

100% Schematic Design Narrative

Department of Water Management – Operations Facility



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EXECUTIVE SUMMARY



Executive Summary

The purpose of this Basis of Design Narrative is to consolidate the data gathered and document the proposed schematic design intent for a new Operations Facility for the Chicago Department of Water Management.

The new Operations Facility will be a 110,000+/- GSF facility, thoughtfully designed to balance functionality, security, and efficiency. Strategically situated near the intersection of Lawrence Ave and Cicero Ave the facility will primarily serve to; house the Department's fleet vehicles and trucks. The facility also incorporates office space for the Department's administrative staff, inventory space for the storage of the Department's supplies, and warehouse space for working.

This Schematic Design phase primarily focused on right sizing the building and providing a Schematic level set of bridging documents that will be used to procure a Design Build Firm to complete Construction Documents.



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PROGRAMMING



Programming

Through weekly design charrettes, the design team was able to develop a programming matrix (included in the Reference Directory) to describe the programmatic spaces, and their rough sizes, requested be included in the design of the building. The matrix is separated into three separate headers:

Admin: Comprised of the more Administrative or office related functions and their support spaces

Warehouse: Comprised program related to the working areas of the building

Inventory: Comprised of program related to storage areas

The matrix also includes a listing of proposed vehicles to be parked inside and outside the structure.

Building Operation

Vehicles, intending to enter the building, access the site through the western drive. This is accomplished through either the Lawrence Ave entrance to the north or the Wilson Ave entrance to the south. For security, both entrances are equipped with motorized ornamental fences and swing gates. These gates are intended to be left open during hours of operation, and can be opened remotely from the security room or booth after hours. Along the service drive, there is a western transient lane for employees intending to park temporarily to clock in. Vehicles can enter the

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building through the southern garage door. At the rear of the building there is a large lot intended for employee parking. These employees can clock in after entering the southern doors.

Much of the east part of the building is dedicated to vehicle parking. Vehicles are intended to reverse into their spaces. The western portion of the building is dedicated to warehouse working space and a raised inventory platform. The northern portion of the building houses the more administrative program of the building.



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CIVIL NARRATIVE

New DWM Operation Facility**Basis of Design Narrative – 100% Schematic Design Revision 1****A10 Project Summary****A1001 Existing Property**

The project will develop the ±7.28-acre property located at 4825 W Lawrence Avenue. The site is bounded by W Lawrence Avenue to the north, the Chicago Milwaukee & St. Paul & Pacific Railroad to the west, W Wilson Avenue along the south property line, and the Chicago & Northwestern Railway which is currently not in use to the east. There is an existing 1-story tall frame building on the property along with a large material stockpile, several acres of gravel/asphalt pavement, and various concrete pavement pads throughout the site. Prior to 2021, there was another building in the north half of the property that has since been torn down.

A1002 Proposed Project

The scope of this project is to consolidate the existing operations of the DWM Northern District into a single location at 4825 W Lawrence Avenue. New facilities will include a ±3.3-acre building that will provide parking for DWM fleet vehicles, office space, inventory space, and warehouse supported spaces. The proposed site includes a new northern parking lot for public/visitor parking, a new drive that will span from the northwestern corner of the property all the way down to the south entrance/exit gate to Wilson Avenue. Along the west property line will be a parking lane for employees. A new material dump spray down area, outdoor material storage area, transfer station, and material storage bays will be located south of the new building. The southern portion of the site will be used for temporary parking.

A1003 Existing Utilities

The project will require the removal and/or relocation of the majority of existing utilities located on the property. All sewers on the property are to be removed as well as any water services to the existing structure(s). Existing light poles and utility poles within the vicinity of the proposed building footprint are to be removed and the overhead wiring is to be rerouted or disconnected entirely. Additional research will be required to determine if there are existing stormwater detention facilities on the property that would need to be dealt with.

A20 Demolition/Site Clearing/Erosion Control**A2001 Earthwork**

Excavation shall be performed in accordance with IDOT Standard Specifications for Road and Bridge Construction (latest edition) and shall also include the following:

- Excavation to design subgrade ±0.1'.
- Hauling, placement, and compaction of excavated material to 95% Standard Proctor Density, in fill areas.
- Discing and drying of suitable materials to obtain proper compaction.
- Borrow excavation to obtain suitable material.
- Undercutting, hauling and placement of unsuitable materials to non-structural fill areas.
- Handling, hauling and placement of all excess spoil, to fill areas.

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- Import or export of material necessary to bring site to final grade.
- Fill to obtain desired subgrade shall be coordinated with stormwater management objectives.

A2002 Earthwork Removal

Earthwork removal will be in accordance with the forthcoming geotechnical report provided to us. Removals onsite are incidental to construction as well as requirements for at grade and earthwork improvements discussed below.

A2003 Geotechnical Analysis

Geotechnical borings and infiltration test borings were completed at the site on August 15th, 2025. A total of two (2) infiltration test borings were taken, one at the north end and one at the south end of the property. Eleven (11) additional soil borings were taken at the locations of the future structures. Final boring results show the majority of the site to have a lean clay subgrade with several areas being topped with gravel fill. The groundwater elevation was measured at three borings within the site that ranged from 25.8' CCD to 28.5' CCD at different locations. The geotechnical engineer recommends using 28.8' CCD for the design of permanent features at the site.

A2004 Erosion Control

Erosion control measures anticipated for the project are as follows:

- Construction fence with dust screening at property boundary
- Silt fence at property boundary and at base of all stock piles
- Inlet filters at all proposed catch basins
- Temporary seeding at all stock piles
- Permanent erosion control blankets and seeding at all berms

A2005 Existing Utilities

Removal of the existing utilities in this area will be required for the installation of new site features and utilities.

A30 At Grade Improvements**A3001 Pavement Improvements**

- Subgrade preparation shall include final grading of the pavement subgrade to $\pm 1"$ with an average subgrade elevation of $\pm 0.02'$ from the proposed subgrade elevation.
- Aggregate base course for concrete pavements shall be constructed in conformance with Section 351. It shall be type "B" with a CA-6 gradation. Up to 25% RAP allowable for base course aggregate as long as required gradation is maintained.
- Concrete sidewalks shall be 5" thick with a 6" CA-6 granular base. The concrete shall be 3,500 psi air entrained. A $\frac{1}{2}"$ premoulded, sealed expansion joint shall be provided at minimum 30' intervals and tooled contraction joints at 5' centers will be required. Maximize recycled content for concrete; substitute fly-ash and slag for up to 40% of cementitious material.
- Concrete pavement shall be 8" PCC with 6"x6" W4xW4 WWF with an 8" compacted CA-6 aggregate base (WWF shall be excluded f. The concrete shall be 3,500 psi air entrained. A $\frac{1}{2}"$ premoulded, sealed expansion joint shall be provided at minimum 60' intervals and tooled contraction joints at 10' centers will be required. Maximize recycled content for concrete; substitute fly-ash and slag for up to 40% of cementitious material.
- Asphalt pavement shall consist of 1.5" Mix D N50 surface course and 2.5" IL-19L N50 binder course on an 8" compacted CA-6 aggregate base.
- 12" minimum compacted CA-6 aggregate pavement in parking and other vehicular areas.

New DWM Operation Facility**Basis of Design Narrative – 100% Schematic Design Revision 1****A40 Site Grading****A4001 Existing Grading**

The existing grading/drainage for the site is generally as follow:

- Based on the survey topographic data, the site is generally quite flat with the majority of the ± 7 -acre site lying somewhere between 33.00 C.C.D. and 36.00 C.C.D., varying throughout. About 150-ft north of the existing frame building is a high point/ridge that directs all surface runoff either north to the W Lawrence Avenue right-of-way or south to several catch-basins visible in the survey. The elevation at the northern property line varies between 31.90 C.C.D. to 34.15 C.C.D. before draining off the site. The catch-basins that collect the southern runoff appear to outfall north to the 42-inch RCP combined City sewer under W Lawrence Avenue, however it's difficult to confirm with the limited survey information available.

- The site is surrounded to the west and east by railroad embankments that rise about 10 to 12-ft above the existing site elevations at the property lines. Stormwater runoff is directed onto the site from a portion of these embankments. Southeast of the existing building is also a ± 0.35 -acre raised area that appears to have been used for overflow truck parking and rises to 42.00 C.C.D.
- The southernmost ± 0.65 -acres of the property drain to several catch-basins located in the asphalt drive. These convey stormwater to the combined 8-inch City sewer under W Wilson Avenue. The asphalt drive going to the south gate drops from 34.00 C.C.D. to about 30.40 C.C.D. within 50-ft of the southern property line.

A4002 Proposed Grading/Drainage

The grading design will aim to minimize haul-off of soil and subgrade materials while capturing stormwater runoff as required by the City of Chicago Department of Water Management. Where on-site soils are deemed suitable for proposed landscape they shall be stockpiled and re-used. Additional soils testing will be required moving forward to make the determination. All stormwater runoff will be collected, detained on-site, and released into the 42-inch RCP combined sewer under W Lawrence Avenue.

A50 Stormwater Management**A5001 Stormwater Requirements**

- The proposed project is a regulated development per the City of Chicago Department of Water Management Stormwater Ordinance. As such, stormwater detention will be required for the project.
- The stormwater ordinance regulates three stormwater-related components: Release Rate Control (detention storage), Volume Control (retention storage), Run Off Control (sewer and overland conveyance).

A5002 Stormwater Assumptions

- Total development area will be ± 7.28 acres based on the proposed site geometry.
- Due to the existing conditions and previous use of the site, it will be assumed that the soil is contaminated and that infiltration BMPs to meet volume control detention requirements will not be allowed. Additionally due to the shallow groundwater elevation depth per the geotechnical report, infiltration would not be a feasible option as the bottom of the BMP requires a 3.5-ft vertical separation from the groundwater table as set by the Chicago Stormwater Ordinance. Volume control detention will be provided as oversized detention.

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- Since the site outfall connects directly to a 42-inch combined sewer, the maximum allowable release rate will be based on the Outlet Drainage Basin that this site is located within. The basin is the Foster East Drainage Basin which has an outlet sewer capacity of 0.39 cfs/acre.

A5003 Stormwater Management Summary

- Release Rate Control: Based on the above assumptions, the preliminary stormwater rate control volume required is 94,000 cu. ft. (2.16 ac-ft)
- Volume Control: Based on the above assumptions, the preliminary stormwater volume control volume required is 12,000 cu. ft. (0.27 ac-ft)
- Detention can be provided through detention tank(s), oversized piping, and above-ground surface ponding, where applicable.

A60 Underground Utility Improvements**A6001 Performance Specifications**

1. General
 - All underground utility improvements shall be constructed in accordance with the City of Chicago.
 - Select granular trench backfill will be required for all storm sewer trenches lying under existing or proposed streets, loading dock or sidewalks, and within 24" thereof. Trench materials shall be Illinois Department of Transportation CA-6 gradation.
 - Manholes, catch basins, and inlets shall be constructed of reinforced precast concrete ring construction with tongue and groove joints in conformance with ASTM C-478.
2. Sanitary sewer shall be installed in accordance with the following:
 - Pipe material shall be of water main quality, Ductile Iron Pipe (DIP), Class 56 or equivalent, ASTM C-700 specification, with PVC compression collar seal type joints conforming to ASTM Specification D 1784.
 - Pipe bedding shall consist of compacted aggregate, CA-11, placed 6" below to springline of pipe, and compacted FA-6 from springline of the pipe to 12" above for the width of the trench. Up to 25% RAP allowable for base course aggregate as long as required gradation is maintained.
 - Frames and lids shall be as specified by the City of Chicago and shall include an external 10" elastomeric band extending from the frame to the manhole.
3. Water Main shall be installed in accordance with the following:
 - Pipe material shall be Ductile Iron Pipe, Class 56 or equivalent with mechanical joints.
 - Pipe bedding shall consist of compacted aggregate, CA-11 or CA-16, placed 6" below and to springline of pipe, and compacted CA-16 from spring line to 12" above the pipe for the width of the trench. Up to 25% RAP allowable for base course aggregate as long as required gradation is maintained.
 - Frame and lids shall be as specified by the City of Chicago.
 - Thrust blocking will be required at all bends greater than 11¼" degrees.
 - Testing shall be in conformance with the City of Chicago.
4. Storm Sewer shall be installed in accordance with the following:
 - City of Chicago Stormwater Regulations 2024.
 - Pipe material shall be reinforced concrete pipe for pipes greater than 15 inches, ASTM C-76, Class III, Wall-B O-ring joints is the minimum requirement. Pipe material shall be DIP or PVC-SDR-26 for pipes 12" and smaller in diameter.
 - Pipe bedding shall consist of Illinois Department of Transportation CA-11 gradation compacted from 6" below to the spring line of the pipe and

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compacted CA-11 or CA-16 from spring line of the pipe to 12" above, over the trench width. Up to 25% RAP allowable for base course aggregate as long as required gradation is maintained.

- Frame and lids shall be as specified by the City of Chicago.

A6002 Site Utility Improvements

The Site Utility Improvements will include:

- Storm. It is anticipated that the Department of Water Management will allow for a single sewer connection for the proposed storm system. An intake meeting with the Department of Water Management shall be held to determine potential number of sewer connections.
- Sanitary. New sanitary services will be provided for the proposed building. Sanitary sewers shall be combined with the site storm sewers prior to outfalling into the existing combined City sewer.
- Water. It is anticipated that the proposed water service will tap into the 12-inch water main on W Lawrence Avenue. Coordination with the Department of Water Management is required for final location of service. There is an existing 48-inch feeder main closer to the property, however CDWM does not allow water service connections to feeder mains of that size. An additional water service connection has been requested from the proposed building to the new guard house located central to the site. This pipe is shown as a 2-inch copper (type K) pipe for the purposes of pricing, but the final size and routing is to be determined. An extension of this water service has been shown as an alternate to an additional guard house located at the southern edge of the site.
- Gas. Service location is still to be determined. Review of Peoples Gas atlases and coordination with Peoples Gas is required to determine location of gas service for the proposed building.
- Electric. Service location is still to be determined. Review of ComED atlases and coordination with ComED is required to determine location of electrical services for the proposed building.
- Data. Service location is still to be determined. Coordination with service provider is required to determine data service routing to the proposed building.

A70 LEED Credits**A7001 Rainwater Management Requirements:**

- Option 1: In a manner best replicating natural site hydrology processes, retain on site the runoff from the associated percentile of regional or local rainfall events. The percentile event volume must be retained (i.e. infiltrated, evapotranspired, or collected and reused) using low-impact development (LID)/green infrastructure (GI) practices. GI and LID strategies can be either structural or non-structural.
- Option 2: Calculate the difference between the projected runoff volume under the proposed design conditions and the runoff volume under natural land cover conditions that existed prior to any disturbance. Retain (i.e. infiltrate, evapotranspire, or collect and reuse) on site the increase in runoff volume using LID and GI practices.

A80 Special Considerations**A8001 Permitting Authorities**

We anticipate permitting through the following authorities concerning civil engineering works:

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- Chicago Department of Transportation (CDOT)
- City of Chicago Department of Buildings – civil/stormwater consultant reviewers
- Office of Underground Coordination
- Chicago Department of Water Management – water section

A90 Outstanding Items for Civil Engineering Design A9001

Outstanding Items

- The final geotechnical report outlining soil/bedrock profiles, water table, pavement/earthwork recommendations, etc.
- Environmental report with Soil Management Plan [SMP] outlining soil characteristics and IEPA requirements for soil management.
- Office of Underground Utility Atlases

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A10 Landscape Ordinance

A1001 Parkway Requirements

- One (1) tree per twenty-five (25) linear feet of frontage on a public right of way.
- Two and one half (2-1/2) inch minimum caliper trees outside the greater downtown area.
- Continuous, open planters with planting soil volumes are preferred. Individual 5' x 15' open planters are another option.
- Where the parkways (the distance between the back of curb to the edge of the right-of-way) is less than or equal to nine (9) feet wide, no street tree is required.
- Where the parkway (the distance between the back of curb to the edge of the right-of-way) is between nine (9) and twelve (12) feet wide, street trees must be planted using a tree grate to provide adequate room for pedestrians.

A1002 Perimeter Requirements:

- Seven (7) foot wide perimeter landscaped area (2 foot car overhang, 5 foot landscaped area)
- Continuous screening hedge maintained thirty (30) and forty-eight (48) inches height.
- The tree planting required in perimeter landscaped area, one (1) tree per twenty-five (25) linear feet.

A1003 Interior Landscape Requirements:

- Required landscaped area of parking lots and other vehicular use areas to vary as a function of size:
 - Parking lots between 4,500 and 30,000 SF: internal landscaped area equal to seven and one-half (7.5) percent of total area.
 - Parking lots above 30,000 SF: internal landscaped area equal to ten (10) percent of total area.
- One (1) tree per 125 SF of required internal landscaped area.
- Two and one-half (2-1/2) inch minimum caliper trees outside the greater downtown area.
- Internal planting islands must be spaced no further than fifteen (15) parking spaces apart.

A1004 Ornamental Fence Requirements:

- Ornamental metal fencing around new parking lots and other vehicular use areas (four (4) foot height typical; six (6) foot around secured parking lots), to be located five (5) feet from sidewalks in seven (7) foot perimeter landscape area.
- Ornamental metal fencing required along lot lines adjacent to public streets.
- Landscape screening required adjacent to residential and industrial uses.
- Hose bibs are required every one hundred (100) feet throughout perimeter landscape.

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- (12) foot height chain link fence with three strand barbed-wire (barbed-wire to be priced as alternate).
- Chain link security fence along site perimeter, with automatically opened swing gates at vehicular entrances.

A1006 Trash Enclosure Requirements:

- A six (6) foot height masonry screen wall is required around dumpsters and other trash collection bins and areas.
- Enclosures are to be furnished with opaque, lockable gates and masonry walls planted with vines.
- Vines are to be planted in planting beds (12" wide minimum) around the perimeter of the masonry walls.
- It is encouraged that additional plants be planted in the perimeter planting beds.

A20 LEED Credits**A2001 Open Space Requirements:**

- Provide outdoor space greater than or equal to 30% of the total site (including the building footprint)
- At least 25% of the required outdoor open space must be vegetated space planted with two or more types of vegetation or have overhead vegetated canopy.

A2002 Outdoor Water Use Reduction Requirements:

- Option 1: no irrigation required: show that the landscape does not require a permanent irrigation system beyond a maximum two (2) year establishment period.
- Option 2: reduced irrigation: reduce the project's landscape requirement by at least 30% from the calculated baseline for the site's peak watering month. Reductions must be achieved through plant species selection and irrigation system efficiency, as calculated by the Environmental Protection Agency (EPA) Water Sense Water Budget Tool.

A2003 Heat Island Reduction Requirements:

- Option 1: Nonroof and roof. Alternatively, an SRI and SR weighted average approach may be used to calculate compliance. Use any combination of the following strategies:
 - Use the existing plant material or install plants that provide shade over paving areas (including playgrounds) on the site within 10 years of planting. Install vegetated planters. Plants must be in place at the time of occupancy permit and cannot include artificial turf.
 - Provide shade with structures covered by energy generation systems, such as solar thermal collectors, photovoltaics, and wind turbines.
 - Provide shade with architectural devices or structures. If the device or structure is a roof, it shall have an aged solar reflectance (SR) value of at least 0.28 as measured in accordance with ANSI/CRRS S100. If the device or structure is not a roof, or if aged solar reflectance information is not available, it shall have at installation an initial SR of at least 0.33 as measured in accordance with ANSI/CRRS S100.
 - Provide shade with vegetated structures.
 - Use paving materials with an initial solar reflectance (SR) value of at least 0.33.



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- Use an open grid pavement system (at least 50% unbound).
- Option 2: parking under cover. Place a minimum of 75% parking spaces under cover.

A30 Native and Adaptive Landscape

A3001 The planting material selected will be native and adaptive to the Chicago Midwest area. The planting material includes shade trees, ornamental trees, evergreen trees, evergreen shrubs, deciduous shrubs, ornamental grasses, and perennials.



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STRUCTURAL NARRATIVE



STRUCTURAL DESIGN NARRATIVE

New DWM Ops Facility

Chicago, IL

Building Code: Chicago Building Code 2019 with April 2022 Supplement
International Building Code 2018 – Amended

Design Codes Used: ASCE 7-16 – Minimum Design Loads for Buildings and Other Structures
ACI 318-14 – Building Code Requirements for Structural Concrete
AISC 360-16 – Specification for Structural Steel Buildings
TMS 402-16 – Specification for Masonry Structures

<u>Materials:</u>	Concrete (foundations):	$f'_c = 5,000$ psi (normal weight), air entrained
	Concrete (slab-on-grade):	$f'_c = 4,000$ psi (normal weight)
	Steel Rebar:	ASTM A615, Grade 60
	Steel WF & WT Shapes:	ASTM A992; $F_y = 50$ ksi, $F_u = 65$ ksi
	Steel HSS (Sq & Rect):	ASTM A500, Grade C; $F_y = 50$ ksi, $F_u = 62$ ksi
	Steel Angle, Channels, Plates:	ASTM A36; $F_y = 36$ ksi, $F_u = 58$ ksi

Building Description & Construction:

The project consists of a new two-story operations facility for Department for Water Management at 4825 West Lawrence Avenue, Chicago, IL 60630. The new facility is anticipated to be approximately 109,800 square feet and will be used for storage of Department of Water Management Trucks. The vehicular storage area will be a single-story area with a maximum of 25'-0" clear height from floor to roof. See attached PDF Markups for tentative grid layout as well as overall superstructure elements. Based on the preliminary information provided by the geotechnical engineer, a shallow foundation system is anticipated. Ground-level slabs are anticipated to be on-grade.

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Structural Loads:

Gravity Loads:

Roof – Dead Load	
At typical Locations	12 psf
Solar	5 psf
Roof – Live Load	
Minimum Design Live Load	20 psf
Floor – Dead Load	
At typical Locations	20 psf
Floor – Live Load	
Heavy Vehicles Garage Areas	250 psf
Lobby, Stairs, and Exits	100 psf
Storage (light)	125 psf
Office and Administrative Areas	50 psf

Snow Loads:

Ground Snow Load, P_g min	25 psf
Importance Factor, I_s	1.20

Seismic Load:

Risk Category	IV
Importance Factor, I_e	1.50
Site Class	D (Assumed)
S_{DS}	0.123
S_{D1}	0.1
Seismic Design Category	C

Wind Load:

Risk Category	IV
Basic Wind Speed, V	120 mph (Ultimate)
Exposure Category	B
Min MWFRS Wind Pressure	16psf (Ultimate)

Deflection Criteria:

Roof	L/240
Floor	L/360
Drift (Wind)	H/400 story, H/500 total for MRI 25-year wind (80 mph)

Specifications:

Anticipated structural specification sections to be used on this project include the following:

03 30 00	Cast-in-Place Concrete
03 41 00	Precast Concrete
04 20 00	Unit Masonry
05 12 00	Structural Steel Framing
05 21 00	Steel Joists
05 31 00	Steel Decking



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EXTERIOR ENCLOSURE NARRATIVE

I. Exterior Facade:

a. Metal Panel Wall Assembly:

- i. Metal Panel: Provide Metal panel as shown on drawings, temper as required to suit finish and forming operations. Bond strength to be tested in accordance with ASTM D1781. Flame spread index less than 25 and smoke-developed index less than 450 in accordance with ASTM E84 or UL 723. Flashing per selected manufacturers details. Basis of Design: as shown in Exterior Material Schedule on Drawings.
- ii. Metal furring channel or panel clip (coordinate with manufacturer requirements)
- iii. Continuous Rigid Polystyrene insulation (Min R11.4) to comply with IECC requirements. Thermally broken Z framing to be mounted to backup wall between insulation boards for metal furring attachment.
- iv. Air/Weather barrier applied to backup wall.

b. Insulated Precast Panel Wall Assembly

- i. Provide metal panel cladding over precast panel where designated in drawings.
- ii. Insulated Precast panel. Provide composite panel consisting of the following: Outer wythe of concrete, finish to "Polished Acid Etch. Thermal insulation core (min R11.4, continuous), inner wythe of concrete reinforced and sized for structural requirements.

c. At Admin areas, provide interior furred out for gypsum wall board.

II. Window Flashing

- i. Provide 40 mil self-adhering membrane for all window sill flashing. Provide Self-adhering membrane for all window jambs, headers, door openings, inside and outside corners, and all other transitions. Provide penetration and termination sealant as required.B2034



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III. Exterior Louvers, Screens, Fencing

- i. Provide fixed drainable blade extruded aluminum louvers. Minimum 4" louver depth, nominal thickness 0.80-inch. Finish: clear anodic finish, AAMA 611, Class I, 0.018 mm. Provide stainless steel bird screens.

IV. Storefront

i. Storefront Window:

1. Provide manufacturer's extruded or formed aluminum framing members of thickness required and reinforced as required to support imposed loads (as required by manufacturer) Members to be thermally-broken, and fully gasketed. Clear anodic finish.

ii. Glazed Doors & Entrances

1. Manufacturer's standard thermally broken glazed entrance doors for manual swing or automatic operation. Finish to match adjacent storefront framing.

V. Solid Exterior Doors

- i. Provide extra heavy duty hollow metal doors and frames at exterior, metallic coated face, minimum A40 coating, minimum 16-guage, SDI 250.8, Level 3, seamless. 1-3/4-inch thickness. Provide fully welded, metallic coated steel frames, minimum A40 coating, minimum 14-guage.
- ii. Door Hardware: TBD. Under development with DWM Security Team. Current assumption is that all exterior doors will require keycard access. Inventory and secure storage areas will also require keycard access.

VI. Overhead Doors

- i. Rolling Steel Door: provide automatic powered rolling steel door formed with galvanized steel curtain and fabricated so that finished door assembly is rigid and aligned with tight hairline joints, free of warp, twist, and deformation; and complies with requirements in DASMA 203/204. Door to comply with UL 325. Provide door components capable of operating for not less than 1,000,000 operation cycles. Steel curtain: ASTM A653/A653M, zinc-coated (galvanized), cold-rolled, commercial steel sheet with G90 zinc coating. Manufacturer's standard galvanized-steel guide system sized for size and weight of door. Provide galvanized steel guide reinforcement and support members. Weather seals: replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber or neoprene fitted to bottom, top and jambs of door. Heavy duty, corrosion-resistant hardware, with stainless steel fasteners. Slide bolt locking device. Motor: UL Listed, brake to prevent curtain free fall in event of motor failure. Exterior doors to be insulated.

VII. Roofing

i. Roof Assemblies

1. Administrative Roofs

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- a. Thermoplastic Polyolefin (TPO) Roofing: fabric reinforced TPO sheet, ASTM D 4434, internally fabric or scrim reinforced, uniform flexible backed TPO sheet, 60 mils nominal thickness. White membrane with energy star listing, solar reflectance index of 82 (3 yr aged 64min), FM Global 4450 or 4470 listed, fire/windstorm Class 1A-90. Class A exterior fire- test exposure per UL 790. Special warranty period: 20 year guarantee of watertightness for full system.
 - b. Type X 5/8-inch glass-mat substrate board, water-resistant gypsum substrate ASTM C1177/C1177M, mechanical fastened to roof deck.
 - c. Self- Adhering-Sheet Vapor Retarder ASTM D1970/D1970M, polyethylene film laminated to layer of rubberized asphalt adhesive, minimum 40-mil total thickness; maximum permeance rating of 0.1 perms, cold applied with slip-resisting surface and release paper backing.
 - d. Tapered insulation crickets sloped approximately 1/4" per foot as required to divert water at rooftop equipment or vertical structures.
 - e. Polyiso board insulation: ASTM C1289, Type II, class mat facer on both major surfaces. Minimum Grade 2 compressive strength. Tapered insulation to be sloped at 1/4" per foot toward roof drains. R-30 Min.
 - f. Roof Deck (See Structural)
 - g. Roof Joists and Girders (See Structural).
2. Warehouse Roof:
- a. Thermoplastic Polyolefin (TPO) Roofing: fabric reinforced TPO sheet, ASTM D 4434, internally fabric or scrim reinforced, uniform flexible backed TPO sheet, 60 mils nominal thickness. White membrane with energy star listing, solar reflectance index of 82 (3 yr aged 64min), FM Global 4450 or 4470 listed, fire/windstorm Class 1A-90. Class A exterior fire- test exposure per UL 790. Special warranty period: 20 year guarantee of watertightness for full system.
 - b. Type X 5/8-inch glass-mat substrate board, water-resistant gypsum substrate ASTM C1177/C1177M, mechanical fastened to roof deck.
 - c. Self- Adhering-Sheet Vapor Retarder ASTM D1970/D1970M, polyethylene film laminated to layer of rubberized asphalt adhesive, minimum 40-mil total thickness; maximum permeance rating of 0.1 perms, cold applied with slip-resisting surface and release paper backing.
 - d. Tapered insulation crickets sloped approximately 1/4" per foot as required to divert water at rooftop equipment or vertical structures.
 - e. Polyiso board insulation: ASTM C1289, Type II, class mat facer on both major surfaces. Minimum Grade 2 compressive strength. R-30 Min.
 - f. Roof Deck (See Structural)

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- g. Roof Joists and Girders (See Structural). Roof Girder top chord to be tapered to roof drains.

VIII. Flashings & Trim

- a. Copings: manufactured metal coping system consisting of metal coping cap in section lengths not exceeding 12-feet, concealed anchorage, with corner units, end cap units and concealed splice plates with finish matching coping caps. Formed aluminum sheet 0.063-inch thick. Finish: two-coat fluoropolymer. Coping-Cap Attachment Method: face leg hooked to continuous cleat with back leg fastener exposed, fabricated from coping-cap material.
- b. Roof-edge Drainage Systems: Gutters manufactured in uniform section lengths not exceeding 12-feet with matching corner units, ends, outlet tubes and other accessories. Elevate back edge at least 1-inch above front edge. Aluminum Sheet: 0.063-inch thick. Downspouts: closed face rectangular same material as gutters. Provide cast iron hubs to min 96" above grade.

IX. Trash Enclosures

- a. For trash enclosures, provide ground face masonry Unit: Trendstone manufactured by Northfield Block Company, Morris, IL or equal, ASTM C90, integral water repellent, ASTM C1262 and ASTM C744.

X. Guard booths

- a. Prefabricated guard booths to be provided at material storage area and at south Wilson Ave gate. Guard booths to accommodate working stations for two personnel. Booths should provide toilet facilities and have integral lighting and HVAC.
- b. Wilson Ave booth will require connection to keycard/intercom gate operator for afterhours access of Trucks.
- c. Basis of Design: Big Industries

XI. Cameras

- a. DWM has provided a list of typical security camera specs and parts to accompany the locations shown in the drawings (This has been included in the Reference Directory). The specification of these cameras (and locations) should be re-reviewed with DWM and the final chosen technology consultant to confirm compatibility.



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INTERIOR NARRATIVE

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- a. Metal stud partitions to be 3-5/8" 20 gauge minimum metal studs at 16" on center
- b. Interior Concrete Masonry Units: ASTM C90, integral water repellent. Provide fire resistance as noted on the drawings. Size: 8" x 16" x 8" (nominal).
- c. Provide fire-retardant wood blocking, furring, shims and hanging strips where required to install new millwork and accessories. This shall include all cabinets as required

II. Interior Doors

- a. All interior doors to be heavy duty hollow metal doors, metallic coated face, minimum A40 coating, minimum 16-gauge, SDI 250.8, Level 3, seamless. 1-3/4- inch thickness. Doors and Frames in fire rated partitions to be fire rated in accordance with local code requirements
- b. Provide fully welded, metallic coated steel frames, minimum A40 coating, minimum 14-gauge. Frame to be factory primed for field finish paint.
- c. Provide all door hardware for a complete and functioning installation. All hardware shall be BHMA certified.

III. Fittings

- a. Built-in millwork: provide custom grade wood cabinets with face frame, flush overlay: any closed-grain hardwood, panel products: medium-density overlay, butt hinges and wire pulls, high pressure laminate finish.
- b. Countertops: Provide solid surface countertop surface and 4 inch backsplash.
- c. Fabrications will include all accessory steel items needed to complete the installation of other parts of the Work, including but not limited to the following:
 - i. Steel framing and supports.
 - ii. Accessory angles, plates, channels, etc.
 - iii. Any required bolts, screws, nails, fasteners, etc.
 - iv. Metal edgings.
 - v. Any other steel item or accessory not specifically shown, noted or called for
 - vi. All materials selected for the project will be screened / optimized for LEEDv4 material transparency criteria – including low emitting values, availability of environmental product disclosures/health product disclosures, and responsible sourcing standards.

IV. Guardrails & Handrails

- a. Provide railings with 1-1/2-inch diameter posts, top rail and handrail with 1/2-inch square vertical pickets. Railings shall support minimum uniform load of 50lb/ft. applied in any direction, concentrated load of 200lbs, infill guards 50lbs/ft. All provided factory primed for field paint finish.



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V. Stairs

- a. Exit stairs: Concrete filled metal pan stairs. Delegated design of structure to be provided by fabricator, signed and sealed by an Illinois engineer. Structural performance: uniform load of 100psf, concentrated load of 300psf. Railings shall support minimum uniform load of 50lb/ft. applied in any direction, concentrated load of 200lbs, infill guards 50lbs/ft. All metal to be factory primed for field paint finish. Provide fully welded construction.
 - i. Railings shall be 1-1/2-inch diameter posts, top rail and handrail with 1/2-inch square vertical pickets. All provided factory primed for field paint finish. Wall mounted handrail shall be 1-1/4-inch diameter.
 - ii. Tread and landing finish shall be sealed concrete.
 - iii. Underside of stairs shall be exposed.
 - iv. Provide intermediate field primer and (2) finish coats, semi-gloss finish.
- b. Vehicle Wash: galvanized metal pan stairs and catwalk.. Delegated design of structure to be provided by fabricator, signed and sealed by an Illinois engineer. Structural performance: uniform load of 100psf, concentrated load of 300psf. Railings shall support minimum uniform load of 50lb/ft. applied in any direction, concentrated load of 200lbs, infill guards 50lbs/ft. All metal to be factory primed for field paint finish. Provide fully welded construction.
 - i. Railings shall be 1-1/2-inch diameter posts, top rail and handrail with 1/2-inch square vertical pickets. All provided factory primed for field paint finish. Wall mounted handrail shall be 1-1/4-inch diameter. Galvanized.
 - ii. Tread and landing finish shall be open bar grate style treads with serration.
 - iii. Underside of stairs shall be exposed.
 - iv. Provide intermediate field primer and (2) finish coats, semi-gloss finish.

VI. Interior Finishes

- a. Provide Finishes as follows:
 - i. Warehouse
 - 1. Vehicle Storage (138)
 - a. Walls: Concrete/CMU
 - i. Alternate 01: Provide industrial wall sound baffles at perimeter walls of Vehicle Storage.
 - b. Floors: Sealed concrete
 - c. Ceiling: Exposed
 - i. Alternate 02: Provide industrial ceiling sound baffles at Vehicle storage ceiling.

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2. Work/Pit Area (132-134)
 - a. Walls: Concrete/CMU. Corkboard to be provided in certain areas for tool storage
 - b. Floors: Sealed concrete
 - c. Ceiling: Exposed
3. Restrooms (104, 105, 122, 123, 126, 127, 205, 206)
 - a. Walls: ceramic tile/gypsum
 - b. Floors: ceramic tile
 - c. Ceiling: gypsum
4. Foreman/Super Offices (111, 113 – 121)
 - a. Walls: gypsum.
 - b. Floors: vinyl tile
 - c. Ceiling: Acoustic ceiling tile
5. Break Room (110, 219)
 - a. Walls: gypsum
 - b. Floors: vinyl tile
 - c. Ceiling: acoustic ceiling tile. Automatic Roller shades to be provided at all window locations.
6. Office Suite (112, 112A, 128-131, 136)
 - a. Walls: Gypsum
 - b. Floors: Vinyl Tile
 - c. Ceiling: Acoustic Ceiling Tile
7. Inventory/Staging (125, 125A, 125B, 125C, 125D)
 - a. Walls: CMU.
 - b. Floors: Sealed concrete
 - c. Ceiling: Exposed

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8. Utility Room (107A, 107B, 108, 109, 124, 139, 140, 208, 209)
 - a. Walls: CMU.
 - b. Floors: Sealed concrete
 - c. Ceiling: Exposed
9. Clock-in Room (135)
 - a. Walls: CMU
 - b. Floors: Sealed concrete
 - c. Ceiling: Exposed
- ii. Administrative
 1. Vestibule (101)
 - a. Walls: Gypsum
 - b. Floors: Walk off carpet tile
 - c. Ceiling: Acoustic ceiling tile
 2. Lobby (102,201)
 - a. Walls: Gypsum
 - b. Floors: Vinyl tile
 - c. Ceiling: Acoustic Ceiling tile
 3. Training (103)
 - a. Walls: Gypsum
 - b. Floors: Vinyl tile
 - c. Ceiling: Acoustic Ceiling tile (Provide automatic roller shades at all storefront/windows)
 4. Security (103A)
 - a. Walls: Gypsum
 - b. Floors: Vinyl tile
 - c. Ceiling: Acoustic Ceiling tile (Provide automatic roller shades at all storefront/windows)

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5. Commissioner Reception (202)
 - a. Walls: Gypsum
 - b. Floors: Carpet tile
 - c. Ceiling: Acoustic Ceiling tile(Provide automatic roller shades at all storefront/windows)
6. Commissioner office (203)
 - a. Walls: Gypsum
 - b. Floors: Carpet tile
 - c. Ceiling: Acoustic Ceiling tile (Provide automatic roller shades at all storefront)
7. Offices (210-212, 214-218, 221-224)
 - a. Walls: Gypsum
 - b. Floors: Carpet tile
 - c. Ceiling: Acoustic Ceiling tile (Provide automatic roller shades at all storefront)
8. Conference room (204)
 - a. Walls: Gypsum
 - b. Floors: Carpet tile
 - c. Ceiling: Acoustic Ceiling tile
9. Open Office areas (213)
 - a. Walls: Gypsum
 - b. Floors: Carpet tile
 - c. Ceiling: Acoustic Ceiling tile (Provide automatic roller shades at all storefront.windows)
10. Wellness room (220)
 - a. Walls: Gypsum
 - b. Floors: Carpet tile
 - c. Ceiling: Acoustic Ceiling tile



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PLUMBING NARRATIVE



D00 MEP General Requirements

D0001 PURPOSE

This document will serve as the MEP Basis of Design for the project to be used for developing the MEP Construction Documents and the Design Build Construction Cost. The Construction Documents shall be prepared by a Firm Licensed to practice engineering in Illinois and signed/sealed by an Illinois Professional Engineer.

D20 Plumbing

SCOPE-OF-WORK

Provide all labor, materials, tools, instructions, data, testing/test results, reports, spare parts and equipment required to construct and install completely functional plumbing systems in accordance with the Basis of Design and building functional requirements.

Provide any apparatus, appliance, material or work necessary to make the work complete in all respects, ready for operation, and to perform in the manner indicated. Even if not particularly specified, these items will be furnished and installed by the Contractor without additional expense to the Owner.

D2002 PLUMBING FIXTURES

Water Closet – Wall mounted, vitreous china, elongated, hard wired sensor,

1.28GPF. ADA

Urinals – Wall mounted, vitreous china, washout, hard wired sensor, 0.125GPF.

ADA.

Lavatories – Wall mounted, vitreous china, rectangular, hard wired sensor, 0.5GPM.

ADA.

Stainless steel sinks – Drop in type, single bowl, gooseneck faucet with wrist blade handles, 0.5GPM. ADA.

Electric water coolers – Hi/Low configuration, filtered, bottle filling station. ADA.

Emergency shower – Emergency eye/face and shower combination unit, tempered per

OSHA requirements, hard piped for supply and drain.

Mop Receptor – Floor mounted, molded stone, wall mounted faucet.

All plumbing fixtures shall be installed in neat, finished, and uniform manner, with all required service conditions properly made. Provide sanitary waste and vent and domestic water supply pipes all fixtures.

D2003 STORM DRAINAGE

Storm piping shall consist of interior downspouts. Drainage shall be sized in accordance with the Chicago Building Code based on appropriate rain fall rate for 60 minute duration and a 100-year return. Roof drains shall be cast iron with cast iron dome and sump receiver. A secondary roof drainage system shall be provided as either overflow drains, drained to daylight or as parapet scuppers. Under slab storm shall collect and exit the building in coordination with structure defined by Civil Engineer.

D2004 SANITARY DRAINAGE

Provide sanitary waste and vent to each individual fixture. Underslab waste shall collect and exit the building in coordination with structures defined by Civil Engineer. Provide parking area drains spaced in accordance with the floor sloping. The drains shall be 12" diameter, heavy duty, and shall collect to a flush with floor Oil/Water separator (OWS). At each staging area dock space, provide a trench drain and collect to the OWS. The Oil Water separator shall be rated for a heavy traffic load. Provide a 10'-0" trench drain at the Vehicle Wash. All general waste shall drain by gravity. All break room sinks shall collect to a under-cabinet type grease interceptor. Venting shall collect and penetrate the roof at appropriate spacing as to meet the horizontal venting guidelines within the code.

D2005 DOMESTIC WATER SYSTEM

Provide new 8" incoming combined water service to Water Room from Lawrence Ave. Domestic water to be sized at 2" and Fire Protection to be sized at 6". Provide a duplex, domestic water, package, booster pump with VFD drives and external hydro-pneumatic tank. Est. 2.5HP pending water pressure test results. Provide a high efficiency, gas-fired water heater, sized at 120% system demand. Est. 300,000BTU, 120Gallon storage. Provide hot water return with circuit setter valves and aquastat at pump.

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Provide cold, hot and hot water return drops at each individual or group of fixtures. Each branch or drop shall include shut-off ball valves and a circuit setter valve on the hot water return line. Provide exterior hose bibbs spaced at 75'-0" increments. Hose bibbs shall be downstream of a testable double check valve. All piping to be insulated.

Suggested location for booster pump: Mechanical room. Footprint, 4'-0" x 4'-0" with 3'-0" front clearance for maintenance.

Suggested location for water heater: Mechanical room. Footprint, 3'-0" x 3'-0" with front clearance for maintenance.

D2006 COMPRESSED AIR SYSTEM

Provide new compressed air system serving air drops defined by the owner and at the pressure wash within the pressure wash bay. Compressed air lines shall run overhead from the compressor to hose reel cabinets suspended in the garage, air drops at walls/columns and to a drop near the pressure wash area. Provide rotary screw compressor sized for 120% capacity, VSD for trimming, cycling refrigerated air dryers, receiver tank, discharge flow controller and drain valves on all components.

Suggested location for compressor: Mechanical room. Footprint, 3'-0" x 5'-0" with front clearance for maintenance.

D2007 PRESSURE WASH SYSTEM

Provide hose bibb(s) at wash location.

D2008 MATERIALS

General Installation: Install pipe, tube and fittings in accordance with recognized industry practices which will achieve permanently leak-proof piping systems, capable of performing each indicated service without piping failure. Install each run with a minimum of joints and couplings.

A. Domestic Water Distribution

- i. Below Grade: Not applicable
- ii. Above Grade:
 - a. Piping 3" inches and smaller shall be Type L copper tubing.
 - b. Piping 4" and large shall be galvanized steel.
 - c. Provide dielectric unions when connecting piping of dissimilar metals.

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- B. Sanitary, Waste and Vent Piping**
- i. Below Grade: Piping shall be hub and spigot cast iron piping.
 - ii. Above Grade: Hub and spigot cast iron, DWV copper.
- C. Storm Piping**
- i. Interior downspouts shall be fully protected within column webs or by bollards.
 - ii. Below Grade: Piping shall be ASTM D2665, Hub and spigot cast iron.
 - iii. Above Grade: Piping shall be cast iron, Hub and spigot cast iron.
- D. Piping Insulation:** Fibrous glass insulation shall be installed on all domestic water piping above grade and within plumbing walls. Insulate all storm drain bodies and horizontal fittings/runs. Insulate valves, fittings, etc., through the elbow to vertical.
- | <u>IPS Pipe Size</u> | <u>Insulation Thickness</u> |
|----------------------|-----------------------------|
| 2 inch and under | 1 inch |
| 2-1/2 inch to 6 inch | 1-1/2 inch |
- E. Backflow Preventers:** Shall be installed required by code and shall be appropriate for intended service.



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HVAC NARRATIVE

D30 HVAC**D3001 SCOPE-OF-WORK**

All design and construction work shall be coordinated with other disciplines and trades. Provide all labor, materials, tools, instructions, data, testing/test results, reports, spare parts and equipment required to construct and install completely functional HVAC system in accordance with the Basis of Design and building functional requirements.

Provide any apparatus, appliance, material or work necessary to make the work complete in all respects, ready for operation, and to perform in the manner per the documents and functional intent of building. Even if not particularly specified, these items will be furnished and installed by the Contractor without additional expense to the Owner.

D3002 DESIGN CRITERIA**A. Outside Design Temperatures:**

1. Summer: 93 degrees F DB, 73 degrees coincident F WB (0.4% ASHRAE)
2. Winter: -10 degrees F (Code Mandated)

B. Indoor Design Temperatures:**1. Interior Parking:**

- Summer ventilation only.
- Winter heating at 68 deg F.

2. Admin/Warehouse Support:

- Summer cooling at 74 deg F.
- Winter heating at 70 deg F.

3. Inventory:

- Summer ventilation only.
- Winter heating at 68 deg F.

C. Codes and Standards

- Chicago Building Code
- Chicago Energy Transformation Code 2022
- ASHRAE 90.1: Energy Standard for Buildings Except Low-Rise Residential Buildings
- ASHRAE 62.1: Ventilation and Acceptable Indoor Air Quality
- ASHRAE 55: Thermal Environmental Conditions for Human Occupancy

D3003 HVAC SYSTEM SELECTIONS

- A. Interior Parking:** Provide variable speed heating and ventilation makeup air unit for code minimum supply ventilation. Interlock with variable speed exhaust fan(s). Design criteria shall be based on the following and

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validated by load calculations once the plans are further developed.

1. Ventilation Requirement: 1.0 CFM/SF maximum, nominal 80,000 CFM
 2. Equipment Type
 - i. High-efficiency indirect-fired rooftop air handling unit with modulating gas valve and variable speed supply fan. Recirculation is not permitted.
 - ii. Rooftop exhaust fan(s) with variable speed drives.
 - iii. High-efficiency gas-fired unit heaters at entry doors.
 - iv. Provide carbon monoxide/nitrogen dioxide detection system with sensors every 5,000 SF.
- B. Admin: Provide variable volume packaged rooftop air handling unit with gas heating and DX cooling. Provide ducted distribution to interior spaces with VAV terminals with electric reheat. Design criteria shall be based on the following and validated by load calculations once the plans are further developed.
1. Ventilation Requirement: 0.6 CFM/SF, nominal 3,900 CFM
 2. Equipment Type
 - i. High-efficiency variable volume rooftop air handling unit with modulating gas valve, and variable speed supply and exhaust fans. Unit shall be nominal 12.5 tons.
 - ii. Provide VAV terminal units with electric reheat coils, nominally 7 zones at 600 CFM each. Provide programmable thermostat and CO2 sensor in each space. The controls for shared multi-occupant spaces and individual offices shall comply with LEED requirements.
- C. Warehouse Support: Provide variable volume packaged rooftop air handling unit with gas heating and DX cooling. Provide ducted distribution to interior spaces with VAV terminals with electric reheat. Design criteria shall be based on the following and validated by load calculations once the plans are further developed.
1. Ventilation Requirement: 0.6 CFM/SF, nominal 5,000 CFM
 2. Equipment Type
 - i. High-efficiency variable volume rooftop air handling unit with modulating gas valve, and variable speed supply and exhaust fans. Unit shall be nominal 17.5 tons.
 - ii. Provide VAV terminal units with electric reheat coils, nominally 9 zones at 600 CFM each. Provide programmable thermostat and CO2 sensor in each space. The controls for shared multi-occupant spaces and individual offices shall comply with LEED requirements.
 - iii. Provide gas-fired unit heater in wash bay.

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- D. Inventory: Provide variable speed heating and ventilation air handling unit for code minimum supply ventilation. Interlock with variable speed exhaust fan(s). Design criteria shall be based on the following and validated by load calculations once the plans are further developed.

1. Ventilation Requirement: 0.5 CFM/SF, nominal 2,700 CFM
2. Equipment Type
 - i. High-efficiency indirect-fired rooftop air handling unit with modulating gas valve and variable speed supply fan.
 - ii. Rooftop exhaust fan(s) with variable speed drives.
 - iii. Ducted supply and return with recirculation permitted.
 - iv. Flammable storage room shall be kept at negative pressure with respect to adjacent spaces. Exhaust shall operate continuously and be of explosion-proof construction. A switch of the break glass type shall be located outside of the room for emergency shutoff.

E. Utilities

1. A new gas service shall be provided off Lawrence Avenue. The recommended service pressure shall be 2 PSI, and the main distribution and meter shall be sized for the total loads including HVAC heating, domestic water heating, emergency generator, and owner provided equipment.
2. The gas meter shall be provided with two pulse modulation outputs, one for use by the utility and one for use for LEED monitoring.
3. Electric and water meters shall be provided with auxiliary outputs for use for LEED monitoring.

F. Building Automation System

1. A building automation system shall be utilized to adjust and log equipment setpoints for commissioning, monitor equipment alarms, and to log utility usage data for LEED.

D3004 GARAGE GAS DETECTION SYSTEM

The overall control system for gas detection shall be a multi-point, analog system that detects CO and NO₂ emissions. The number of zones shall be per the manufacturer's requirements and the capability of the gas detection equipment. Each zone shall be equipped with a CO and NO₂ sensor with home runs to the multi-point controller. The controller shall be capable of providing multiple relay outputs for fan control and multiple analog outputs to control VFDs. There shall be one system in place for the garage areas.

The CO and NO₂ sensors shall be electrochemical type and shall be calibrated to alert the controller at 25 ppm and 3 ppm concentration, respectively. When a CO or NO₂ sensor reads a gas concentration exceeding the maximum allowable, the sensor alerts the controller. The controller shall sound an audible alarm and activate a strobe, and the controller shall activate the exhaust fan responsible for purging to exhaust at a maximum rate until the sensors read gas concentrations at an acceptable level.

D3005 LEED REQUIREMENTS

- A. Energy and Atmosphere
 1. The systems shall be commissioned by a third party.
 2. High-efficiency systems shall be utilized to exceed the requirements of ASHRAE 90.1. Mechanical systems shall utilize variable speed fans, high efficiency cooling, greater than 90% efficiency heating, and demand-controlled ventilation to exceed the baseline energy model. Efficient LED interior and exterior lighting shall be selected to exceed baseline requirements.
 3. R-454B refrigerant shall be utilized to meet credits for fundamental and enhanced refrigerant management.
 4. Water, power, and gas meters shall be monitored by a building management system. Additional water and electrical submeters may be added for additional credits.
- B. Indoor Environmental Quality
 1. Ventilation systems shall meet the requirements of ASHRAE 62.1.
 2. MERV-13 filters, CO2 monitoring, and exhaust pressurization shall be utilized to comply with enhanced indoor air quality strategies.
 3. Systems and setpoints shall be selected for occupant comfort. Shared multi-occupant spaces and individual offices shall have temperature controls and CO2-based demand-controlled ventilation that comply with ASHRAE standards.

D3006 COMED INCENTIVE REQUIREMENTS

1. Direct-fired makeup air units shall have a rated efficiency of 92% or higher.
2. Demand controlled ventilation with CO2 sensors shall be utilized to reduce outside air volume during periods of low occupancy. CO and NO2 sensors shall be utilized in the garage to reduce airflow to code minimum when vehicles are not in use.
3. Cooling equipment shall have a rated efficiency at least 10% above the energy code minimum.



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FIRE PROTECTION NARRATIVE

New DWM Operation Facility*Basis of Design Narrative – 100% Schematic Design Revision 1***D40 Fire Protection****D4001 SCOPE-OF-WORK**

Provide all labor, materials, tools, instructions, data, testing/test results, reports, spare parts and equipment required to construct and install completely functional fire protection system in accordance with the Basis of Design and building functional requirements.

Provide any apparatus, appliance, material or work necessary to make the work complete in all respects, ready for operation, and to perform in the manner indicated. Even if not particularly specified, these items will be furnished and installed by the Contractor without additional expense to the Owner.

D4002 CODES AND STANDARDS

Chicago Building Code.

Underwriters Laboratories (UL)

Applicable NFPA

D4003 GENERAL FIRE PROTECTION

Provide a 6" water service from an approved backflow device. Provide a 750GPM fire pump, vertical incline type, with controller, pressure maintenance pump and sprinkler manifold. Est 50HP, 30PSI boost pressure.

Suggested location for Fire Pump: Mech/Water room. Pump Footprint, 3'-0" x 6'-0" with front clearance for maintenance. Controller Footprint: 2'-0" x 5'-0" with 3'-0" front clearance to meet code.

New water service shall be a combined main split into 2" domestic and 6" sprinkler. Fire Protection is required for each new space. Provide light hazard protection at office areas and common areas, ordinary hazard protection with upright heads at Inventory, work areas and vehicle parking. Any tire storage or high hazard items shall be protected by extra hazard protection.

No sprinkler heads required for dedicated electrical spaces.

Provide wet pipe sprinkler system at warehouse. Alternate: provide dry type heads at vehicle parking with a dry valve and compressor located within a heated space.



D4004 FIRE PROTECTION SPECIALTIES

Fire extinguishers shall be provided throughout in accordance with NFPA 70 requirements. Provide surface wall mounts for each extinguisher.



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ELECTRICAL NARRATIVE

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All design and construction work shall be coordinated with other disciplines and trades. Provide all labor, materials, tools, instructions, data, testing/test results, reports, spare parts and equipment required to construct and install completely functional Electrical system in accordance with the Basis of Design and building functional requirements.

Provide any apparatus, appliance, material or work necessary to make the work complete in all respects, ready for operation, and to perform in the manner per the documents and functional intent of building Even if not particularly specified, these items will be furnished and installed by the Contractor without additional expense to the Owner.

D5002 DESIGN CRITERIA**A. Codes and Standards**

- Chicago Building Code
- American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) 90.1-2016
- Chicago Electrical Code (CEC) 2018
- International Energy Conservation Code (IECC) with State of Illinois Energy Efficient Building Act
- National Fire Protection Agency (NFPA) 101 – 2000
- Chicago Energy Transformation Code 2022
- Chicago Sustainable Development Policy 2024
- Illuminating Engineering Society (IES) Standards

D5003 Basis of Design**A. Full Building/Distribution**

1. Provide new 480/277V, 1200A, 3 phase, 4 wire main service for new building and applicable site areas supplied from exterior utility-provided service transformer. Provide one or multiple stepdown transformers for 208Y/120V, 3 phase, 4 wire power. All interior lighting, special systems, general receptacles, applicable special equipment, EV charging stations, and applicable HVAC equipment will be fed from 208Y/120V stepdown transformer. All applicable HVAC, Site Lighting, and special equipment will be fed from the 480/277V service. Provide branch and distribution panels.
 - i. Distribution Panels – NEMA 1 circuit breaker type with front doors as manufactured by Square D, Cutler Hammer, or General Electric.
 - ii. Lighting and Receptacle Panels – NEMA 1 circuit breaker type with bolt-on branch breakers in NEMA enclosures as manufactured by Square D, Cutler Hammer, or General Electric.
 - iii. All main switchboards, stepdown transformers, distribution panels, and branch panels to be located within building's main electrical room or within other applicable equipment rooms.

2. Alternate scope: Provide new outdoor-rated exterior gas fired generator along with ATS (automatic transfer switches) will be provided for all emergency, critical loads, security system and life safety including communication infrastructure such as MDF and IDF rooms. All ATSES, emergency distribution panels, emergency stepdown transformers, and emergency branch panels to be located within building's main electrical room or within other applicable equipment rooms. All emergency distribution systems will be located in separate room from main switchboard.
3. All security, IT, phone and data equipment are to be designed, furnished, and installed by the owner. The contractor includes furnishing and installation of raceways and wire only. All security, IT, and phone/data equipment are to be supplied by the owner.
4. Grounding: The electrical services and systems shall be grounded in accordance with CEC requirements. A supplementary ground wire shall be included in all conduits for the purpose of grounding all metallic non-current carrying parts of the electrical equipment the conduit is feeding. All motors shall be grounded through an individual lug inside the motor junction box which will be installed if not already provided. All electronic system grounds shall be electrically insulated from power system grounds.

B. Parking Garage

1. Lighting

- i. Energy efficient LED fixtures will be utilized in all parts of this project.
- ii. High bay LED fixtures with a minimum efficiency of 40 lumens per watt, 80 CRI, and tested in compliance with IES LM-79 and IES LM-80
- iii. Emergency lighting shall be provided per CEC.
 - If alternate scope is selected, emergency and exit lighting shall be powered by generator.
 - If not, provide City of Chicago-approved wall-mounted emergency lighting with 90-minute battery backup. All exit signs to be "integral 90-minute battery backup" type.
- iv. With the exception of emergency lights, lighting power density of interior garage areas to be less than or equal to 0.28 watts/ft². Ideally, lighting power density of interior garage areas shall be less than or equal to 0.18 watts/ft².

2. Power

- i. Power shall be provided for all general purpose and miscellaneous equipment and systems including lifts, fluid supply equipment, and HVAC equipment.
- ii. Any electrical equipment or device located within the garage shall be NEMA 4x.

3. Low Voltage

- i. New fire alarm and detection system including smoke detectors, duct smoke detectors, heat detectors, manual pull stations, and audio/visual alarms shall be provided. Devices shall be placed based on new architectural layout.
- ii. New security system including cameras and card readers shall be provided. Devices shall be placed based on new architectural layout.

C. Office/Admin Areas

1. Lighting

- i. Energy efficient LED fixtures will be utilized in all parts of this project.
- ii. With the exception of emergency lights, lighting power density of office areas to be less than or equal to 0.51 watts/ft². Ideally, lighting power density of office areas shall be less than or equal to 0.45 watts/ft².
- iii. Emergency lighting shall be provided per CEC.
 - If alternate scope is selected, emergency and exit lighting shall be powered by generator.
 - If not, provide City of Chicago-approved wall-mounted emergency lighting with 90-minute battery backup. All exit signs to be “integral 90-minute battery backup” type.
- iv. Local lighting controls with dual switching/dimming shall be provided in all offices, conference rooms, admin areas, and work areas.
- v. Automatic lighting controls such as occupancy/vacancy sensors, time clocks and daylight sensors shall be implemented as required per ASHRAE 90.1 and IECC requirements. Lights in office area shall be programmed for manual on and auto off after 10 minutes without movement detection, except in cases where automatic controls endangers building occupants.

2. Power

- i. Main power for Office/Admin areas shall be provided by new service in Main Electrical room via new distribution panels which will be located throughout the building.
- ii. 208Y/120V power shall be provided for all general purpose and miscellaneous equipment and systems. Percentage of system backup to be determined.
- iii. Distribution Panels – NEMA 1 circuit breaker type with front doors as manufactured by Square D, Cutler Hammer, or General Electric.
- iv. Lighting and Receptacle Panels – NEMA 1 circuit breaker type with bolt-on branch breakers in NEMA enclosures as manufactured by Square D, Cutler Hammer, or General Electric.
- v. Grounding: The electrical services and systems shall be grounded in accordance with CEC requirements. A supplementary ground wire shall be included in all conduits

for the purpose of grounding all metallic non-current carrying parts of the electrical equipment the conduit is feeding. All motors shall be grounded through an individual lug inside the motor junction box which will be installed if not already provided. All electronic system grounds shall be electrically insulated from power system grounds.

3. Low Voltage

- i. New MDF room shall be equipped with incoming fiber optic cables service and IT infrastructure to support the facility.
- ii. All Owner provided IT equipment, security and network related equipment shall be located with coordination with Owner's vendors and IT team.
- iii. Tel/Data outlets shall be provided for workstations, training room tables and offices based on new architectural layout.
- iv. New fire alarm and detection system including smoke detectors, duct smoke detectors, heat detectors, manual pull stations, and audio/visual alarms shall be provided. Devices shall be placed based on new architectural layout.
- v. New security system including cameras and card readers shall be provided. Devices shall be placed based on new architectural layout.

D. Warehouse/Work Areas:

1. Lighting

- i. Energy efficient LED fixtures will be utilized in all parts of this project.
- ii. High bay LED fixtures with a minimum efficiency of 40 lumens per watt, 80 CRI, and tested in compliance with IES LM-79 and IES LM-80
- iii. With the exception of emergency lights, lighting power density of warehouse areas to be less than or equal to 0.28 watts/ft². Ideally, lighting power density of warehouse areas shall be less than or equal to 0.18 watts/ft².
- iv. Emergency lighting shall be provided per CEC.
 - If alternate scope is selected, emergency and exit lighting shall be powered by generator.
 - If not, provide City of Chicago-approved wall-mounted emergency lighting with 90-minute battery backup. All exit signs to be "integral 90-minute battery backup" type.
- v. Local lighting controls shall be provided in all non-corridor areas.
- vi. Automatic lighting controls such as occupancy/vacancy sensors and time clocks shall be implemented as required per ASHRAE 90.1 and IECC requirements. Lights in warehouse area shall be programmed for manual on and auto off after 10 minutes without movement detection, except in cases where automatic controls endangers building occupants.

2. Power

- i. 208Y/120V power shall be provided for all general purpose and miscellaneous equipment and systems. Percentage of system backup to be determined.
- ii. 277/480V power shall be provided for welding and other processes. To be determined.
- iii. Distribution Panels – NEMA 1 circuit breaker type with front doors as manufactured by Square D, Cutler Hammer, or General Electric.
- iv. Lighting and Receptacle Panels – NEMA 1 circuit breaker type with bolt-on branch breakers in NEMA enclosures as manufactured by Square D, Cutler Hammer, or General Electric.
- v. Grounding: The electrical services and systems shall be grounded in accordance with CEC requirements. A supplementary ground wire shall be included in all conduits for the purpose of grounding all metallic non-current carrying parts of the electrical equipment the conduit is feeding. All motors shall be grounded through an individual lug inside the motor junction box which will be installed if not already provided. All electronic system grounds shall be electrically insulated from power system grounds.

3. Low Voltage

- i. Tel/Data outlets shall be provided for workstations and offices based on new architectural layout.
- ii. New fire alarm and detection system including smoke detectors, duct smoke detectors, heat detectors, manual pull stations, and audio/visual alarms shall be provided. Devices shall be placed based on new architectural layout.
- iii. New security system including cameras and card readers shall be provided. Devices shall be placed based on new architectural layout.

E. Exterior:

1. Lighting

- i. Energy efficient LED fixtures will be utilized in all parts of this project.
- ii. Pole mounted 277V exterior fixtures shall be provided for exterior parking illumination.
- iii. Outdoor-rated recessed downlights shall be provided at building entrance.
- iv. Lighting power density of exterior parking and drive areas shall be less than or equal to 0.03 watts/ft². Lighting power density for exterior pedestrian walkways and vehicle entrances and exits shall be less than or equal to 8 watts/linear foot.
- v. Exterior fixtures shall be automatically controlled by fixture-mounted photocell.
- vi. If building has periods of unoccupied time, exterior lights shall be programmed to reduce their loads by 70 percent during those times.

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- vii. Per Appendix III, Section Exterior Fixtures of the Chicago Sustainable Development Policy, all exterior lights shall be dark-sky compliant and/or full-cutoff to minimize up-lighting conditions.
- viii. Footcandle ratings of exterior spaces to comply with IES standards. Footcandle rating at property line to be 0.

2. Power

- i. Provide 37 level II Electric Vehicle Charging Stations at applicable parking spaces. Charging stations to draw power from dedicated electrical panels.
- ii. Provide plug-ins for diesel block heaters in far south gravel parking lot.

D5004 LEED REQUIREMENTS**A. Minimum Energy Performance**

- 1. Building electrical systems to exceed requirements of ASHRAE 90.1 – 2016.
- 2. Provide energy efficient light fixtures and control system to meet the energy performance requirement.
- 3. Investigate a possibility to sign up for ComEd green power program which will reduce the carbon foot print for the project.

B. Building Level Energy Metering

- 1. Provide electrical meters capable of monitoring electricity usage on a monthly basis. Owner to submit monthly electrical energy consumption to the US Green Building Council (henceforth referred to as USGBC), beginning when project achieves LEED certification or at occupancy, whichever comes first, and extending for at least five years. Owner to submit documentation of meter locations, meter ownership, Letter of Owner Commitment, and systems metered to USGBC.
- 2. Provide (6) meters at each location expected to account for >10% of electrical load: (1) overall service meter, (1) at 208/120V distribution panel, (1) at electric vehicle charger panel, and (3) at each MAU.

C. Light Pollution Reduction

- 1. Site is considered to be in a “LZ2” Model Lighting Ordinance lighting zone. Ensure all specified pole light fixtures have a BUG rating of B0 – U2 – G2 or lower. Ensure all specified building-mounted fixtures have a BUG rating of B0 – U2 – G1 or lower.



HIGH PERFORMANCE DESIGN GOALS



High Performance Design Goals

The project will have specific High Performance design requirements due to its funding source, and its use. This project is required to achieve, at a minimum, a LEED SILVER rating as administered by GBCI. The project has already been registered under LEED 4.0 as a part of the Schematic Design phase. The team has included a preliminary LEED Checklist in the directory, showing a potential path for achieving LEED Silver. This should be further developed during the design process. Due to receiving public funds, the project is also required to comply with the Chicago Sustainable Development Policy. The team has also included a draft of the policy Matrix in the directory. This project will also be participating in the Energy Efficiency Program offered by ComED. Copies of the required forms that must be completed by the Design team have been included in the directory.



Moody Nolan

New DWM Operation Facility

Basis of Design Narrative – 100% Schematic Design Revision 1

ALTERNATES

New DWM Operation Facility

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- A. Alternate No. 01 Acoustic Baffles
 - 1. Base Bid: None
 - 2. Alternate: Provide ceiling hung, industrial acoustic baffles at the ceiling of the interior vehicle parking area in the building
- B. Alternate No. 02 Acoustic Wall Panels
 - 1. Base Bid: None
 - 2. Alternate: At all perimeter walls of the interior vehicle parking area, provide wall mounted, acoustic wall panels.
- C. Alternate No. 03 Dry Sprinkler System in Warehouse
 - 1. Base Bid: Wet Sprinkler System
 - 2. Alternate: Dry Sprinkler System, See FP Narrative for more information.
- D. Alternate No. 04 Emergency Generator
 - 1. Base Bid: None
 - 2. Alternate: Provide Emergency Generator and associated equipment. See Electrical drawings for more information.
- E. Alternate No. 05 Interior Furnishings
 - 1. Base Bid: None
 - 2. Alternate: Provide interior furnishings as shown on Drawings. Final layouts and quantities to be confirmed with end user.
- F. Alternate No. 06 Wilson Ave Guard Booth
 - 1. Base Bid: None
 - 2. Alternate: Provide prefabricated Guardbooth with accessible restroom at Wilson Ave exit. Provide concrete slab and associated utility connections as required by Vendor.
- G. Alternate No. 07 Chainlink Fence Barbed wire
 - 1. Base Bid: None
 - 2. Alternate: Add Barbed wire to 12'-0" tall chainlink fence at perimeter of property. See Landscape drawings for more information.