLY PERFORMANCE [1]**			**GLASS PERFORMANCE**							**FENESTRATION ASSEMBLY**	**FENESTRATION ASSEMBLY ENERGY DESIGN PERFORMANCE (AT VISION PANELS)**				**MEETS DESIGN GOALS**
	U-VALUE MAX	**SHGC MAX**	**VT MIN**	**U-VALUE MAX**	**SHGC MAX**	**VT MIN**	**U-VALUE MAX**	**SHGC MAX**	**VT MIN**	**GLASS TYPE TAG**	**GLASS U-VALUE**	**CD RECOMMENDED U-VALUE MAX**	**GLASS SHGC**	**CD RECOMMENDED SHGC MAX**	**GLASS VT**	**CD RECOMMENDED VT [3] MIN**	**TYPE TAG**	**U-VALUE**	**SHGC**	**VT**	**YES / NO**
CURTAIN WALL (VISION PANEL ONLY)	X.XX	X.XX	X.XX	0.32	0.38 N/S / 0.33 E/W	0.46	0.38	0.4				< X.XX		X.XX		< X.XX					
WINDOW WALL (VISION PANEL ONLY)	X.XX	X.XX	X.XX	0.32	0.38 N/S / 0.33 E/W	0.46	0.38	0.4				< X.XX		< X.XX		< X.XX					
STOREFRONT (VISION PANEL ONLY)	X.XX	X.XX	X.XX	0.32	0.38	0.46	0.38	0.4				< X.XX		< X.XX		< X.XX					
FIXED WINDOW	X.XX	X.XX	X.XX	0.32	0.38	0.42	0.38	0.4	0.4			< X.XX		< X.XX		< X.XX					
OPERABLE WINDOW	X.XX	X.XX	X.XX	0.41	0.33	0.32	0.45	0.4				< X.XX		< X.XX		< X.XX					

[1] (REFER TO THE REFERENCE NOTE ABOVE, UNDER OPAQUE ENERGY ASSEMBLY PERFORMANCE.)
[3] THE VISUAL TRANSMITTANCE (VT) OF THR CENTER-OF-GLASS (GLASS ONLY) SHOULD BE AS HIGH AS AVAILABLE, WHILE MEETING THE DESIRED U-VALUE AND SHGC, REFER TO THE G0401 SHEET COMPANION.

AUTHORITY HAVING JURISDICTION

THIS SHEET IS AN ENERGY CODE COMPLIANCE AND BUILDING PERFORMANCE PLANNING SHEET, USED BY TEAMS DURING DESIGN. IF THERE ARE ANY CONFLICTS BETWEEN THIS SHEET AND ANY AHJ REQUIRED ENERGY CODE COMPLIANCE FORMS OR REPORTS, THE AHJ REQUIRED DOCUMENTATION TAKES PRECEDENCE.

FOR PROJECTS WITH EMBODIED CARBON GOALS: [COMPLETE BY **END OF CONSTRUCTION DOCUMENTS**]

EMBODIED CARBON

EMBODIED CARBON INTENSITY (ECI) kgCO2e/SF	BASELINE ECI	DESIGN ECI	* TARGET % REDUCTION IN ECI	FINAL % REDUCTION IN ECI
** SUBSTRUCTURE				
SUPERSTRUCTURE				
ENVELOPE				
INTERIORS				
TOTAL				
SOURCE				
EXAMPLE SOURCES	eg., TALLY WBLCA, CLF BASELINE	eg., TALLY WBLCA, EC3 TOOL	eg., 2030 COMMITMENT, CLIENT GOAL	

* THE 2030 COMMITMENT EMBODIED CARBON REDUCTION TARGET IS 45% STARTING IN 2025 AND 100% BY 2040.
** INCLUDES ALL STRUCTURE IN CONTACT WITH THE GROUND, SUCH AS, FOOTINGS AND SLAB ON GRADE.

FOR NEW CONSTRUCTION, ADDITIONS, AND ALTERATIONS: [COMPLETE BY **END OF DESIGN DEVELOPMENT**]

AIR TIGHTNESS PERFORMANCE

FOR HIGH PERFORMING BUIDINGS, WHOLE-BUILDING AIR INFILTRATION TESTING (EG: THE BLOWER DOOR TEST) IS RECOMMENDED. WILL THIS BE PERFORMED?	

FOR ALL PROJECTS: [COMPLETE BY **END OF DESIGN DEVELOPMENT**]

ENERGY CODE COMPLIANCE

HAVE YOU DETERMINED RESPONSIBLE PARTIES FOR COMPLETING ALL ENERGY CODE COMPLIANCE FORMS?	
HAVE YOU VERIFIED ENERGY CODE COMPLIANCE BY ALL DISCIPLINES?	
LINK TO COMPLIANCE FORMS OR ENERGY MODEL REPORT	

FOR NEW CONSTRUCTION, ADDITIONS, AND ALTERATIONS: [COMPLETE BY **END OF DESIGN DEVELOPMENT**]

ANNUAL ENERGY

CONSUMPTION	ANNUAL PREDICTED ENERGY CONSUMPTION	UNITS
GRID ELECTRICITY		
NATURAL GAS UTILITY		
DISTRICT ENERGY		
OTHER FOSSIL FUEL		
GENERATION	ANNUAL PREDICTED ENERGY GENERATION	UNITS
ON-SITE RENEWABLE ENERGY		kWh/YR
ON-SITE SYSTEM CAPACITY		kW
OFF-SITE RENEWABLE ENERGY		kWh/YR
OFF-SITE SYSTEM CAPACITY		kW
CALCULATED ANNUAL NET ENERGY		UNITS
TOTAL CONSUMPTION		kBTU/YR
TOTAL GENERATION		kBTU/YR
NET ENERGY		kBTU/YR
NET EUI WITH RENEWABLES		kBTU/SF/YR

SCHEMATIC DESIGN 6/16/2023
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ENERGY DESIGN GOALS
SHEET TITLE

22-320
PROJECT NUMBER

G-401
SHEET NUMBER

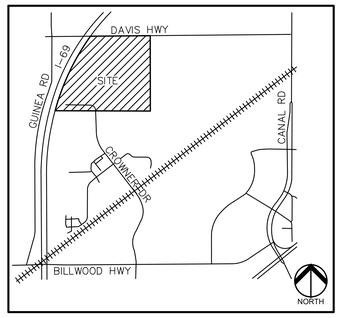
PRELIMINARY SITE - SCHEMATIC DESIGN

MDHHS LAB

CROWNER DRIVE AND DAVIS HIGHWAY

DELTA TOWNSHIP, EATON COUNTY, MICHIGAN

PERMIT / APPROVAL SUMMARY		
DATE SUBMITTED	DATE APPROVED	PERMIT / APPROVAL



LOCATION MAP
NO SCALE

INDEX OF DRAWINGS

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C-7.2	DAVIS HIGHWAY/CROWNER DRIVE INTERSECTION PLAN
C-8.0	NOTES AND DETAILS

DESIGN TEAM

OWNER/APPLICANT/DEVELOPER

NAME
ADDRESS
CITY, STATE ZIP
CONTACT: XXXX
PHONE: XXX.XXX.XXXX
EMAIL: XXXXXXXX

CIVIL ENGINEER

PEA GROUP
3135 PINE TREE ROAD, SUITE D
LANSING, MI 48911
CONTACT: ERIC A. IVERSEN, PE
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ANN ARBOR, MICHIGAN 48104
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LANDSCAPE ARCHITECT

PEA GROUP
SELECT LANDSCAPE ARCHITECT

PEA GROUP

SCHEMATIC DESIGN 6/16/23
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t: 844.813.2949
www.peagroup.com
PEA JOB NO. 22-1150.00

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COVER SHEET

SHEET TITLE

22-320

PROJECT NUMBER

C-0.0

SHEET NUMBER

LEGAL DESCRIPTION:

(PER EATON COUNTY TAX INFROMATION)

NW FRL 1/4 LYING S&E OF HWY R/W. SEC 4, T3N, R3W, WINDSOR TWP

(PER SECONDARY GOVERNMENTAL COMPLEX PLATS.)

PARCEL NO.17 L.455, P.891

Beginning at the Northwest corner of the West 40 acres of the South 62 acres of the Northwest fractional quarter of Section 4, T3N , R3W, Windsor Township, Eaton County, Michigan; thence South 264 feet along the West line of said Northwest fractional quarter; thence East 330 feet at right angles to said West line; thence North 264 feet parallel to said West line; thence West 330 feet to the place of beginning, containing 2 acres, more or less, subject to easements and restrictions of record.

PARCEL NO.19 L.460, P.772

A parcel of land in NW 1/4 of Section 4 T3N , R3W ss: The W 40 acres of S 62 acres of NW frl. 1/4 except the N 264 ft. of W 330 feet. Also , a parcel of land in SW 1/4 of Section 4 T3N, R3W ss : The W 1/2 of SW 1/4 except therefrom : the Grand Trunk Western Railroad R.O.W. and N 165 ft. of W 1/2 of SW 1/4 ; and S 330 ft. of E 132 ft. of W 1/2 of SW 1/4 ; and S 377.14 ft. of E 231 ft. of W 847.6 ft. of W 1/2 of SW 1/4 and also a parcel beg. 327 ft. N of SW cor. of SW 1/4 where Grand Trunk Western Railroad R.O.W. crosses Guinea Road, th N along Guinea Road 552 ft., th E at rt. Angles 285 ft., th S parallel to Guinea Road 348 ft., th SWly along said Railroad R.O.W. to point of beginning, including all fluid mineral, oil and gas rights, subject to easements and restrictions of record, containing 105 acres, more or less.

PARCEL NO.22 L.472, P.454

A parcel of Land in Section 4, T3N, R3W , described as : Commencing at the NE corner of the NW fractional 1/4 ; thence South 35.63 chains; thence West 14.30 chains; thence North 15.63 chains; thence West 68.04 rods; thence North 80.52 rods; thence East 146.295 feet ; thence South 340.7 feet; thence East 386.6 feet; thence North 340.7 feet; thence East to point of beginning.

AND also commencing at the NW corner of the NW fractional 1/4 ; thence South 80.52 rods; thence East 34.77 rods; thence North 80.52 rods; thence West 34.77 rods to point of beginning, together with all singular hereditaments and appurtenances thereunto belonging or in anywise appertaining, including all fluid mineral, oil and gas rights , subject to easements and restrictions of record, containing 99.29 acres, more or less.

DMB TO DNR SECONDARY COMPLEX LEASE
PARCEL DNR #1

A PARCEL OF LAND IN THE N ¼OF SECTION 4, T3N – R3W, WINDSOR TOWNSHIP, EATON COUNTY, MICHIGAN, MORE PARTICULARLY DESCRIBED AS BEGINNING AT THE N ¼CORNER OF SAID SECTION 4; THENCE S89°59'23"E 10.41 FEET TO THE S ¼ CORNER OF SECTION 33, T4N – R3W; THENCE N89°49'17"E 2512.35 FEET ON THE NORTH LINE OF SAID SECTION 4 TO THE WESTERLY RIGHT OF WAY OF CANAL ROAD; THENCE S00°02'44"E 440.60 FEET ON SAID ROAD RIGHT OF WAY; THENCE N89°57'16"E 20.00 FEET ON SAID RIGHT OF WAY; THENCE S00°02'44"E 384.90 FEET ON SAID RIGHT OF WAY TO THE NORTHWESTERLY RIGHT OF WAY OF THE GRAND TRUNK WESTERN RAILROAD; THENCE ALONG SAID RAILROAD RIGHT OF WAY FOR THE FOLLOWING THREE (3) COURSES:
1. S55°41'00"W 69.95 FEET;
2. 504.97 FEET ON THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 10165.54 FEET, A CENTRAL ANGLE OF 02°50'46" AND A LONG CHORD BEARING S54°15'36"W 504.92 FEET;
3. S52°49'20"W 1969.86 FEET TO THE NORTH LINE OF A CONSUMERS POWER COMPANY FEE STRIP;

THENCE S85°58'52"W 504.43 FEET ON SAID NORTH LINE TO THE CENTER OF SAID SECTION 3; THENCE S89°50'04"W 1427.65 FEET ON SAID NORTH LINE; THENCE N00°12'19"E 1225.54 FEET; THENCE N89°42'17"W 873.95 FEET TO THE EASTERLY RIGHT OF WAY OF INTERSTATE HIGHWAY I–69; THENCE ALONG SAID RIGHT OF WAY FOR THE FOLLOWING FIVE (5) COURSES:
1. 1205.29 FEET ON THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 4992.96 FEET, A CENTRAL ANGLE OF 13°49'52" AND A LONG CHORD BEARING N29°00'01"E 1202.37 FEET;
2. S89°59'20"E 653.13 FEET;
3. N00°00'40"E 50.16 FEET;
4. S89°59'20"E 270.20 FEET;
5. N00°00'40"W 50.11 FEET TO THE NORTH LINE OF SAID SECTION 4;

THENCE N89°59'23"E 787.83 FEET ON SAID NORTH LINE TO THE POINT OF BEGINNING, CONTAINING 192.22 ACRES.

UTILITY INFORMATION

WATER MAIN – DELTA CHARTER TOWNSHIP
SANITARY SEWER – DELTA CHARTER TOWNSHIP
STORM SEWER – DELTA CHARTER TOWNSHIP
ELECTRIC – LANSING BOARD OF WATER AND LIGHT
TELEPHONE – AT&T
GAS – CONSUMERS ENERGY
FIBER OPTIC – ROGERS TELECOM UNDERGROUND FIBER OPTIC

SURVEYOR'S NOTES

A) BEARINGS WERE BASED ON MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE

B) WETLAND WAS LOCATED BY PEA GROUP ON MARCH 19, 2023.

FLOODPLAIN NOTE:

BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26045C0216E DATED NOVEMBER 26, 2010.

BENCHMARKS

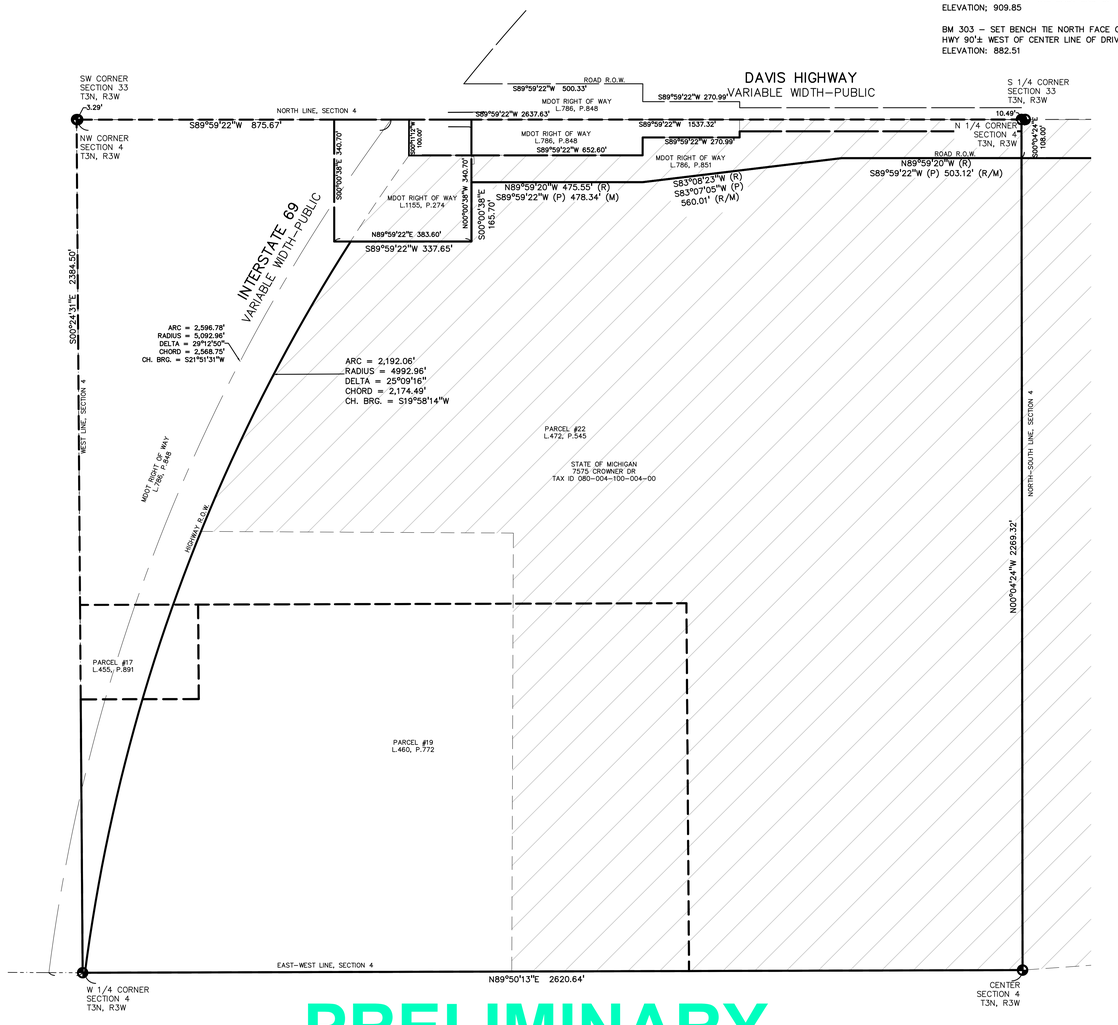
(NAVD 88, GPS DERIVED)

BM 300 – NAIL IN THE SOUTH SIDE OF LIGHT POLE BASE LOCATED 100'± NORTHEAST OF THE NORTHWEST CORNER OF A BROWN SHEET METAL GARAGE BUILDING (MDOT).
ELEVATION: 886.59

BM 301 – NAIL IN THE WEST SIDE OF LIGHT POLE BASE LOCATED 17'± EAST OF THE CENTERLINE OF COWER DRIVE AND 180'± NORTHERLY OF FLAG POLE.
ELEVATION: 887.09

BM 302 – CUT "+" IN TO OF SIDE WALL AT EAST END OF BRIDGE ON DAVIS HWY. OVER I–69 BEING 3.3'± OF THE EAST END OF THE SIDE WALL.
ELEVATION; 909.85

BM 303 – SET BENCH TIE NORTH FACE OF POWER POLE ON THE SOUTH SIDE OF DAVIS HWY 90'± WEST OF CENTER LINE OF DRIVE TO HOUSE NUMBER 8375.
ELEVATION: 882.51



PRELIMINARY

LEGEND:

- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC.MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN & LIGHTPOLE
- EX. FENCE
- EX. GUARD RAIL
- EX. SPOT ELEVATION
- EX. CONTOUR
- EX. WETLAND
- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- R P C RECORDED / PROJECTED / CALCULATED
- DMB TO DNR SECONDARY COMPLEX LEASE

REVISIONS	
ADDED TOPO	03/22/23

ORIGINAL ISSUE DATE: JANUARY 23, 2023

DRAWING TITLE:
BOUNDARY SURVEY

PEA JOB NO.	2022-1150
P.M.	JH
SUR.	JH
DN.	JML

DRAWING NUMBER:
C-1.0

PEA GROUP
t: 844.813.2949
www.peagroup.com

NORTH
0 75 150 300
SCALE: 1" = 150'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED ON RECORDS APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT
HOBBS & BLACK ARCHITECTS, INC.
117 E. ALLEGAN STREET
LANSING, MICHIGAN 48933

PROJECT TITLE
MDHHS LAB
DELTA TOWNSHIP, MICHIGAN 48813

FILE NO: 171/22186.CAK
INDEX NO: Y23037

PUBLIC HEALTH & ENVIRONMENTAL SCIENCE LAB
DIMONDALE, MI
PROJECT

PEA GROUP
t: 844.813.2949
www.peagroup.com
PEA JOB NO. 22-1150.00
CONSULTANT

FOR REFERENCE ONLY

NOT FOR CONSTRUCTION

BOUNDARY SURVEY
SHEET TITLE

22-320
PROJECT NUMBER

C-1.0
SHEET NUMBER

HOBBS + BLACK ARCHITECTS
www.HOBBS-BLACK.com

CANNONDESIGN

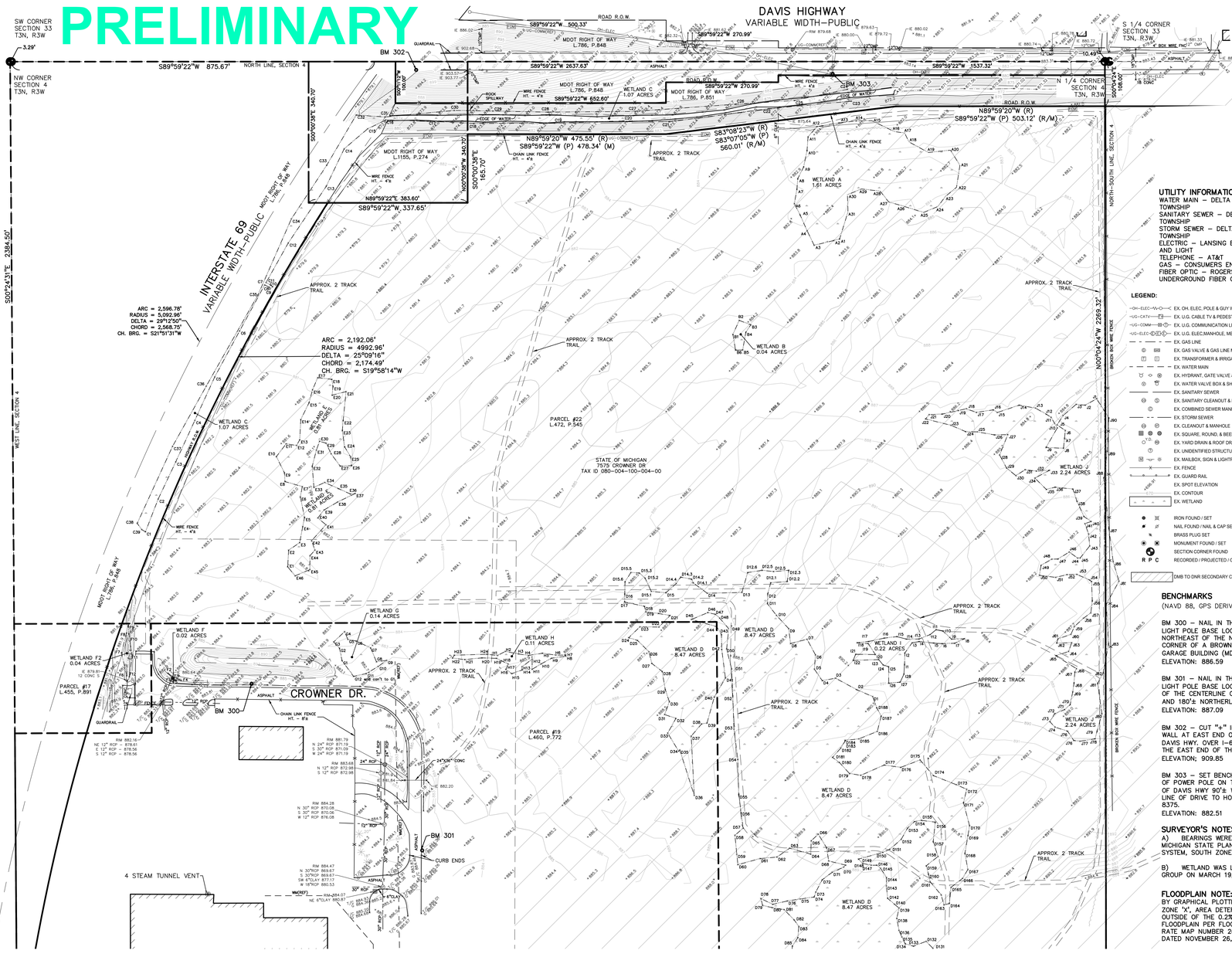
Sheet Size - 36x48

SCHEMATIC DESIGN 6/16/23
DATE ISSUED
DRAWN BY
CHECKED BY

S:\PROJECTS\2022\2022-1150 MDHHS LAB - REPDWG\CONCEPT\C-1.0_C-1.1(TOPO-22-1150.DWG PLOT DATE: 16/06/2023 BY: Shannon Pugh

S:\PROJECTS\2022\2022-1150 MDHHS LAB - REPDWG\CONCEPT\C-1.0_C-1.1(TOPO-22-1150.dwg PLOT DATE: 6/16/2023 11:38 AM BY: Shannon Pugh

PRELIMINARY



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UNDERGROUND FIBER OPTIC

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- IRON FOUND / SET
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- MONUMENT FOUND / SET
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- RECORDED / PROJECTED / CALCULATED
- DMB TO DNR SECONDARY COMPLEX LEASE

BENCHMARKS

(NAVD 88, GPS DERIVED)

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NORTH

0 50 100 200
SCALE: 1" = 100'

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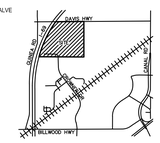

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DELTA TOWNSHIP, MICHIGAN 48813

REVISIONS	
ADDED TOPO	03/22/23

ORIGINAL ISSUE DATE:
JANUARY 23, 2023

DRAWING TITLE
TOPOGRAPHIC SURVEY

PEA JOB NO.	2022-1150
P.M.	JH
SUR.	JH
DN.	JML

DRAWING NUMBER:
C-1.1

PEA GROUP
t: 844.813.2949
www.peagroup.com

Sheet Size - 36x48

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CANNONDESIGN

FILE NO: 171/22186.CAK
INDEX NO: Y23037

PUBLIC HEALTH & ENVIRONMENTAL SCIENCE LAB
DIMONDALE, MI

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PEA GROUP
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PEA JOB NO. 22-1150.00

CONSULTANT

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TOPOGRAPHIC SURVEY
SHEET TITLE

22-320
PROJECT NUMBER

C-1.1
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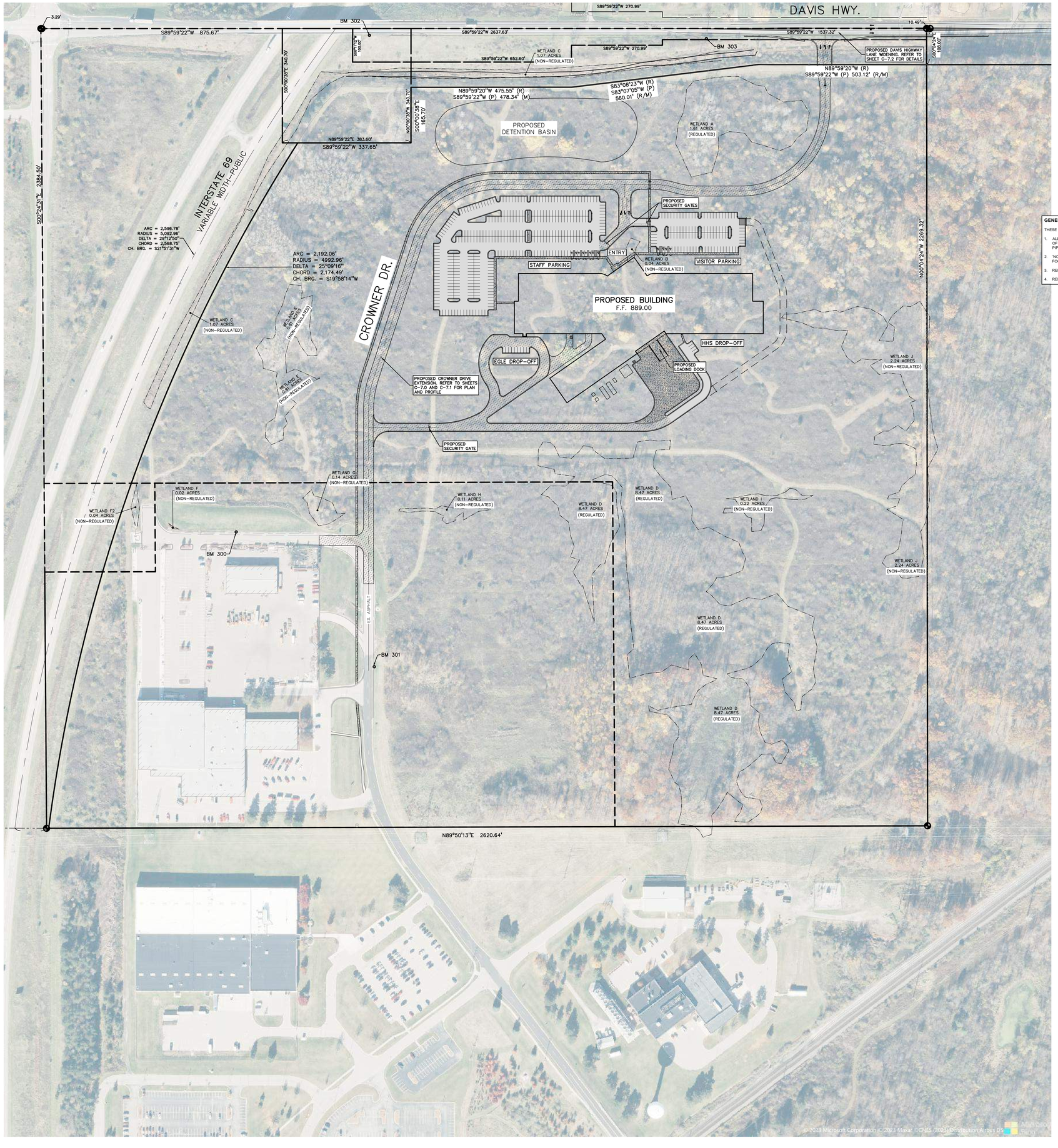

LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

NORTH

0 50 100 200

SCALE: 1" = 100'

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
2. 'NO PARKING-FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT XXX FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. REFER TO NOTES & DETAILS SHEET FOR ON-SITE PAVING DETAILS.
4. REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS

Sheet Size - 36x48

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PEA JOB NO. 22-1150.00

CONSULTANT

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OVERALL SITE PLAN

SHEET TITLE

22-320

PROJECT NUMBER

C-3.0

SHEET NUMBER

S:\PROJECTS\2022\2022-1150 MDHHS LAB - REPD\WDC\CONCEPT\C-3.0\OVERALLSITE-22-1150.DWG PLOT DATE: 16/06/2023 BY: Shannon Pugh

LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
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- SIGN
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- FENCE
- GUARD RAIL

NORTH

0 15 30 60

SCALE: 1" = 30'

GENERAL NOTES:

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3. REFER TO NOTES & DETAILS SHEET FOR ON-SITE PAVING DETAILS.
4. REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS

REFER TO SHEET C-7.2 FOR DAVIS HWY. AND CROWNER DRIVE INTERSECTION DETAILS

DAVIS HWY.

S89°59'22"W 2637.63'

S89°59'22"W 1537.32'

S89°59'22"W 270.99'

S89°59'22"W 652.60'

WETLAND C
1.07 ACRES

BM 303

27.33'r

N89°59'20"W (R)
S89°59'22"W (P) 503.12' (R/M)

S83°08'23"W (R)
S83°07'05"W (P)
560.01' (R/M)

N89°59'20"W 475.55' (R)
S89°59'22"W (P) 478.34' (M)

PROPOSED DITCH

WETLAND A
1.61 ACRES
(REGULATED)

PROPOSED DETENTION BASIN

165.70'

HEAVY DUTY ASPHALT PAVEMENT, TYP. REFER TO DETAIL ON SHEET C-8.0

265'r

235'r

MATCHLINE – SEE SHEET C-3.2

MATCHLINE – SEE SHEET C-3.2

CROWNER DR.

30'

24.5'r

24.3'r

12.5' 12' 12.5'

37'

S:\PROJECTS\2022\2022-1150 MDHHS LAB - REP\DWG\CONCEPT\[C-3.1-C-3.3]SITE 22-1150.DWG PLOT DATE: 16/06/2023 BY: Shannon Pugh

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CANNONDESIGN

FILE NO: 171/22186.CAK
INDEX NO: Y23037

PUBLIC HEALTH & ENVIRONMENTAL SCIENCE LAB
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PEA JOB NO. 22-1150.00

CONSULTANT

FOR REFERENCE ONLY

NOT FOR CONSTRUCTION

SITE PLAN - NORTH

SHEET TITLE

22-320

PROJECT NUMBER

C-3.1

SHEET NUMBER

SITE DATA TABLE:

SITE AREA: X.XX ACRES (XX,XXX SF.) NET AND GROSS

ZONING: XXXXXX

PROPOSED USE: RETAIL (X,XXX SF)/RESTAURANT (X,XXX SF.)

BUILDING INFORMATION:
MAXIMUM ALLOWABLE BUILDING HEIGHT = XX FT.(X STORIES)
PROPOSED BUILDING HEIGHT = X STORY

BUILDING FOOTPRINT AREA = X,XXX SF.

BUILDING LOT COVERAGE = X.X%

SETBACK REQUIREMENTS:	REQUIRED:	PROPOSED:
FRONT (NORTH)	X'	X'
SIDE (EAST)	X'	X'
SIDE (WEST)	X'	X'
REAR (SOUTH)	X'	X'

PARKING CALCULATIONS:
RETAIL = 1 SPACE PER XXX. SF.
TOTAL RETAIL PARKING REQUIRED = X,XXX/XXX = XX SPACES

RESTAURANT = XX EMPLOYEES + XX PERSONS IN SEATING & WAITING AREAS:
RESTAURANT A = XX SPACES FOR XX SEATS INDOOR, X SPACES REQUIRED FOR SEATING LESS THAN XX (XX OUTDOOR SEATS), X SPACES FOR XX EMPLOYEES, X SPACES FOR XX PEOPLE MAXIMUM OCCUPANCY IN XXX SF WAITING AREA:
TOTAL PARKING REQUIRED = XX SPACES

RESTAURANT B = XX SPACES FOR XX SEATS INDOOR, X SPACES FOR XX EMPLOYEES, X SPACES FOR XX PEOPLE MAX. OCCUPANCY IN XXX SF WAITING AREA:
TOTAL PARKING REQUIRED = XX SPACES

TOTAL REQUIRED PARKING = XX SPACES

TOTAL PROPOSED PARKING SPACES = XX SPACES INC. X H/C SPACES

BICYCLE PARKING REQUIRED = X% OF TOTAL CAR SPACES = X SPACES
BICYCLE PARKING PROVIDED = X SPACES

LOADING CALCULATIONS:
LOADING REQUIRED = 1 SF. PER L.F. OF BUILDING FRONTAGE OR XXX SF. PER BUILDING
LOADING PROVIDED = XXX SF. AT BACK OF BUILDING

OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = XX%
PROVIDED OPEN SPACE = XX%

SITE SOILS INFORMATION:
ACCORDING TO THE USDA NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY FOR (WAYLAND) COUNTY, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:

XXXXXXX
XXXXXXX

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'	(R)
SIDEWALK RAMP 'TYPE F'	(F)
SIDEWALK RAMP 'TYPE P'	(P)
SIDEWALK RAMP 'TYPE C'	(C)
SIDEWALK RAMP 'TYPE D'	(D)
CURB DROP ONLY	(X)

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
'BARRIER FREE PARKING' SIGN	[3]
'VAN ACCESSIBLE' SIGN	[4]
'CROSSWALK' SIGN	[5]
'DO NOT ENTER' SIGN	[6]
'SIDEWALK ENDS' SIGN	[7]
'NO PARKING LOADING ZONE' SIGN	[8]

REFER TO DETAIL SHEET FOR SIGN DETAILS

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
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4. REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS

LEGEND:

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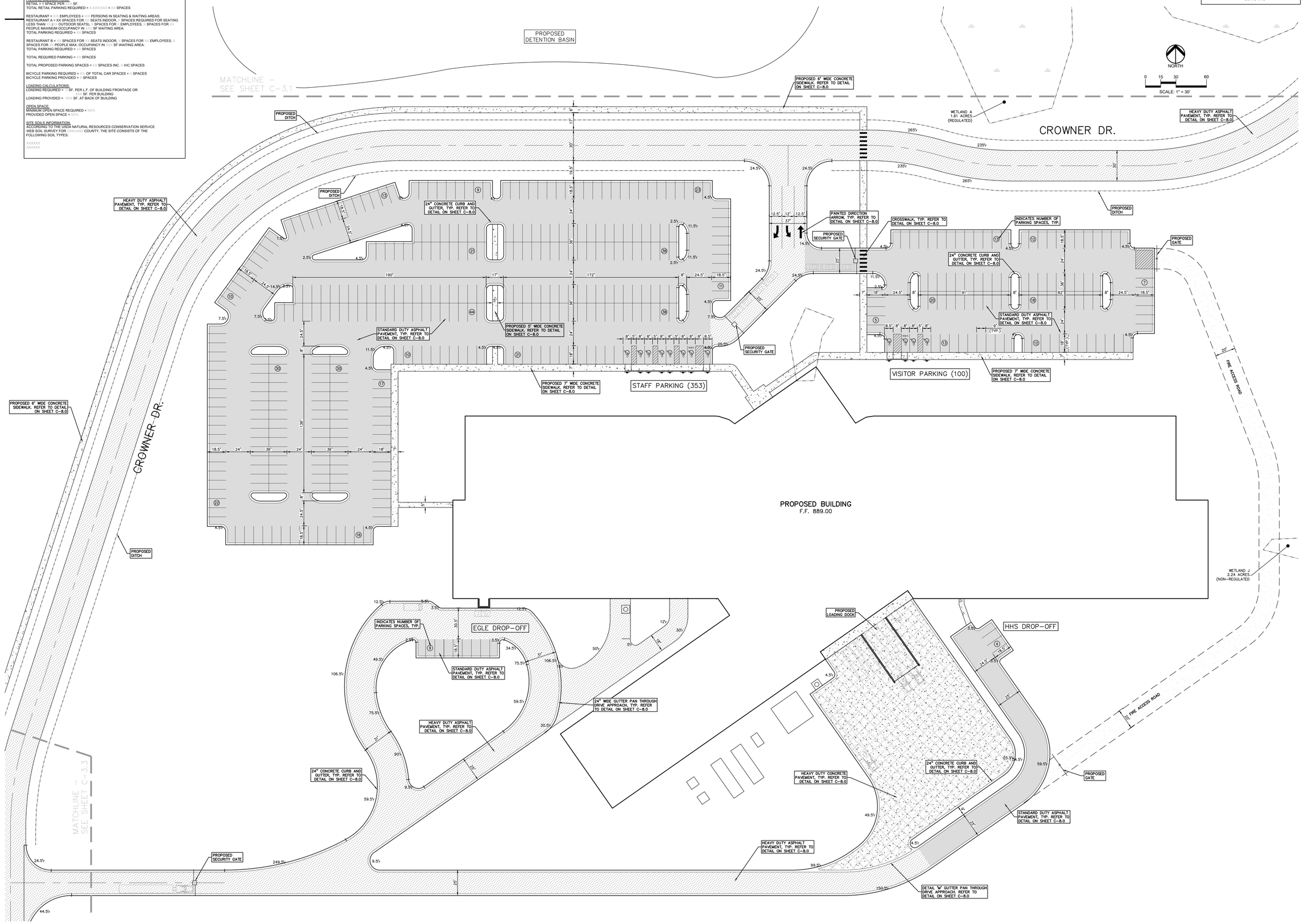

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SITE PLAN - CENTRAL
SHEET TITLE

22-320
PROJECT NUMBER

C-3.2
SHEET NUMBER

S:\PROJECTS\2022\22022-1150 MDHHS LAB - REPIN\WD\CONCEPT\[C-3.1-C-3.3]SITE 22-1150.DWG PLOT DATE: 18/06/2023 BY: Shannon Pugh

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NORTH

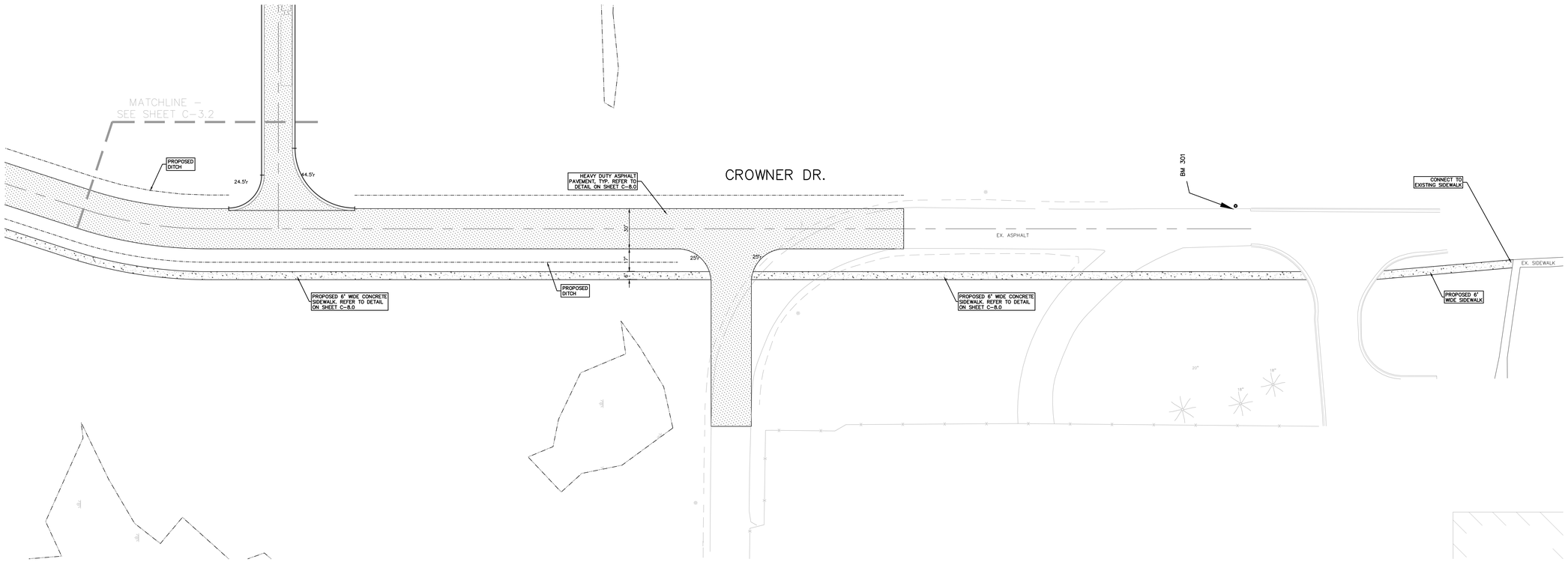
0 15 30 60

SCALE: 1" = 30'

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
2. 'NO PARKING-FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT XXX FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. REFER TO NOTES & DETAILS SHEET FOR ON-SITE PAVING DETAILS.
4. REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS



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FILE NO: 171/22186.CAK
INDEX NO: Y23037

PUBLIC HEALTH & ENVIRONMENTAL SCIENCE LAB
DIMONDALE, MI
PROJECT

PEA GROUP
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www.peagroup.com
PEA JOB NO. 22-1150.00
CONSULTANT

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SITE PLAN - SOUTH
SHEET TITLE

22-320
PROJECT NUMBER

C-3.3
SHEET NUMBER

S:\PROJECTS\2022\22022-1150 MDHHS LAB - REP\DWG\CNCEPT\[C-3.1-C-3.3]SITE-22-1150.DWG PLOT DATE: 16/06/2023 BY: Shannon Pugh

DAVIS HIGHWAY
VARIABLE WIDTH–PUBLIC

S89°59'22"W 500.33'
S89°59'22"W 270.99'
S89°59'22"W 2637.63'
S89°59'22"W 1537.32'
S89°59'22"W 270.99'
S89°59'22"W 652.60'
BM 302
BM 303
WETLAND C
1.07 ACRES
N00°01'12"W
100.00'
N89°59'20"W (R)
S89°59'22"W (P) 503.12' (R/M)
S83°08'23"W (R)
S83°07'05"W (P)
560.01' (R/M)
N89°59'20"W 475.55' (R)
S89°59'22"W (P) 478.34' (M)
N00°00'38"W 340.70'
S00°00'38"E
165.70'
489°59'22"E 383.60'
89°59'22"W 337.65'
PROPOSED DETENTION BASIN
WETLAND A
1.61 ACRES
PROPOSED BUILDING
F.F. 889.00
WETLAND B
0.04 ACRES
CROWNER DR.
MATCHLINE
MATCHLINE
MATCHLINE
MATCHLINE
TLAND G
4 ACRES
WETLAND H
0.11 ACRES
WETLAND D
8.47 ACRES
WETLAND D
8.47 ACRES
WETLAND I
0.22 ACRES
24"X36" CONC
BM 301

GRADING LEGEND:

- EXISTING SPOT ELEVATION
- 922.50 — PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES
- 870 — EXISTING CONTOUR
- 922 — PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB	G = GUTTER GRADE
T/P = TOP OF PAVEMENT	FG = FINISH GRADE
T/S = TOP OF SIDEWALK	RIM = RIM ELEVATION
T/W = TOP OF WALL	B/W = BOTTOM OF WALL

REFER TO GRADING NOTES ON SHEET C-X.X

NORTH

0 30 60 120

SCALE: 1" = 60'

Sheet Size - 36x48

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PRELIMINARY GRADING PLAN

SHEET TITLE

22-320

PROJECT NUMBER

C-4.0

SHEET NUMBER

S:\PROJECTS\2022\2022-1150 MDHHS LAB - RFP\DWG\CONCEPT\C-4.0\GRADE-22-1150.DWG PLOT DATE: 16/06/2023 BY: Shannon Pugh

DAVIS HIGHWAY
VARIABLE WIDTH–PUBLIC

BM 302

BM 303

OUTFALL

PROPOSED DETENTION BASIN

CROWNER DR.

PROPOSED BUILDING
F.F. 889.00

64'–36" STORM DRAIN
52'–36" STORM DRAIN
13'–36" STORM DRAIN
40'–12" STORM DRAIN
148'–12" STORM DRAIN
PROPOSED CATCH BASIN, TYP.
119'–30" STORM DRAIN
FIRE HYDRANT, TYP.
45° BEND
119'–30" STORM DRAIN
45° BEND
23'–12" PVC WATER MAIN
5'–12" PVC WATER MAIN
120'–30" STORM DRAIN
PROPOSED CATCH BASIN, TYP.
204'–30" STORM DRAIN
48'–12" STORM DRAIN
92'–12" STORM DRAIN
236'–24" STORM DRAIN
212'–24" STORM DRAIN
12" GATE VALVE
12" GATE VALVE
12"x12"x12" TEE
10'–12" PVC WATER MAIN
12" GATE VALVE
12"x12"x6" TEE
FIRE HYDRANT, TYP.
12'–6" PVC WATER MAIN
265'–12" PVC WATER MAIN
45° BEND
50'–12" STORM DRAIN
49'–12" STORM DRAIN
12'–12" PVC WATER MAIN
45° BEND
CONNECT TO EXISTING WATER MAIN.
259'–15" STORM DRAIN
50'–12" PVC SANITARY SEWER at 0.25%
400'–12" SANITARY SEWER at 0.25%
208'–12" SANITARY SEWER at 0.25%
483'–12" PVC WATER MAIN
264'–8" SANITARY SEWER
128'–8" SANITARY SEWER
36'–24" STORM DRAIN
44'–12" PVC WATER MAIN
12" GATE VALVE
407'–12" PVC WATER MAIN
24'–12" STORM DRAIN
PROPOSED MANHOLE, TYP.
PROPOSED CATCH BASIN, TYP.
12"x12"x12" TEE
284'–8" SANITARY SEWER
FIRE HYDRANT, TYP.
29'–24" STORM DRAIN
70'–24" STORM DRAIN
95'–6" SANITARY SEWER
24'–12" STORM DRAIN
459'–12" PVC WATER MAIN
286'–8" SANITARY SEWER
269'–18" STORM DRAIN
45° BEND
199'–8" PVC WATER MAIN
PROPOSED MANHOLE, TYP.
57'–15" STORM DRAIN
50'–18" STORM DRAIN
24'–12" STORM DRAIN
125'–8" STORM DRAIN
125'–8" STORM DRAIN
121'–8" STORM DRAIN
134'–15" STORM DRAIN
24'–12" STORM DRAIN
PROPOSED CATCH BASIN, TYP.
175'–8" SANITARY SEWER
FIRE HYDRANT, TYP.
56'–12" STORM DRAIN
PROPOSED MANHOLE, TYP.
204'–12" PVC WATER MAIN
182'–8" SANITARY SEWER
120'–60" STORM DRAIN
60'–12" STORM DRAIN
69'–12" STORM DRAIN
PROPOSED CATCH BASIN, TYP.
94'–24" STORM DRAIN
120'–15" STORM DRAIN
171'–18" STORM DRAIN
465'–12" PVC WATER MAIN
111'–15" STORM DRAIN
111'–15" STORM DRAIN
36'–24" STORM DRAIN
120'–30" STORM DRAIN
130'–30" STORM DRAIN
31'–12" STORM DRAIN
114'–18" STORM DRAIN
180'–15" STORM DRAIN
123'–15" STORM DRAIN
99'–12" STORM DRAIN
FIRE HYDRANT, TYP.
PROPOSED CATCH BASIN, TYP.
137'–15" STORM DRAIN

24"x36" CONC.

UTILITY LEGEND:

- EX. OH. ELEC. POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC.MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- PROPOSED WATER MAIN
- PROPOSED HYDRANT AND GATE VALVE
- PROPOSED TAPPING SLEEVE, VALVE & WELL
- PROPOSED POST INDICATOR VALVE
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY CLEANOUT & MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER CLEANOUT & MANHOLE
- PROPOSED CATCH BASIN, INLET & YARD DRAIN

NORTH

0 30 60 120
SCALE: 1" = 60'

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FILE NO: 171/22186.CAK
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CONSULTANT

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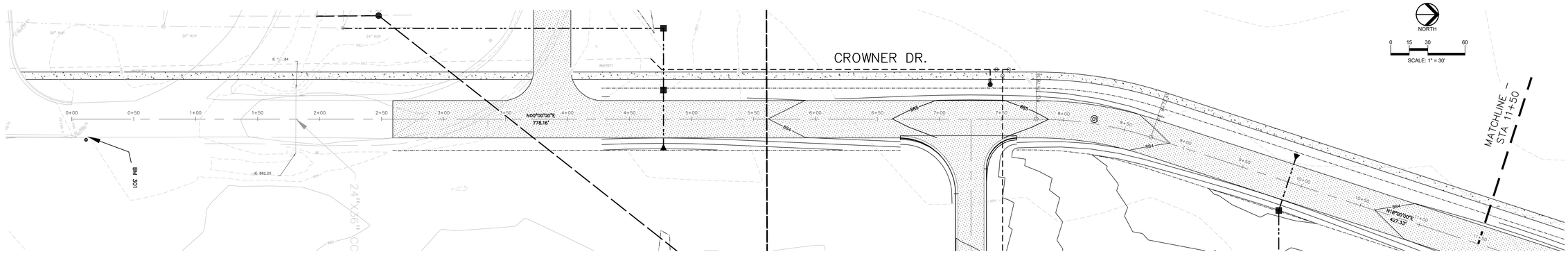
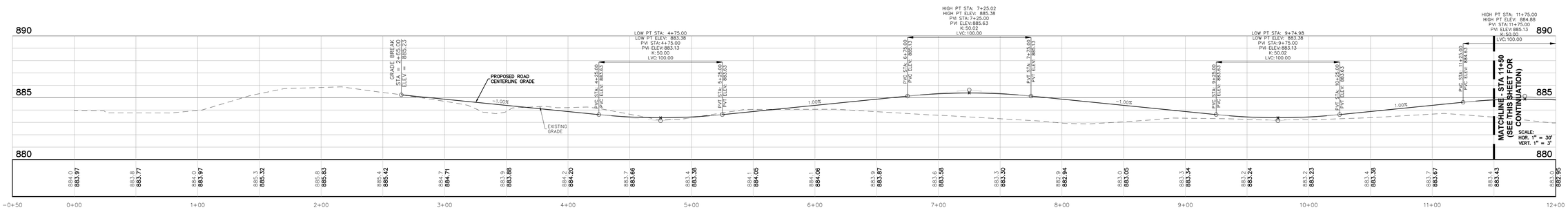
PRELIMINARY UTILITY PLAN
SHEET TITLE

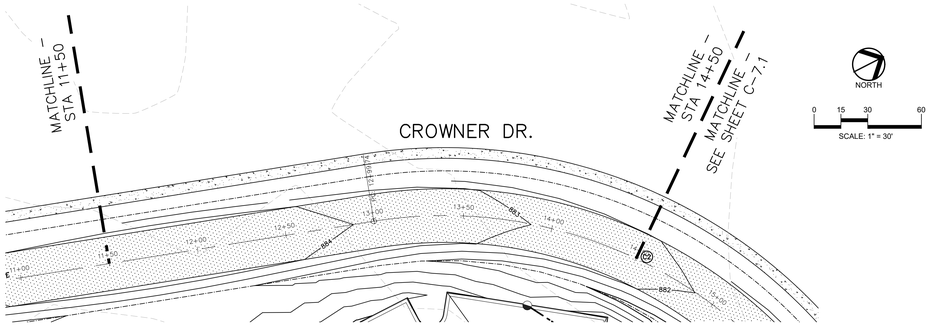
22-320
PROJECT NUMBER

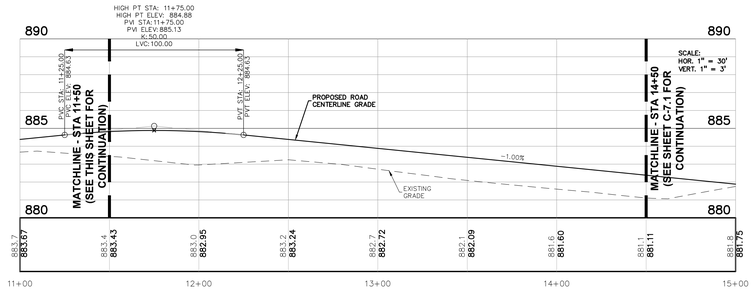
C-6.0
SHEET NUMBER

S:\PROJECTS\2022\2023-1150 MDHHS LAB - REPD\WG\CONCEPT\C-6.0UTIL-22-1150.DWG PLOT DATE: 16/06/2023 BY: Shannon Pugh









CURVE TABLE

CURVE #	RADIUS	ARC	DELTA	CHORD	CH. BRG.
C1	300.00'	94.25	18° 00' 00"	93.86'	N9° 00' 00"E
C2	250.00'	314.16	72° 00' 00"	293.89'	N54° 00' 00"E

LEGEND:

- CONCRETE PAVEMENT (STD. DUTY, HEAVY DUTY, R.O.W. ONLY)
- ASPHALT PAVEMENT (STD. DUTY, HEAVY DUTY, DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

Sheet Size - 36x48

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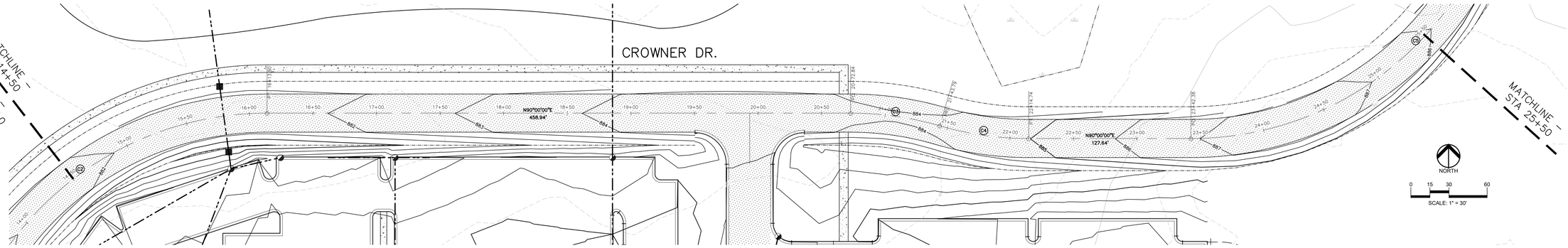
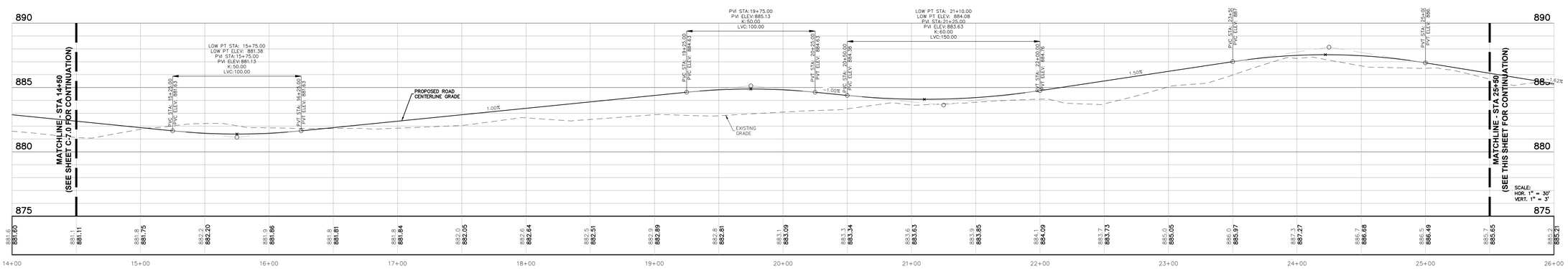
CROWNER DRIVE PLAN AND PROFILE
SHEET TITLE

22-320
PROJECT NUMBER

C7.0
SHEET NUMBER

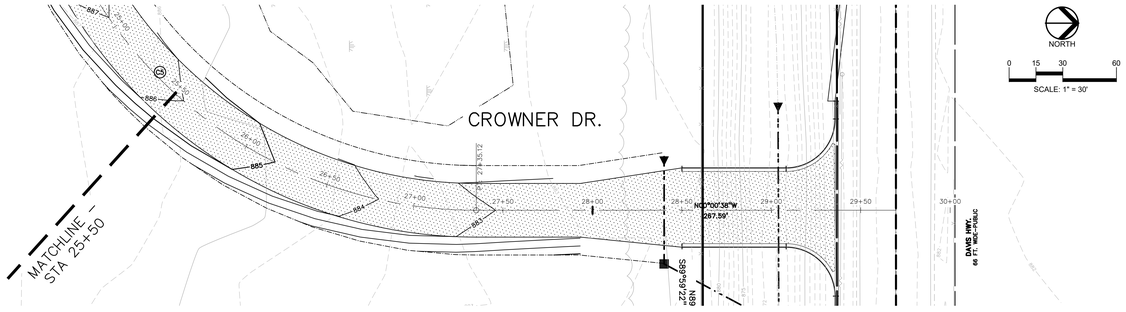
S:\PROJECTS\2022\2022-1150 MDHHS LAB - REP\DWG\CONCEPT\C-7.0_C-7.1(ROAD)-22-1150.DWG PLOT DATE: 16/06/2023 BY: Shannon Pugh

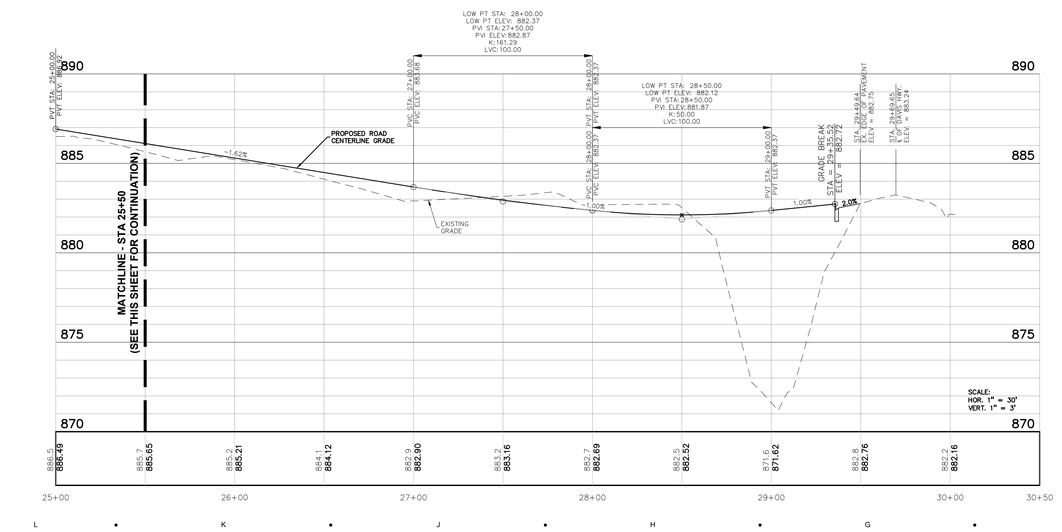




CURVE TABLE					
CURVE #	RADIUS	ARC	DELTA	CHORD	CH. BRG.
C2	250.00'	314.16	72° 00' 00"	293.89'	N54° 00' 00"E
C3	250.00'	70.95	16° 15' 37"	70.71'	S81° 52' 12"E
C4	250.00'	70.95	16° 15' 37"	70.71'	S81° 52' 12"E
C5	250.00'	392.74	90° 00' 38"	353.59'	N44° 59' 41"E

LEGEND:
- CONCRETE PAVEMENT (STD DUTY; HEAVY DUTY; R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY; HEAVY DUTY; DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL





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CROWNER DRIVE PLAN AND PROFILE

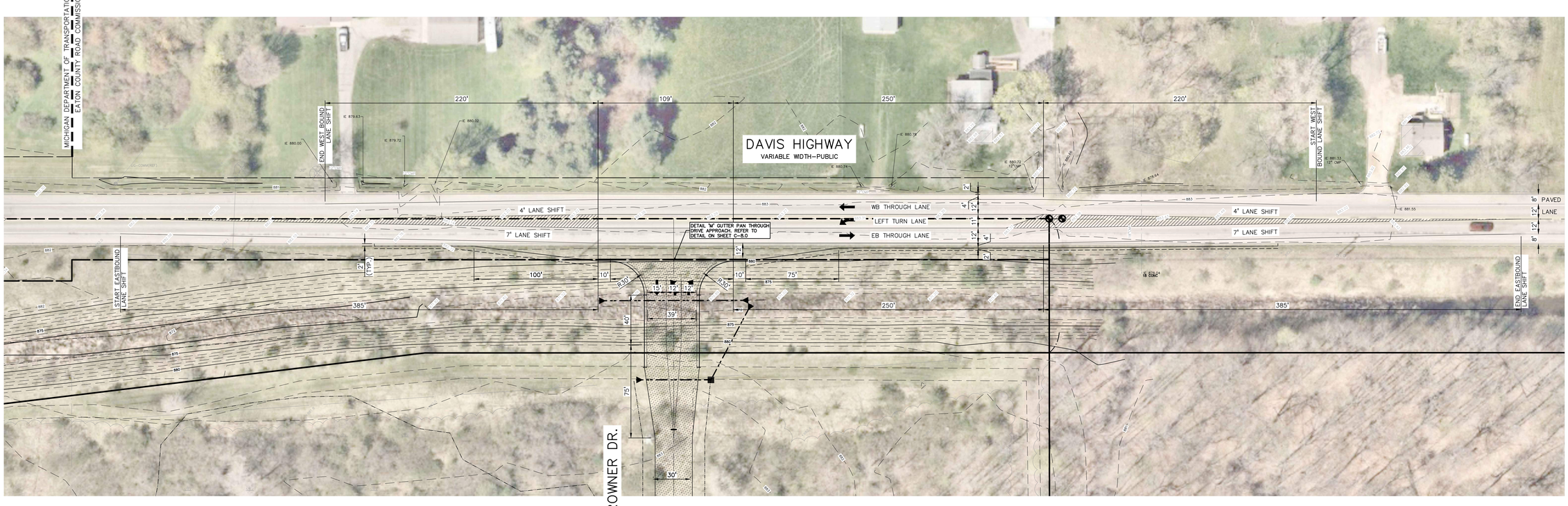
SHEET TITLE

22-320

PROJECT NUMBER

C7.1

SHEET NUMBER



NORTH

0 15 30 60

SCALE: 1" = 30'

Sheet Size - 36x48

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DAVIS HIGHWAY/ CROWNER DRIVE INTERSECTION PLAN

SHEET TITLE

22-320

PROJECT NUMBER

C-7.2

SHEET NUMBER

S:\PROJECTS\2022\2022\1150 MDHHS LAB - R\PDWG\CONCEPT\C-7.2\INTERSECTION-23-1150.DWG PLOT DATE: 16/06/2023 BY: Shannon Pugh

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. ALL CONSTRUCTION, WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT OSHA, [redacted] AND MUNICIPALITY STANDARDS AND REGULATIONS.
2. THE CONTRACTOR SHALL NOTIFY THE [redacted] ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
3. THE CONTRACTOR SHALL CONTACT THE ENGINEER SHOULD THEY ENCOUNTER ANY DESIGN ISSUES DURING CONSTRUCTION. IF THE CONTRACTOR MAKES DESIGN MODIFICATIONS WITHOUT THE WRITTEN DIRECTION OF THE DESIGN ENGINEER, THE CONTRACTOR DOES SO AT HIS OWN RISK.
4. ALL NECESSARY PERMITS, TESTING, BONDS AND INSURANCES ETC., SHALL BE PAID FOR BY THE CONTRACTOR. THE OWNER SHALL PAY FOR ALL [redacted] INSPECTION FEES.
5. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE 811/ONE CALL UTILITY LOCATING CENTER, THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF NO NOTIFICATION IS GIVEN AND DAMAGE RESULTS, SAID DAMAGE WILL BE REPAIRED AT SOLE EXPENSE OF THE CONTRACTOR. IF EXISTING UTILITY LINES ARE ENCOUNTERED THAT CONFLICT IN LOCATION WITH NEW CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER SO THAT THE CONFLICT MAY BE RESOLVED.
6. CONTRACTOR SHALL VERIFY THAT THE PLANS AND SPECIFICATIONS ARE THE VERY LATEST PLANS AND SPECIFICATIONS AND FURTHERMORE, VERIFY THAT THESE PLANS AND SPECIFICATIONS HAVE BEEN APPROVED. ALL ITEMS CONSTRUCTED BY THE CONTRACTOR PRIOR TO RECEIVING FINAL APPROVAL, HAVING TO BE ADJUSTED OR RE-DONE, SHALL BE AT THE CONTRACTORS EXPENSE. SHOULD THE CONTRACTOR ENCOUNTER A CONFLICT BETWEEN THESE PLANS AND/OR SPECIFICATIONS, THEY SHALL SEEK CLARIFICATION IN WRITING FROM THE ENGINEER BEFORE COMMENCEMENT OF CONSTRUCTION. FAILURE TO DO SO SHALL BE AT SOLE EXPENSE TO THE CONTRACTOR.
7. ANY WORK WITHIN THE STREET OR HIGHWAY RIGHTS-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK.
8. ALL PROPERTIES OR FACILITIES IN THE SURROUNDING AREAS, PUBLIC OR PRIVATE, DESTROYED OR OTHERWISE DISTURBED DUE TO CONSTRUCTION, SHALL BE REPLACED AND/OR RESTORED TO THE ORIGINAL CONDITION BY THE CONTRACTOR.
9. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADING, SIGNAGE, LIGHTS AND TRAFFIC CONTROL DEVICES TO PROTECT THE WORK AND SAFELY MAINTAIN TRAFFIC IN ACCORDANCE WITH LOCAL REQUIREMENTS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION). THE DESIGN ENGINEER, OWNER, [redacted] AND STATE SHALL NOT BE HELD LIABLE FOR ANY CLAIMS RESULTING FROM ACCIDENTS OR DAMAGES CAUSED BY THE CONTRACTOR'S FAILURE TO COMPLY WITH TRAFFIC AND PUBLIC SAFETY REGULATIONS DURING THE CONSTRUCTION PERIOD.
10. THE USE OF CRUSHED CONCRETE IS PROHIBITED ON THE PROJECT WITHIN 100 FEET OF ANY WATER COURSE (STREAM, RIVER, COUNTY DRAIN, ETC.) AND LAKE, REGARDLESS OF THE APPLICATION OR LOCATION OF THE WATER COURSE OR LAKE RELATIVE TO THE PROJECT LIMITS.
11. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, INLETS, GATE WELLS ETC.) WITHIN GRADED AND /OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.

PAVING NOTES:

1. IN AREAS WHERE NEW PAVEMENTS ARE BEING CONSTRUCTED, THE TOPSOIL AND SOIL CONTAINING ORGANIC MATTER SHALL BE REMOVED PRIOR TO PAVEMENT CONSTRUCTION.
2. REFER TO ARCHITECTURAL PLANS FOR DETAILS OF FROST SLAB AT EXTERIOR BUILDING DOORS.
3. CONSTRUCTION TRAFFIC SHOULD BE MINIMIZED ON THE NEW PAVEMENT. IF CONSTRUCTION TRAFFIC IS ANTICIPATED ON THE PAVEMENT STRUCTURE, THE INITIAL LIFT THICKNESS COULD BE INCREASED AND PLACEMENT OF THE FINAL LIFT COULD BE DELAYED UNTIL THE MAJORITY OF THE CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. THIS ACTION WILL ALLOW REPAIR OF LOCALIZED FAILURE, IF ANY DOES OCCUR, AS WELL AS REDUCE LOAD DAMAGE ON THE PAVEMENT SYSTEM.
4. ALL EXPANSION JOINTS AND CONCRETE PAVEMENT JOINTS TO BE SEALED.
5. CONCRETE PAVEMENT JOINTING – UNLESS SHOWN OTHERWISE IN THE PLANS OR REQUIRED BY THE AUTHORITY HAVING JURISDICTION;
 5.1. WHERE PROPOSED CONCRETE ABUTS A STRUCTURE, PROVIDE A MINIMUM 1/2" EXPANSION JOINT. THE JOINT FILLER BOARD MUST BE AT LEAST THE FULL DEPTH OF THE CONCRETE AND HELD DOWN A 1/2" TO ALLOW FOR SEALING.
 5.2. WHERE PROPOSED CONCRETE ABUTS EXISTING CONCRETE OR IN BETWEEN POURS OF PROPOSED CONCRETE (CONSTRUCTION JOINT), PROVIDE 5/8" DOWELS EVERY 30" CENTER TO CENTER HALF WAY ALONG THE THICKNESS OF THE PROPOSED PAVEMENT. ALTERNATE DOWELS SIZES AND SPACING MUST BE APPROVED THE ENGINEER PRIOR TO COMMENCING WORK AND VIA THE SUBMITTAL PROCESS.
 5.3. WHERE PROPOSED CONCRETE ABUTS EXISTING OR PROPOSED SIDEWALK OR CURBING, PROVIDE A MINIMUM 1/2" EXPANSION JOINT.
 5.4. CONTROL, LONGITUDINAL AND/OR TRANSVERSE JOINTS SHALL BE PLACED TO PROVIDE PANELS WITHIN THE PAVEMENT AS SQUARE AS POSSIBLE WITH THE FOLLOWING MAXIMUM SPACING PARAMETERS:
  5.4.1. 6-INCH THICK CONCRETE PAVEMENT: 12' X 12'
  5.4.2. 8-INCH THICK CONCRETE PAVEMENT: 15' X 15'
 5.5. IRREGULAR-SHAPED PANELS MAY REQUIRE THE USE OF REINFORCING MESH OR FIBER MESH AS DETERMINED BY THE ENGINEER. THE USE OF MESH MUST BE APPROVED THE ENGINEER PRIOR TO COMMENCING WORK AND VIA THE SUBMITTAL PROCESS.
 5.6. IF A JOINT PLAN IS NOT PROVIDED IN THE PLANS, THE CONTRACTOR SHALL SUBMIT ONE TO THE ENGINEER FOR REVIEW PRIOR TO COMMENCING WORK AND VIA THE SUBMITTAL PROCESS.
6. CONCRETE CURBING JOINTING – UNLESS SHOWN OTHERWISE IN THE PLANS OR REQUIRED BY THE AUTHORITY HAVING JURISDICTION
 6.1. JOINTS WHEN ADJACENT TO ASPHALT PAVEMENT
  6.1.1. PLACE CONTRACTION JOINTS AT 10' INTERVALS
  6.1.2. PLACE 1/2" EXPANSION JOINT AT CATCH BASINS, EXISTING AND PROPOSED SIDEWALK OR EXISTING CURBING.
  6.1.3. PLACE 1" EXPANSION JOINT:
   6.1.3.1. AT SPRING POINTS OF INTERSECTIONS OR ONE OF THE END OF RADIUS LOCATIONS IN A CURVE
   6.1.3.2. AT 400' MAXIMUM INTERVALS ON STRAIGHT RUNS
   6.1.3.3. AT THE END OF RADIUS AT OPPOSITE ENDS IN A CURBED LANDSCAPE ISLAND
 6.2. JOINTS WHEN TIED TO CONCRETE PAVEMENT
  6.2.1. PLACE CONTRACTION JOINTS OPPOSITE ALL TRANSVERSE CONTRACTION JOINTS IN PAVEMENT
  6.2.2. PLACE 1/2" EXPANSION JOINT AT CATCH BASINS, EXISTING AND PROPOSED SIDEWALK OR EXISTING CURBING.
  6.2.3. PLACE 1" EXPANSION JOINT OPPOSITE ALL TRANSVERSE EXPANSION JOINTS IN PAVEMENT
  6.2.4. CURB AND GUTTER AND CONCRETE SHALL BE TIED TOGETHER SIMILAR TO A LONGITUDINAL LANE TIE JOINT (MDOT B1 JOINT)
 6.3. IN BETWEEN POURS OF PROPOSED CONCRETE CURBING (CONSTRUCTION JOINT):
  6.3.1. CARRY THE REBAR CONTINUOUSLY BETWEEN POURS
  6.3.2. IF THE REBAR IS NOT LONG ENOUGH TO CARRY CONTINUOUSLY, THEN TIE TWO PIECES OF REBAR PER THE LATEST MDOT SPECIFICATIONS
7. CONCRETE SIDEWALK JOINTING – UNLESS SHOWN OTHERWISE IN THE PLANS OR REQUIRED BY THE AUTHORITY HAVING JURISDICTION
 7.1. PLACE TRANSVERSE CONTRACTION JOINTS EQUAL TO THE WIDTH OF THE WALK WHEN WIDTH IS LESS THAN 8'
 7.2. PLACE TRANSVERSE AND LONGITUDINAL CONTRACTION JOINTS EQUAL TO 1/2 THE WIDTH OF THE WALK WHEN WIDTH IS EQUAL TO OR GREATER THAN 8'
 7.3. PLACE 1" EXPANSION JOINT WHERE ABUTTING SIDEWALK RAMP AND/OR RADIUS IN INTERSECTION
 7.4. PLACE TRANSVERSE 1/2" EXPANSION JOINT AT MAXIMUM OF 100' SPACING
 7.5. PLACE 1/2" EXPANSION JOINT WHEN ABUTTING A FIXED STRUCTURE, OTHER PAVEMENT (CONCRETE PAVEMENT AND DRIVE APPROACHES), UTILITY STRUCTURES, LIGHT POLE BASES AND COLUMNS

GENERAL GRADING AND EARTHWORK NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING TREES AND BRUSH AND REMOVE ALL THAT ARE NECESSARY TO GRADE SITE.
2. ALL GRADES ARE TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
3. THE STAGING OF CONSTRUCTION ACTIVITIES SHALL OCCUR ONLY WITHIN THE SITE BOUNDARIES. ANY CONSTRUCTION ACTIVITIES OUTSIDE OF THE SITE BOUNDARIES SHALL BE AT THE SOLE RESPONSIBILITY AND RISK OF THE CONTRACTOR.
4. ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL MEET THE REQUIREMENTS OF THE AUTHORIZED PUBLIC AGENCY OF JURISDICTION. [redacted]
5. ALL EARTHWORK AND GRADING OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE SOILS INVESTIGATION AND REPORT.
6. REFER TO SOIL EROSION CONTROL PLAN FOR ADDITIONAL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AND NOTES.
7. THE DETENTION BASIN SIDE SLOPES AND ALL SLOPE EXCEEDING [redacted] MUST BE STABILIZED BY SODDING OR BY PLACING A MULCH BLANKET PEGGED IN PLACE OVER SEED.
8. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED OR SODDED IN ACCORDANCE WITH THE LANDSCAPE PLANS. PROVIDE A MINIMUM OF [redacted] OF TOPSOIL IN THESE AREAS UNLESS OTHERWISE NOTED.
9. THE CONTRACTOR SHALL NOTE EXISTING UNDERGROUND UTILITIES WITHIN AND ADJACENT TO THE SITE. BACKFILL FOR EXISTING UTILITY TRENCHES SHALL BE EXAMINED CRITICALLY. ANY TRENCHES FOUND TO HAVE SOFT, UNSTABLE OR UNSUITABLE BACKFILL MATERIAL, IN THE OPINION OF THE THIRD PARTY TESTING COMPANY, THAT ARE TO BE WITHIN THE ZONE OF INFLUENCE OF PROPOSED BUILDINGS OR PAVEMENT SHALL BE COMPLETELY EXCAVATED AND BACKFILLED WITH SUITABLE MATERIAL.
10. ON-SITE FILL CAN BE USED IF THE SPECIFIED COMPACTION REQUIREMENTS CAN BE ACHIEVED. IF ON-SITE SOIL IS USED, IT SHOULD BE CLEAN AND FREE OF FROZEN SOIL, ORGANICS, OR OTHER DELETERIOUS MATERIALS.
11. THE FINAL SUBGRADE/EXISTING AGGREGATE BASE SHOULD BE THOROUGHLY PROOFROLLED USING A FULLY LOADED TANDEM AXLE TRUCK OR FRONT END LOADER UNDER THE OBSERVATION OF A GEOTECHNICAL/PAVEMENT ENGINEER. LOOSE OR YIELDING AREAS THAT CANNOT BE MECHANICALLY STABILIZED SHOULD BE REINFORCED USING GEOGRIDS OR REMOVED AND REPLACED WITH ENGINEERED FILL OR AS DICTATED BY FIELD CONDITIONS.
12. SUBGRADE UNDERCUTTING, INCLUDING BACKFILLING SHALL BE PERFORMED TO REPLACE MATERIALS SUSCEPTIBLE TO FROST HEAVING AND UNSTABLE SOIL CONDITIONS. ANY EXCAVATIONS THAT MAY BE REQUIRED BELOW THE TOPSOIL IN FILL AREAS OR BELOW SUBGRADE IN CUT AREAS WILL BE CLASSIFIED AS SUBGRADE UNDERCUTTING.
13. SUBGRADE UNDERCUTTING SHALL BE PERFORMED WHERE NECESSARY AND THE EXCAVATED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR. ANY SUBGRADE UNDERCUTTING SHALL BE BACKFILLED AS RECOMMENDED IN THE GEOTECHNICAL ENGINEERING REPORT FOR THE PROJECT.
14. ANY SUB-GRADE WATERING REQUIRED TO ACHIEVE REQUIRED DENSITY SHALL BE CONSIDERED INCIDENTAL TO THE JOB.

GENERAL UTILITY NOTES:

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE [redacted]
2. ALL TRENCHES UNDER OR WITHIN THREE (3) FEET OR THE FORTY-FIVE (45) DEGREE ZONE OF INFLUENCE LINE OF EXISTING AND/OR PROPOSED PAVEMENT, BUILDING PAD OR DRIVE APPROACH SHALL BE BACKFILLED WITH [redacted] COMPACTED TO AT LEAST NINETY-FIVE (95) PERCENT OF MAXIMUM UNIT WEIGHT (ASTM D-1557). ALL OTHER TRENCHES TO BE COMPACTED TO [redacted]% OR BETTER.
3. WHERE EXISTING MANHOLES OR SEWER PIPE ARE TO BE TAPPED, DRILL HOLES 4" CENTER TO CENTER, AROUND PERIPHERY OF OPENING TO CREATE A PLANE OF WEAKNESS JOINT BEFORE BREAKING SECTION OUT.
4. THE LOCATIONS AND DIMENSIONS SHOWN ON THE PLANS FOR EXISTING UTILITIES ARE IN ACCORDANCE WITH AVAILABLE INFORMATION WITHOUT UNCOVERING AND MEASURING. THE DESIGN ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION OR THAT ALL EXISTING UNDERGROUND FACILITIES ARE SHOWN. CONTRACTOR SHALL FIELD VERIFY UTILITIES.
5. THE CONTRACTOR SHALL COORDINATE TO ENSURE ALL REQUIRED PIPES, CONDUITS, CABLES AND SLEEVES ARE PROPERLY PLACED FOR THE INSTALLATION OF GAS, ELECTRIC, PHONE, CABLE, IRRIGATION, ETC. IN SUCH A MANNER THAT WILL FACILITATE THEIR PROPER INSTALLATION PRIOR TO THE PLACEMENT OF THE PROPOSED PAVEMENT AND LANDSCAPING.
6. PIPE LENGTHS INDICATED ARE FROM CENTER OF STRUCTURE AND TO END OF FLARED END SECTION UNLESS NOTED OTHERWISE.
7. CONTRACTOR SHALL INSPECT ALL EXISTING PUBLIC STORM SEWER, SANITARY SEWER AND WATER MAIN STRUCTURES WITHIN THE LIMITS OF CONSTRUCTION AND WITH THE GOVERNING AGENCY INSPECTOR PRIOR TO ESTABLISHING FINAL GRADE. NOTIFY THE ENGINEER, OWNER/DEVELOPER, AND GOVERNING AGENCY IF STRUCTURE IS DEEMED TO BE STRUCTURALLY UNSOUND AND/OR IN NEED OF REPAIR.

STORM SEWER NOTES:

1. ALL STORM SEWER 12" DIAMETER OR LARGER SHALL BE [redacted] WITH MODIFIED TONGUE AND GROOVE JOINT WITH RUBBER GASKETS UNLESS SPECIFIED OTHERWISE (ASTM C-443).
2. ALL STORM SEWER LEADS SHALL BE CONSTRUCTED AT 1.00% MINIMUM SLOPE.
3. ALL STORM SEWER 10" OR LESS AND/OR LEADS SHALL BE [redacted]
4. JOINTS FOR [redacted] PIPE SHALL BE [redacted] AS SPECIFIED IN A.S.T.M. DESIGNATION [redacted]

WATER MAIN NOTES:

1. ALL WATER MAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF [redacted] BELOW FINISH GRADE. WHEN WATER MAINS MUST DIP TO PASS UNDER A STORM SEWER OR SANITARY SEWER, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE KEPT TO A MINIMUM LENGTH BY THE USE OF VERTICAL [redacted] DEGREE BENDS, PROPERLY ANCHORED.
2. ALL TEES, BENDS, CONNECTIONS, ETC. ARE CONSIDERED INCIDENTAL TO THE JOB.
3. PHYSICAL CONNECTIONS SHALL NOT BE MADE BETWEEN EXISTING AND NEW WATER MAINS UNTIL REQUIRED TESTING IS SATISFACTORILY COMPLETED.
4. MAINTAIN 10' HORIZONTAL CLEARANCE BETWEEN OUTER EDGE OF WATERMAIN AND ANY SANITARY/STORM SEWER OR STRUCTURE.
5. NO PHYSICAL CONNECTION TO THE EXISTING WATER MAIN CAN BE MADE UNTIL ALL NEW WATER MAIN PASSES PRESSURE AND BACTERIOLOGICAL TESTS TO THE SATISFACTION OF THE [redacted]
6. ALL WATER MAIN AND FITTINGS (3" DIAMETER AND LARGER) SHALL BE DUCTILE IRON, CLASS [redacted]
7. WATER MAIN SERVICE LEADS SHALL BE TYPE 'K' ANNEALED SEAMLESS COPPER WITH FLARED FITTINGS, UNLESS OTHERWISE NOTED.
8. ALL FIRE HYDRANTS SHALL BE [redacted] PER [redacted] STANDARDS.
9. ALL HYDRANTS TO BE A MINIMUM OF [redacted] FROM BACK OF CURB, TYP.
10. ALL NECESSARY FITTINGS, THRUST BLOCKS, RESTRAINING GLANDS, BLOW OFFS, ETC. FOR WATER MAIN ARE CONSIDERED INCIDENTAL TO THIS PROJECT. THE CONTRACTOR SHALL INSTALL THESE ITEMS AS NECESSARY AND AS REQUIRED BY THE [redacted]
11. THE WATER MAIN CONTRACTOR SHALL NOTIFY THE INSPECTION SECTION OF THE [redacted] AT [redacted] AT LEAST THREE WORKING DAYS IN ADVANCE OF STARTING CONSTRUCTION.

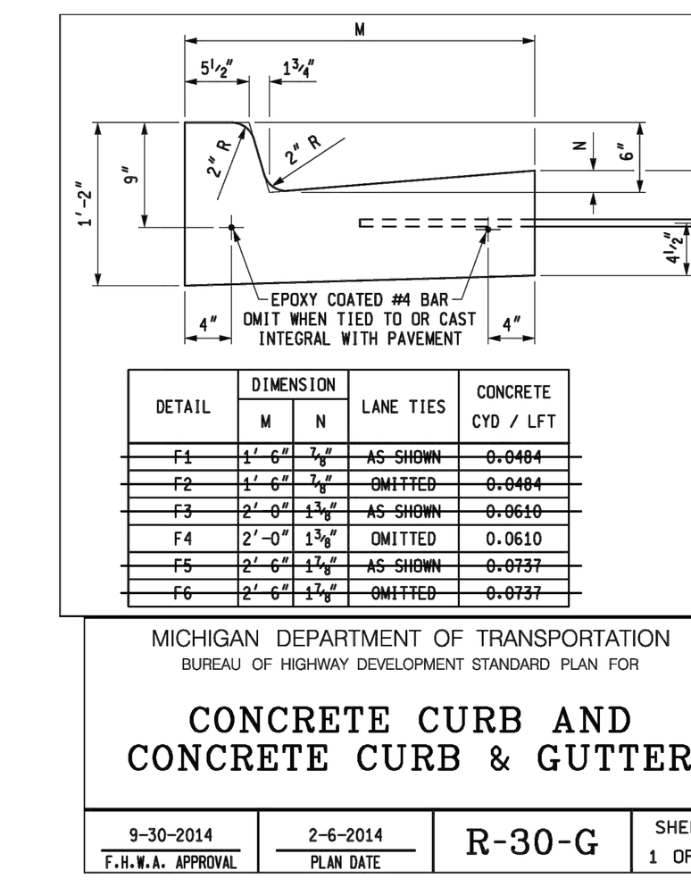
SANITARY SEWER NOTES:

1. DOWNSPOUTS, WEEP TILE, FOOTING DRAINS OR ANY CONDUIT THAT CARRIES STORM OR GROUND WATER SHALL NOT BE ALLOWED TO DISCHARGE INTO A SANITARY SEWER.
2. ALL SANITARY LEADS SHALL BE CONSTRUCTED AT 1.00% MINIMUM SLOPE.
3. ALL SANITARY SEWER [redacted] OR LARGER SHALL BE [redacted] AND FITTINGS, WITH ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
4. ALL SANITARY SEWER LEADS SHALL BE [redacted] PIPE AND FITTINGS. ALL JOINTS TO BE ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
5. SANITARY LEADS SHALL BE PROVIDED WITH CLEANOUTS EVERY [redacted] FEET AND AT EVERY BEND AS SHOWN. ALL CLEANOUTS TO BE PROVIDED WITH [redacted]

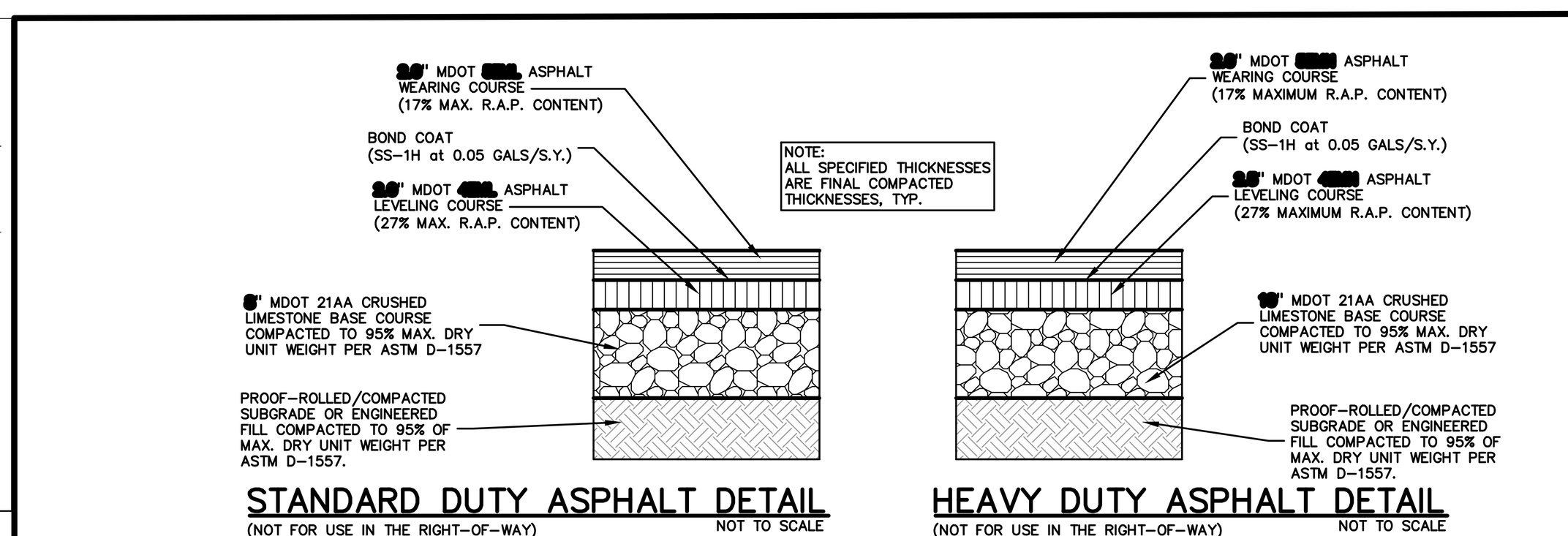
CONSTRUCTION MATERIAL SUBMITTALS

UNLESS REQUIRED OTHERWISE IN THE PROJECT SPECIFICATIONS, THE CONTRACTOR SHALL ONLY SUBMIT THE FOLLOWING CONSTRUCTION MATERIAL SUBMITTALS, AS APPLICABLE TO THE PLANS, FOR REVIEW BY THE ENGINEER. UNLESS APPROVED IN ADVANCE AND IN WRITING BY THE ENGINEER, ANY MATERIAL SUBMITTALS PROVIDED TO THE ENGINEER FOR REVIEW IN ADDITION TO THIS LIST SHALL BE RETURNED TO THE CONTRACTOR WITHOUT A REVIEW BEING PERFORMED.

1. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES
2. UTILITY TRENCH BACKFILL MATERIAL WITH ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
3. RIP RAP MATERIAL WITH ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
4. STORM AND SANITARY SEWER PIPING INCLUDING JOINTS
5. STORM AND SANITARY SEWER STRUCTURES
6. STORM AND SANITARY SEWER STRUCTURE FRAME AND COVERS INCLUDING CLEAN OUTS
7. WATER DISTRIBUTION SYSTEM PIPING INCLUDING JOINTS
8. WATER DISTRIBUTION SYSTEM STRUCTURES
9. WATER DISTRIBUTION SYSTEM STRUCTURE FRAME AND COVERS
10. WATER DISTRIBUTION SYSTEM SHUT OFF BOXES
11. WATER DISTRIBUTION SYSTEM FIRE HYDRANTS
12. WATER DISTRIBUTION SYSTEM GATE VALVES
13. STORM WATER MANAGEMENT OUTLET CONTROL STRUCTURES INCLUDING COVERS OR GRATES
14. STORM WATER MANAGEMENT OUTLET SEDIMENTATION BASIN RISERS INCLUDING GRATES
15. STORM WATER MANAGEMENT MECHANICAL PRE-TREATMENT UNITS INCLUDING COVERS
16. STORM WATER MANAGEMENT OIL/GREASE SEPARATORS
17. STORM WATER MANAGEMENT UNDERGROUND DETENTION SYSTEM MATERIAL AND SHOP DRAWINGS DEPICTING THE LAYOUT OF THE SYSTEM
18. PAVEMENT AGGREGATE BASE MATERIAL WITH ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
19. PAVEMENT UNDERDRAIN MATERIAL AND BACKFILL WITH ALL BACKFILL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
20. PAVEMENT MIX DESIGNS SUBMITTED FOR REVIEW BY THE ENGINEER MUST FOLLOW THE CURRENT MDOT REVIEW CHECKLISTS AS SUMMARIZED BELOW AND ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER:
 • 8.1. CONCRETE MIX DESIGN REVIEW CHECKLIST (FORM 2000)
 • 8.2. SUPERPAVE MIX DESIGN CHECKLIST (FORM 1862)
 • 8.3. MARSHALL MIX DESIGN CHECKLIST (FORM 1849)
21. SITE FENCING AND GATES INCLUDING FOOTINGS
22. SITE RAILINGS INCLUDING FOOTING OR EMBEDMENTS
23. ANY ITEMS SHOWN IN THE PLANS OR DETAIL SHEETS THAT SPECIFICALLY STATE FOR THE CONTRACTOR TO SUBMIT A SHOP DRAWING TO THE ENGINEER FOR REVIEW. THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO:
 •• RETAINING WALL MATERIAL AND STRUCTURAL CALCULATIONS
 •• TRENCH DRAIN MATERIAL AND SHOP DRAWING DEPICTING THE LAYOUT OF THE SYSTEM
 •• ANY SPECIALITY ITEMS SHOWN IN THE PLANS OR DETAIL SHEETS THAT SPECIFICALLY DO NOT STATE FOR THE CONTRACTOR SHALL SUBMIT A SHOP DRAWING TO THE ENGINEER FOR REVIEW BUT THE CONTRACTOR REQUESTS TO BE REVIEWED. THE CONTRACTOR'S REQUEST FOR REVIEW MUST BE IN WRITING AND APPROVED BY THE ENGINEER PRIOR TO SUBMITTING THE INFORMATION.



DETAIL	DIMENSION M	DIMENSION N	LANE TIES	CONCRETE CYD / LFT
F1	1'-6"	7/8"	AS SHOWN	0.0484
F2	1'-6"	7/8"	OMITTED	0.0484
F3	2'-0"	1 3/8"	AS SHOWN	0.0610
F4	2'-0"	1 3/8"	OMITTED	0.0610
F5	2'-6"	1 7/8"	AS SHOWN	0.0737
F6	2'-6"	1 7/8"	OMITTED	0.0737

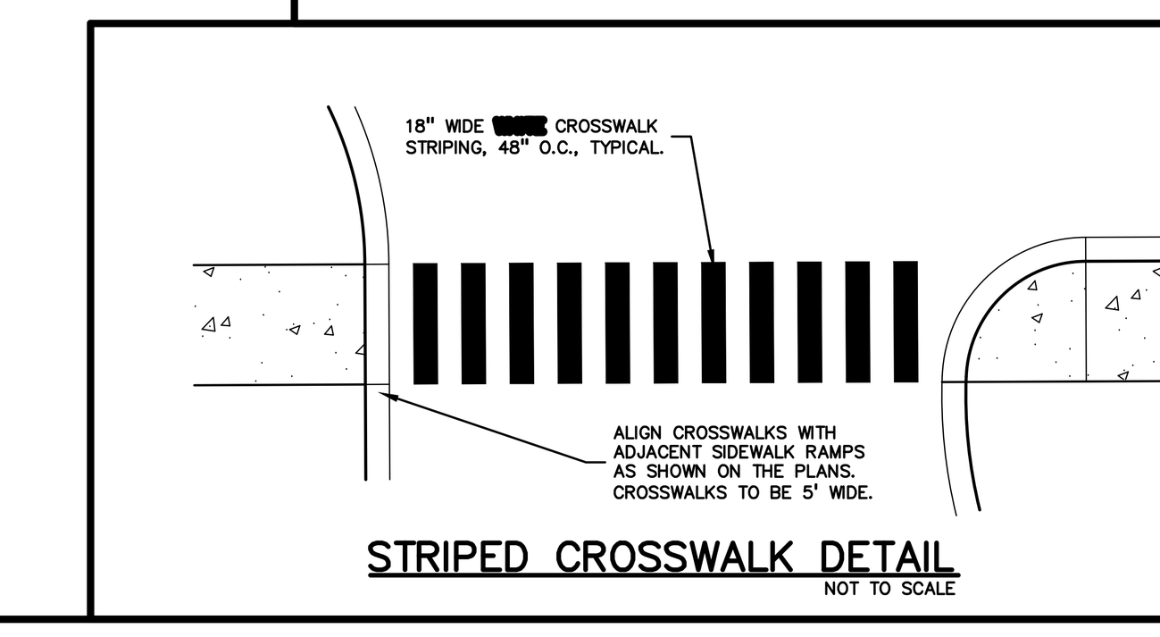


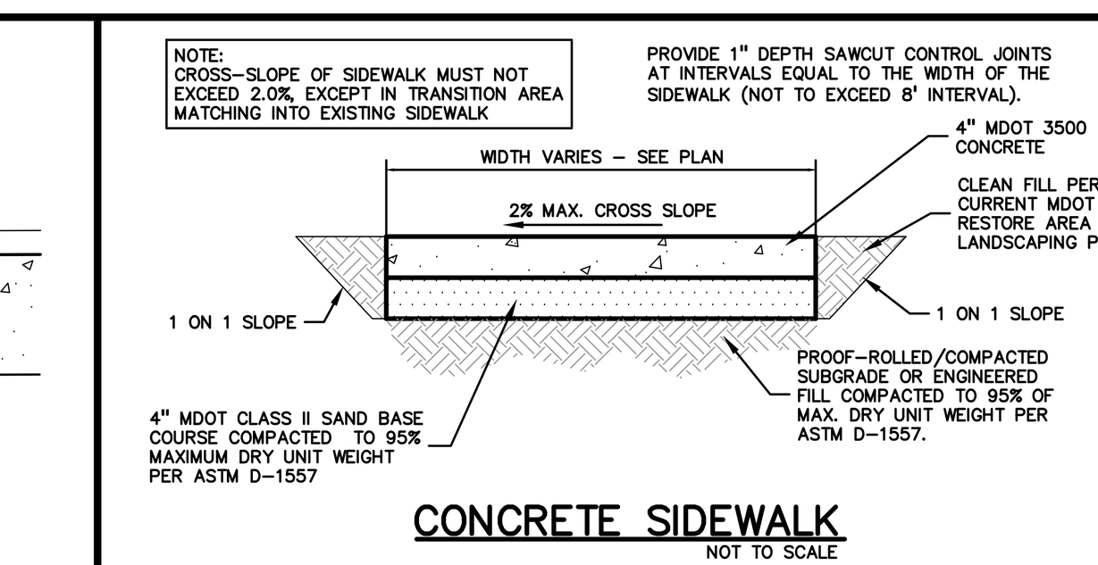
AGGREGATE BASE NOTE:
THIS PAVEMENT SECTION DESIGN ASSUMES THE USE OF MDOT 21AA CRUSHED LIMESTONE BASE MATERIAL THAT MEETS THE REQUIREMENTS OF MDOT STANDARD SPECIFICATION SECTION 902 FOR AGGREGATES. IF CRUSHED CONCRETE AGGREGATE BASE IS PROPOSED IN LIEU OF THE SPECIFIED CRUSHED LIMESTONE MATERIAL, PEA GROUP WILL REQUIRE A MINIMUM 25% INCREASE IN BASE THICKNESS. HOWEVER, IF TESTING DOCUMENTATION IS PROVIDED TO PEA GROUP THAT SHOWS THAT THE CRUSHED CONCRETE MATERIAL MEETS ALL REQUIREMENTS OF MDOT SPECIFICATION SECTION 902, THEN THE 25% INCREASE IN THICKNESS MAY BE REEVALUATED.

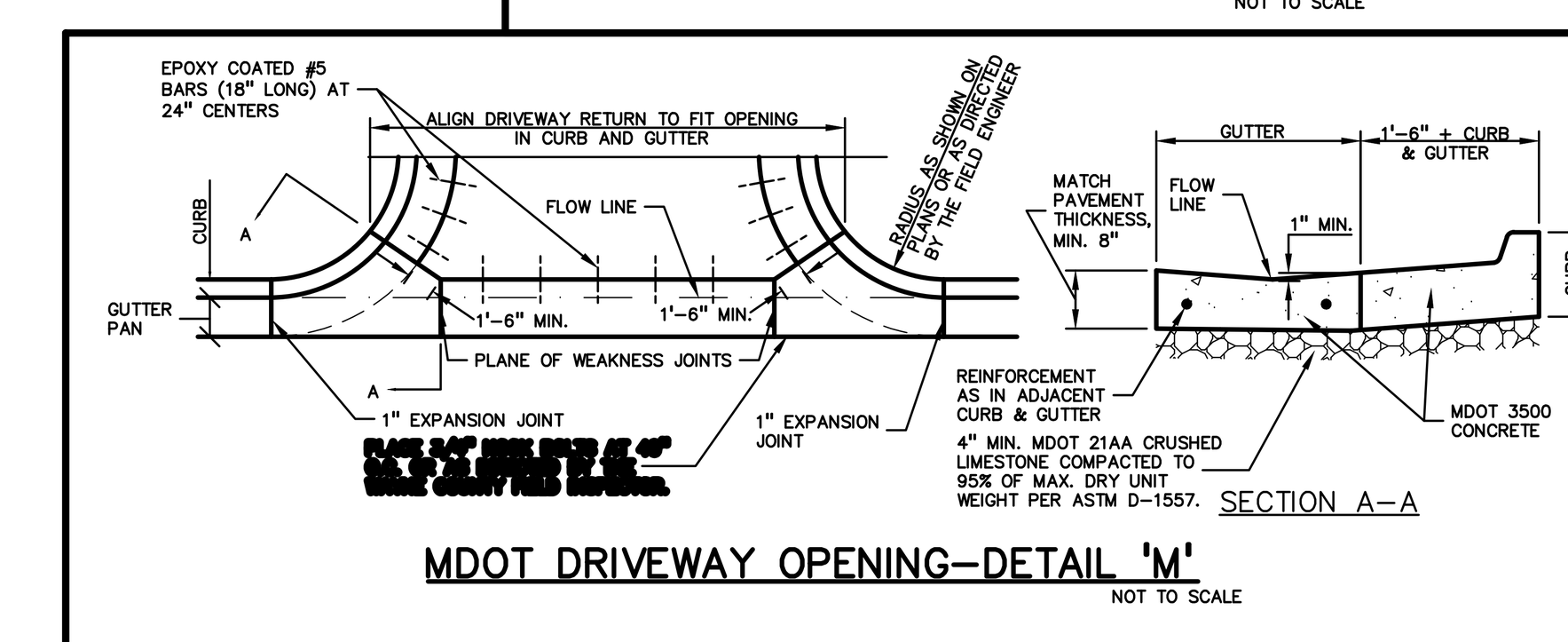
ASPHALT MATERIAL NOTES:
HOT-MIX ASPHALT MIXTURES UTILIZING RECYCLED ASPHALT PAVEMENT (RAP) MUST MEET MDOT SPECIAL PROVISION 12SP501(E). THE BINDER GRADE FOR THIS WORK IS PG64-28. IF ASPHALT MIXES CONTAINING RAP ARE TO BE SUPPLIED FOR THIS PROJECT, THE ASPHALT BINDER MUST BE REVISED PER MDOT 'TIER 1' OR 'TIER 2' REQUIREMENTS (RAP CONTENT UP TO 27% MAXIMUM). TIER 3 MIXES ARE NOT ACCEPTABLE ON THIS PROJECT. AN ASPHALT MIX DESIGN FOR ALL SPECIFIED MIXES SHOULD BE FORWARDED TO PEA GROUP FOR REVIEW PRIOR TO CONSTRUCTION

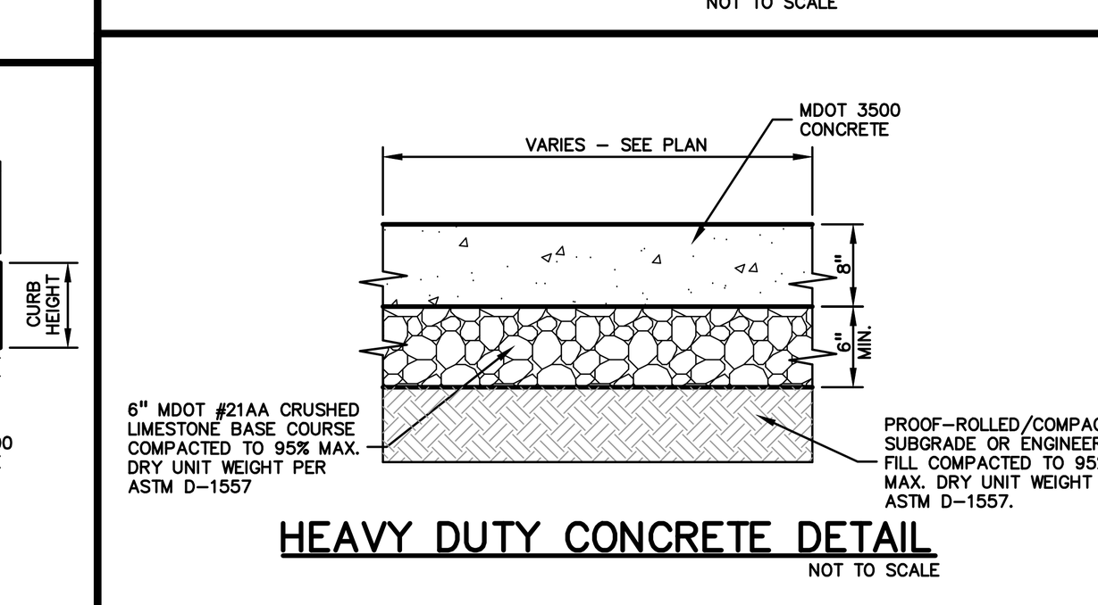
ASPHALT MIX DESIGN CHART

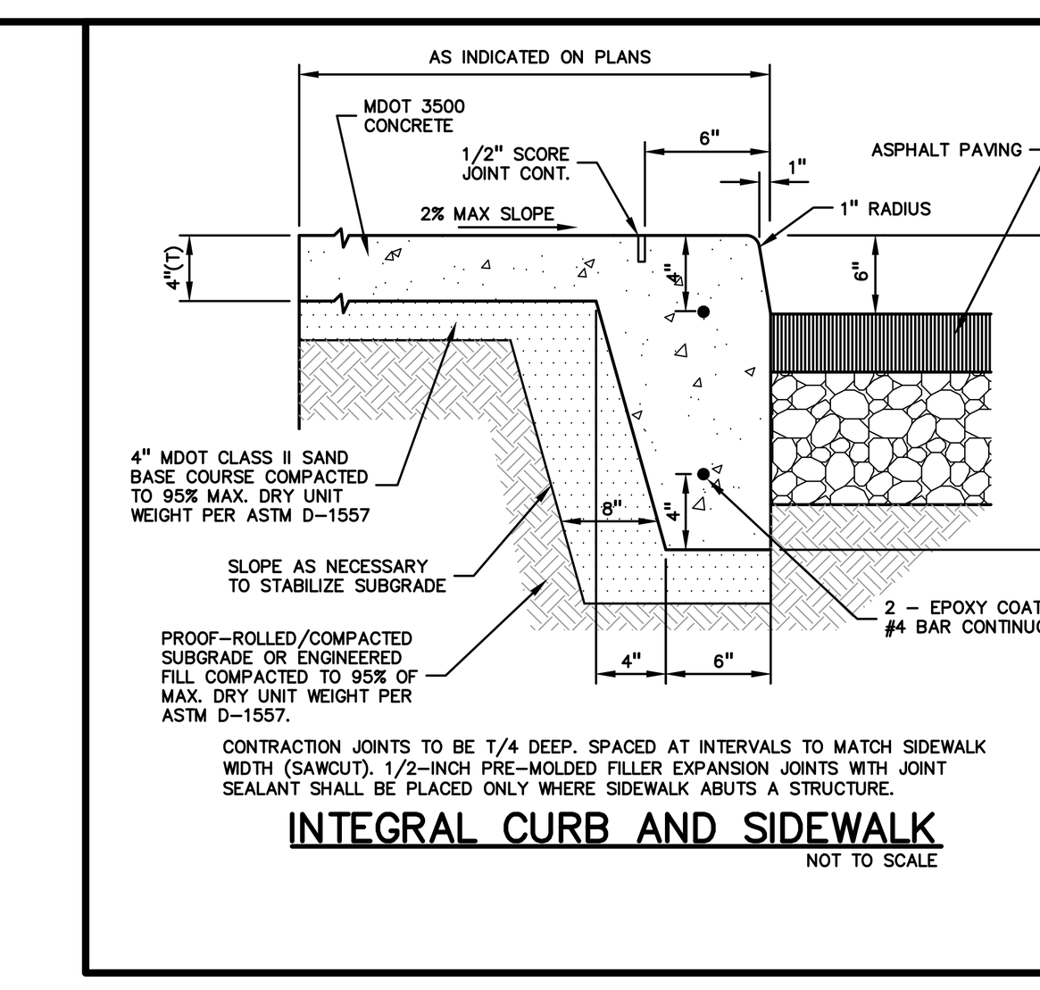
COMMERCIAL ADT 0-300	COMMERCIAL ADT 301-1000	COMMERCIAL ADT 1001-3400	COMMERCIAL ADT ≥3401	APPLICATION RATE (LB/YD²), MINIMUM – MAXIMUM
4EL	4EML	4EMH	4EMH	220-275
5EL	5EML	5EMH	SMA OR 5EMH	165-220
PG 58-28	PG 64-28	PG 64-28	PG 70-28P	

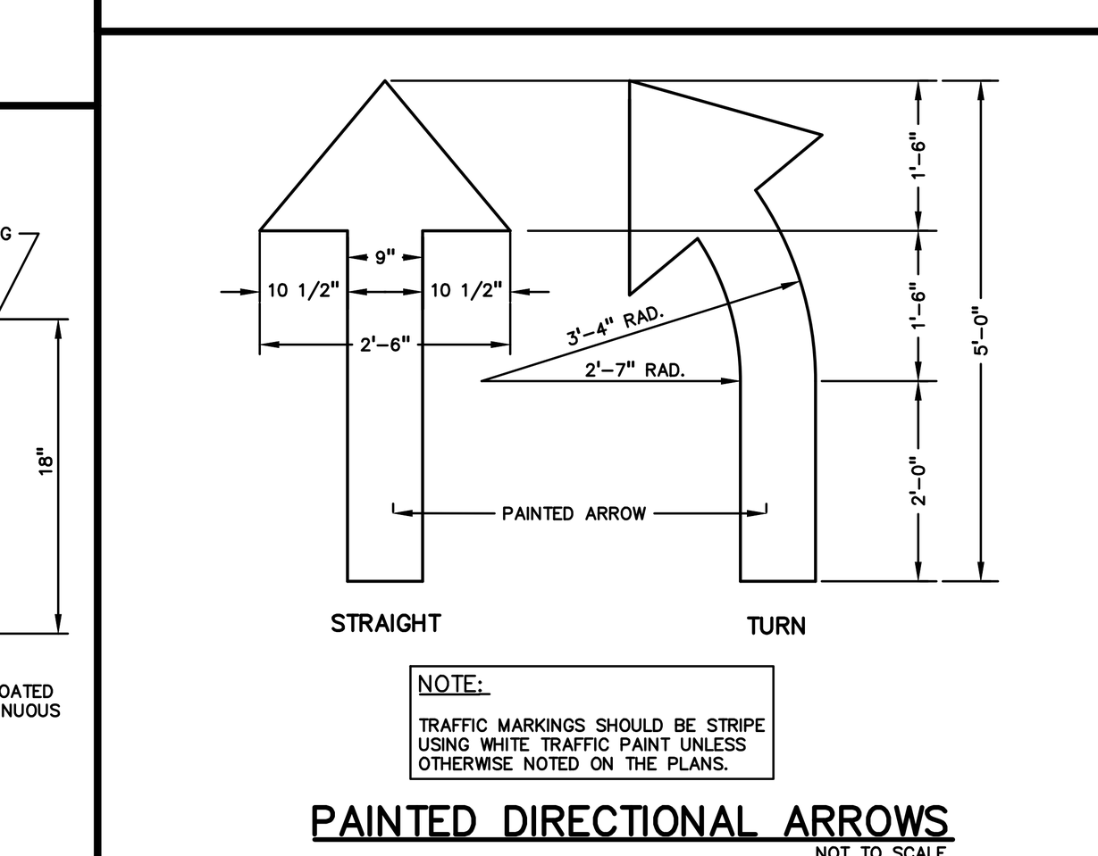


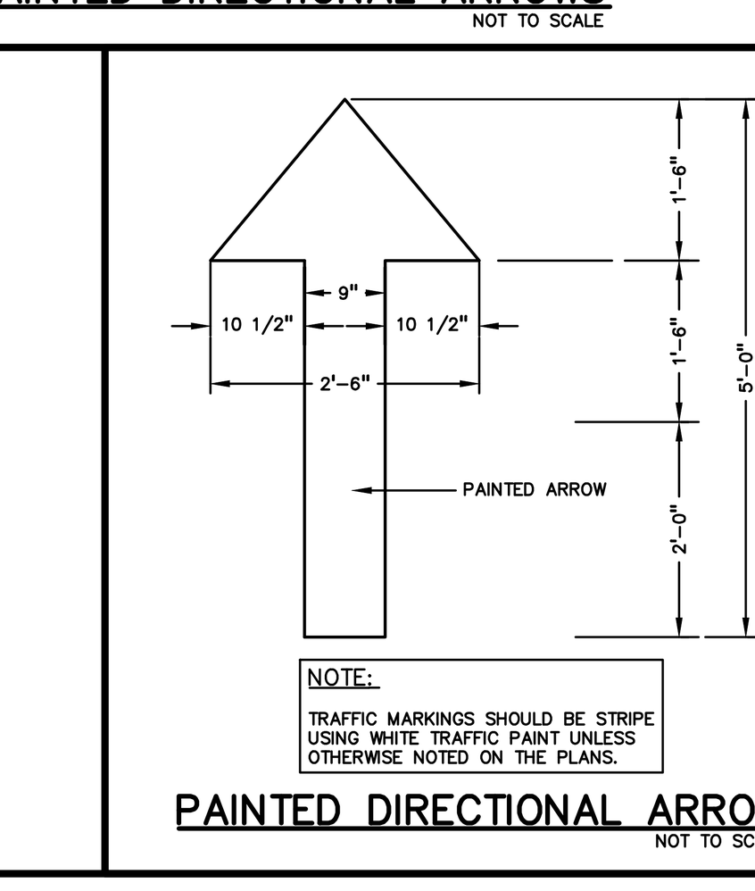


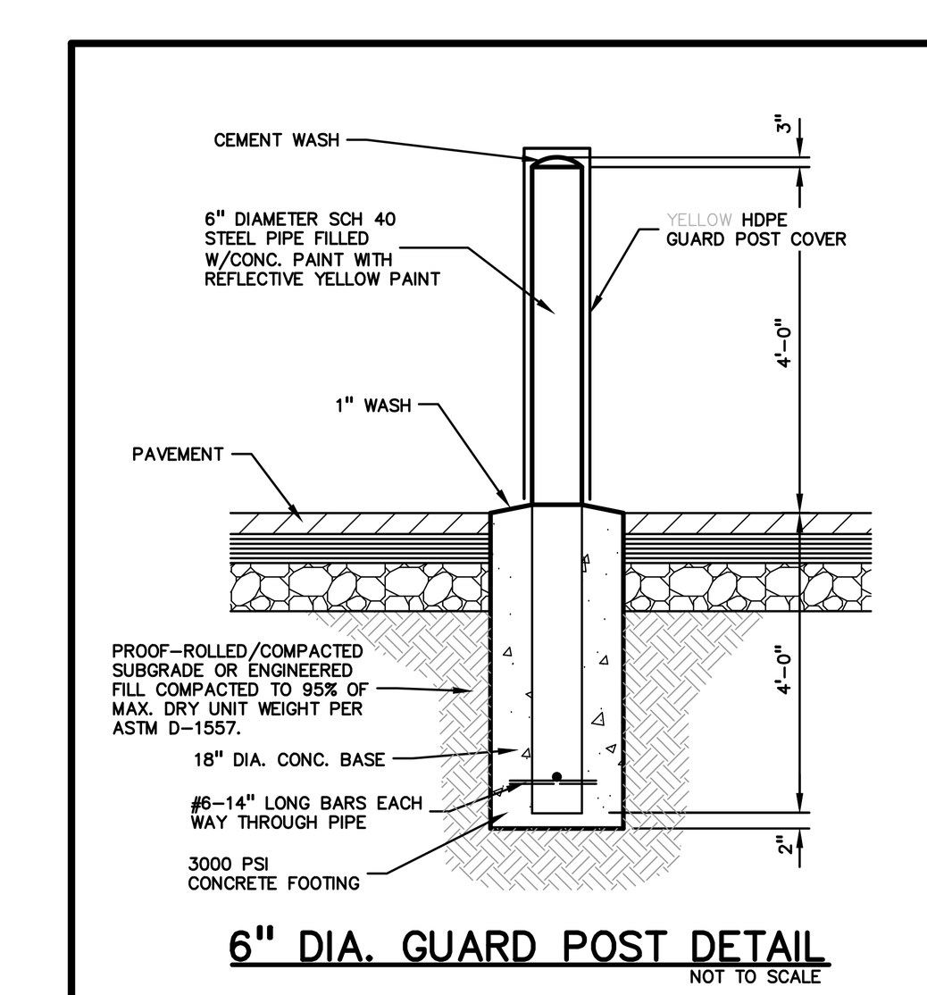


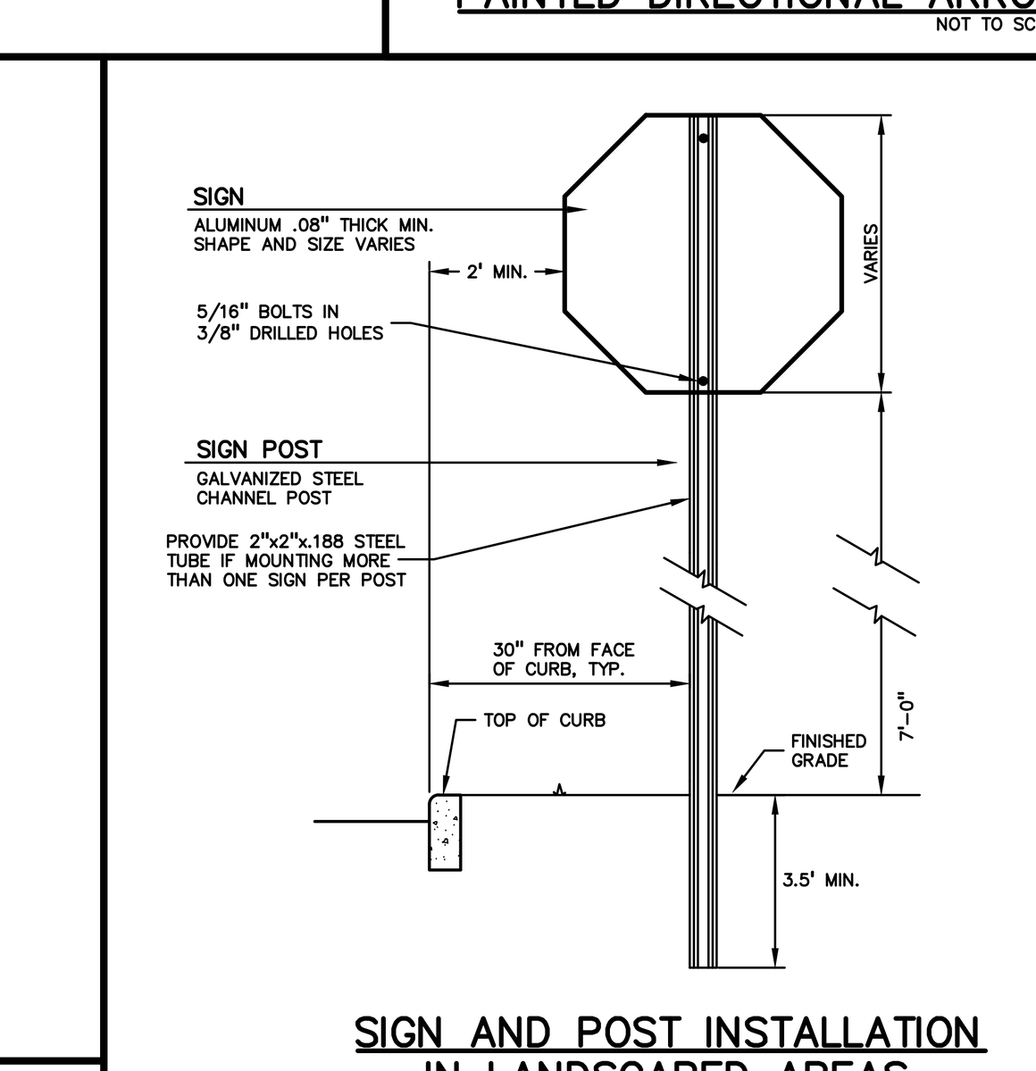






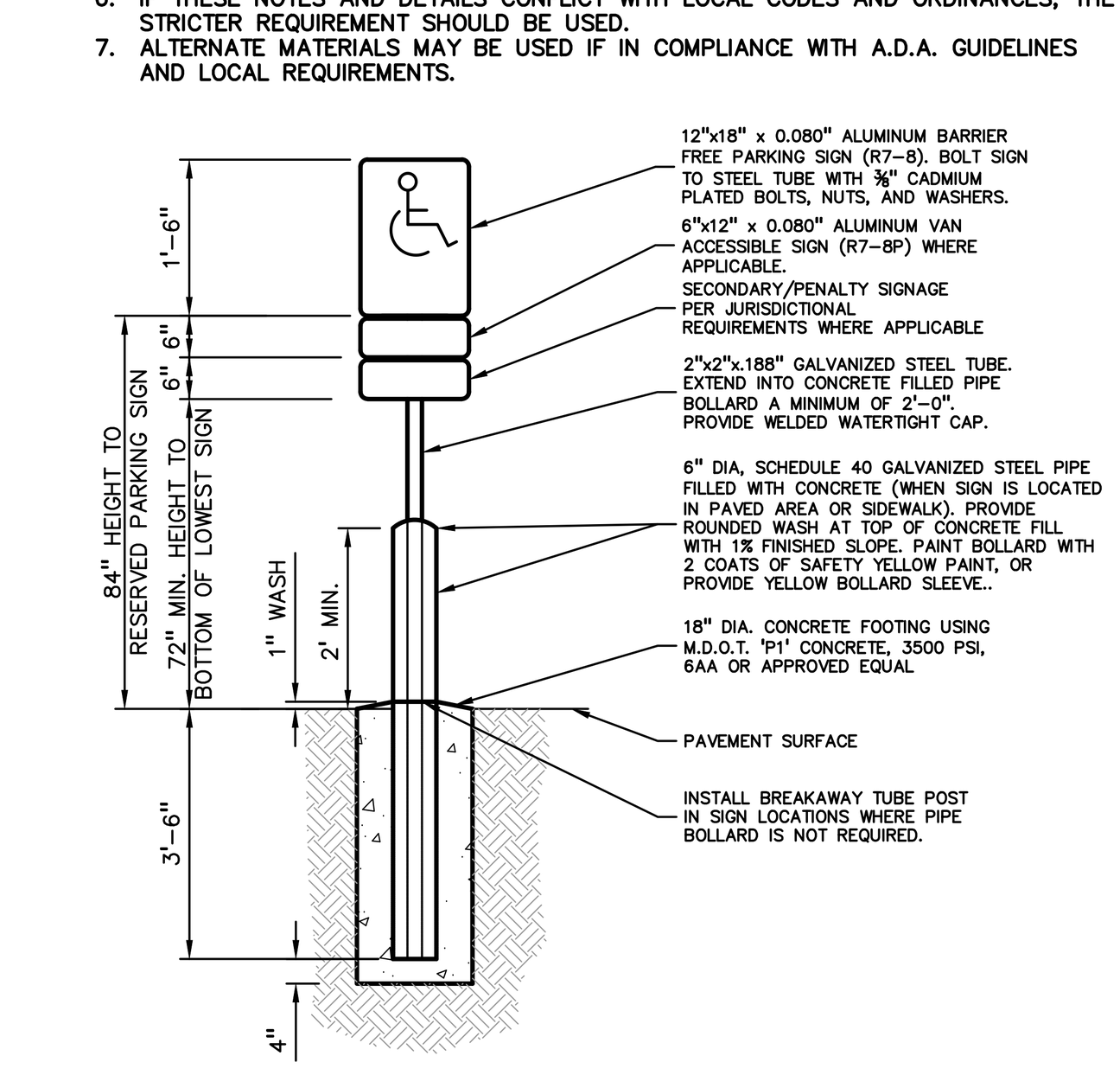






BARRIER FREE SIGN NOTES:

1. ONE SIGN IS REQUIRED AT EACH BARRIER FREE PARKING SPACE.
2. ALL SIGNS SHALL COMPLY WITH THE LATEST STANDARDS OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD).
3. WHEN TWO BARRIER FREE PARKING SPACES ARE ADJACENT AND FACING EACH OTHER, TWO SIGNS ARE REQUIRED, BUT CAN BE MOUNTED ON THE SAME POST.
4. SIGN POSTS SHALL BE 2" NOM. SQUARE 14-GAUGE GALVANIZED STEEL TUBE WITH 7/16" HOLES AT 1" CENTERS. POSTS SHALL TELESCOPE INSIDE ANCHOR POSTS A MINIMUM OF 12".
5. ANCHOR POSTS SHALL BE 2.25" NOM. SQUARE 12-GAUGE GALVANIZED STEEL POST, A MINIMUM OF 3 FEET LONG.
6. IF THESE NOTES AND DETAILS CONFLICT WITH LOCAL CODES AND ORDINANCES, THE STRICTER REQUIREMENT SHOULD BE USED.
7. ALTERNATE MATERIALS MAY BE USED IF IN COMPLIANCE WITH A.D.A. GUIDELINES AND LOCAL REQUIREMENTS.



SCHEMATIC DESIGN 6/16/23
DATE ISSUED
DRAWN BY
CHECKED BY

HOBBS + BLACK ARCHITECTS
www.hobbs-black.com
CANNONDESIGN

FILE NO: 171/22186.CAK
INDEX NO: Y23037

PUBLIC HEALTH & ENVIRONMENTAL SCIENCE LAB
DIMONDALE, MI
PROJECT

PEA GROUP
t: 844.813.2949
www.peagroup.com
PEA JOB NO. 22-1150.00
CONSULTANT

FOR REFERENCE ONLY

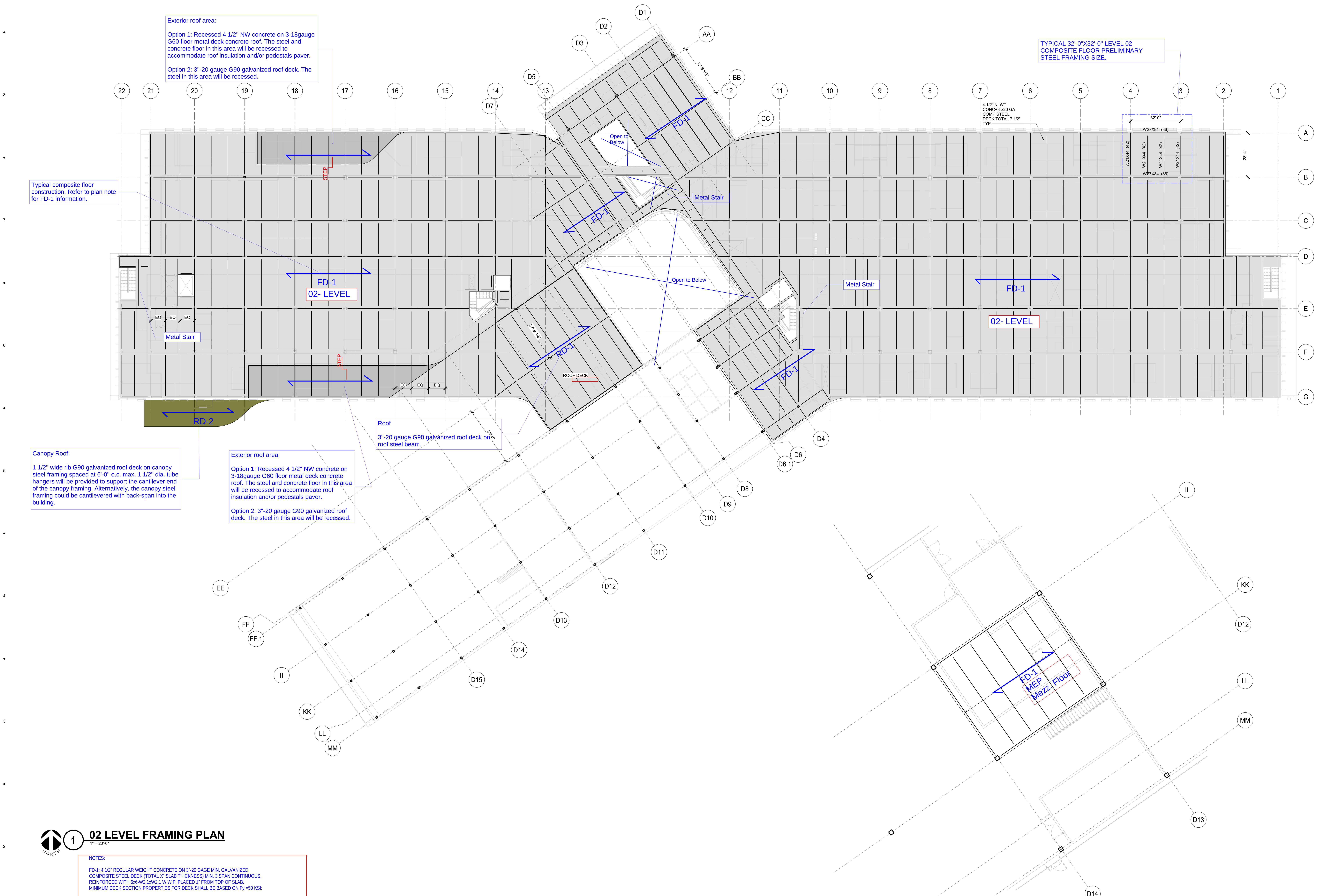
NOT FOR CONSTRUCTION

NOTES AND DETAILS
SHEET TITLE

22-320
PROJECT NUMBER

C-8.0
SHEET NUMBER

S:\PROJECTS\2022\2022-1150 MDHHS LAB - RFP\DWG\CONCEPT\(C-8.0)NOTES-22-1150.DWG PLOT DATE: 16/06/2023 BY: Shannon Pugh



1 02 LEVEL FRAMING PLAN

1" = 20'-0"

NOTES:

FD-1: 4 1/2" REGULAR WEIGHT CONCRETE ON 3"-20 GAGE MIN. GALVANIZED COMPOSITE STEEL DECK (TOTAL X" SLAB THICKNESS) MIN. 3 SPAN CONTINUOUS, REINFORCED WITH 6x6-W2.1xW2.1 W.W.F. PLACED 1" FROM TOP OF SLAB. MINIMUM DECK SECTION PROPERTIES FOR DECK SHALL BE BASED ON Fy =50 KSI:

RD-1: 3"-20 GAGE MIN. TYPE "B" WIDE RIB GALVANIZED STEEL ROOF DECK (MIN. 3 SPAN CONT.) MINIMUM DECK SECTION PROPERTIES FOR DECK SHALL BASED ON Fy = 40 KSI:

RD-2: 1 1/2"-20 GAGE MIN. TYPE "B" WIDE RIB GALVANIZED STEEL ROOF DECK (MIN. 3 SPAN CONT.) MINIMUM DECK SECTION PROPERTIES FOR DECK SHALL BASED ON Fy = 40 KSI:

2 MEZZANINE FRAMING PLAN

1/8" = 1'-0"

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SCHEMATIC DESIGN 6/16/2023

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PUBLIC HEALTH & ENVIRONMENTAL SCIENCE LAB
DIMONDALE, MI

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KEY PLAN

NOT FOR CONSTRUCTION

02 LEVEL FRAMING PLAN

SHEET TITLE

22-320

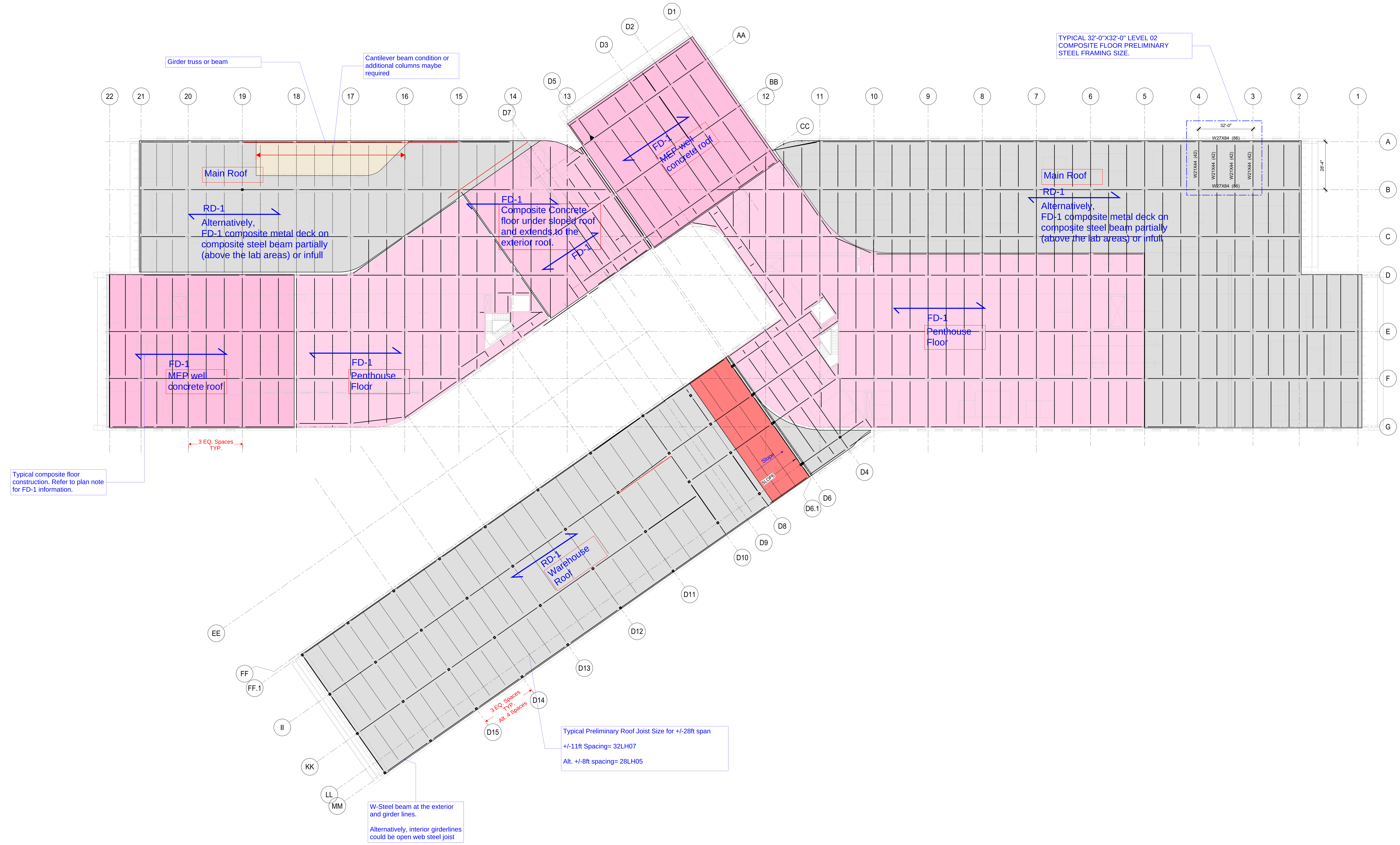
PROJECT NUMBER

SK-201

SHEET NUMBER

IMEG
33533 W. TWELVE MILE
SUITE 200
FARMINGTON HILLS, MI 48331
P: 248.344.2800 F: 248.344.1650
www.imegcorp.com

REF. SCALE IN INCHES
PROJECT #22010122.00



1 PENTHOUSE - OVERALL FRAMING PLAN -SK

1" = 20'-0"

NORTH

NOTES:

FD-1: 4 1/2" REGULAR WEIGHT CONCRETE ON 3"-20 GAGE MIN. GALVANIZED COMPOSITE STEEL DECK (TOTAL X" SLAB THICKNESS) MIN. 3 SPAN CONTINUOUS, REINFORCED WITH 6x6-W2.1xW2.1 W.W.F. PLACED 1" FROM TOP OF SLAB. MINIMUM DECK SECTION PROPERTIES FOR DECK SHALL BE BASED ON Fy =50 KSI:

RD-1: 3"-20 GAGE MIN. TYPE "B" WIDE RIB GALVANIZED STEEL ROOF DECK (MIN. 3 SPAN CONT.) MINIMUM DECK SECTION PROPERTIES FOR DECK SHALL BASED ON Fy = 40 KSI:

SCHEMATIC DESIGN 6/16/2023

DATE ISSUED

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FILE NO: 171/22186.CAK
INDEX NO: Y23037

PUBLIC HEALTH & ENVIRONMENTAL SCIENCE LAB
DIMONDALE, MI

PROJECT

CONSULTANT

FOR REFERENCE ONLY

KEY PLAN

MAIN ROOF AND PENTHOUSE FLOOR

SHEET TITLE

22-320

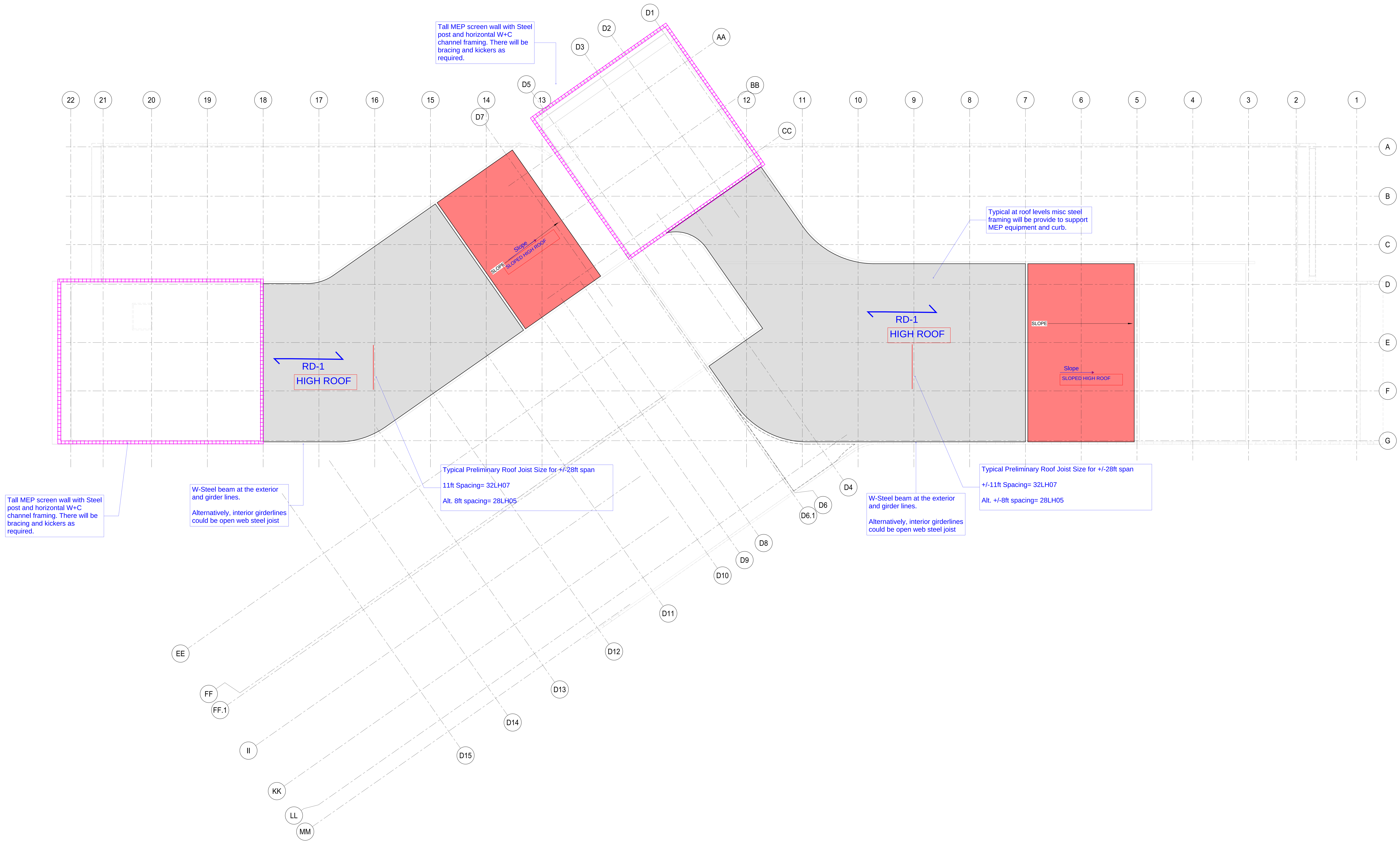
PROJECT NUMBER

SK-202

SHEET NUMBER

NOT FOR CONSTRUCTION

IMEG



1 HIGH ROOF - OVERALL FRAMING PLAN -SK

1" = 20'-0"

NORTH

NOTES:

RD-1: 3"-20 GAGE MIN. TYPE "B" WIDE RIB GALVANIZED STEEL ROOF DECK (MIN. 3 SPAN CONT.)
MINIMUM DECK SECTION PROPERTIES FOR DECK SHALL BASED ON Fy = 40 KSI:

IMEG
33533 W. TWELVE MILE
SUITE 200
FARMINGTON HILLS, MI 48331
P: 248.344.2800 F: 248.344.1650
www.imegcorp.com

REF. SCALE IN INCHES

PROJECT #22010122.00

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PUBLIC HEALTH & ENVIRONMENTAL SCIENCE LAB
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CONSULTANT

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KEY PLAN

HIGH ROOF FRAMING PLAN
SHEET TITLE

22-320
PROJECT NUMBER

SK-203
SHEET NUMBER

LEVEL 01 PLAN

SCALE - 1" = 20'-0"

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2023-05-30

CONCEPTUAL EXP JT., BRACING & POUR STRIP PLAN

SHEET TITLE

22-320

PROJECT NUMBER

SK-204

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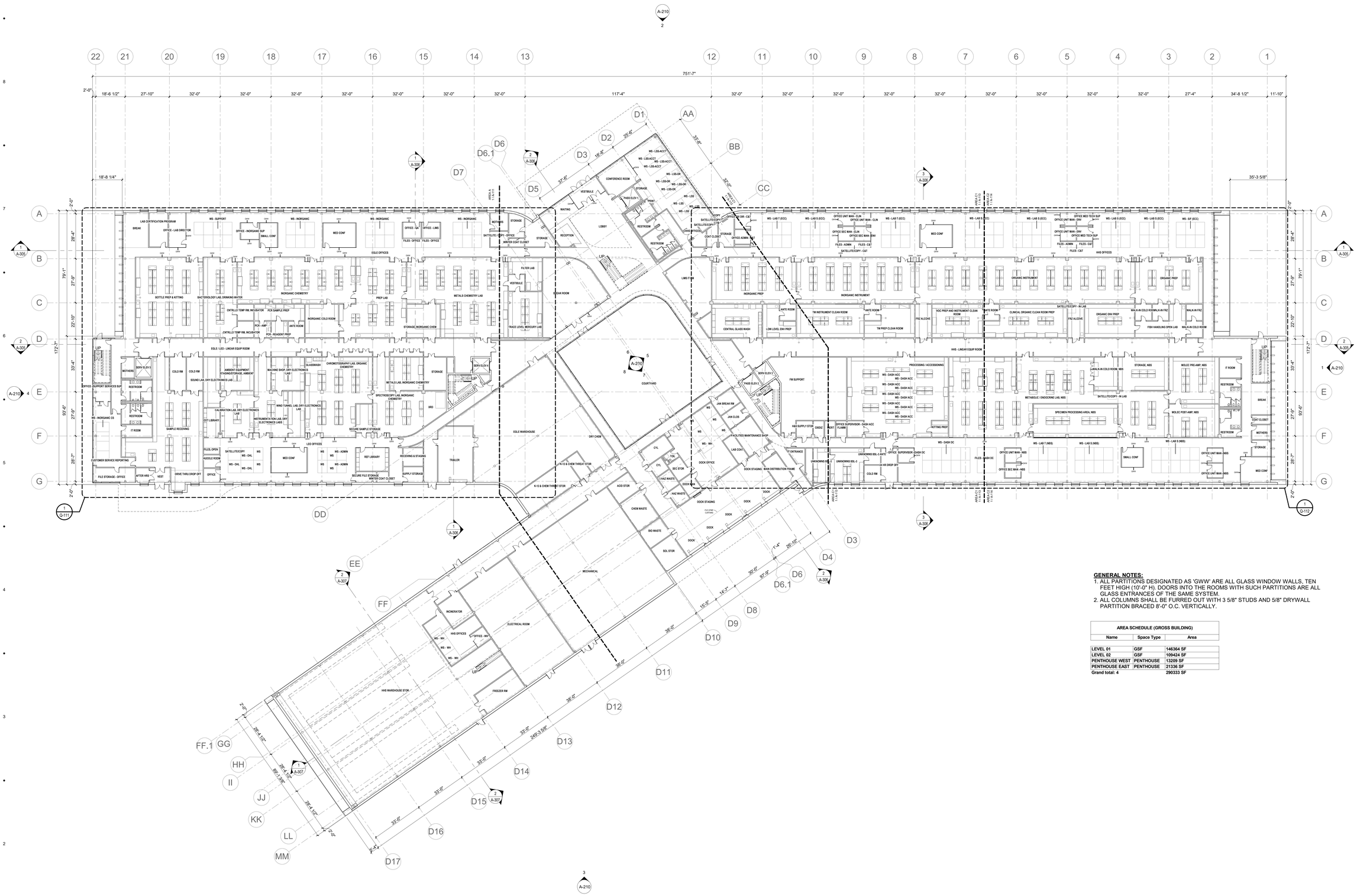

NORTH

1 A-110

LEVEL 01 FLOOR PLAN

SCALE - 1" = 20'-0"

GENERAL NOTES:

1. ALL PARTITIONS DESIGNATED AS 'GWW' ARE ALL GLASS WINDOW WALLS, TEN FEET HIGH (10'-0" H). DOORS INTO THE ROOMS WITH SUCH PARTITIONS ARE ALL GLASS ENTRANCES OF THE SAME SYSTEM.
2. ALL COLUMNS SHALL BE FURRED OUT WITH 3 5/8" STUDS AND 5/8" DRYWALL PARTITION BRACED 8'-0" O.C. VERTICALLY.

AREA SCHEDULE (GROSS BUILDING)

Name	Space Type	Area
LEVEL 01	GSF	146364 SF
LEVEL 02	GSF	109424 SF
PENTHOUSE WEST	PENTHOUSE	13209 SF
PENTHOUSE EAST	PENTHOUSE	21336 SF
Grand total: 4		290333 SF

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A B C1 C2 D NORTH

KEY PLAN

LEVEL 01 FLOOR PLAN - COMPOSITE

SHEET TITLE

22-320

PROJECT NUMBER

A-110

SHEET NUMBER

NOT FOR CONSTRUCTION

LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W/ SINK
- SCULLERY SINK
- PASS THROUGH WINDOW
- EXHAUST SNORKEL
- EMERGENCY SAFTEY SHOWER W/ EYEWASH

ABBREVIATIONS

BSC	BIOSAFETY CABINET
DDT	DOWN DRAFT TABLE
EXS	EXHAUST SNORKEL
FH	FUME HOOD
FH-PT	FUME HOOD PASS THROUGH
GSP	GENETIC SCREENING PROCESSOR
GW	GLASSWASH
MS	MASS SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
WT	WATER TREATMENT
XRD	X-RAY DIFFRACTOMETER

BREAK
346 SF AREA
100 SF PROGRAM
246 SF Δ

LAB CERTIFICATION PROGRAM
262 SF AREA
200 SF PROGRAM
62 SF Δ

ICE - LAB DIRECTOR
237 SF AREA
200 SF PROGRAM
37 SF Δ

WS - SUPPORT
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - ADMIN
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - SUPPORT
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - INORGANIC
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - SUPPORT
48 SF AREA
48 SF PROGRAM
0 SF Δ

FILES - OFFICE
48 SF AREA
48 SF PROGRAM
0 SF Δ

OFFICE - INORGANIC SUP
121 SF AREA
120 SF PROGRAM
1 SF Δ

SMALL CONF
169 SF AREA
125 SF PROGRAM
44 SF Δ

WS - INORGANIC
48 SF AREA
48 SF PROGRAM
0 SF Δ

MED CONF
314 SF AREA
315 SF PROGRAM
-1 SF Δ

OFFICE - QA
114 SF AREA
120 SF PROGRAM
-6 SF Δ

OFFICE - LIMS
114 SF AREA
120 SF PROGRAM
-6 SF Δ

FILES - OFFICE
67 SF AREA
48 SF PROGRAM
19 SF Δ

MOTHERS
107 SF AREA
100 SF PROGRAM
27 SF Δ

SATTELITE / COPY - OFFICE
111 SF AREA
83 SF PROGRAM
66 SF Δ

1 / A-111

EGLE OFFICES
1,436 SF AREA
1468 SF Δ

BOTTLE PREP & KITTING
2294 SF AREA
2295 SF PROGRAM
158 SF Δ

BACTERIOLOGY LAB, DRINKING WATER
1029 SF AREA
1015 SF PROGRAM
51 SF Δ

INORGANIC CHEMISTRY
2282 SF AREA
2500 SF PROGRAM
408 SF Δ

PREP LAB
1716 SF AREA
1900 SF PROGRAM
134 SF Δ

METALS CHEMISTRY LAB
2681 SF AREA
2625 SF PROGRAM
139 SF Δ

CNTRLLD TEMP RM, INCUBATOR
102 SF AREA
50 SF PROGRAM
53 SF Δ

CNTRLLD TEMP RM, INCUBATOR
103 SF AREA
50 SF PROGRAM
53 SF Δ

PCR SAMPLE PREP
220 SF AREA
313 SF PROGRAM
-7 SF Δ

PCR - AMP
103 SF AREA
100 SF PROGRAM
3 SF Δ

PT

PCR - REAGENT PREP
103 SF AREA
114 SF PROGRAM
-32 SF Δ

ANTE ROOM
103 SF AREA
70 SF PROGRAM
33 SF Δ

INORGANIC COLD ROOM
434 SF AREA
209 SF PROGRAM
214 SF Δ

STORAGE, INORGANIC CHEM
436 SF AREA
440 SF PROGRAM
-4 SF Δ

EGLE / LEO - LINEAR EQUIP ROOM
2399 SF AREA
0 SF PROGRAM
2399 SF Δ

AMBIENT EQUIPMENT STAGING/STORAGE, AMBIENT
444 SF AREA
440 SF PROGRAM
4 SF Δ

GAS CYLINDER ALCOVES, AMBIENT
67 SF AREA
25 SF PROGRAM
42 SF Δ

CHEM STAGING / STOR AMBIENT
39 SF AREA
210 SF PROGRAM
-171 SF Δ

CHEM STAGING / STOR AMBIENT
52 SF AREA
210 SF PROGRAM
-158 SF Δ

CHEM STAGING / STOR AMBIENT
51 SF AREA
210 SF PROGRAM
-159 SF Δ

GLASSWASH
199 SF AREA
200 SF PROGRAM
-01 SF Δ

MOTHERS
139 SF AREA
100 SF PROGRAM
-1 SF Δ

SERV ELEV 5

COLD RM
212 SF AREA
216 SF PROGRAM
-4 SF Δ

COLD RM
212 SF AREA
200 SF PROGRAM
12 SF Δ

SOUND LAB, DRY ELECTRONICS LAB
1,100 SF AREA
1,100 SF PROGRAM
19 SF Δ

MACHINE SHOP, DRY ELECTRONICS LAB
434 SF AREA
400 SF PROGRAM
34 SF Δ

METALS LAB, INORGANIC CHEMISTRY
434 SF AREA
280 SF PROGRAM
154 SF Δ

STORAGE
295 SF AREA
120 SF PROGRAM
175 SF Δ

SERV ELEV 4

OFFICE - SUPPORT SERVICES SUP
121 SF AREA
120 SF PROGRAM
4 SF Δ

RESTROOM
242 SF AREA
0 SF PROGRAM
242 SF Δ

RESTROOM
242 SF AREA
0 SF PROGRAM
242 SF Δ

CUSTOMER SERVICE REPORTING
332 SF AREA
416 SF PROGRAM
-115 SF Δ

IT ROOM
147 SF AREA
0 SF PROGRAM
147 SF Δ

SAMPLE RECEIVING
2008 SF AREA
2125 SF PROGRAM
-42 SF Δ

CET LIBRARY
186 SF AREA
160 SF PROGRAM
26 SF Δ

CALIBRATION LAB, DRY ELECTRONICS LAB
642 SF AREA
640 SF PROGRAM
46 SF Δ

INSTRUMENTATION LAB, DRY ELECTRONICS LABS
788 SF AREA
550 SF PROGRAM
238 SF Δ

WIND TUNNEL LAB, DRY ELECTRONICS LAB
1,101 SF AREA
1,000 SF PROGRAM
-9 SF Δ

CHROMOTOGRAPHY LAB, ORGANIC CHEMISTRY
756 SF AREA
218 SF PROGRAM
426 SF Δ

SECURE SAMPLE STORAGE
180 SF AREA
210 SF PROGRAM
-130 SF Δ

SPECTROSCOPY LAB, INORGANIC CHEMISTRY
1,170 SF AREA
1,080 SF PROGRAM
167 SF Δ

XRD
256 SF AREA
200 SF PROGRAM
56 SF Δ

WS - INORGANIC CS
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - INORGANIC CS
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - INORGANIC CS
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - INORGANIC CS
48 SF AREA
48 SF PROGRAM
0 SF Δ

LEO OFFICES
1,938 SF AREA
1938 SF Δ

FILES, OPEN
42 SF AREA
48 SF PROGRAM
-6 SF Δ

HUDDLE ROOM
83 SF AREA
0 SF PROGRAM
83 SF Δ

SATELLITE/COPY
64 SF AREA
20 SF PROGRAM
44 SF Δ

WS - OHL
64 SF AREA
48 SF PROGRAM
16 SF Δ

WS
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - OHL
64 SF AREA
48 SF PROGRAM
16 SF Δ

WS - OHL
64 SF AREA
48 SF PROGRAM
16 SF Δ

WS
48 SF AREA
48 SF PROGRAM
0 SF Δ

MED CONF
353 SF AREA
315 SF PROGRAM
38 SF Δ

WS
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - ADMIN
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS
48 SF AREA
48 SF PROGRAM
0 SF Δ

WS - ADMIN
48 SF AREA
48 SF PROGRAM
0 SF Δ

REF LIBRARY
299 SF AREA
280 SF PROGRAM
19 SF Δ

SECURE FILE STORAGE
85 SF AREA
90 SF PROGRAM
-4 SF Δ

WINTER COAT CLOSET
48 SF AREA
50 SF PROGRAM
-2 SF Δ

RECEIVING & STAGING
165 SF AREA
120 SF PROGRAM
29 SF Δ

SUPPLY STORAGE
122 SF AREA
64 SF PROGRAM
58 SF Δ

TRAILER
762 SF AREA
703 SF PROGRAM
62 SF Δ

FILE STORAGE - OFFICE
233 SF AREA
300 SF PROGRAM
-67 SF Δ

AFTER HRS
74 SF AREA
100 SF PROGRAM
-26 SF Δ

VEST
118 SF AREA
0 SF PROGRAM
118 SF Δ

DRIVE THRU DROP OFF
198 SF AREA
504 SF PROGRAM
-352 SF Δ

OFFICE
91 SF AREA
90 SF PROGRAM
1 SF Δ

UP

1 / A-306

NORTH

1 / A-111 LEVEL 01 FLOOR PLAN - AREA A

SCALE - 1/8" = 1'-0"

Autodesk Docs://20720-1 MI PH-ES Lab/20320-Arch-DTMB State Environmental Science Labs-2023.rvt
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PROJECT

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KEY PLAN

LEVEL 01 FLOOR PLAN - AREA A

SHEET TITLE

22-320

PROJECT NUMBER

A-111

SHEET NUMBER

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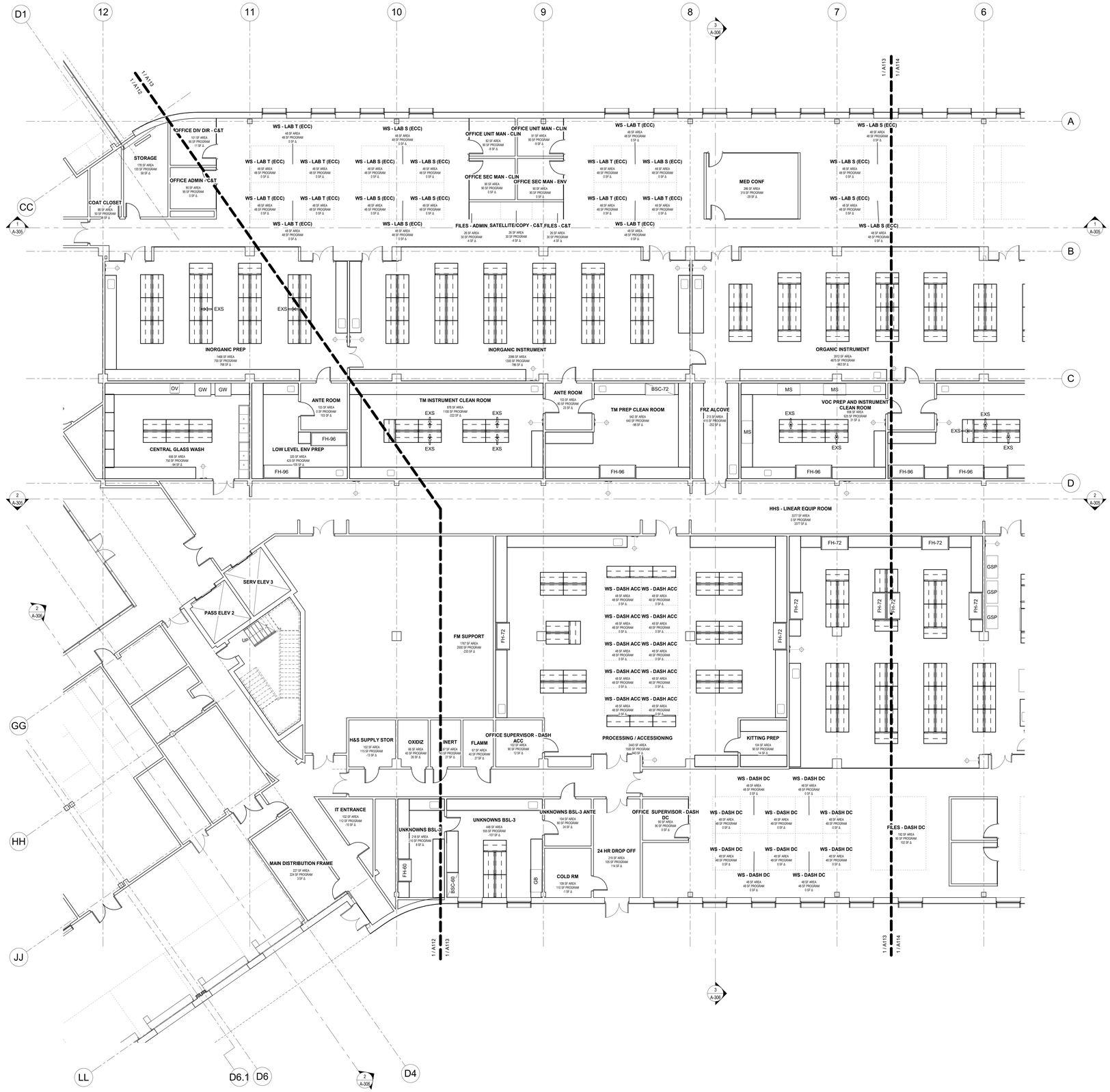

NORTH

1 / A-113 LEVEL 01 FLOOR PLAN - AREA C1

SCALE - 1/8" = 1'-0"

LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W SINK
- SCULLERY SINK
- PASS THROUGH WINDOW
- EXHAUST SNORKEL
- EMERGENCY SAFTEY SHOWER W EYEWASH

ABBREVIATIONS

BSC	BIOSAFETY CABINET
DDT	DOWN DRAFT TABLE
EXS	EXHAUST SNORKEL
FH	FUME HOOD
FH-PT	FUME HOOD PASS THROUGH
GSP	GENETIC SCREENING PROCESSOR
GW	GLASSWASH
MS	MASS SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
SC	SCULLERY SINK
XRD	X-RAY DIFFRACTOMETER

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KEY PLAN

LEVEL 01 FLOOR PLAN - AREA C1

SHEET TITLE

22-320

PROJECT NUMBER

A-113

SHEET NUMBER

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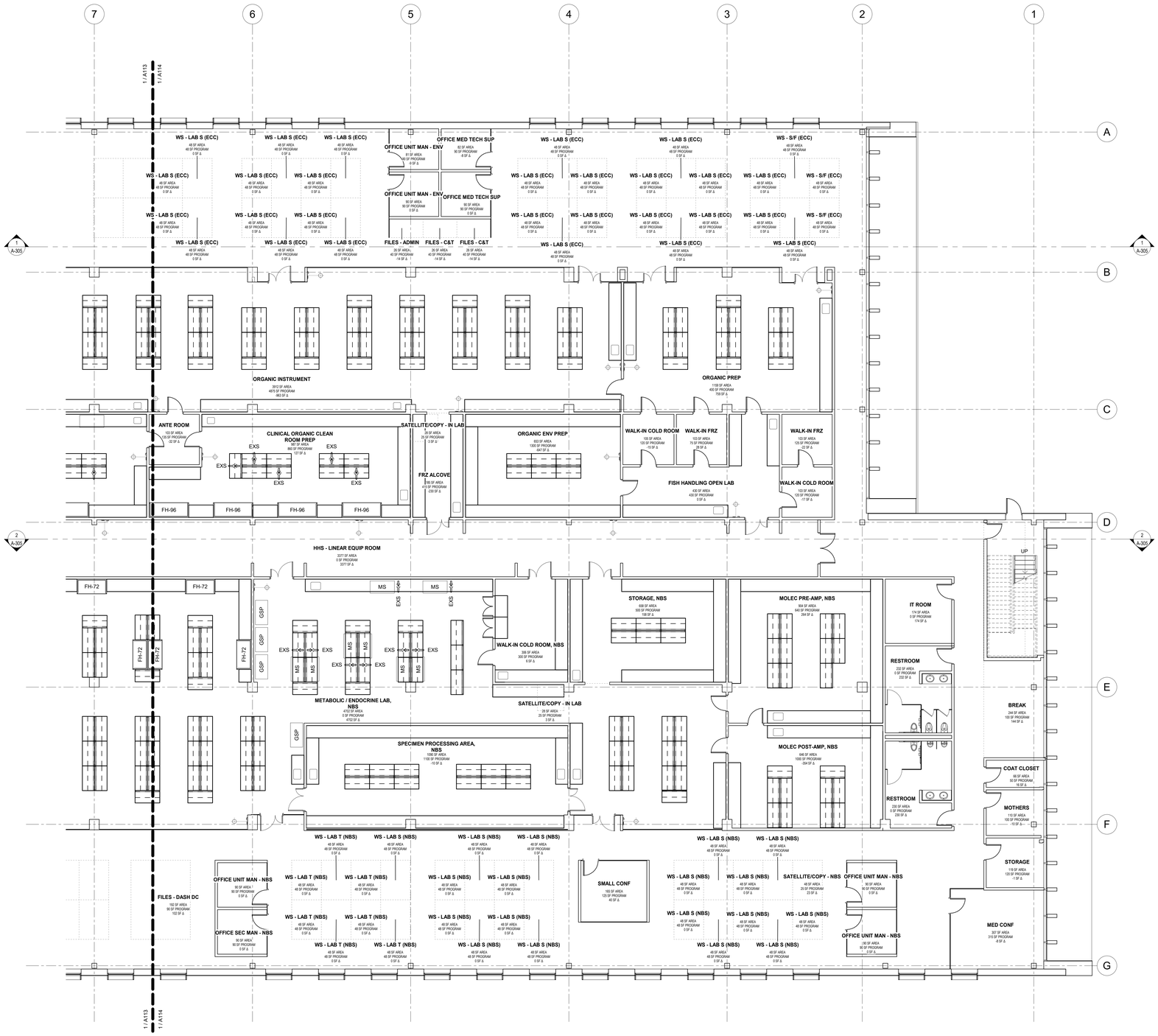

NORTH

1 / A-114 LEVEL 01 FLOOR PLAN - AREA C2

SCALE - 1/8" = 1'-0"

LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W SINK
- SCULLERY SINK
- PASS THROUGH WINDOW
- EXHAUST SNORKEL
- EMERGENCY SAFTEY SHOWER W EYEWASH

ABBREVIATIONS

BSC	BIOSAFETY CABINET
DDT	DOWN DRAFT TABLE
EXS	EXHAUST SNORKEL
FH	FUME HOOD
FH-PT	FUME HOOD PASS THROUGH
GSP	GENETIC SCREENING PROCESSOR
GW	GLASSWASH
MS	MASS SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
UT	ULTRA CENTRIFUGE
XRD	X-RAY DIFFRACTOMETER

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KEY PLAN

LEVEL 01 FLOOR PLAN - AREA C2

SHEET TITLE

22-320

PROJECT NUMBER

A-114

SHEET NUMBER

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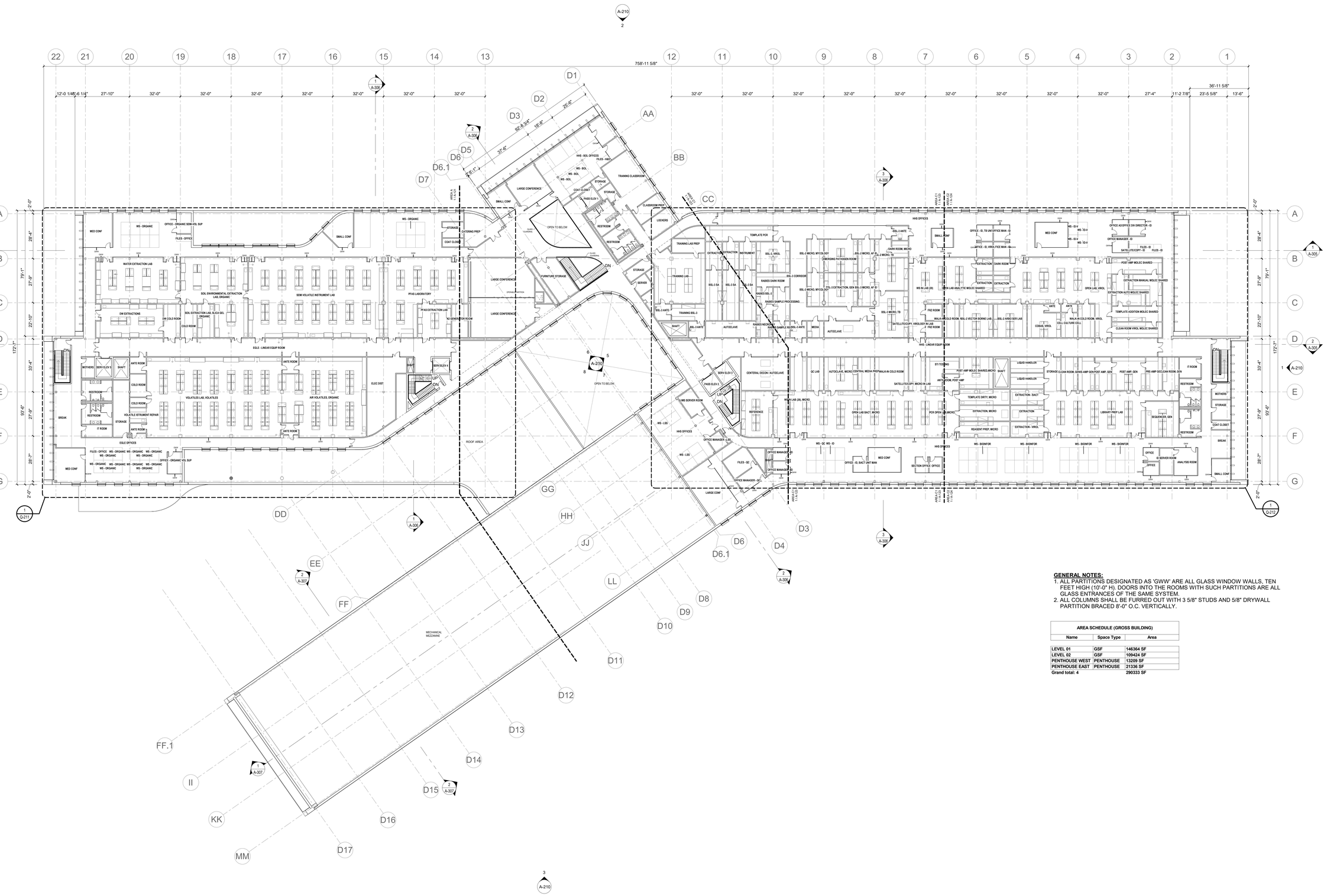

GENERAL NOTES:

1. ALL PARTITIONS DESIGNATED AS 'GWW' ARE ALL GLASS WINDOW WALLS, TEN FEET HIGH (10'-0" H). DOORS INTO THE ROOMS WITH SUCH PARTITIONS ARE ALL GLASS ENTRANCES OF THE SAME SYSTEM.
2. ALL COLUMNS SHALL BE FURRED OUT WITH 3 5/8" STUDS AND 5/8" DRYWALL PARTITION BRACED 8'-0" O.C. VERTICALLY.

AREA SCHEDULE (GROSS BUILDING)

Name	Space Type	Area
LEVEL 01	GSF	146364 SF
LEVEL 02	GSF	109424 SF
PENTHOUSE WEST	PENTHOUSE	13209 SF
PENTHOUSE EAST	PENTHOUSE	21336 SF
Grand total: 4		290333 SF

NORTH

1 A-120 LEVEL 02 FLOOR PLAN

SCALE - 1" = 20'-0"

Sheet Size - 36x42

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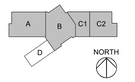

KEY PLAN

LEVEL 02 FLOOR PLAN - COMPOSITE

SHEET TITLE

22-320

PROJECT NUMBER

A-120

SHEET NUMBER

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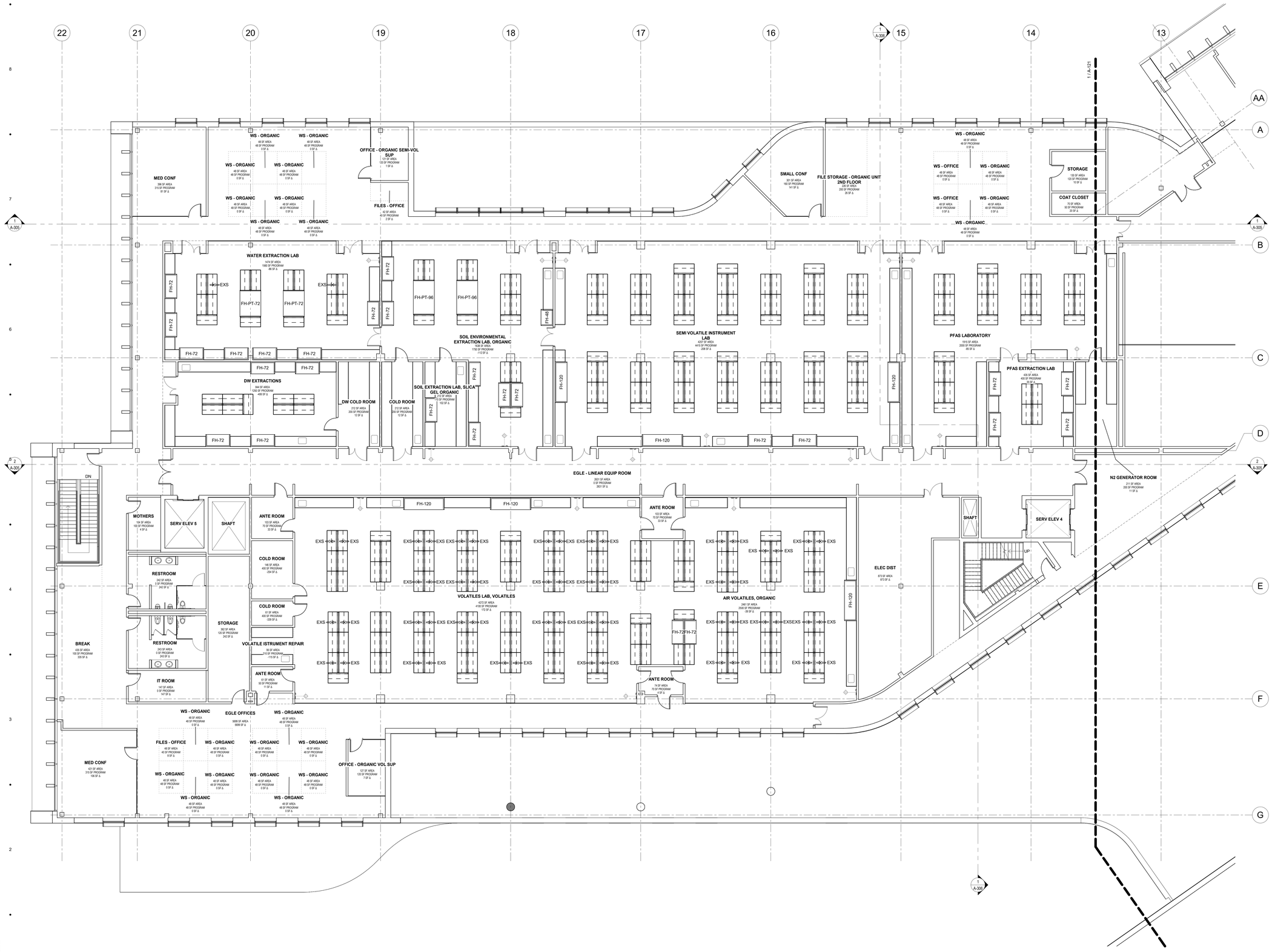

NORTH

2 A-121 LEVEL 02 FLOOR PLAN - AREA A

SCALE - 1/8" = 1'-0"

LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W/ SINK
- SCULLERY SINK
- PASS THROUGH WINDOW
- EXHAUST SNORKEL
- EMERGENCY SAFTEY SHOWER W/ EYEWASH

ABBREVIATIONS

BSC	BIOSAFETY CABINET
DDT	DOWN DRAFT TABLE
EXS	EXHAUST SNORKEL
FH	FUME HOOD
FH-PT	FUME HOOD PASS THROUGH
GSP	GENETIC SCREENING PROCESSOR
GW	GLASSWASH
MS	MASS SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
WC	WATER CONTACT
XRD	X-RAY DIFFRACTOMETER

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KEY PLAN

LEVEL 02 FLOOR PLAN - AREA A
SHEET TITLE

22-320
PROJECT NUMBER

A-121
SHEET NUMBER

NOT FOR CONSTRUCTION

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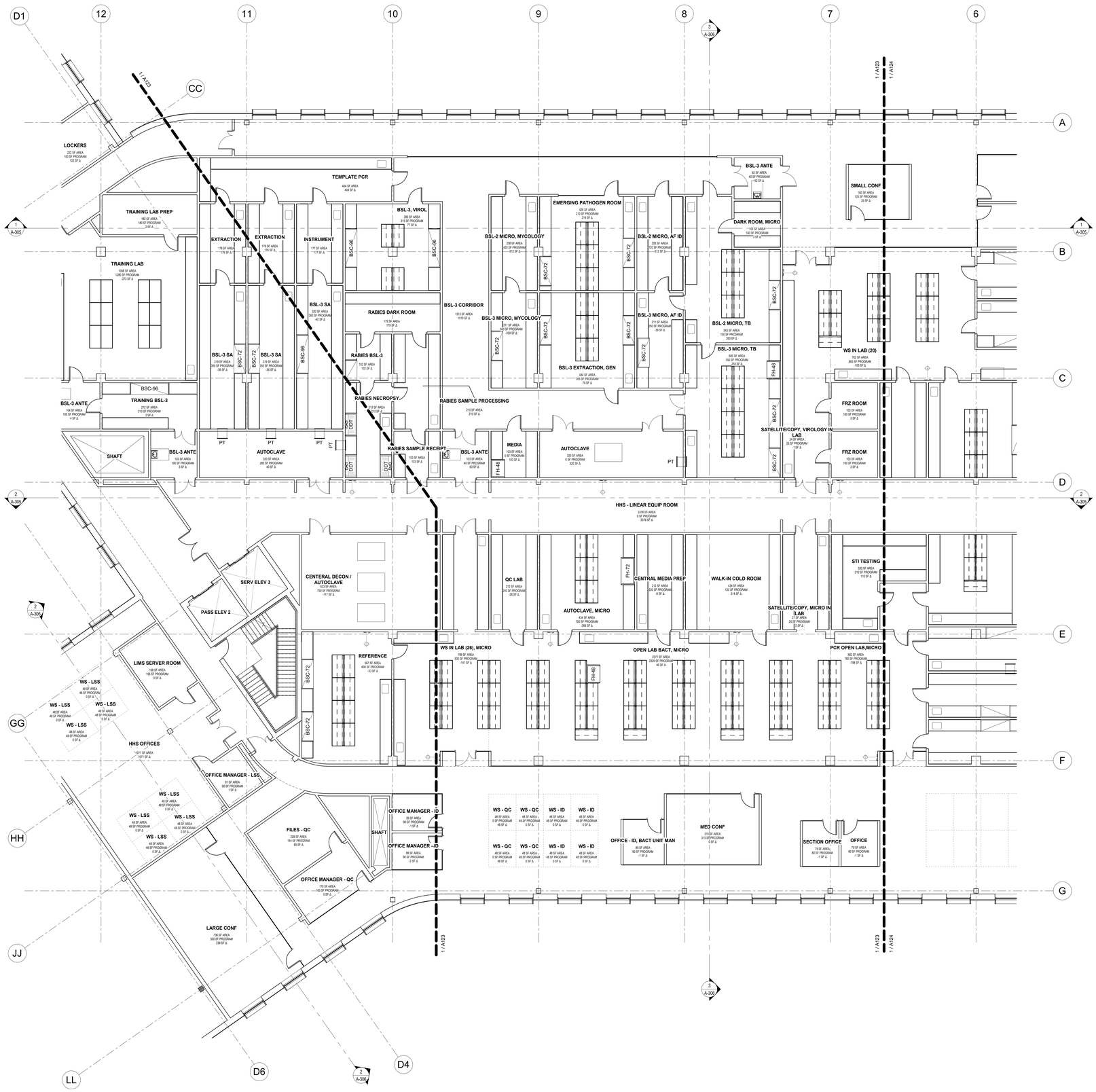

NORTH

1 A-123 LEVEL 02 FLOOR PLAN - AREA C1

SCALE - 1/8" = 1'-0"

LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W/ SINK
- SCULLERY SINK
- PASS THROUGH WINDOW
- EXHAUST SNORKEL
- EMERGENCY SAFTEY SHOWER W/ EYEWASH

ABBREVIATIONS

BSC	BIOSAFETY CABINET
DDT	DOWN DRAFT TABLE
EXS	EXHAUST SNORKEL
FH	FUME HOOD
FH-PT	FUME HOOD-PASS THROUGH
GSP	GENETIC SCREENING PROCESSOR
GW	GLASSWASH
MS	MASS SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
SCT	SAMPLE CUTTER
XRD	X-RAY DIFFRACTOMETER

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A | B | C1 | C2 | D — NORTH

KEY PLAN

LEVEL 02 FLOOR PLAN - AREA C1

SHEET TITLE

22-320

PROJECT NUMBER

A-123

SHEET NUMBER

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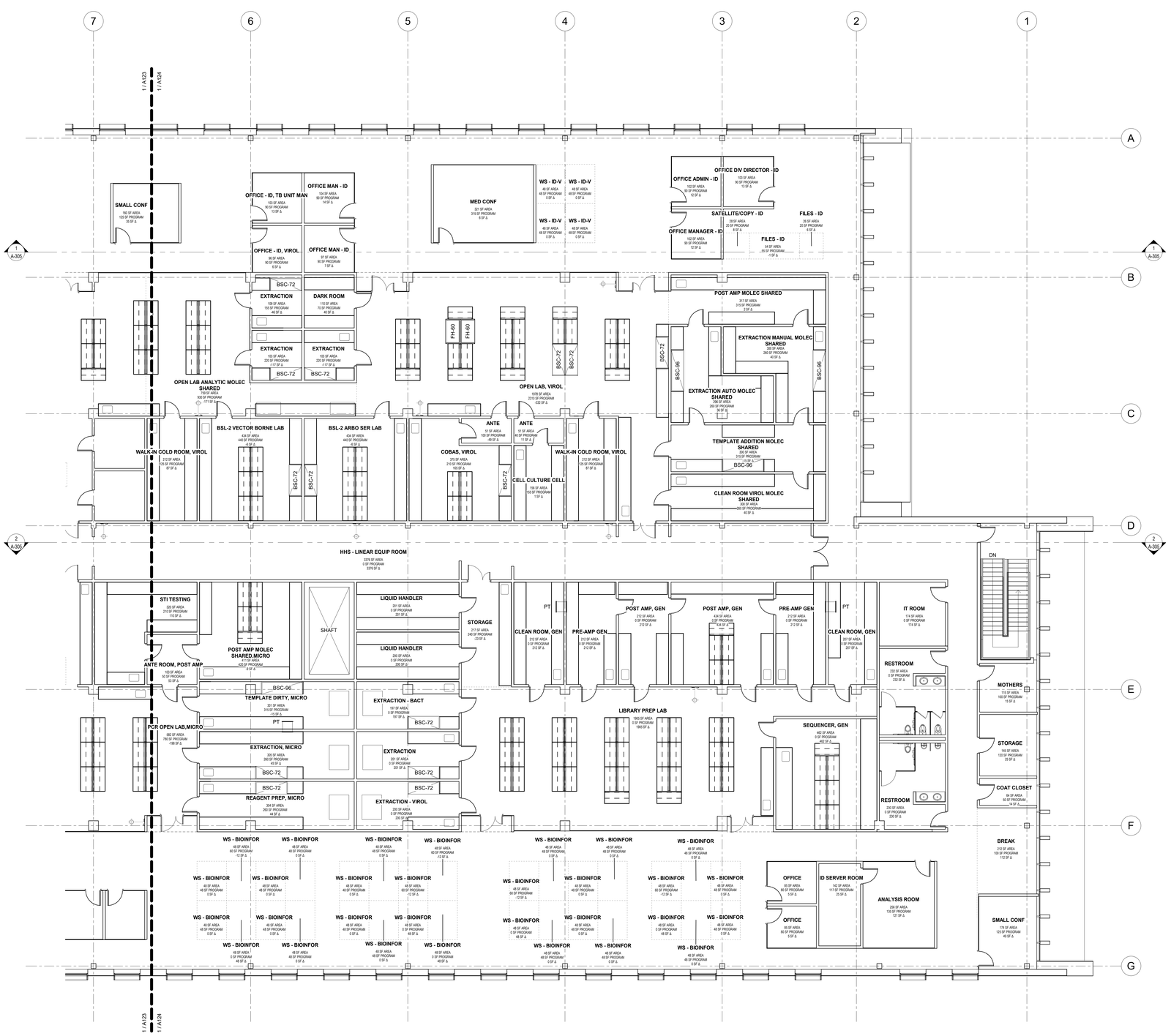
LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W/ SINK
- SCULLERY SINK
- PASS THROUGH WINDOW
- EXHAUST SNORKEL
- EMERGENCY SAFTEY SHOWER W/ EYEWASH

ABBREVIATIONS

BSC	BIOSAFETY CABINET
DDT	DOWN DRAFT TABLE
EXS	EXHAUST SNORKEL
FH	FUME HOOD
FH-PT	FUME HOOD PASS THROUGH
GSP	GENETIC SCREENING PROCESSOR
GW	GLASSWASH
MS	MASS SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
WT	WATER TREATMENT
XRD	X-RAY DIFFRACTOMETER



NORTH

1 A–124 LEVEL 02 FLOOR PLAN - AREA C2

SCALE - 1/8" = 1'-0"

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INDEX NO: Y23037

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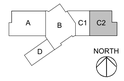

KEY PLAN

LEVEL 02 FLOOR PLAN - AREA C2

SHEET TITLE

22-320

PROJECT NUMBER

A-124

SHEET NUMBER

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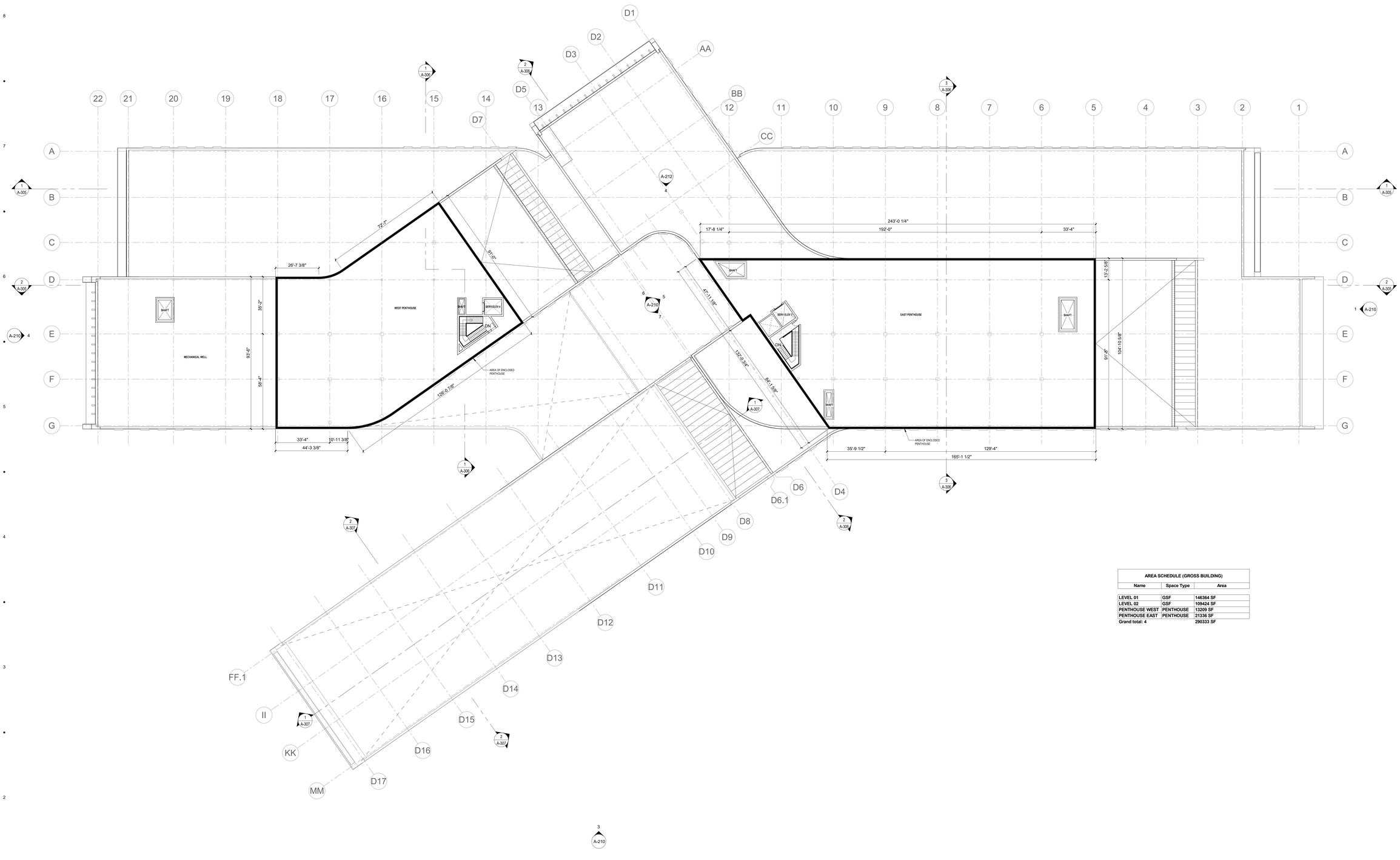

AREA SCHEDULE (GROSS BUILDING)		
Name	**Space Type**	**Area**
LEVEL 01	GSF	146364 SF
LEVEL 02	GSF	109424 SF
PENTHOUSE WEST	PENTHOUSE	13209 SF
PENTHOUSE EAST	PENTHOUSE	21336 SF
Grand total: 4		290333 SF

NORTH

1 A-130 / A-210

PENTHOUSE FLOOR PLAN

SCALE - 1" = 20'-0"

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KEY PLAN

PENTHOUSE FLOOR PLAN - COMPOSITE

SHEET TITLE

22-320

PROJECT NUMBER

A-130

SHEET NUMBER

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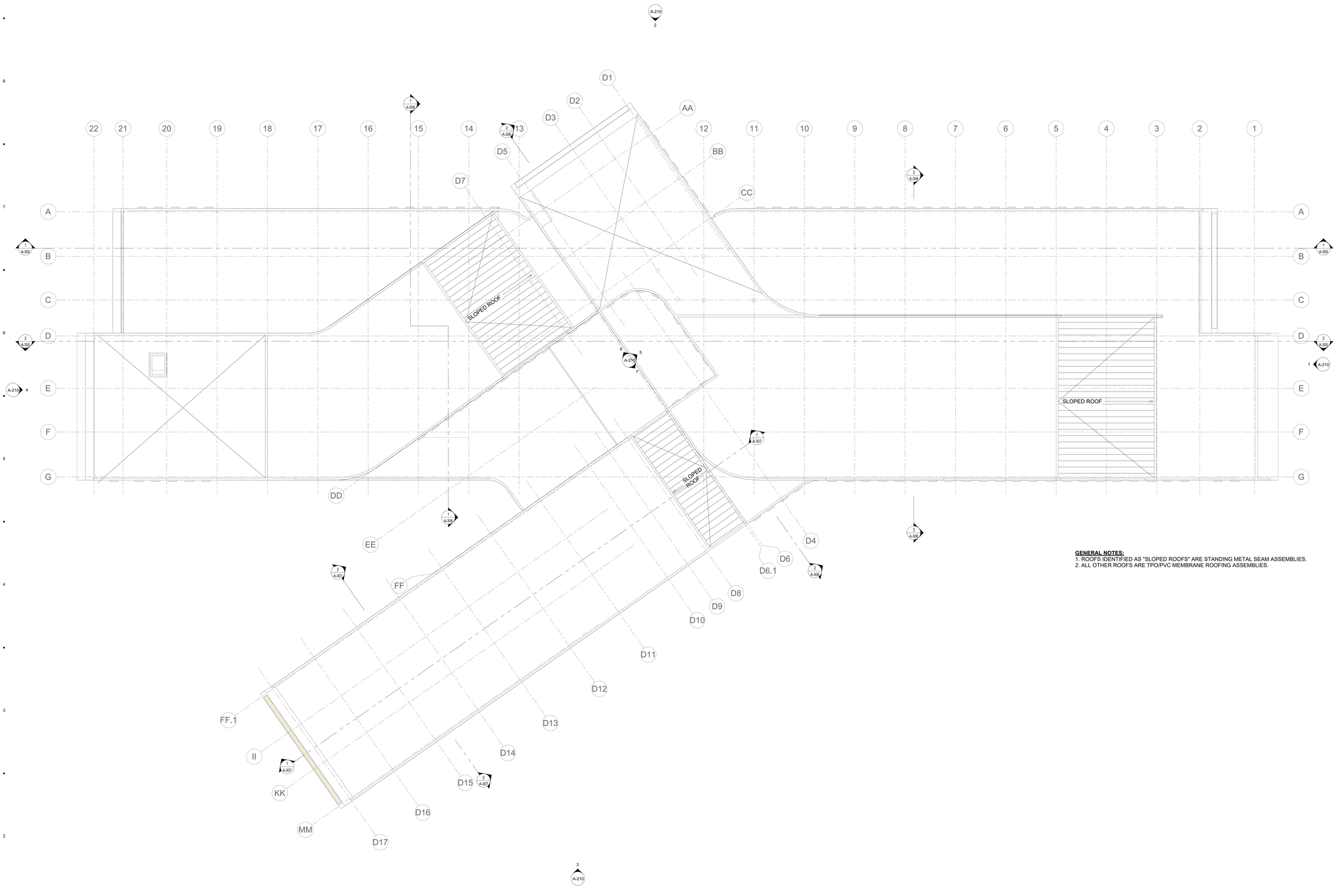

NORTH

1 A-150 ROOF PLAN

SCALE - 1" = 20'-0"

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KEY PLAN

ROOF PLAN - COMPOSITE

SHEET TITLE

22-320

PROJECT NUMBER

A-150

SHEET NUMBER

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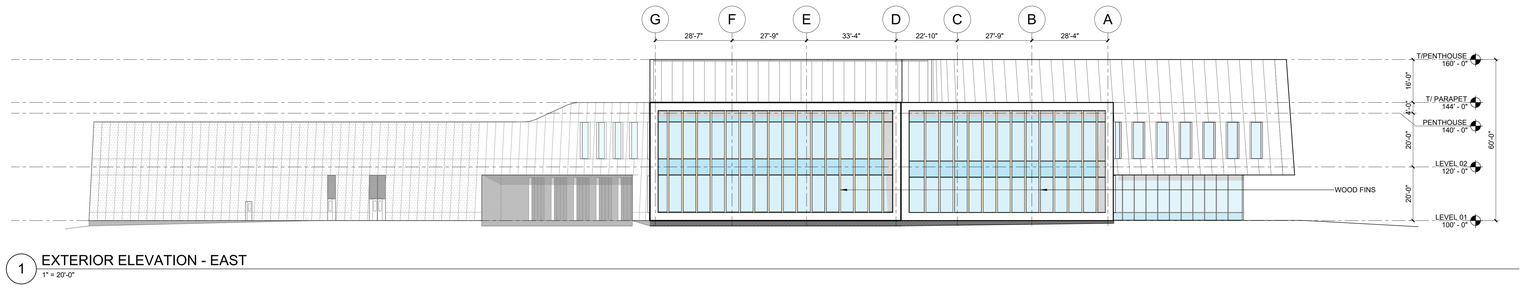
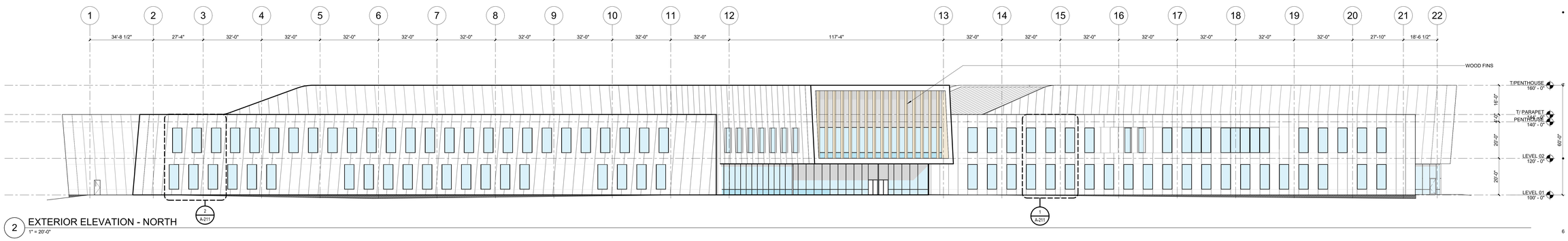


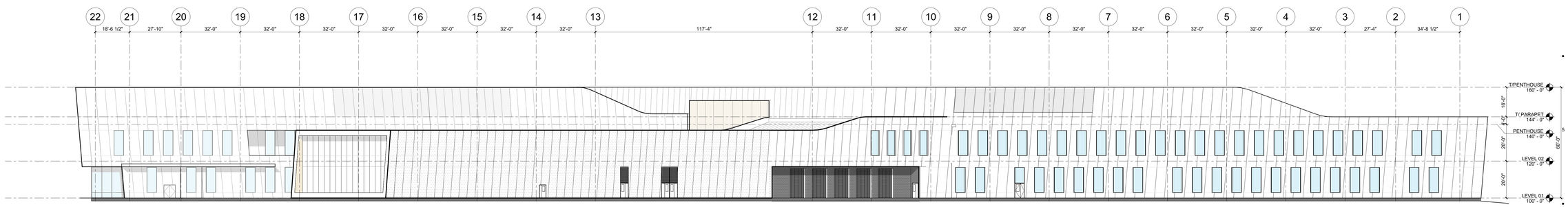
1 EXTERIOR ELEVATION - EAST
1" = 20'-0"

MATERIAL LEGEND

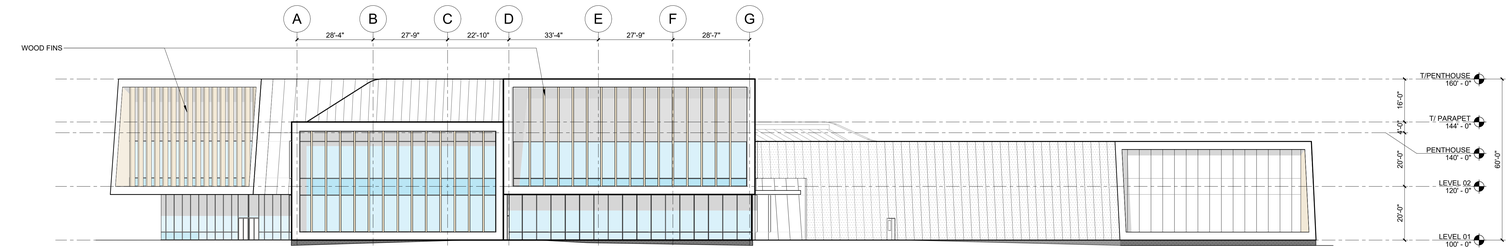
- COMPOSITE METAL PANEL RAINSCREEN ASSEMBLY
- COMPOSITE INSULATED METAL PANEL
- PERFORATED METAL PANEL
- VISION GLAZING
- SPANDREL GLAZING
- EXTERIOR WOOD PANEL / FINS
- LOUVER
- FINISHED CMU



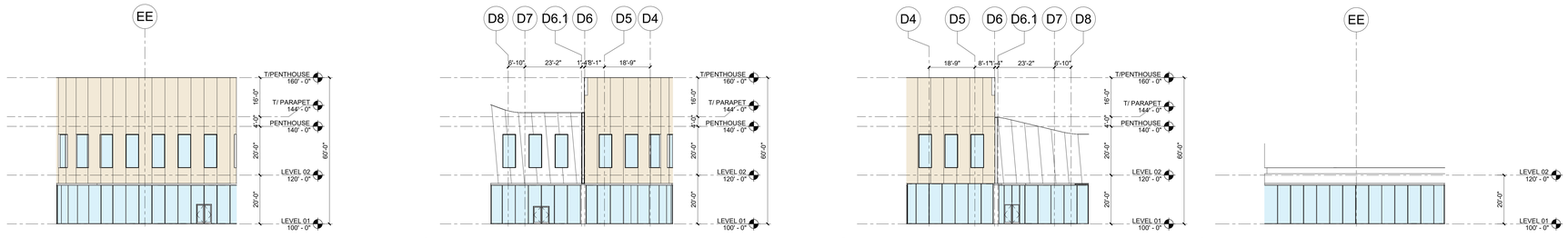
2 EXTERIOR ELEVATION - NORTH
1" = 20'-0"



3 EXTERIOR ELEVATION - SOUTH
1" = 20'-0"



4 EXTERIOR ELEVATION - WEST
1" = 20'-0"



5 EXTERIOR ELEVATION - COURTYARD NE
1" = 20'-0"

6 EXTERIOR ELEVATION - COURTYARD NW
1" = 20'-0"

7 EXTERIOR ELEVATION - COURTYARD SE
1" = 20'-0"

8 EXTERIOR ELEVATION - COURTYARD SW
1" = 20'-0"

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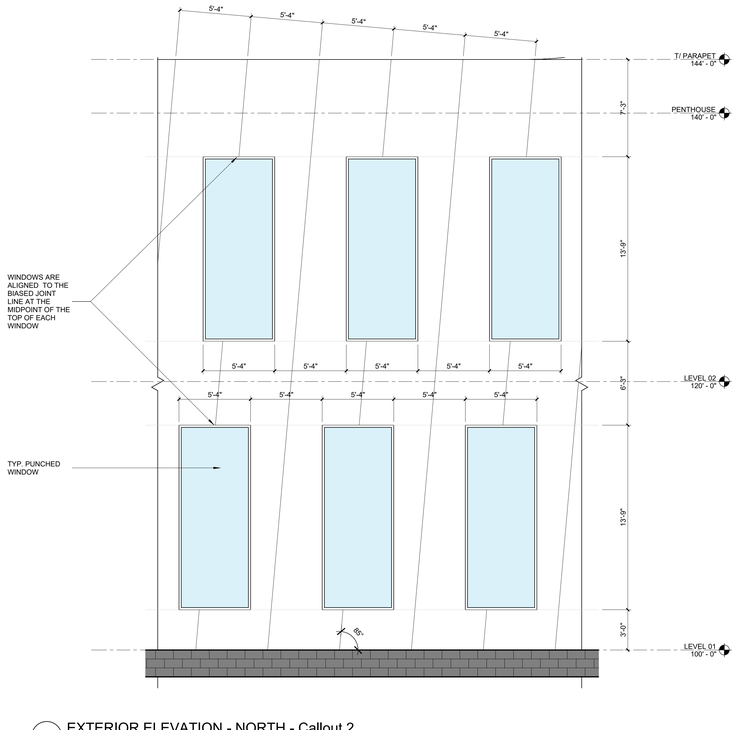
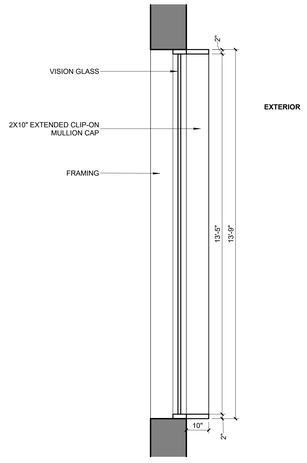
EXTERIOR ELEVATIONS
SHEET TITLE

22-320
PROJECT NUMBER

A-210
SHEET NUMBER

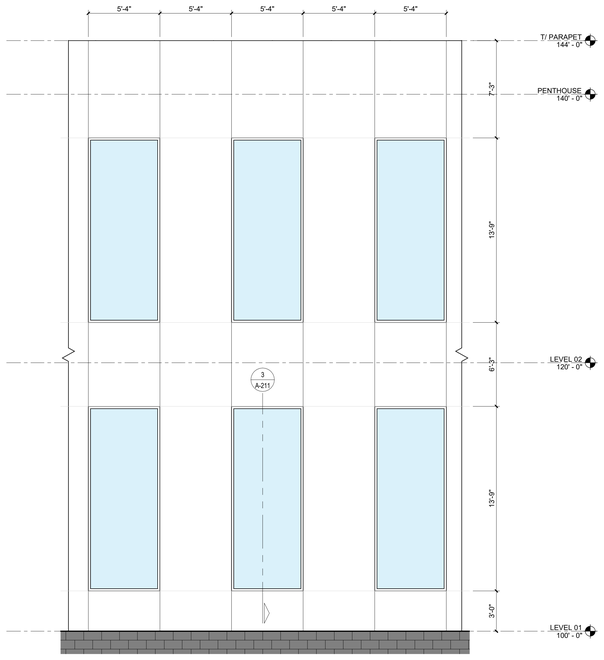


1 TYP. EXTERIOR FACADE
1/4" = 1'-0"



3 TYP. PUNCHED WINDOW
1/2" = 1'-0"

2 EXTERIOR ELEVATION - NORTH - Callout 2
1/4" = 1'-0"



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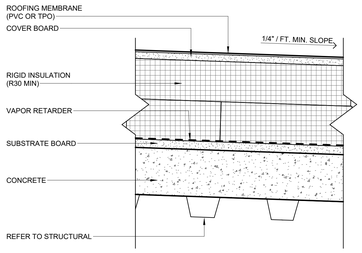
EXTERIOR ELEVATIONS
SHEET TITLE

22-320
PROJECT NUMBER

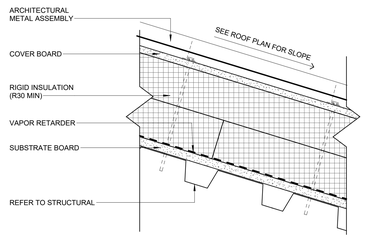
A-211
SHEET NUMBER



RA-03

5 ROOF ASSEMBLY - PVC OR TPO - SLOPING STEEL DECK WITH INSULATION OVER CONCRETE

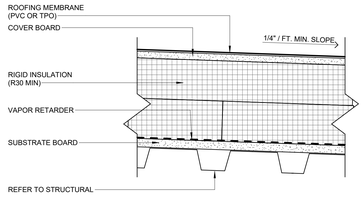
3" = 1'-0"



RA-01

1 ROOF ASSEMBLY -STANDING SEAM - SLOPING STEEL DECK WITH INSULATION

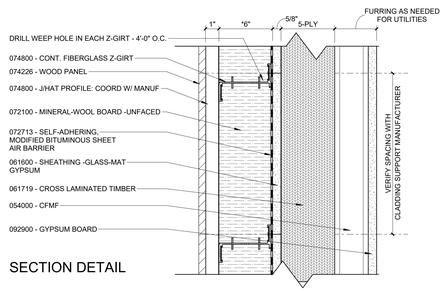
3" = 1'-0"



RA-02

2 ROOF ASSEMBLY - PVC OR TPO - SLOPING STEEL DECK WITH INSULATION

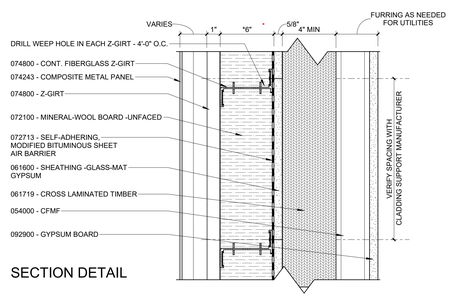
3" = 1'-0"



WA-01

3 WALL ASSEMBLY - WOOD PANEL CLADDING ON CONT. THERMAL Z-GIRTS CLT WITH FIBROUS INSULATION - VERTICAL SUBGIRTS

3" = 1'-0"



WA-02

4 WALL ASSEMBLY - MCM PANELS ON CONT. THERMAL Z-GIRTS CFMF WITH FIBROUS INSULATION - VERTICAL SUBGIRTS

3" = 1'-0"

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EXTERIOR WALL & ROOF ASSEMBLIES

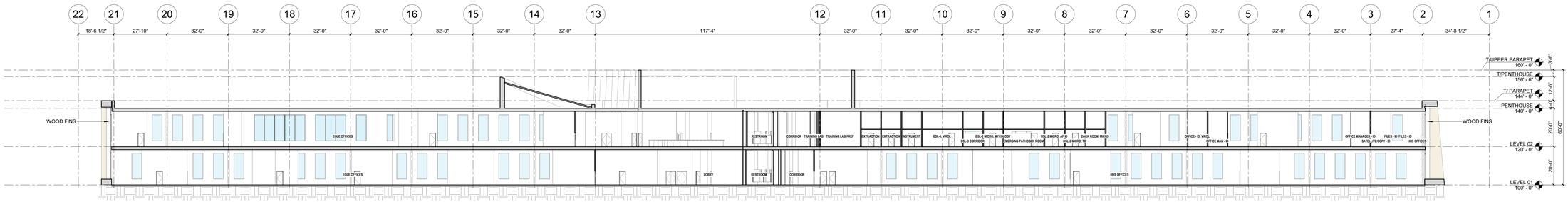
SHEET TITLE

22-320

PROJECT NUMBER

A-300

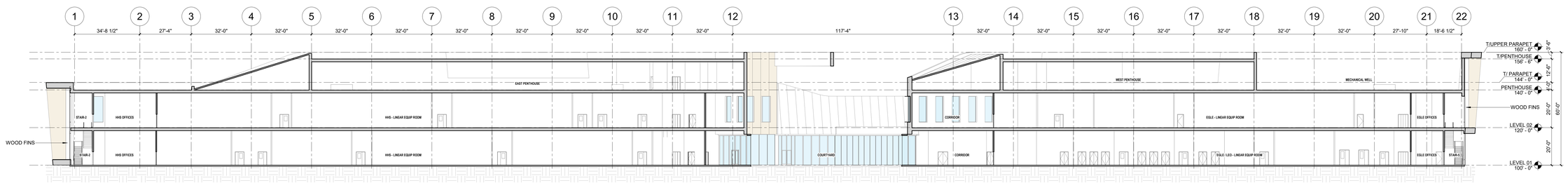
SHEET NUMBER



1 A-305

BUILDING SECTION - OFFICE CORRIDOR

SCALE - 1" = 20'-0"



2 A-305

BUILDING SECTION - SERVICE CORRIDOR

SCALE - 1" = 20'-0"

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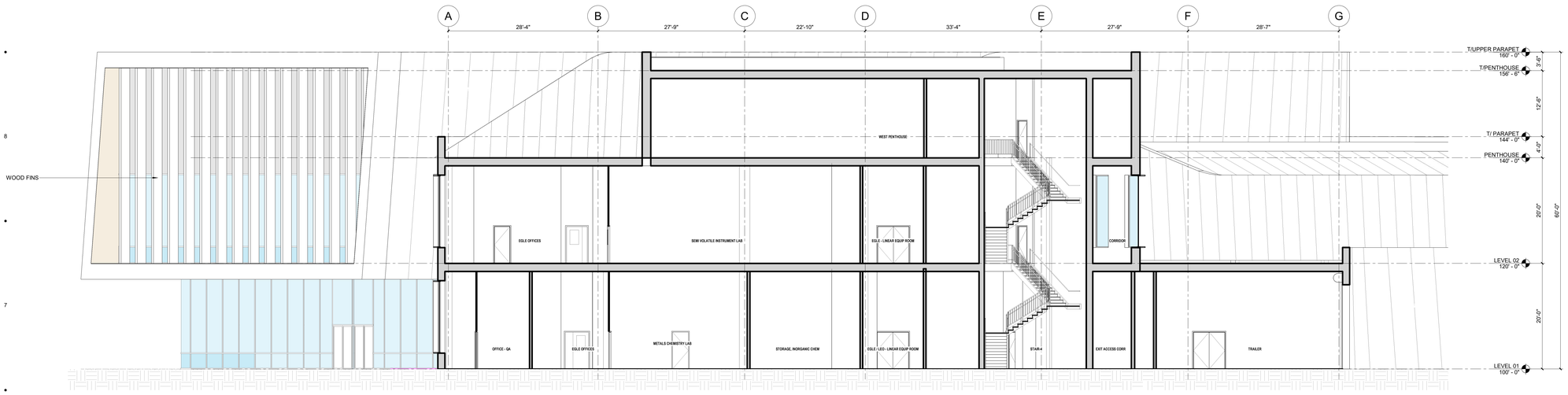
BUILDING SECTIONS
SHEET TITLE

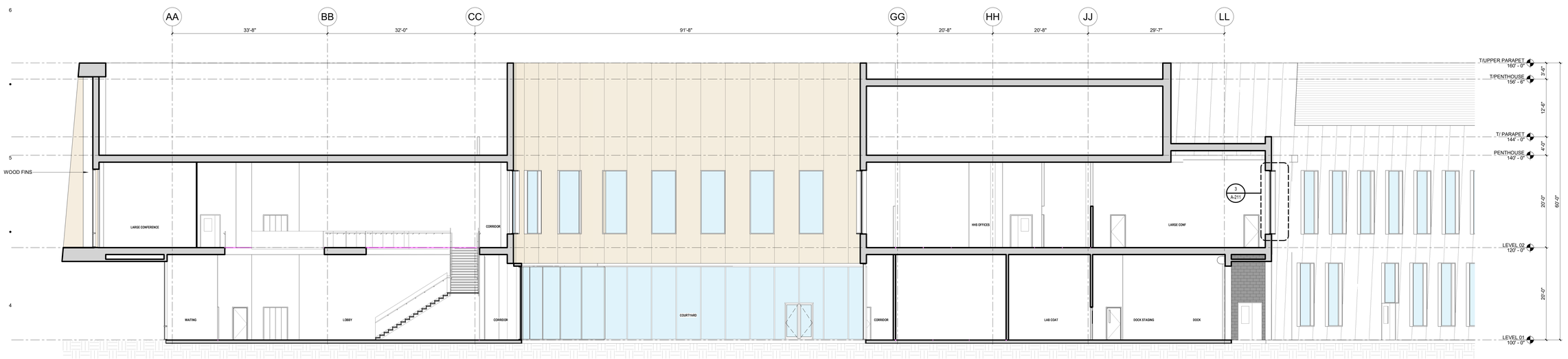
22-320
PROJECT NUMBER

A-305
SHEET NUMBER



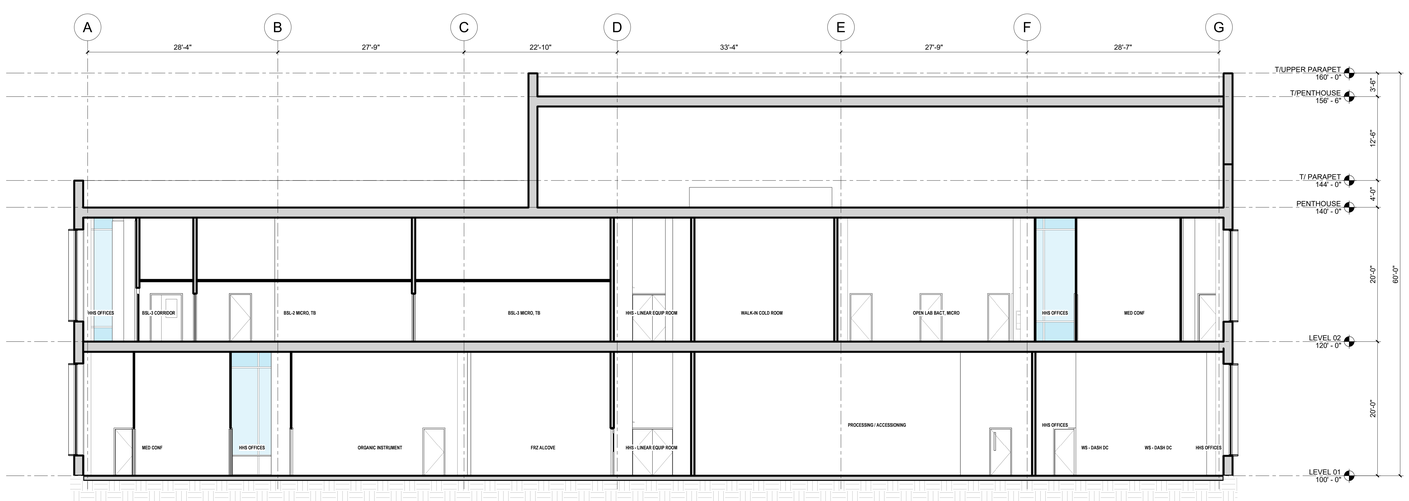
1 / A-306 BUILDING SECTION - AREA A

SCALE - 1/8" = 1'-0"



2 / A-306 BUILDING SECTION - AREA B

SCALE - 1/8" = 1'-0"



3 / A-306 BUILDING SECTION - AREA C

SCALE - 1/8" = 1'-0"

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BUILDING SECTIONS

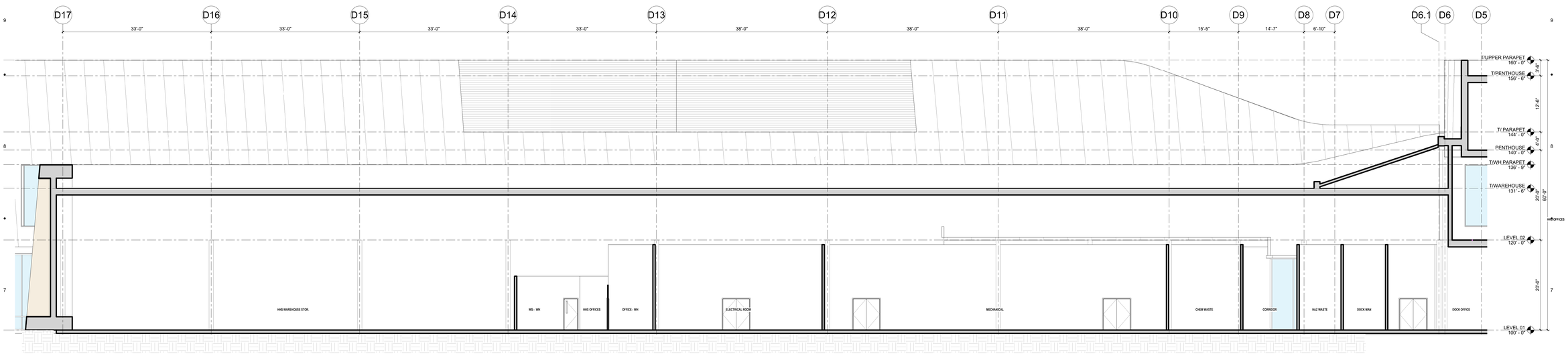
SHEET TITLE

22-320

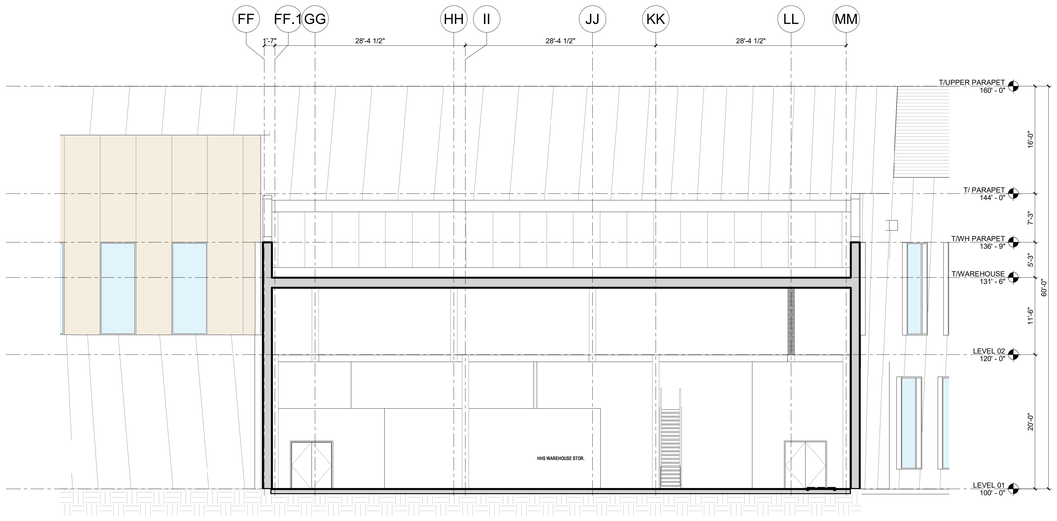
PROJECT NUMBER

A-306

SHEET NUMBER



1 BUILDING SECTION - AREA D LONGITUDINAL
1/8" = 1'-0"



2 BUILDING SECTION - AREA D
1/8" = 1'-0"

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BUILDING SECTIONS
SHEET TITLE

22-320
PROJECT NUMBER

A-307
SHEET NUMBER

FINISH LEGEND

SYMBOL	SPEC SECTION	MANUFACTURER	STYLE	PRODUCT NUMBER	COLOR	FINISH	SIZE	COMMENTS
BASE								
IB-1	096500	TARKETT	INTEGRAL BASE	245	FOGGY SHORES		4" H	TO BE USED IN CONJUCTION WITH RS-1 WITH METAL TOP CAP
IB-2	096500	TARKETT	INTEGRAL BASE	847	HARDWIRED		4" H	TO BE USED IN CONJUCTION WITH RS-2 WITH METAL TOP CAP
IB-3	096723	STONHARD	STONSHIELD FE		FLAGSTONE		4" H	TO BE USED IN CONJUCTION WITH RF-1 WITH METAL TOP CAP
IB-4	096723	STONHARD	STONCLAD/STONKOTE		MUSHROOM		4" H	TO BE USED IN CONJUCTION WITH RF-2 WITH METAL TOP CAP
PB-1	093000	ATLAS CONCORDE	BOOST		GRAY		4" H	TO BE USED IN CONJUNCTION WITH PTL-1; LOBBY AND CORRIDORS
RB-1	096513	JOHNSONITE	RUBBER COVE BASE		TBD		4" H	TO BE USED IN CONJUCTION WITH RESILIENT FLOORING
RB-2	096513	JOHNSONITE	RUBBER STRAIGHT BASE		TBD		4" H	TO BE USED IN CONJUNCTION WITH CARPETING
CEILINGS								
ACP-1	095113	ARMSTRONG	OPTIMA HEALTH ZONE	1941	WHITE		2' X 2'	9/16" SILHOUETTE BEVELED TEGULAR GRID
ACP-2	095113	ARMSTRONG	OPTIMA HEALTH ZONE	1940	WHITE		2' X 2'	9/16" SILHOUETTE BEVELED TEGULAR GRID
ACP-3	095113	ARMSTRONG	INVISACOUSTICS		TECH BLACK		2' X 4'	DIRECT-APPLY
ACP-4	095113	ARMSTRONG	CLEAN ROOM VL	868	WHITE		2' X 2'	15/16" PRELUDE GASKETED GRID
FLOOR								
CPT-1	096800	SHAW	ADVANCE		FLEXIBLE			
EM-1	124813	SHAW	PATH TILE	34500	EBONY		24" X 24"	VESTIBULE AND PUBLIC ELEVATORS
RF-1	096723	STONHARD	STONSHIELD FE		FLAGSTONE	STAIN/CLEAR URETHANE		
RF-2	096723	STONHARD	STONCLAD/STONKOTE		MUSHROOM	STAIN/EPOXY TOP COAT		
RS-1	096500	TARKETT	IQ OPTIMA	245	FOGGY SHORES			HEAT WELD ROD COLOR TO MATCH
RS-2	096500	TARKETT	IQ OPTIMA	847	HARDWIRED			HEAT WELD ROD COLOR TO MATCH
RT-1	096500	NORA	NORAMENT CASTELLO	5352	CITADEL		40" X 40"	3.5 MM THICK
RT-2	096500	SHAW	STRAND	16761	CLAY		18" X 36"	2.5MM THICK
SC-1	033543		SEALED CONCRETE					
SDT-1	096536	VPI	STATMATE	16	CLOUD			
GLAZING								
DGL-1	088000	OMNIDECOR	DECORFLOU STRIPES		LOW-IRON			
DGL-2	088000	SKYLINE	OBLIQUE REGULAR		POND			
METAL								
MT-1	093000	SCHLUTER	QUADEC					OUTSIDE CORNERS OF TILE, VERIFY THICKNESS IN FIELD
MT-2	093000	SCHLUTER	COVE BASE TRIM					VERIFY THICKNESS IN FIELD
MT-3	093000	SCHLUTER	RENO-U					VERIFY THICKNESS IN FIELD
MT-4	093000	SCHLUTER	SCHIENE					VERIFY THICKNESS IN FIELD
MT-5	093000	SCHLUTER	JOLLY					TOP CAP FOR PARTIAL HEIGHT TILE; VERIFY THICKNESS IN FIELD
MTL-1	055000	PURE+FREEFORM	LUXURY VINTAGE	GP040	GUN METAL			
MILLWORK								
ER-1	123553	DURCON	EPOXY RESIN COUNTER TOP		TAN		1" THICK	
ER-2	123553	DURCON	EPOXY RESIN COUNTER TOP		KHAKI		1" THICK	
ER-3	123553	DURCON	EPOXY RESIN COUNTER TOP		BLACK ONYX		1" THICK	
LC-1	123553	KEWAUNEE SCIENTIFIC CORP.	PAINTED STEEL CASEWORK	78	SNOW WHITE			
LC-2	123553	KEWAUNEE SCIENTIFIC CORP.	PAINTED STEEL CASEWORK	61	LIGHT NEUTRAL			
LC-3	123553	KEWAUNEE SCIENTIFIC CORP.	WOOD CASEWORK	8148	RIFT CUT WHITE OAK	CLEAR STAIN		
PL-1	064100	WILSONART	MATTE	D427-60	LINEN			
PL-2	064100	FORMICA	MATTE	464-58	GREYSTONE			
PL-3	064100	PANOLAM	SUEDE	HP565-SD	STORM GRAY			
PL-4	064100	NEVAMAR	SUEDE	S605ÅT	WROUGHT IRON			
PL-5	064100	WILSONART	FINE VELVET TEXTURE	7938	NEW AGE OAK			
QZ-1	123600	NASCO STONE + TILE	AGGLO DOGE			POLISHED		
SSM-1	123600	CORIAN	SOLID SURFACE		CIRRUS WHITE		1/2" THICK	
WD-1	064100	HEITINK	WOOD VENEER		QTR OAK LIGHT	CLEAR FINISH		
PAINT								
PT-1	099100	BENJAMIN MOORE	EGGSHELL	OC-61	WHITE DIAMOND			
PT-1A	099100	BENJAMIN MOORE	EPOXY; SEMI-GLOSS	OC-61	WHITE DIAMOND			
PT-2	099100	SHERWIN WILLIAMS	EGGSHELL	SW 7649	SILVERPLATE			
PT-3	099100	BENJAMIN MOORE	EGGSHELL	2135-30	IRON MOUNTAIN			
PT-4	099100	BENJAMIN MOORE	EGGSHELL	OC-68	DISTANT GRAY			
PT-5	099100	SHERWIN WILLIAMS	EGGSHELL	SW 6431	LEAPFROG			
PT-6	099100	SHERWIN WILLIAMS	EGGSHELL	SW 6439	GREENFIELD			
PT-7	099100	BENJAMIN MOORE	EGGSHELL	2065-40	UTAH SKY			
PT-8	099100	SHERWIN WILLIAMS	EGGSHELL	SW 6959	BLUE CHIP			
PT-9	099100	BENJAMIN MOORE	EGGSHELL	2169-30	ORIOLE			
PT-10	099100	BENJAMIN MOORE	EGGSHELL	2169-10	RACING ORANGE			
PT-11	099100	SHERWIN WILLIAMS	EGGSHELL	SW 2831	CLASSICAL GOLD			
PT-12	099100	IDEA PAINT	DRY ERASE PAINT	CREATE FREE	CLEAR			
PT-13	099100	SHERWIN WILLIAMS	EGGSHELL	SW 7650	ELLIE GRAY			
STONE								
ST-1	044300	BELDEN BRICK	MODULAR ALASKA	22-36	WHITE VELOUR			
TILE								
CT-1	093000	HERITAGE	ZEN + CLAY		GLOSS BLACK			USED IN CUSTOM PATTERN WITH CT-2, DETAIL TBD
CT-2	093000	HERITAGE	ZEN + CLAY		SEA GREEN			USED IN CUSTOM PATTERN WITH CT-1, DETAIL TBD
PTL-1	093000	ATLAS CONCORDE	BOOST		GRAY		60 X 120 CM	LOBBIES AND CORRIDORS, PUBLIC TOILETS
PTL-2	093000	ATLAS CONCORDE	BOOST URBAN		WHITE			PUBLIC TOILETS
PTL-3	093000	ATLAS CONCORDE	BOOST		WHITE			SHOWERS AND STAFF TOILETS
PTL-4	093000	ATLAS CONCORDE	BOOST		GRAY			SHOWERS AND STAFF TOILETS
WALL COVERING								
WC-1	097200	FILZ FELT	ARO PLANK 1		KIWI, FARN, D'GRUN			
WC-2	097200	FILZ FELT	ARO PLANK 2		ROHWEIß			
WC-3	097200	SUSTAINABLE MATERIALS	3D BRICKS		BLACK			
WALL PROTECTION								
WP-1	068316	CRANE COMPOSITES	VARIETEX	1130	COTTON WHITE	SANDSTONE		.09" THICK
WP-2	068316	CRANE COMPOSITES	VARIETEX	1275	IBIZA	SANDSTONE		.09" THICK
WP-3	068316	CRANE COMPOSITES	VARIETEX	8044	PEPPERDUST	SANDSTONE		.09" THICK
WP-4	068316	CRANE COMPOSITES	DESIGN® (WOOD LOOK)	009MM	MARYLAND MAPLE	SMOOTH		.075" THICK

GENERAL NOTES TO FINISHES

A. SEE AXX FOR DESCRIPTION OF ABBREVIATED REFERENCES AND SYMBOLS IN FINISH AND ELEVATION SHEETS.
B. SEE INTERIOR ELEVATIONS, INTERIOR AND CASEWORK DETAILS, AND FINISH PLANS FOR ADDITIONAL FINISH INFORMATION.
C. REFER TO INTERIOR ELEVATIONS FOR "VARIES" FOR FINISH APPLICATION INFORMATION.
D. REFER TO I SERIES SHEETS FOR ALL FINISH TERMINATIONS.
E. RESILIENT BASE TO BE INSTALLED AT ALL TOE-KICKS OF CABINETRY AND ALONG FINISHES AND EXPOSED ENDS, UNLESS OTHERWISE NOTED.
F. RESILIENT BASE TO BE RB-1 UNLESS OTHERWISE NOTED.
G. RESILIENT FLOORING TO EXTEND UNDER ALL ADJACENT CASEWORK. FIELD COORDINATE ALL FIELD ROUTED PIPE, CONDUIT RUNS, ETC. WITH LOCATED OF RECESSED ACCESSORIES AND EQUIPMENT. IN THE EVENT OF A CONFLICT, ACCESSORY LOCATIONS TAKE PRECEDENCE.
H. ALL PAINTED WALLS TO RECEIVE PT-1 UNLESS OTHERWISE NOTED. CONCRETE WALLS AND COLUMNS TO NOT BE PAINTED UNLESS OTHERWISE NOTED.
I. HEAT WELD ALL SHEET VINYL FLOORING WITH SPECIFIED WELDING ROD COLOR, UNLESS OTHERWISE NOTED.
J. ALL FLOOR MATERIAL CHANGES OCCUR AT THE CENTERLINE OF CLOSED DOOR. AT TRANSITIONS WHERE THERE IS NO DOOR, INSTALL AS INDICATED ON THE FLOOR PLANS. FIELD VERIFY ALL FLOOR TRANSITIONS.
K. FREE STANDING COLUMNS WILL RECEIVE THE SAME FINISHES AS THE NEAREST ADJACENT WALL UNLESS OTHERWISE NOTED.
L. ALL HOLLOW METAL DOOR AND WINDOW FRAMES PAINTED TO MATCH ADJACENT WALL, UNLESS OTHERWISE NOTED. REFER TO DOOR SCHEDULE FOR ADDITIONAL INFORMATION.
M. ALL PAINT TO HAVE EGGSHELL FINISH, UNLESS OTHERWISE NOTED.
N. ALL PAINTED FINISHES TO TERMINATE AT INSIDE CORNER, UNLESS OTHERWISE NOTED.
O. ALL GYPSUM CEILINGS TO RECEIVE PT-1 FINISH UNLESS OTHERWISE NOTED.
P. CONTROL JOINTS TO BE PROVIDED EVERY 30'-0" AT GYP WALLS. ALIGN WITH DOOR JAMBS WHEN POSSIBLE.
Q. ALIGN GROUT JOINTS FOR TILE. FLOOR TO WALL, UNLESS OTHERWISE NOTED.
R. ITEMS REQUIRING FINISH SELECTIONS THAT DO NOT APPEAR IN THE DRAWINGS OR SPECIFICATIONS SHALL BE SELECTED FROM SAMPLE SUBMITTALS OR SHOP DRAWINGS AS REQUIRED BY THE PROJECT MANUAL.
S. RAILS AND BUMPERS TO HAVE MATCHING END CAPS AND CORNERS.
T. REFER TO ELEVATIONS AND MATERIAL LEGEND FOR WALL PROTECTION SHEET MATERIAL HEIGHTS. WHERE WALL PROTECTION SHEET HEIGHT IS GREATER THAN HEIGHT OF THE DOOR FRAME, SHEET TO BE INSTALLED ABOVE DOOR.
U. ALL EXPOSED SCREW HEADS SHALL MATCH ADJACENT SURFACES UNLESS OTHERWISE NOTED.
V. ALL GRILLES, REGISTERS, ACCESS DOORS, SPRINKLERS, COVER PLATES, FIRE EQUIPMENT CABINETS, AND ALL OTHER APPLIED DEVICES REQUIRE JOB FINISH AND SHALL MATCH COLOR OF ADJACENT SURFACE, UNLESS OTHERWISE NOTED.
W. ALL CABINETRY TO HAVE PL-1 FRONTS AND SS-1 TOPS UNLESS OTHERWISE NOTED. OPEN CABINETS TO RECEIVE SAME FINISH AS VERTICAL SURFACES.
X. RUBBER BASE AND WALL PROTECTION TO NOT BE APPLIED TO CMU OR CONCRETE WALLS.

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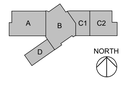

KEY PLAN

FINISH LEGEND

SHEET TITLE

22-320
PROJECT NUMBER

I-100
SHEET NUMBER

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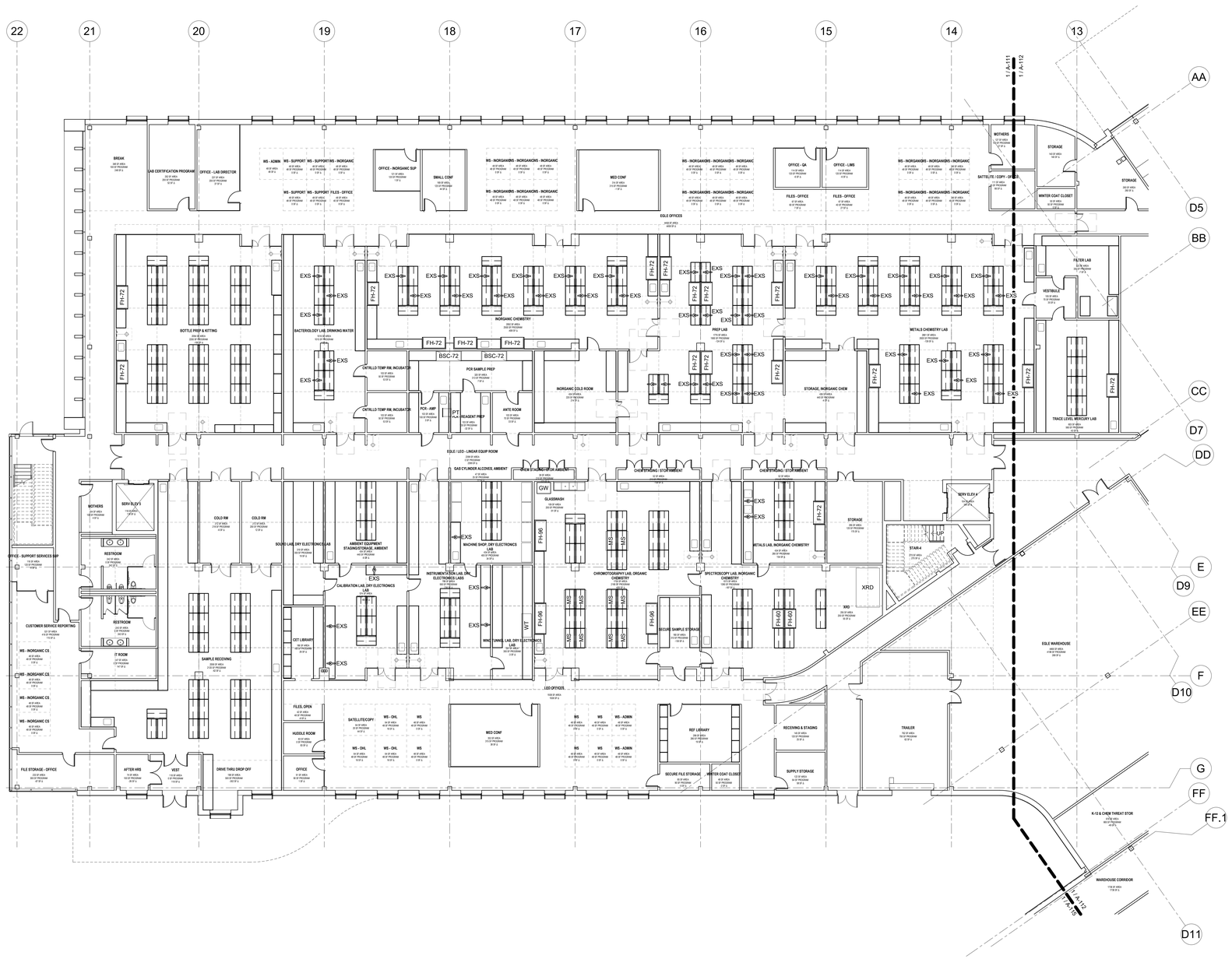

NORTH

1 / Q-111

LEVEL 01 LABORATORY PLAN - AREA A

SCALE - 3/32" = 1'-0"

LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W/ SINK
- SCULLERY SINK
- PASS THROUGH WINDOW
- EXHAUST SNORKEL
- EMERGENCY SAFTEY SHOWER W/ EYEWASH

ABBREVIATIONS

BSC	BIOSAFETY CABINET
DDT	DOWN DRAFT TABLE
EXS	EXHAUST SNORKEL
FH	FUME HOOD
FH-PT	FUME HOOD-PASS THROUGH
GSP	GENETIC SCREENING PROCESSOR
GW	GLASSWASH
IR	INFRARED SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
WT	WIND TUNNEL
XRD	X-RAY DIFFRACTOMETER

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A | B | C1 | C2 | D | NORTH

KEY PLAN

LEVEL 01 LABORATORY PLAN - AREA A

SHEET TITLE

22-320

PROJECT NUMBER

Q-111

SHEET NUMBER

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LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W/ SINK
- SCULLERY SINK
- PASS THROUGH WINDOW
- EXHAUST SNORKEL
- EMERGENCY SAFTEY SHOWER W/ EYEWASH

ABBREVIATIONS

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EXS	EXHAUST SNORKEL
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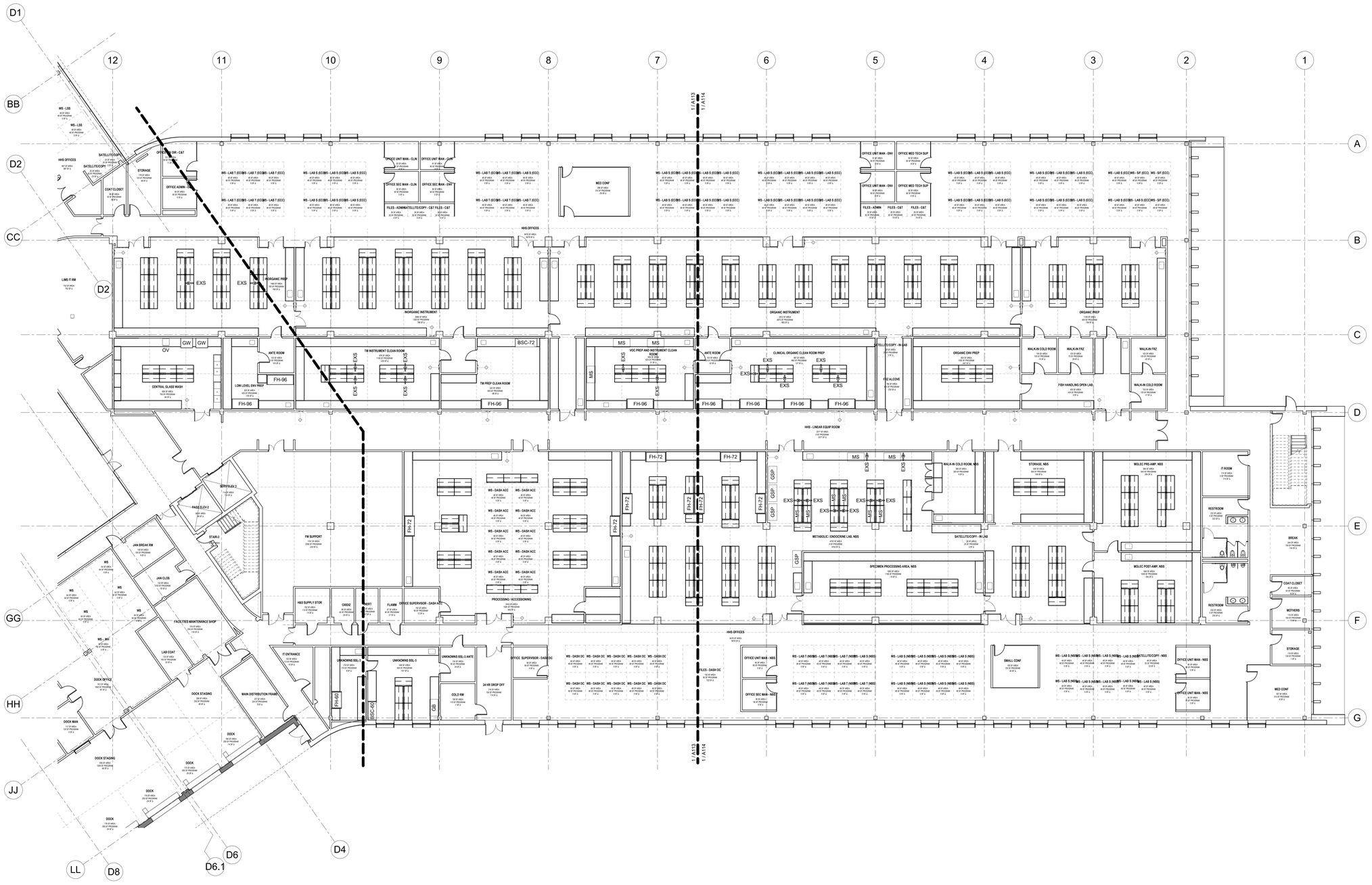
FH-PT	FUME HOOD-PASS THROUGH
GSP	GENETIC SCREENING PROCESSOR
GW	GLASSWASH
IR	INFRARED SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
WT	WIND TUNNEL
XRD	X-RAY DIFFRACTOMETER



NORTH

1 / Q-112 LEVEL 01 LABORATORY PLAN - AREA C

SCALE - 3/32" = 1'-0"

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KEY PLAN

LEVEL 01 LABORATORY PLAN - AREA C

SHEET TITLE

22-320

PROJECT NUMBER

Q-112

SHEET NUMBER

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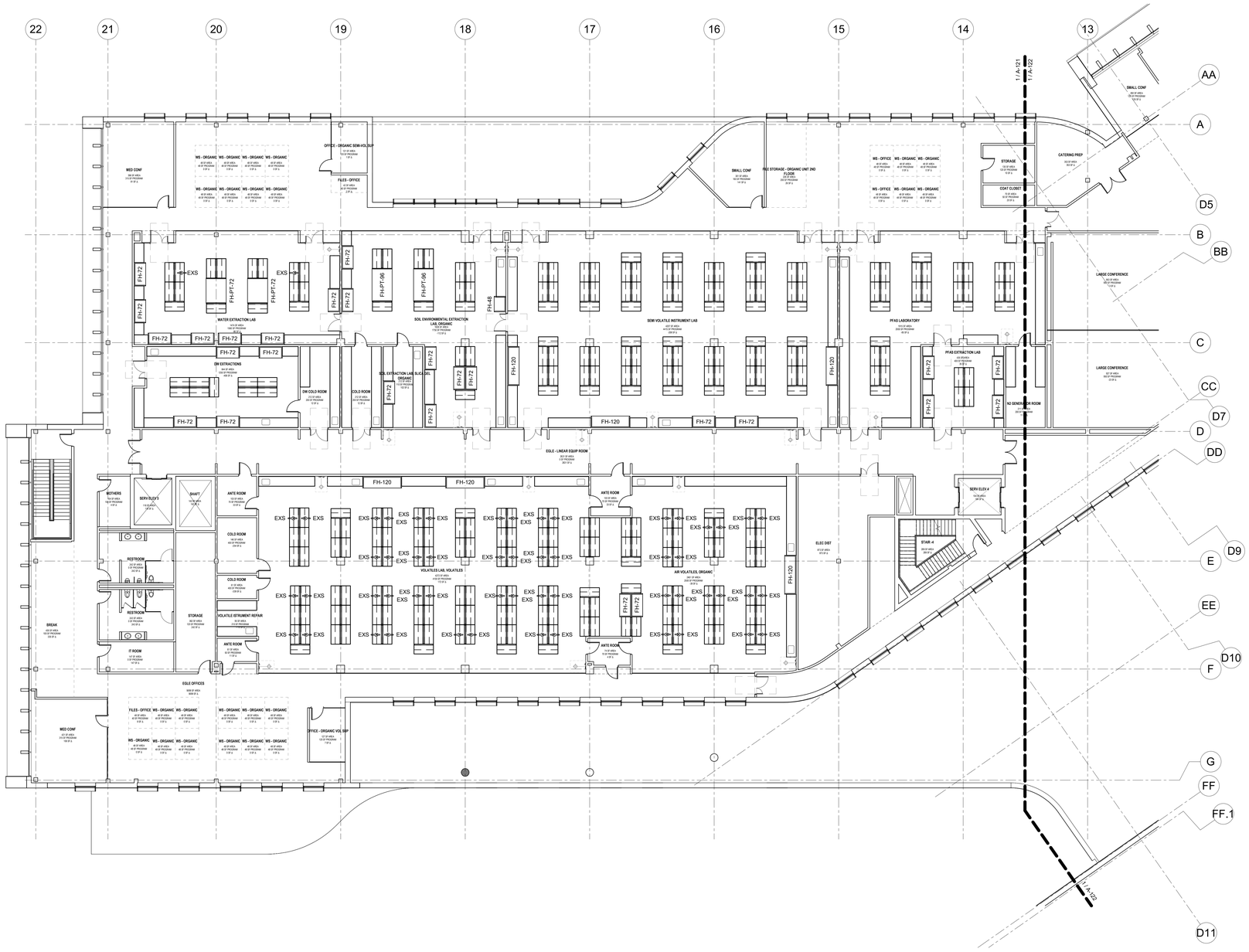

NORTH 1 Q-211

LEVEL 02 LABORATORY PLAN - AREA A

SCALE - 3/32" = 1'-0"

LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W/ SINK
- SCULLERY SINK
- PASS THROUGH WINDOW
- EXHAUST SNORKEL
- EMERGENCY SAFTEY SHOWER W/ EYEWASH

ABBREVIATIONS

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FH-PT	FUME HOOD-PASS THROUGH
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GW	GLASSWASH
IR	INFRARED SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
WT	WIND TUNNEL
XRD	X-RAY DIFFRACTOMETER

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KEY PLAN

LEVEL 02 LABORATORY PLAN - AREA A

SHEET TITLE

22-320

PROJECT NUMBER

Q-211

SHEET NUMBER

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Sheet Size - 36x42

LAB PLANNING LEGEND

SYMBOLS

- BIOSAFETY CABINET
- FUME HOOD
- FUME HOOD - PASS THROUGH
- DOWN DRAFT TABLE
- EQUIPMENT
- MOBILE BENCH
- BENCH W/ SINK
- SCULLERY SINK
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FH-PT	FUME HOOD-PASS THROUGH
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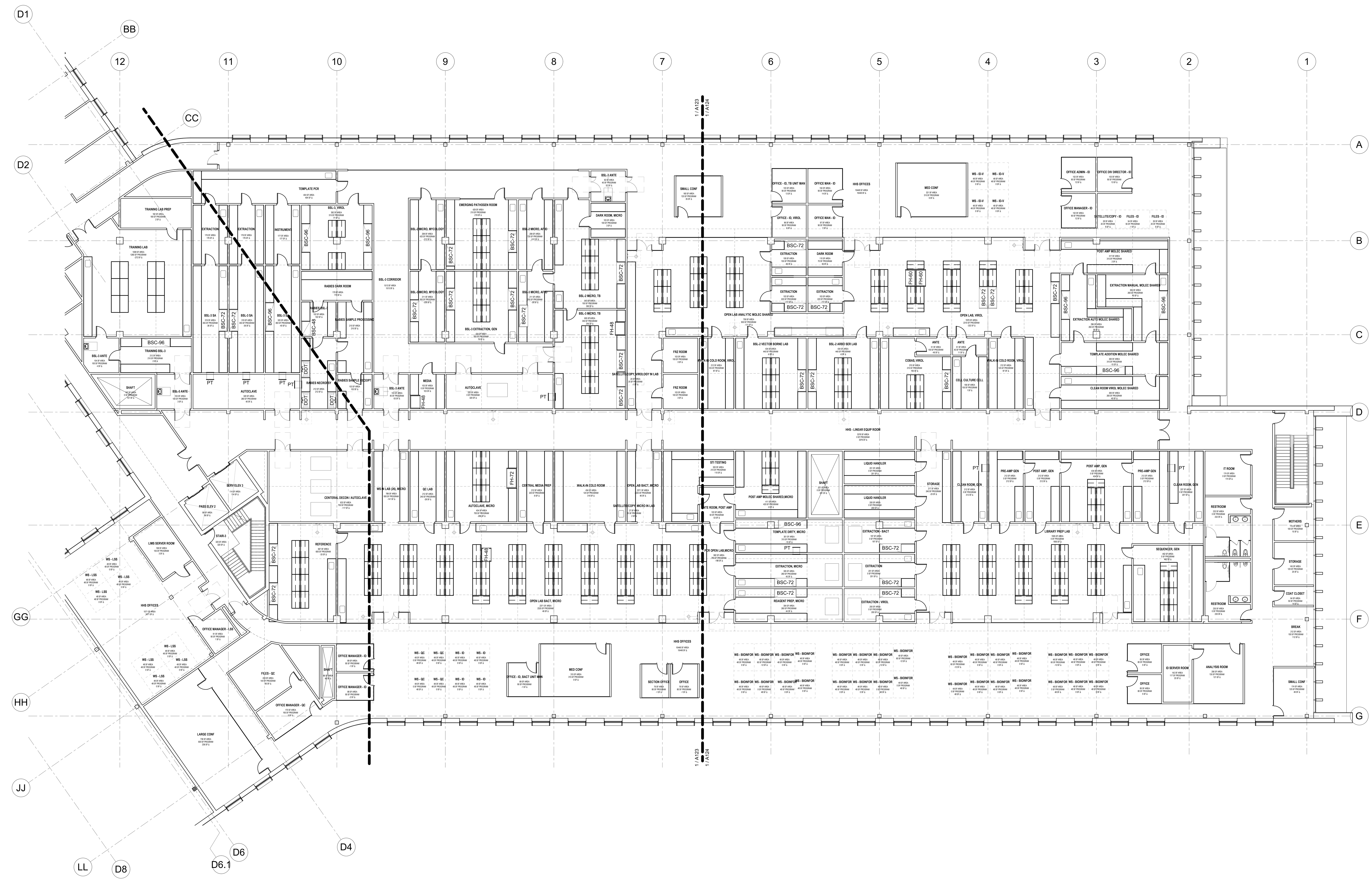
GW	GLASSWASH
MS	MASS SPECTROMETER
OV	OVEN
PT	PASS THROUGH WINDOW
WT	WIND TUNNEL
XRD	X-RAY DIFFRACTOMETER



NORTH

1 Q-212 LEVEL 02 LABORATORY PLAN - AREA C

SCALE - 3/32" = 1'-0"

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KEY PLAN

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LEVEL 02 LABORATORY PLAN - AREA C

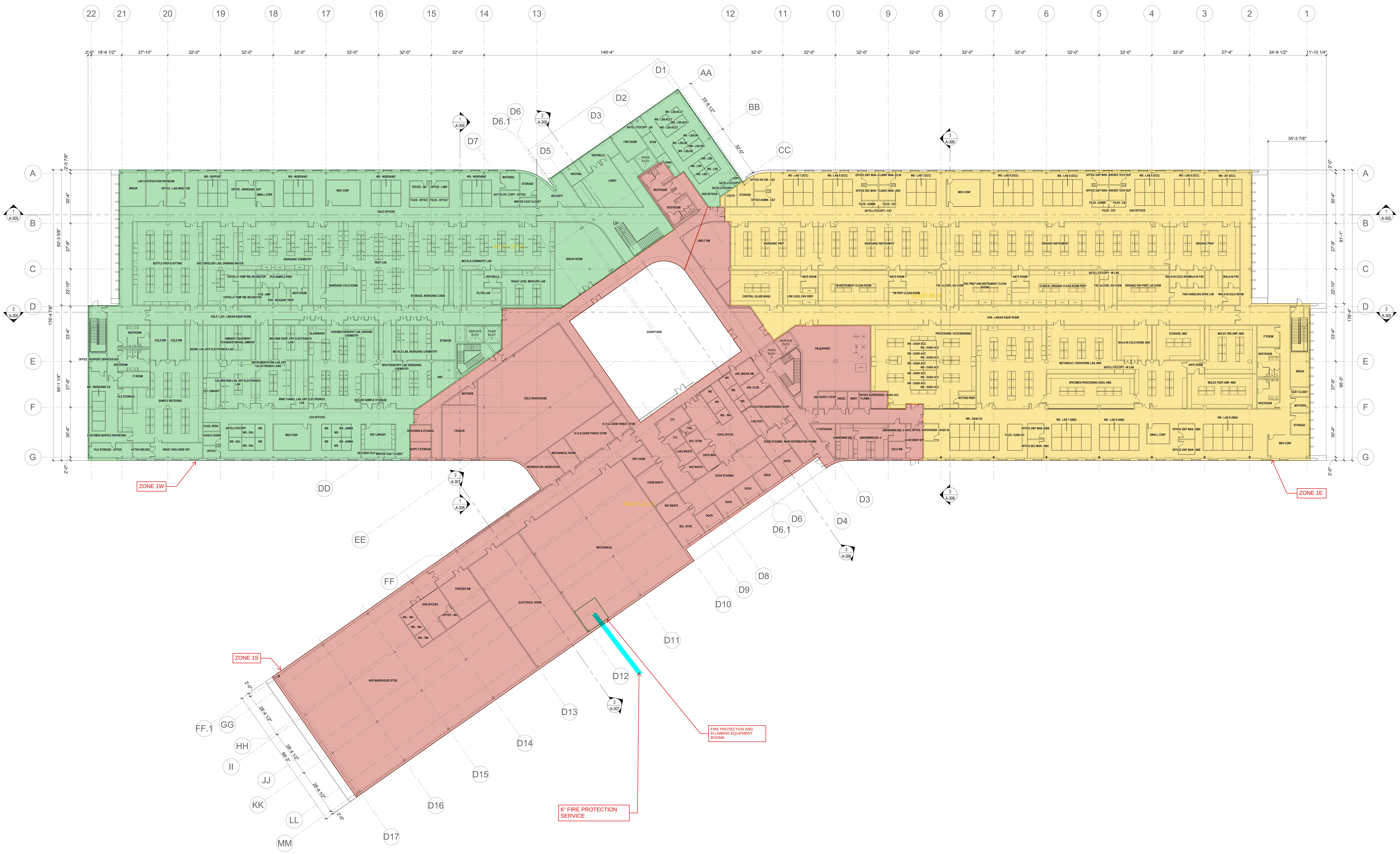
SHEET TITLE

22-320

PROJECT NUMBER

Q-212

SHEET NUMBER



NORTH

1 A-110 LEVEL 01 FLOOR PLAN

SCALE - 1" = 20'-0"

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FIRE PROTECTION FIRST FLOOR PLAN

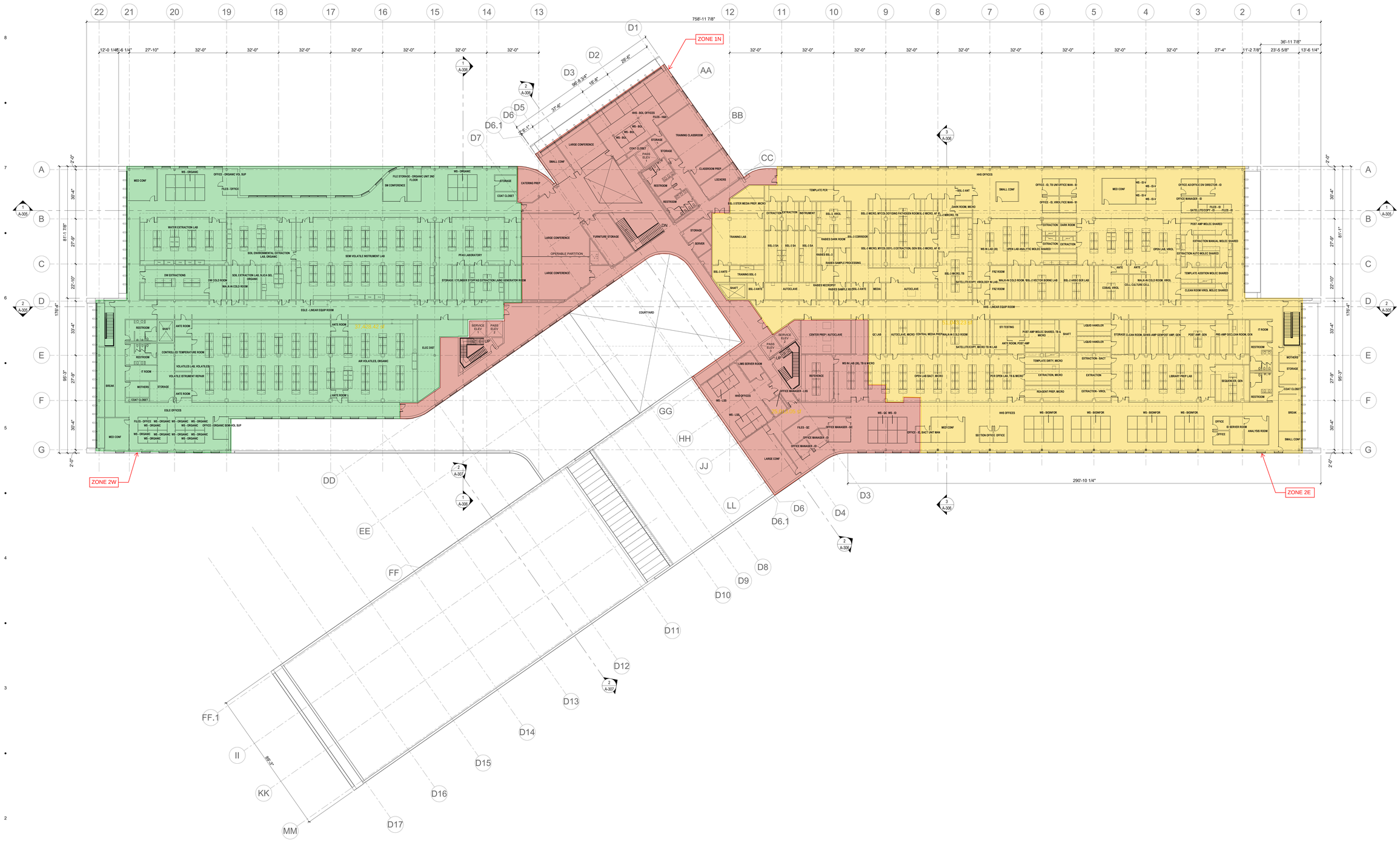
SHEET TITLE

22-320

PROJECT NUMBER

FP-1

SHEET NUMBER



NORTH

1 / A-120 LEVEL 02 FLOOR PLAN

SCALE - 1" = 20'-0"

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FIRE PROTECTION SECOND FLOOR PLAN

SHEET TITLE

22-320

PROJECT NUMBER

FP-2

SHEET NUMBER

THE RED HATCHING PATERNS REPRESENT NON-LABORATORY TEMPERATURE ZONES SERVED BY TERMINAL AIR BOXES

THE PURPLE HATCHING PATERNS REPRESENT LABORATORY TEMPERATURE ZONES SERVED BY SUPPLY AND EXHAUST AIR VALVES

EGLE / LEO

NON-LABORATORY TEMPERATURE ZONES -> 36 SUPPLY TERMINAL AIR BOXES & TWO EXHAUST TERMINAL AIR BOXES

LABORATORY TEMPERATURE ZONES -> 38 SUPPLY AIR VALVES, 38 GENERAL EXHAUST AIR VALVES, & 23 FUME EXHAUST AIR VALVES

HHS

NON-LABORATORY TEMPERATURE ZONES -> 41 SUPPLY TERMINAL AIR BOXES & FOUR EXHAUST TERMINAL AIR BOXES

LABORATORY TEMPERATURE ZONES -> 35 SUPPLY AIR VALVES, 35 GENERAL EXHAUST AIR VALVES, & 16 FUME EXHAUST AIR VALVES

ALL ZONES WITHIN THIS AREA ARE PART OF THE HHS SYSTEMS

ALL ZONES WITHIN THIS AREA ARE PART OF THE EGLE/LEO SYSTEMS

ALL ZONES WITHIN THIS AREA ARE PART OF THE HHS SYSTEMS

ALL ZONES WITHIN THIS AREA ARE PART OF THE WAREHOUSE SYSTEMS

ALL ZONES WITHIN THIS AREA ARE PART OF THE EGLE/LEO SYSTEMS

ALL ZONES WITHIN THIS AREA ARE PART OF THE WAREHOUSE SYSTEMS

FIRST FLOOR BSL

NON-LABORATORY TEMPERATURE ZONES -> 0 SUPPLY TERMINAL AIR BOXES & FOUR EXHAUST TERMINAL AIR BOXES

LABORATORY TEMPERATURE ZONES -> 4 SUPPLY AIR VALVES, 4 GENERAL EXHAUST AIR VALVES, & 2 FUME EXHAUST AIR VALVES

NORTH

1 / A-110

LEVEL 01 FLOOR PLAN

SCALE - 1" = 20'-0"

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KEY PLAN

MECHANICAL TEMPERATURE ZONES

SHEET TITLE

22-320

PROJECT NUMBER

M-1

SHEET NUMBER

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THE RED HATCHING PATERNS REPRESENT NON-LABORATORY TEMPERATURE ZONES SERVED BY TERMINAL AIR BOXES

THE PURPLE HATCHING PATERNS REPRESENT LABORATORY TEMPERATURE ZONES SERVED BY SUPPLY AND EXHAUST AIR VALVES

THE GREEN HATCHING PATERNS REPRESENT BSL TEMPERATURE ZONES SERVED BY SUPPLY AND EXHAUST AIR VALVES

EGLE / LEO

NON-LABORATORY TEMPERATURE ZONES -> 21 SUPPLY TERMINAL AIR BOXES & TWO EXHAUST TERMINAL AIR BOXES

LABORATORY TEMPERATURE ZONES -> 19 SUPPLY AIR VALVES, 19 GENERAL EXHAUST AIR VALVES, & 24 FUME EXHAUST AIR VALVES

ALL ZONES WITHIN THIS AREA ARE PART OF THE EGLE/LEO SYSTEMS

ALL ZONES WITHIN THIS AREA ARE PART OF THE HHS SYSTEMS

HHS

NON-LABORATORY TEMPERATURE ZONES -> 41 SUPPLY TERMINAL AIR BOXES & FOUR EXHAUST TERMINAL AIR BOXES

LABORATORY TEMPERATURE ZONES -> 52 SUPPLY AIR VALVES, 52 GENERAL EXHAUST AIR VALVES, & 2 FUME EXHAUST AIR VALVES

BSL

BSL TEMPERATURE ZONES -> 31 SUPPLY AIR VALVES, 31 GENERAL EXHAUST AIR VALVES, & 10 FUME EXHAUST AIR VALVES

ALL ZONES WITHIN THIS AREA ARE PART OF THE EGLE/LEO SYSTEMS

ALL ZONES WITHIN THIS AREA ARE PART OF THE HHS SYSTEMS

NORTH

1 / A-120 LEVEL 02 FLOOR PLAN

SCALE - 1" = 20'-0"

Sheet Size - 36x42

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KEY PLAN

MECHANICAL TEMPERATURE ZONES

SHEET TITLE

22-320

PROJECT NUMBER

M-2

SHEET NUMBER

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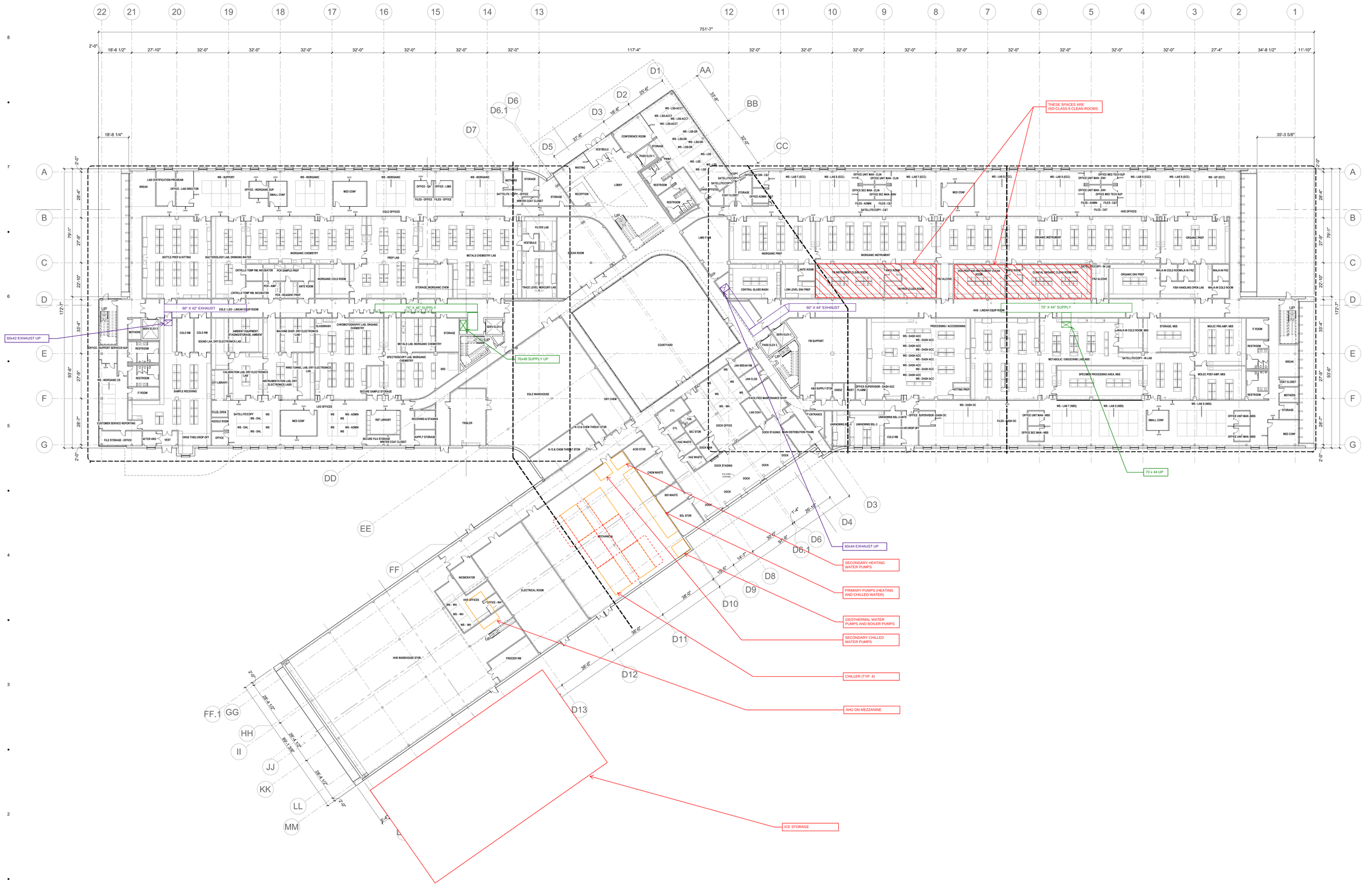

NORTH

1 / A-110

LEVEL 01 FLOOR PLAN

SCALE - 1" = 20'-0"

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A | B | C1 | C2 | D

NORTH

KEY PLAN

VENTILATION - FIRST FLOOR

SHEET TITLE

22-320

PROJECT NUMBER

M-3

SHEET NUMBER

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NORTH

1 / A-120 LEVEL 02 FLOOR PLAN

SCALE - 1" = 20'-0"

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KEY PLAN

VENTILATION - SECOND FLOOR
SHEET TITLE

22-320
PROJECT NUMBER

M-4
SHEET NUMBER

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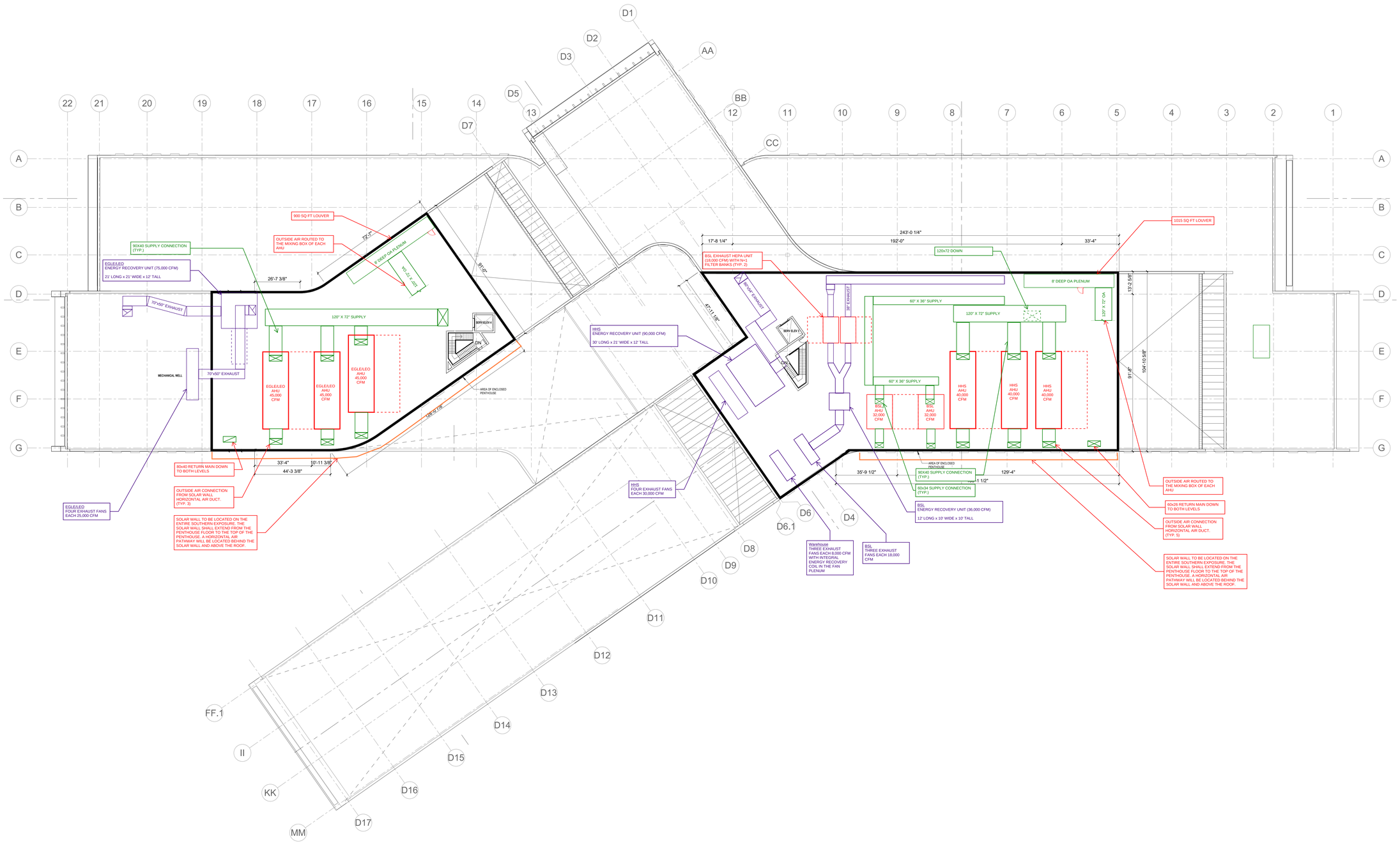

NORTH

1 A-130 / A-210

PENTHOUSE FLOOR PLAN

SCALE - 1" = 20'-0"

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A B C1 C2 D NORTH

KEY PLAN

VENTILATION - PENTHOUSE

SHEET TITLE

22-320

PROJECT NUMBER

M-5

SHEET NUMBER

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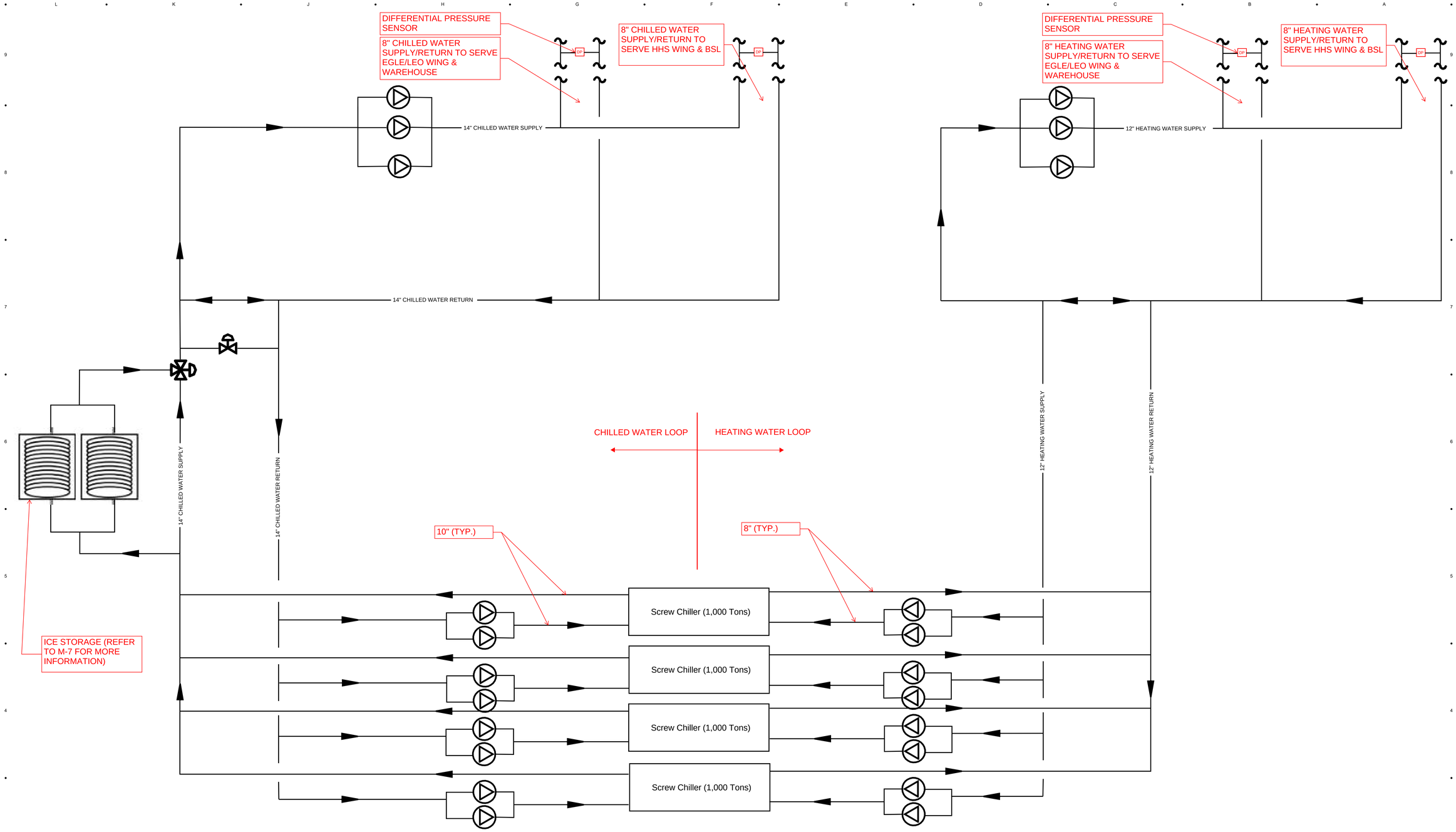

1 HEATING & COOLING DIAGRAM

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MECHANICAL FLOW DIAGRAM

SHEET TITLE

22-320

PROJECT NUMBER

M-6

SHEET NUMBER

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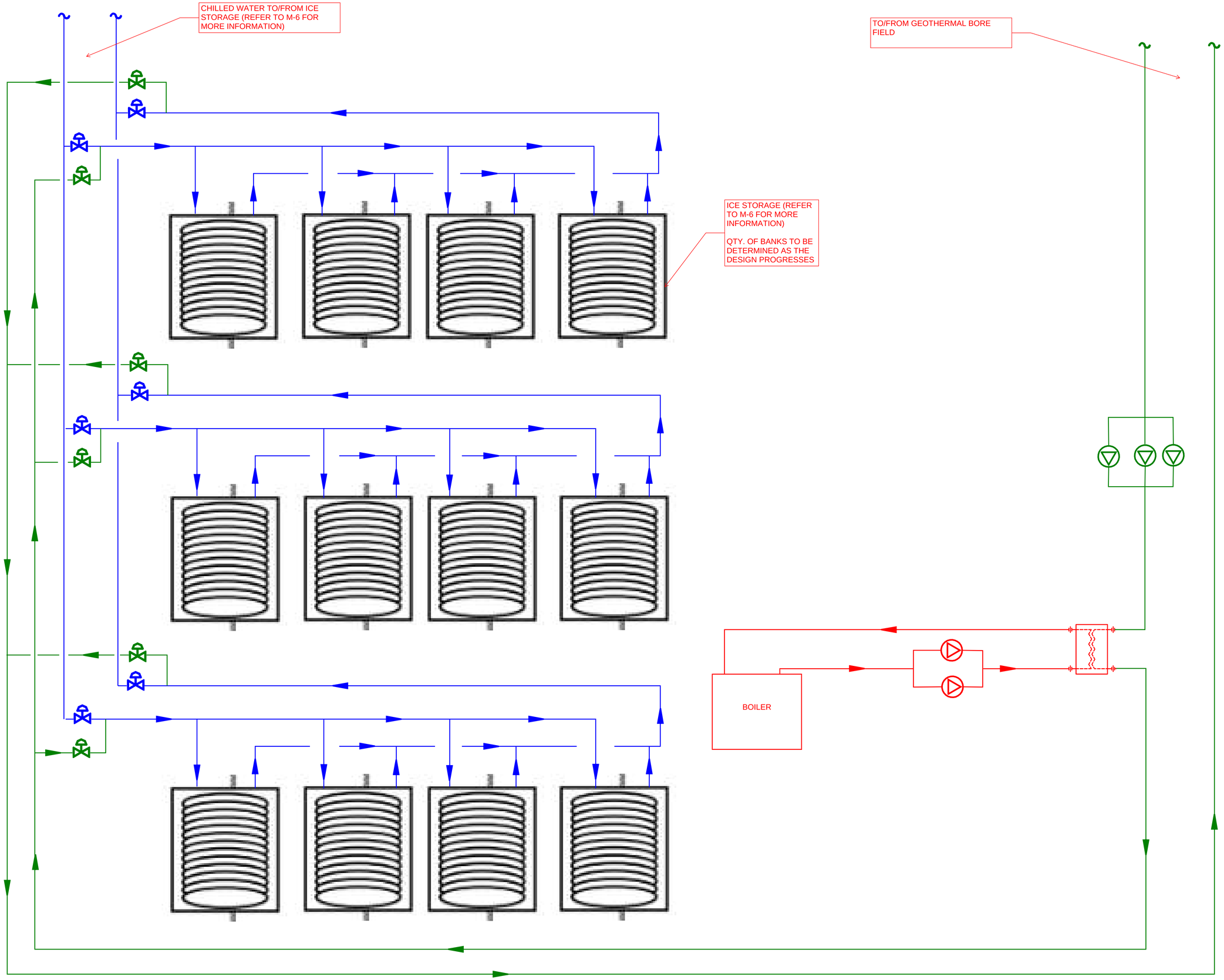

1 ICE STORAGE & GEOTHERMAL DIAGRAM

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MECHANICAL FLOW DIAGRAM
SHEET TITLE

22-320
PROJECT NUMBER

M-7
SHEET NUMBER

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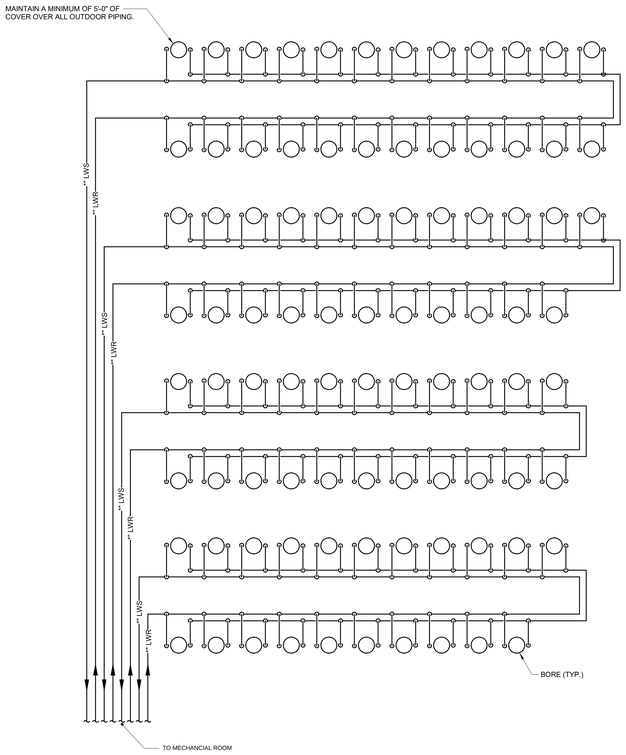

1 GEOTHERMAL CIRCUIT DETAIL
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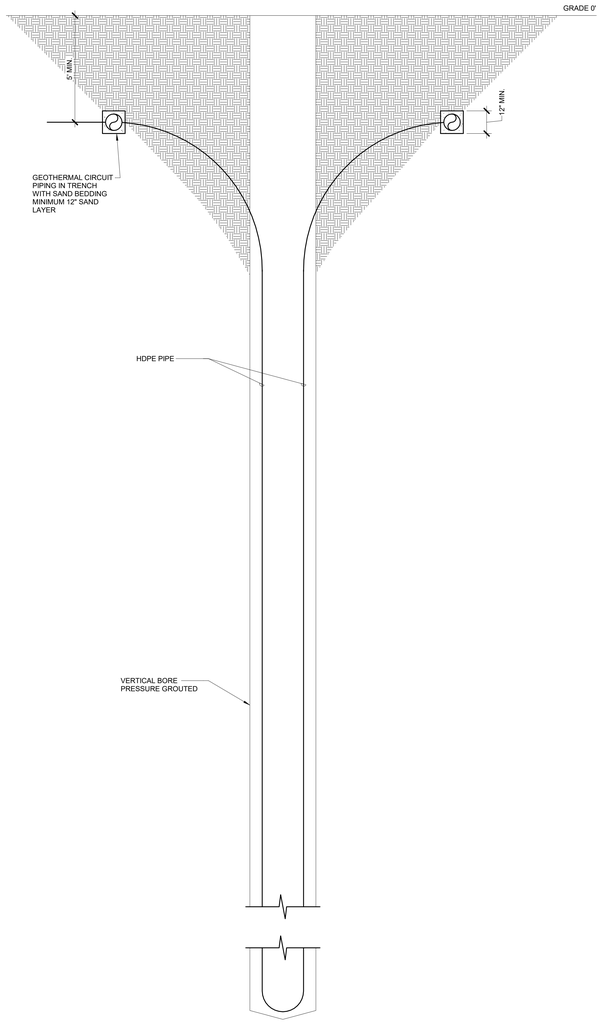
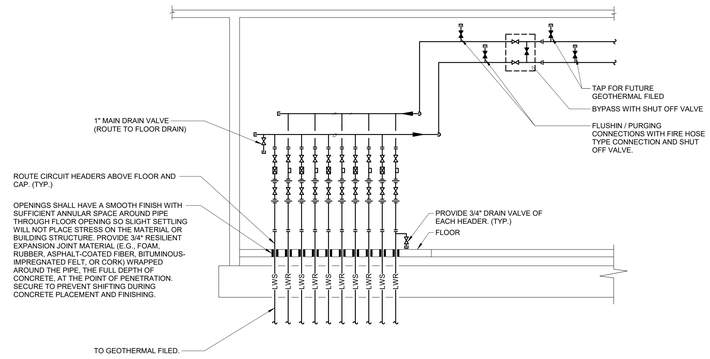


2 VERTICAL GEOTHERMAL BORE PROFILE
NO SCALE



3 WALL PENETRATION - NOISE CONTROL FRAMED WALL
NO SCALE

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FILE NO: 171/22186.CAK
INDEX NO: Y23037

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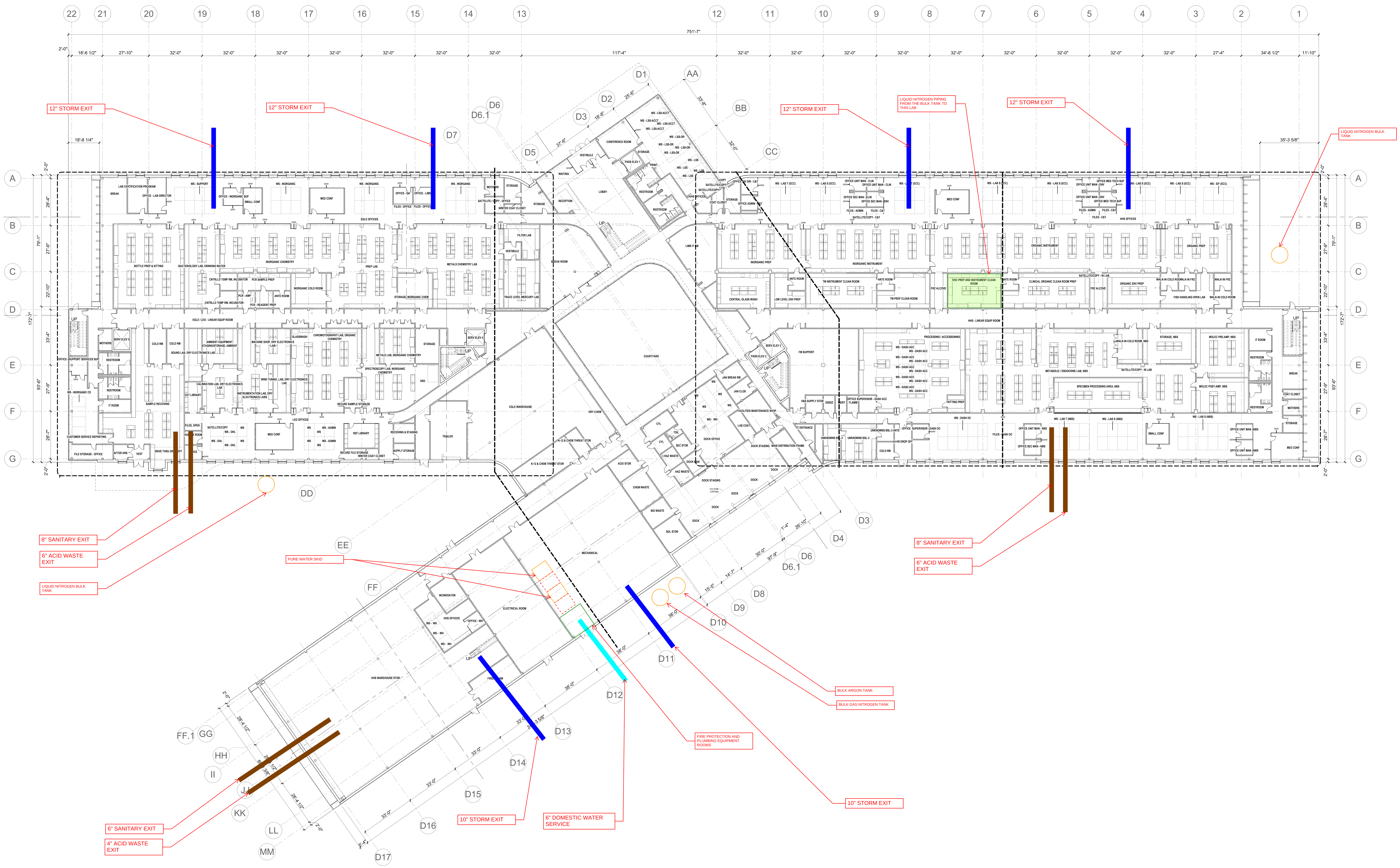
GEOTHERMAL DETAILS
SHEET TITLE

22-320
PROJECT NUMBER

M-8
SHEET NUMBER



NORTH

1 A-110 LEVEL 01 FLOOR PLAN

SCALE - 1" = 20'-0"

Sheet Size - 36x42

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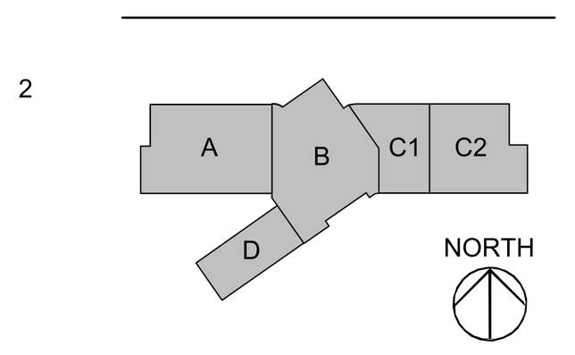

KEY PLAN

PLUMBING - FIRST FLOOR PLAN

SHEET TITLE

22-320

PROJECT NUMBER

P-1

SHEET NUMBER

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NORTH

1 / A-120 LEVEL 02 FLOOR PLAN

SCALE - 1" = 20'-0"

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KEY PLAN

PLUMBING - SECOND FLOOR PLAN

SHEET TITLE

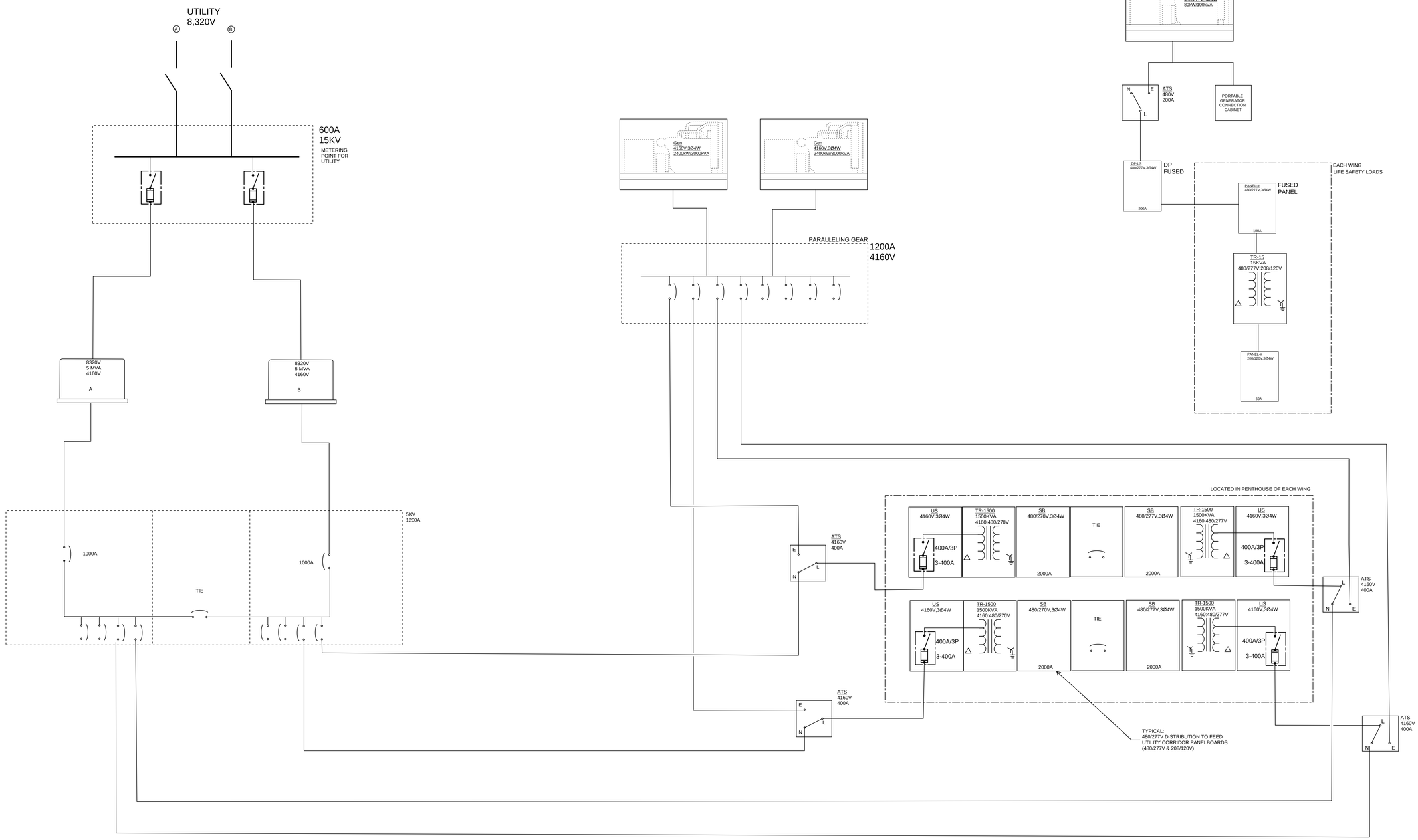
22-320

PROJECT NUMBER

P-2

SHEET NUMBER

NOT FOR CONSTRUCTION



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SCHEMATIC DESIGN ONE-LINE DIAGRAM

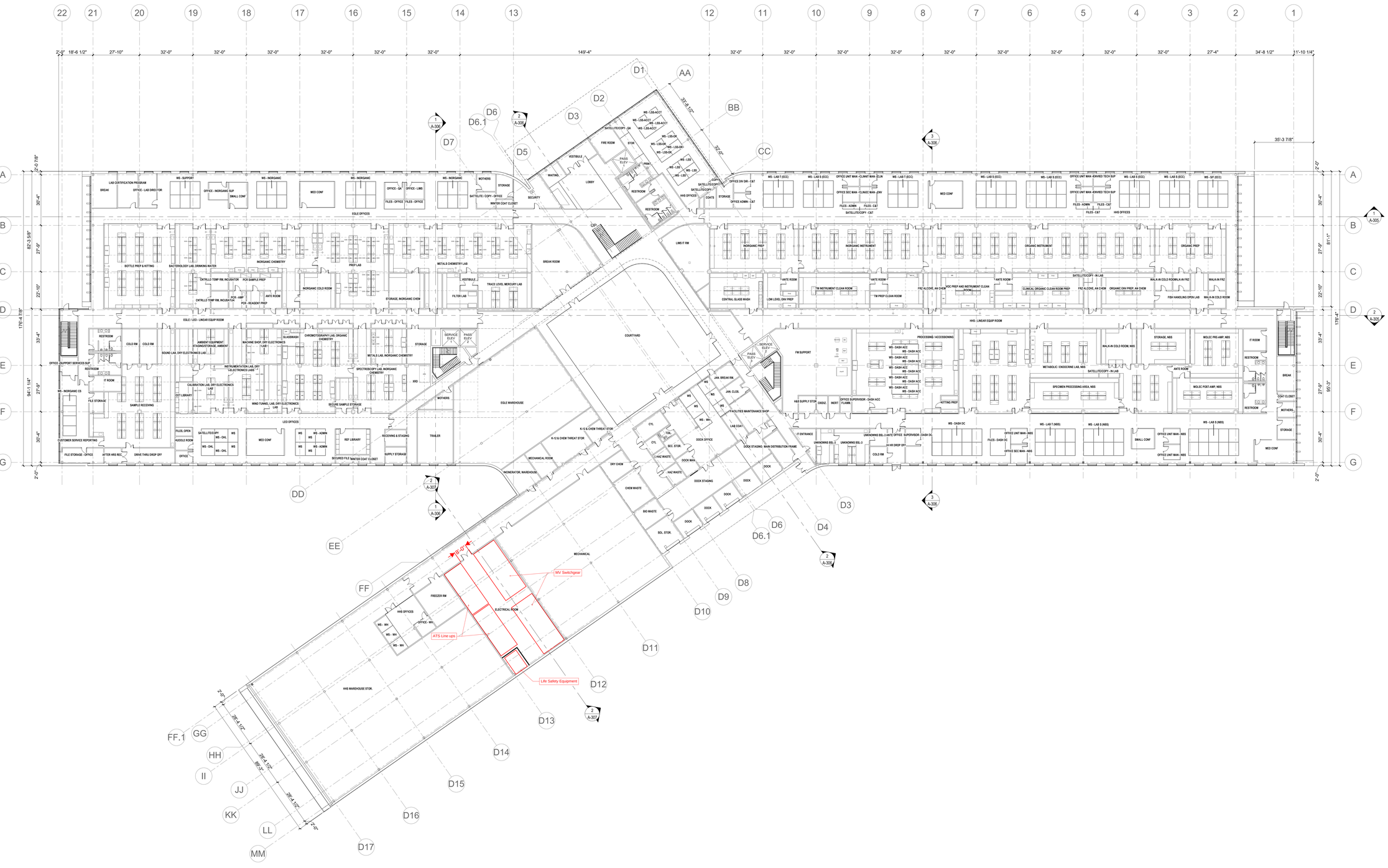
SHEET TITLE

22-320

PROJECT NUMBER

E-1

SHEET NUMBER



NORTH

1 A-110

LEVEL 01 FLOOR PLAN

SCALE - 1" = 20'-0"

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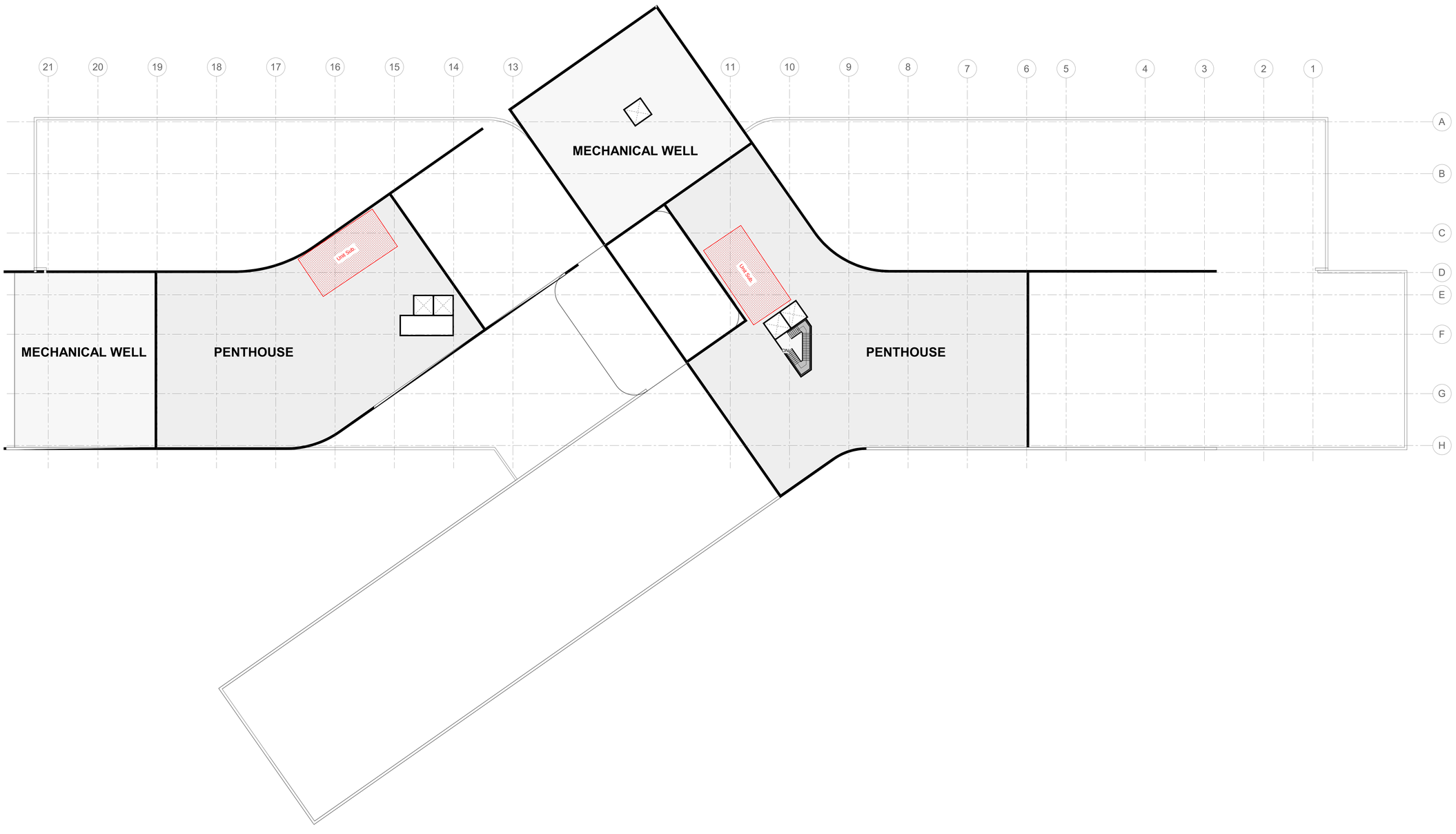
SCHEMATIC DESIGN MAIN ELECTRICAL ROOM
SHEET TITLE

22-320
PROJECT NUMBER

E-2
SHEET NUMBER



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SCHEMATIC DESIGN
PENTHOUSE
ELECTRICAL
SHEET TITLE

22-320
PROJECT NUMBER

E-3
SHEET NUMBER