Purchasing Division
Finance Department

Room 120
411 West First Street
Duluth, Minnesota 55802

218-730-5340
purchasing@duluthmn.gov

Addendum 1
Solicitation 21-AA24
City Hall MEP Renewal Design Services

This addendum serves to notify all bidders of the following changes to the solicitation documents:

The pre-bid meeting sign-in sheet has been uploaded to the City purchasing website and the Bid Express solicitation.

Questions asked and answered during the pre-bid meeting follow:

1. Should existing newer LED lighting be retained in the remodeled areas? *Yes.*
2. Is there an estimated budget for the project? *The project budget is currently estimated at $12 million.*
3. What is the start of construction time frame? *As soon as possible/practical.*
4. Is the RFP anticipated end of contract date the targeted construction completion date? *The construction completion date is flexible due to variables of heating seasons and scheduling.*
5. Who is responsible for energy efficiency testing? *The design team.*
6. Are there existing preliminary energy testing results and will they be shared with the attendees? *Yes, attached is the recommendations from the energy study performed in 2020.*
7. Are there building plans/drawings available? *Yes. Exhibit A to this addendum is the original City Hall plans from early 1900's. Exhibit B to this addendum is the current floor plans. Due to the file sizes, the exhibits are uploaded as separate documents and Exhibit A is in two parts.*
8. Have there been building upgrades such as improvements to windows, doors, roof, and A/C? *Yes, some have been completed such as new windows, and roof. Any existing A/C will be replaced except for in the data center.*
9. What is the current A/C and ventilation status? *Some ventilation exists, there is no central A/C. Any existing A/C will be replaced except for in the data center.*
10. What are the natural ventilation requirements and do they include auto-closure systems for windows? *This depends on the design; but we expect that auto-closures would be included, as well as automated controls for natural ventilation. Also, outdoor air quality will need to be addressed with natural ventilation and filtration to ensure quality indoor air.*

11. Are there considerations for historic preservation? *Yes, the building envelope and exterior areas will need to be approved for historic preservation concerns.*
12. Will the design team need to have a historic building preservation consultant on their team? *Historic preservation will need to be addressed and approved by the Historic Preservation Commission. Whether a designer needs to have a consultant on their team is up to the designer.*
13. Where are the acceptable locations for equipment to be placed outdoors? *The roof areas can be considered after assessing the structural integrity of the proposed locations.*
14. Are meeting or exceeding the SB2030 energy standards required by funding sources? *No, not a requirement; although meeting City goals of performing as efficient as practical and green energy goals need to be met. Refer to the attached City of Duluth Municipal Building Owner Performance Requirements document.*
15. What are the locations of vertical chases? *For MEP, refer to original City Hall plans in Exhibit A to locate specific spaces. For department layouts and ceiling heights, refer to the current floor plans in Exhibit B. Both exhibits are uploaded as separate documents.*
16. Can ceiling heights be adjusted to accommodate ductwork, etc.? *Yes, refer to current floor plans in Exhibit B for specific locations. Ceiling heights vary throughout the entire building.*
17. Does the budget consider significant architectural alterations required for ADA bathrooms? *Yes.*

Please acknowledge receipt of this Addendum by including a copy of the first TWO pages with your proposal.

Posted: **August 27, 2021**

Attachments
Energy Study with HVAC Recommendations
City of Duluth Municipal Building Owner Performance Requirements

Uploads
Pre-bid meeting sign-in sheet
Addendum 1 Exhibit A Part 1 - Original City Hall Plans, pages 1-28
Addendum 1 Exhibit A Part 2 - Original City Hall Plans, pages 29-56
Addendum 1 Exhibit B - Current City Hall Plans as phased for the recent construction project

Gausman & Moore
Mechanical and Electrical Engineers

CITY OF DULUTH CITY HALL
HVAC RECOMMENDATIONS

Prepared For:

ALEX JACKSON
City of Duluth
1532 West Michigan Street
Duluth, MN 55806

Prepared by:

Gausman & Moore Associates, Inc.
501 Lake Avenue South, Suite 210
Duluth, MN 55802
218-722-2555

Contact:

Kalysta Davis, PE
Mechanical Department - Duluth
218-302-6570

Lyssa Hattenberger
Electrical Department – Duluth
218-302-6566

DISCUSSION & RECOMMENDATIONS

General Discussion

The City of Duluth asked Gausman & Moore to put together a set of recommendations for updating the HVAC system for Duluth City Hall, originally built in 1927. The building has never had a significant HVAC update and most rooms do not have ventilation air. The original building design included features which promoted natural cross ventilation including the interior window wells, operable windows, and window transoms into the hallways. However, in the intervening years, many of these natural ventilation features have been removed and that strategy no longer cools the building as effectively as in previous decades. The building is heated with steam radiators in perimeter areas and has only limited mechanical cooling in the IT department and other select spaces. The windows were replaced in 2010 with a combination of double and triple pane windows and includes operable and fixed windows.

An energy model of city hall was created using IES Virtual Environment software and was used to compare two mechanical system options for updating the building; VAV and VRF systems. Variable Air Volume (VAV) systems consist of one or more central air handling units that supply conditioned air to each zone through a VAV box. The temperature in the zone is controlled by altering the temperature and/or quantity of air supplied to each zone. This system would involve installing a large network of ductwork throughout the building and replacing the existing air handling units in the ground floor mechanical room.

The Variable Refrigerant Flow (VRF) system consists of a network of refrigerant piping connecting water cooled condensing units with fan coils throughout the building. The configuration of these components allows for a phased or partial installation which can be easily expanded allowing for additional fan coils to be added at a later date. This expandability of VRF systems is advantageous for phased building construction, allowing branches to be installed in an early project phase but not connecting to a fan coil until a later phase. VRF systems also allow for energy efficient “mixed mode” simultaneous heating and cooling using heat recovery across spaces in the building and includes an integrated control system.

In addition to the VRF system providing heating and cooling, one or more Dedicated Outdoor Air Systems (DOAS) would deliver ventilation air to each space in the building. As DOAS units provide only room neutral ventilation air, in comparison to a VAV system the ductwork will be smaller, the system will be quieter, and will require less fan energy. By locating the DOAS units on each floor rather than in the ground floor mechanical room the existing duct shafts would be open to run piping and be reallocated to other uses.

For both the VAV and VRF simulations the district steam and chilled water heating and cooling plants were simulated in the energy model as a gas-fired boiler and an air-cooled chiller set to 100% efficiency. This removes the plant inefficiencies from the energy model simulation while providing full heating and cooling capacity required to the heat and cool the building.

The results from the energy model show the VRF system would require 40% less energy annually to operate in City Hall over a comparable VAV system. The energy saving characteristics of the VRF system include variable speed compressors for cooling, less fan energy to move less air around the building, and utilizing heat recovery for energy sharing. Based on the energy model results and the physical

characteristics of VRF systems, it is a decidedly the better fit for modernizing City Hall to current HVAC standards. Refer to the presentation in the link provided or scan the QR code for the energy model results previously presented to City of Duluth staff on June 26th, 2020.

Figure 1: *https://prezi.com/p/yujprfn0ta1t/?present=1*

The energy model was also used to compare the potential benefits of using a combination of natural ventilation and mechanical cooling over the option of using mechanical cooling only. With close proximity to Lake Superior, Duluth is known for having its own uniquely cool summer climate, which can be observed in the colored bar diagram in Figure 2. Red indicates the conditions for natural ventilation are good; outdoor air temperatures from 60-80°F, and 30-80% relative humidity. Analysis of the TMY3 indicates 70% of the hours from June 1 to August 31 between 8 am and 5 pm fall into the temperature and humidity range suitable for natural ventilation.

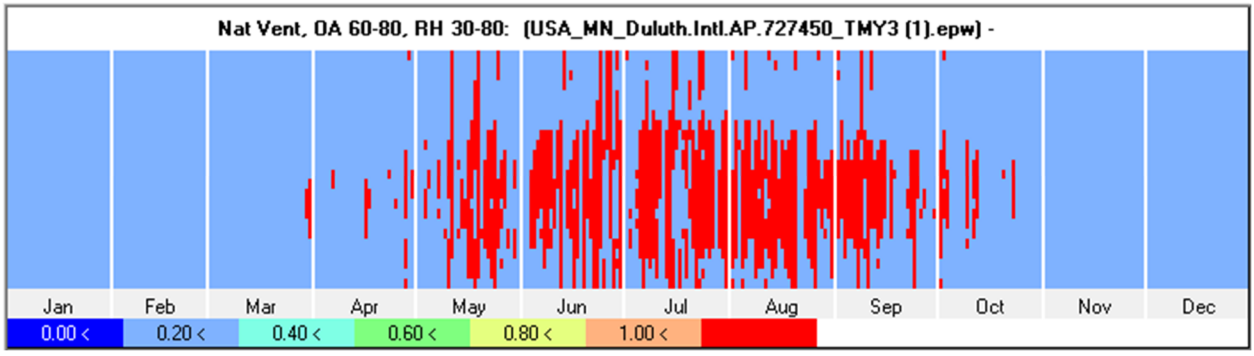


Figure 2: TMY3- Weather Data Analysis: Ideal Natural Ventilation Conditions in Red

Utilizing the natural ventilation strategy with operable windows in City Hall did present an opportunity to reduce the cooling load of the building. The results from the energy model indicate a reduction in cooling compressor energy of 24% based on utilizing natural ventilation when the outdoor conditions are favorable. The control strategy implemented in the simulation included leaving windows on floors 2 or higher to stay open, whereas windows on ground and first floors were closed regardless of outdoor conditions at 5 pm. Windows were open if the following conditions were satisfied: Room temperature was higher than outdoor air temperature, outside air temperature was between 55-80°F, and the relative humidity outside was less than 80%. Additionally, the energy model did indicate the opening/closing of windows based on the previously listed conditions regardless of whether the building was occupied at the time.

HVAC System Recommendations

Perimeter heating

Remove steam and condensate piping to existing steam radiators. Replace this piping with new hydronic hot water piping to serve the existing steam radiators to preserve the historic building nature. The output from the radiators will be reduced to about 70% of previous output, but hydronic hot water has improved

controllability over steam heat. This preliminary heating strategy works in conjunction with the ventilation system, but is separate to take advantage of the existing system design of effectively delivering heat at there the greatest heating loads are at the perimeter. This strategy also allows this historic building to maintain the historic heating system with upgraded energy conservation and thermal comfort control.

Ventilation

We recommend multiple compact DOAS units be located on each floor, either in new mechanical rooms or located above ceilings as space allows. Having one DOAS unit per department allows for better controllability to work in conjunction with natural ventilation strategies. DOAS units will be served with hydronic hot water for heating outside air and chilled water for dehumidification.

Heating and Cooling

The water source VRF condensing units could be located on the ground floor, in the existing mechanical room or garage space, or in a mechanical room on each floor. Refrigerant piping will extend from the water source condensing units to 1-2 refrigerant control boxes per floor, from which refrigerant piping then extends to fan coil units for each thermal zone, which come in a variety of configurations to best fit the needs of each space.

Heating and Cooling Plants

A steam to hot water heat exchanger and a chilled water heat exchanger would be installed and connected to a condenser water loop. This loop would connect to each water source VRF condensing units and the district heating and district cooling systems would modulate as needed to maintain the condenser water loop temperature as required. The building's hydronic hot water and chilled water loops would extend throughout the building to each DOAS unit for ventilation conditioning. The heating loop would be boiler-ready should it be deemed advisable to install one in the future.

Restroom facilities

In addition to the HVAC system needing an update, the restroom facilities in City Hall are not up to the required quantity or accessibility standards. Gausman & Moore worked with RW Fern & Associates to identify the square footage and quantity needed in City Hall. RW Fern has completed a preliminary review with the planning department. Based on discussions, code review, and attached documentation, an estimated 500 SF per floor would be required to provide four toilets per sex per floor, for a total of 40 for the entire building. This square footage estimation does not account for adjustments in size due to location within the building, access to the room, sightlines, etc. In addition, this does not factor in existing toilet rooms that may remain or if the City desires to have some individual toilet rooms throughout the building. Refer to attached documents for more details on restroom fixture calculations.

Smoke Evacuation

Along with updating City Hall's HVAC system for occupant comfort, other equipment will need to be installed to comply with current HVAC and life safety codes. Due to the open stairways in the historic building large smoke evacuation fans will need to be installed on the roof. The details of this design will need to be investigated further in the next phase of design. For the purposes of the opinion of probable

cost below, it was assumed that (2) roof mounted exhaust fans capable of 20,000 CFM each would be installed for smoke evacuation purposes.

Electrical

Power Distribution System

The electrical distribution system associated with the proposed HVAC systems for the building and addition/revision to the existing restroom facilities will include the following:

1000 Amp, 208Y/120V, 3-phase distribution board on the ground floor level. This board will be fed from an existing 1000 amp, 3-pole 'Spare' circuit breaker in the main 2000 amp, 208Y/120V, 3-phase service switchboard 'S3N-G01' located in the ground floor electrical room. The existing service board has an existing peak demand load of 174 kVA @ 208V, 3-phase that is approximately 483 amps. This allows for approximately 1200 amps of spare capacity.

The 1000 amp distribution board will feed a 200 amp, 208Y/120V, 3-phase 42 space, MLO panel on the first, second, third and fourth floors. The panels on each floor will feed the mechanical equipment located on the respective floor, including but not limited to DOAS units, VRF units and controls. They will also feed the lighting and general purpose loads associated with the new restrooms.

The smoke evacuation fans added to meet current life safety code requirements will be fed from the existing 600 amp, 208Y/120V, 3-phase life safety panel 'D3E-G02' located in the generator room on ground floor. The panel has two (2) 'Spare' 200 amp, 3-pole circuit breakers designated for these loads.

Lighting

Specification grade LED lighting will be provided in the new restroom facilities to achieve 15-30 footcandle levels. Lighting will be controlled by dual technology occupancy sensors for automatic on/off.

General Purpose Receptacles

General purpose receptacles will be provided for servicing HVAC equipment as required by code. These receptacles will be GFCI type with weather-proof covers where located on the exterior of the building.

Fire Alarm

The existing fire alarm system includes an addressable fire alarm control panel located in the mechanical room on the ground floor manufactured by Hockiki model FireNET. A remote 12-zone module panel is also located on the ground floor that interfaces the notification devices, sensing devices and addressable relays. Addressable relays will be installed to connect the smoke evacuation fans to the fire alarm system for automatic on in the event of a fire. Visual notification devices will be added to the new restroom facilities and connected to the main fire alarm control panel as required.

Individual DOAS units exceeding 2000 CFM will include duct smoke detectors to facilitate unit shutdown and combination fire/smoke damper control.

Phasing

Phasing will be important to the successful implementation of a new building wide HVAC system. City Hall is a continuously occupied building, so maintaining certain core functions of the building during the remodel will be critical. An additional benefit of VRF systems is they are uniquely suited for phased installation; the configuration of refrigerant piping distribution allows for refrigerant control boxes to be installed and ready for connections in the future. The DOAS strategy previously described also allows for each department to be a separate phase capable of being completed and fully functional quicker compared to a whole building ventilation approach.

The timing of decommissioning and removal of the existing air handling units will need to be discussed further. The units supply about 15,000 CFM of air to a few select large gathering rooms including City Council chambers, and Mayor's reception room. The removal of the existing air handling units to make room for VRF condensing units prior to installation of the DOAS units would leave those large gathering rooms temporarily without ventilation air. Should those units need to remain in place and operational into the later or final phases of the project then additional mechanical and electrical room space will need to be allotted throughout the building.

Additional Energy Saving Operations

The smoke evacuation fans could also be used to take advantage of the cooler climate summer climate by using the fans to do a night purge of the building when the outdoor air temperature cools off on summer evenings when unoccupied. The energy model does not provide an estimate for the potential impact of this option on building energy use.

To make the most of natural ventilation and free cooling, we recommend a unique control strategy. That strategy would be to control a combination of red light/green light indicators that would signal when optimal natural ventilation conditions exist. Installation of window contact switches would disable the HVAC system if any windows in a department are open. This combination would provide guidance to occupants as to when conditions are favorable to utilize mechanical cooling and the window contact switches can ensure all windows are closed before the HVAC system is allowed to operate in cooling or heating mode. This strategy would have limitations programmed so that it doesn't allow the building to drift too far out of compliance with alarms to signal problems before any damage was done.

Gausman & Moore
Mechanical and Electrical Engineers

OPINION OF PROBABLE CONSTRUCTION COST

The opinion of probable cost is broken into two phases; the first phase includes demolition of steam piping throughout the building, installation of the heating and cooling loops to serve the VRF systems, electrical infrastructure, a building management system, and smoke evacuation provisions. The table below includes the breakout for each category and expected cost range.

	Scope Description	Estimate Includes:	Probable Cost Range	
Phase 1	Demolition	Remove 10000 ft steam piping, remove 20000 lb ductwork, remove 2 AHU	$100,000	$120,000
	Hydronic Hot Water Heating Plant Install	Heat exchanger, piping, pumps	$780,000	$936,000
	Chilled Water Cooling Plant Install	Heat exchanger, piping, pumps	$520,000	$624,000
	Electrical Infrastructure & Connections	Electrical Distribution, connections to mech equip, fire alarm	$190,000	$228,000
	Controls	Building BMS system	$50,000	$60,000
	Smoke Evacuation	(2) 20000 CFM fans and 100 ft ductwork	$40,000	$48,000
TOTAL			$1,680,000	$2,016,000

Upon completion of phase 1 all infrastructure will be in place to install a VRF and ventilation systems on one or more floors. The restroom cost is included in the phase 2 estimation as it is based on a cost per square foot, but this scope could be completed before, during, or after phases 1 and 2 and the exact timing of restroom renovation may be critical to the availability of space to be reallocated for mechanical and electrical equipment.

		Cost per sq ft	G	1st	2nd	3rd	4th	Total
Phase 2: Per Floor	Ventilation & VRF System and controls	$20	$603,640	$536,680	$539,080	$459,860	$330,800	$2,470,060
	Electrical Connections		$50,000	$55,000	$55,000	$55,000	$50,000	$265,000
	Restroom, 500 sq ft per floor	$600	$300,000	$300,000	$300,000	$300,000	$300,000	$1,500,000
	TOTAL		$953,640	$891,680	$894,080	$814,860	$680,800	$4,235,060

Phase 1 and 2: Probable Cost Range	
$5,915,000	$7,098,000

Costs not included in the opinion of probable cost includes soft costs for design fees, structural modifications, general construction (including but not limited to existing ceiling removal and replacement), multiple construction mobilizations associated with phased construction, and commissioning.

RW Fern Associates Inc. - AIA Architects
5517 Grand Avenue Duluth, MN 55807
218-722-8271 218-722-9550 Fax

July 16, 2020

Mr. Scott Haedtke
Gausman & Moore
501 Lake Avenue, Suite 210
Duluth, MN 55802

Duluth City Hall
Replacement Toilet Rooms

Dear Scott:

We have concluded our calculations for the minimum required plumbing fixtures based on the newly renovated and future renovated spaces. Attached to this letter is the minimum fixture calculation sheet and supporting floor plans.

As requested, I tried to quantify the required fixtures into an approximate area for planning purposes. The calculations revealed that 32 toilets would be required within the building and dispersed over the five (5) floors. For ease of calculation and to make distribution even, I determined the approximate area based on 40 toilets total (8 toilets per floor – 4 each per sex). Based on this, each toilet room would require approximately 250 SF/sex or 500 SF per floor. Overall the toilet rooms would require about 2500 SF total.

The approximate area does not take into account adjustments in size due to location within the building, access to room, sight lines, etc. In addition, this does not factor in existing toilet rooms that may remain in the remodeling or if the City desires to have some individual toilet rooms throughout the building.

If you have any questions, I would be pleased to review the methodology used to determine quantity and area.

Sincerely,

Robert Fern, AIA
Architect

Encl.

RW Fern Associates Inc. - AIA Architects
5517 Grand Avenue Duluth, MN 55807
218-722-8271 218-722-9550 Fax

July 16, 2020

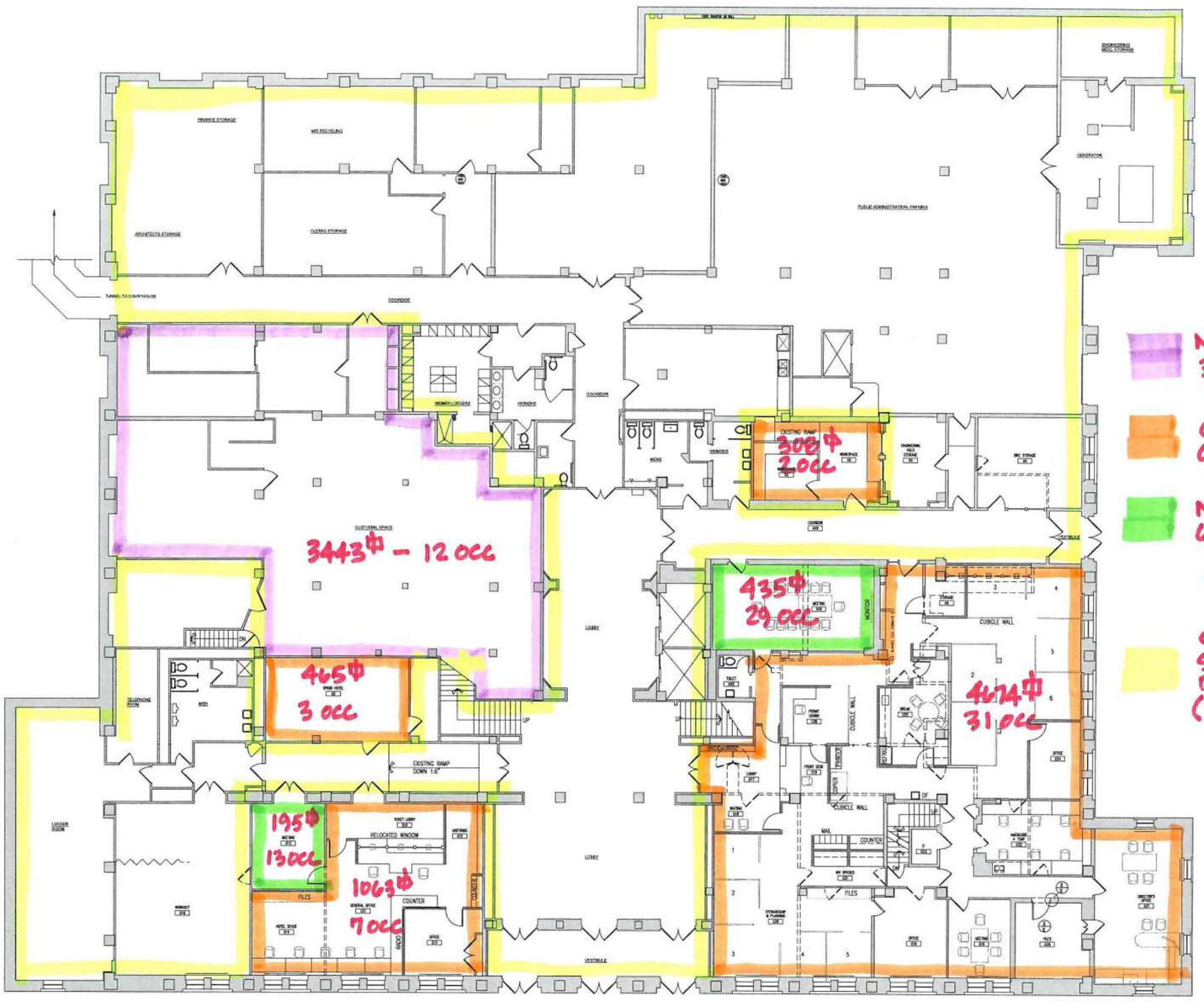
Duluth City Hall Plumbing Fixture Calculations
Minimum required per 2020 MN Building Code, Chapter 29

Occupant Load per attached floor plans:

Ground Floor	97
1st Floor	657
2nd Floor	139
3rd Floor	312
4th Floor	358
Total	1563 occupants

Minimum number of plumbing fixtures (using "B" Occupancy requirements as this classification more closely matched function of building)

Toilets	1/26 first 50	2
	1/50 remainder	30
		32 toilets total
Lavatories	1/40 first 80	2
	1/80 remainder	18
		20 lavs total
Drinking fountains	1/100	16 total
Service sink		1 sink



MAINTENANCE
3443 ϕ ÷ 300 = 12 OCC

OFFICE SPACE
6510 ϕ ÷ 150 = 43 OCC

MTG, OPEN TO PUBLIC
630 ϕ ÷ 15 = 42 OCC

TOTAL THIS FLR = 97 OCC

CIRCULATION AND SPACES OCCUPIED BY BLDG STAFF (NOT IN CALC)

1/1 GROUND FLOOR PLAN

1/8"=1'-0"

GROUND FLOOR

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
DATE: 11-17-19

PLAN NORTH

LINE IS TWO INCHES AT FULL SCALE (30X42 SHT) (IF NOT 2" - SCALE ACCORDINGLY)

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed ARCHITECT under the laws of the State of MINNESOTA

Date TODAY Reg. No. XXXX

PROPOSED PLAN

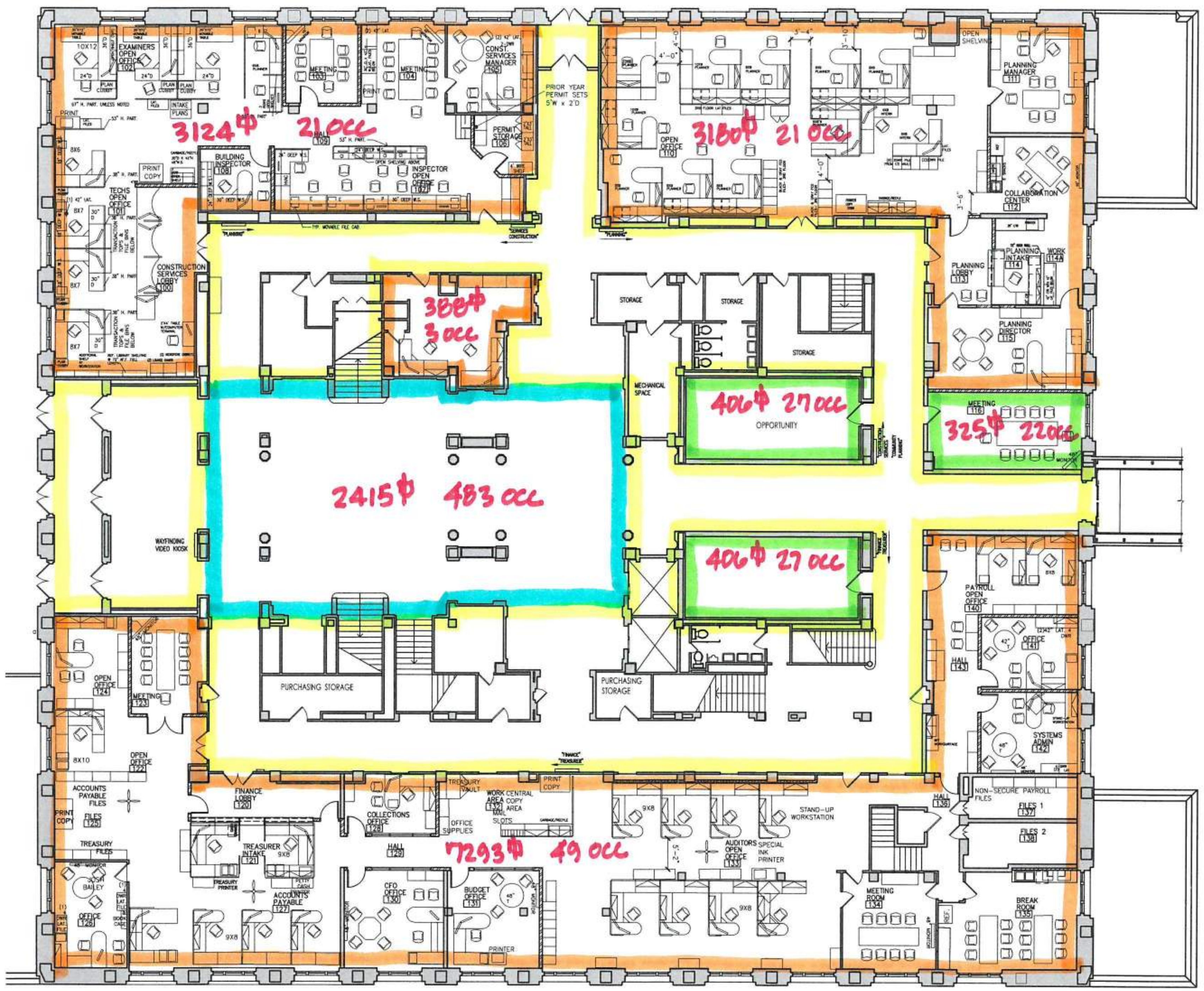
RW Fern Associates Inc. Architects, 5517 Grand Ave, Duluth, Minnesota 55807 (218) 722-8271

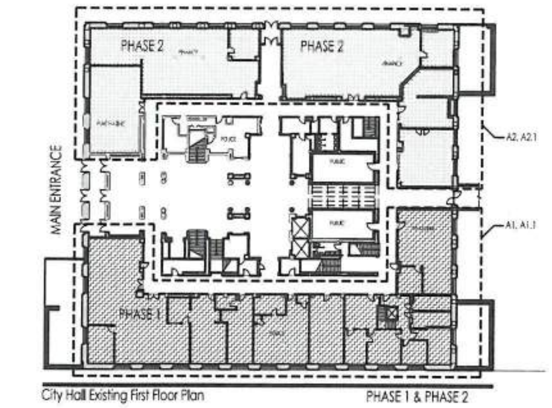
Duluth City Hall Renovation Study
411 West First Street,
Duluth, MN.

Job No. 2471 Date XXX
Drawn By SMW Drawer
Sheet: 1 of: 1

7/16/20

REVISED MINIMUM PLUMBING FIXTURE CALCULATIONS





OFFICE SPACE 14,685⌀ ÷ 150 = 98 OCC

MTG OPEN TO PUBLIC 1,137⌀ ÷ 15 = 76 OCC

ASSEMBLY 2,415⌀ ÷ 5 = 483 OCC

TOTAL THIS FLR 657 OCC

CIRCULATION AND SPACES OCCUPIED BY BLDG STAFF (NOT IN CALC)

1 FF1 1ST FLOOR FURNITURE AND FILES LAYOUT – PHASE 1 AND 2 – FOR REFERENCE ONLY
FOR MECHANICAL, ELECTRICAL & DATA REFERENCE. COORDINATE AS REQUIRED. 1/8"=1'-0"

FIRST FLOOR

RW Fern Associates Inc. Architect, 413 East Superior Street, Duluth, Minnesota 55802 (218) 722-8271

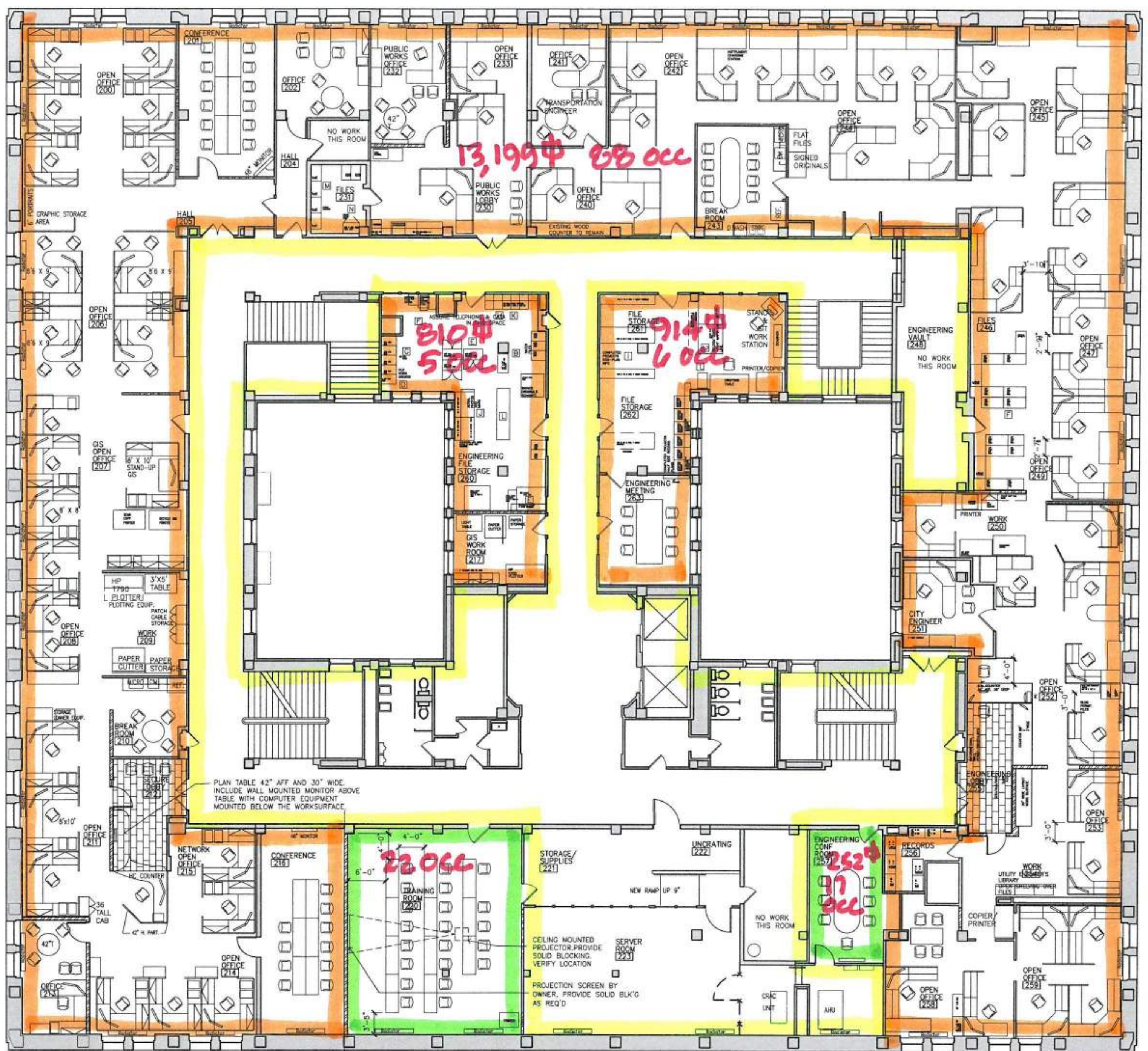
DULUTH CITY HALL – PROJECT # 17-426
INTERIOR RENOVATIONS
411 WEST FIRST STREET, DULUTH, MN. 55802

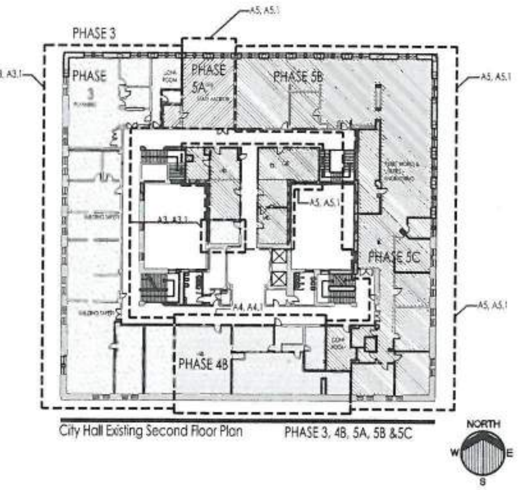
PHASE1 & 2 – FURNITURE AND FILES

REVISED MINIMUM PLUMBING FIXTURE CALCULATIONS 7/16/20

Job No. 2417 Date 6-15-17

Sheet: 2 of 3





OFFICE SPACE
14,923⌀ ÷ 150 = 100 OCC

MTG OPEN TO PUBLIC
252⌀ ÷ 15 = 17 OCC
+ 22 OCC
39 OCC = 39 OCC

TOTAL THIS FLR = 139 OCC

CIRCULATION AND SPACES OCCUPIED BY BLDG STAFF (NOT IN CALC)

1/FF2 2ND FLOOR FURNITURE AND FILES LAYOUT – PHASE 3, 4B, 5A, 5B, & 5C – FOR REFERENCE ONLY

FOR MECHANICAL, ELECTRICAL & DATA REFERENCE. COORDINATE AS REQUIRED.

1/8" = 1'-0"

NORTH

SECOND FLOOR

LINE IS TWO INCHES AT FULL SCALE on a 30x42 sheet (IF NOT 2" – SCALE ACCORDINGLY)

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed ARCHITECT under the laws of the State of MINNESOTA.
ROBERT FERN
Date 6-15-17 Reg. No. 20088

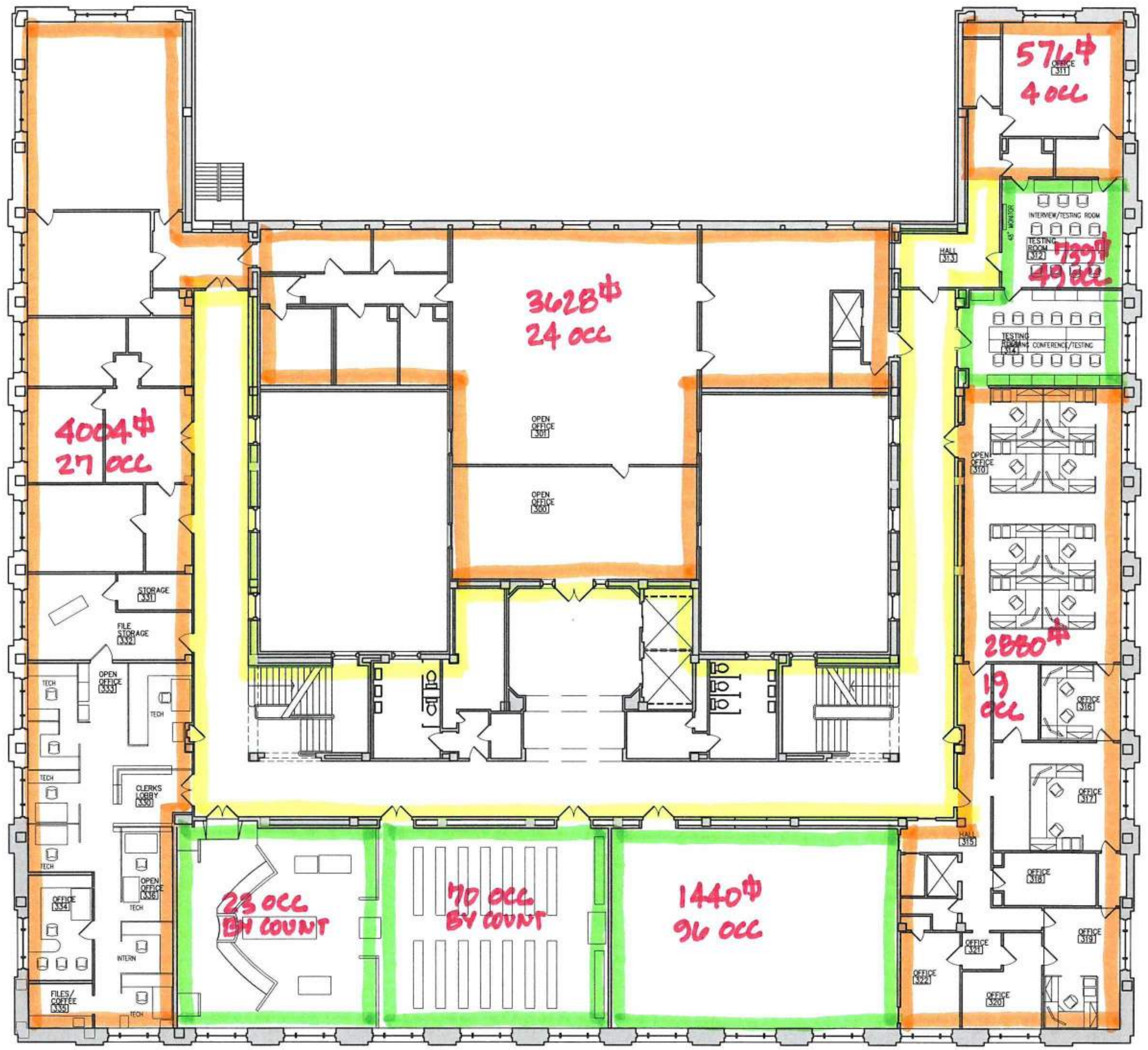
PHASE 3– FURNITURE AND FILES LAYOUT
GIS/MIS DEPT

RW Fern Associates Inc. Architect, 413 East Superior Street, Duluth, Minnesota 55802 (218) 722-8271

DULUTH CITY HALL – PROJECT #17–426
INTERIOR RENOVATIONS
411 WEST FIRST STREET, DULUTH, MN. 55802

Job No. 2417	Date 6-15-17
Drawn By SMW	Drawer 22
Sheet: 3 of: 3	

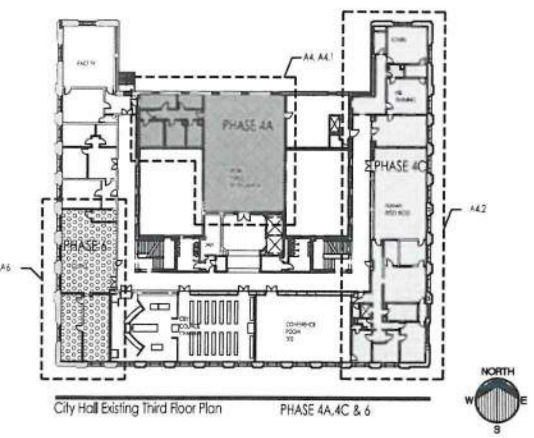
MINIMUM PLUMBING FIXTURE CALCULATIONS 7/16/20



3RD FLOOR FURNITURE AND FILES LAYOUT – PHASE 4A, 4C & 6 — FOR REFERENCE ONLY

FOR MECHANICAL, ELECTRICAL & DATA REFERENCE. COORDINATE AS REQUIRED. 1/8"=1'-0"

NORTH



City Hall Existing Third Floor Plan — PHASE 4A, 4C & 6

OFFICE SPACE
11,088 ⊄ ÷ 150 = 74 occ

MTG OPEN TO PUBLIC
2,179 ⊄ ÷ 15 = 145 occ
\+ 23 occ
\+ 70 occ
238 occ = 238 occ

TOTAL THIS FLR = 312 occ

CIRCULATION AND SPACES OCCUPIED BY BLDG STAFF (NOT IN CALC)

THIRD FLOOR

RW Fern Associates Inc. Architect, 413 East Superior Street, Duluth, Minnesota 55802 (218) 722-8271

DULUTH CITY HALL – PROJECT #17-426
INTERIOR RENOVATIONS
411 WEST FIRST STREET, DULUTH, MN. 55802

3RD FLR FURNITURE AND FILES LAYOUT
PHASE 4A, 4C & 6

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed ARCHITECT under the laws of the State of MINNESOTA
ROBERT FERN
Reg. No. 20088

Job No. 2417 — Date 6-15-17 — Drawn By GMW — 22

Sheet: 4 of 3

LINE IS TWO INCHES AT FULL SCALE on a 30x42 sheet (IF NOT 2" – SCALE ACCORDINGLY)

MINIMUM PLUMBING FIXTURE CALCULATIONS 7/14/20

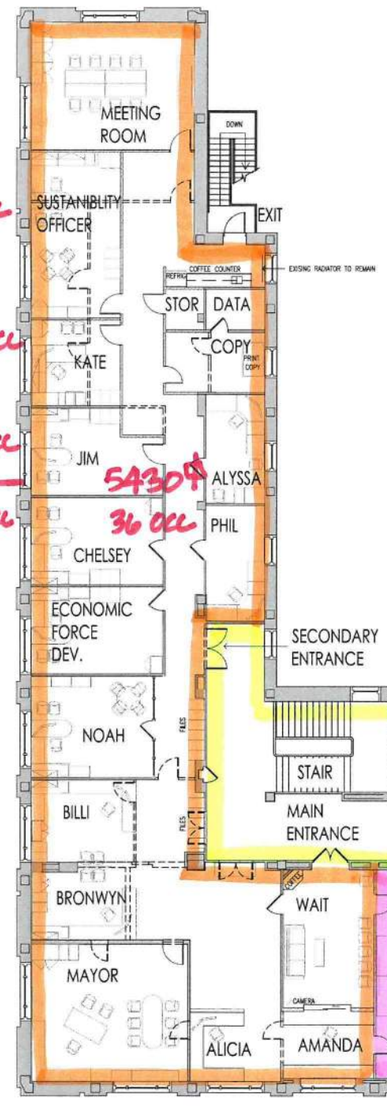
OFFICE SPACE
10,595ф ÷ 150 = 71 occ

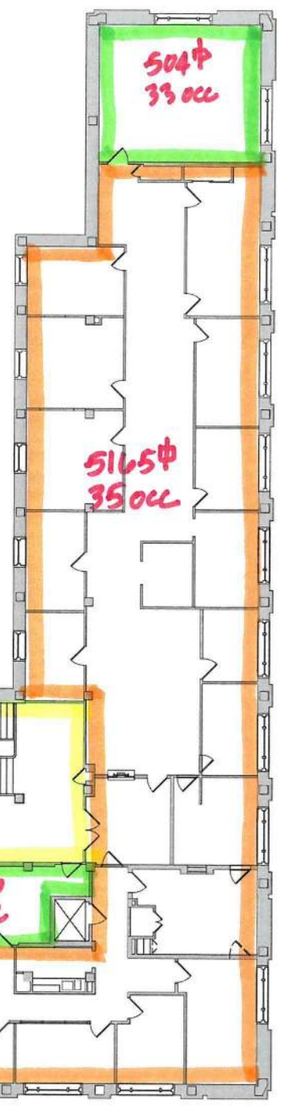
MTG OPEN TO PUBLIC
1,608ф ÷ 15 = 107 occ

MAYOR'S RECEPTION
896ф ÷ 5 = 180 occ

TOTAL THIS FLR 358 occ

CIRCULATION AND SPACES OCCUPIED BY BLDG STAFF (NOT IN CALC)





City Hall Fourth Floor Concept Plan

1/8" = 1'-0"

FOURTH FLOOR

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
DATE: 1/21/20

LINE IS TWO INCHES AT FULL SCALE (50.42 SHT) (IF NOT 2"- SCALE ACCORDINGLY)

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed ARCHITECT under the laws of the State of MINNESOTA

Date 7/2019 Reg. No. 20088

CONCEPT PLAN

RW Fern Associates Inc. Architects, 5517 Grand Ave, Duluth, Minnesota 55807 (218) 722-8271

DULUTH CITY HALL
INTERIOR RENOVATIONS— FOURTH FLOOR
411 WEST FIRST STREET, DULUTH, MN. 55802

Job No. 2471 Date XX/19
Drawn By SMW Checked By TWL
Sheet: 5 of: 1

MINIMUM PLUMBING FIXTURE CALCULATIONS n/a/no

City of Duluth Municipal Building
Owner Performance Requirements

Definitions:

City owned buildings: include all buildings within the City of Duluth building portfolio. Specifically, this includes buildings that are:

- Buildings that are directly owned by the City of Duluth, regardless of building construction or operation (e.g. Civic Center parking ramp)
- Enterprise-funded Buildings
- Conditioned buildings and semi-heated buildings regularly utilized by the City of Duluth

This definition is adopted to ensure real progress towards reducing our greenhouse house gas emissions across all City owned buildings. See attachment for full list.

ASHRAE standard 90.1 is utilized to differentiate different types of buildings this policy:

- Semi-heated spaces: spaces that are heated, but not to comfort levels, and not cooled (for example, a pumphouse)
- Conditioned spaces: enclosed spaces that are heated or cooled for human occupancy
- Unconditioned spaces: enclosed spaces within a building that are not conditioned or semi-heated

Policy:

LOW PITCH ROOF ASSEMBLIES – R- 50 MINIMUM WHERE BUILDING CAN HANDLE THE LOAD, FULLY ADHERED WHITE EPDM WHERE APPLICABLE. FULL TEAR DOWN: INCREASE INSULATION, AIR SEAL, AND VENTS REPLACED. REPLACEMENT: CASE BY CASE BASIS.

ATTIC INSULATION – FOR BOTH SEMI-HEATED AND CONDITIONED SPACES. CEILING/ATTIC MUST STRIVE FOR A VALUE OF R-80.

ROOF LOAD CAPACITY – ROOF DESIGNED TO ACCOMMODATE PV SYSTEM INCLUDING BALLAST (NEW CONSTRUCTION), CASE BY CASE BASIS FOR RENOVATIONS. GROUND MOUNT COULD BE SUBSTITUTED IF APPLICABLE.

HVAC EQUIPMENT & CONTROL – WHENEVER MAJOR COMPONENTS OR SYSTEMS ARE REPLACED WHOLE SYSTEMS COMMISSIONING WILL BE CONSIDERED. UTILIZE VARIABLE FREQUENCY DRIVES WHENEVER PRACTICAL. UPDATE TO MINIMUM OF 90% EFFICIENCY FOR COMBUSTION EQUIPMENT OR INCORPORATE HEAT PUMPS INTO EXISTING HEATING SYSTEMS. ALL OTHER SPECIFICS CAN BE FOUND IN "SECTION 230923 – DIRECT DIGITAL CONTROL (DDC) SYSTEM FOR HVAC" IN THE ADDENDUM.

STRATEGIC COMMISSIONING - WHEN DESIGNING RENOVATION PROJECTS, RECOMMENDATIONS FOR STRATEGIC RETRO-COMMISSIONING OF HVAC SYSTEMS WILL BE CONSIDERED

FLEXIBLE FUEL SYSTEM – WHEN POSSIBLE, DURING RECONSTRUCTION, NEW CONSTRUCTION, OR MAJOR RENOVATIONS, BUILDINGS AND SITES SHOULD BE SWITCHED TO ELECTRIC FUEL SYSTEMS. IF

NOT POSSIBLE, THE INFRASTRUCTURE FOR FUTURE ELECTRIFICATION SHOULD BE BUILT INTO BUILDINGS AND SITES.

ENVELOPE DETAILING AND AIR SEALING - IN CASES OF MAJOR OR COMPLETE EXTERIOR ENVELOPE RENOVATIONS/RETROFITS, ENVELOPE COMMISSIONING WILL BE CONSIDERED. THE FOLLOWING AREAS ARE TO BE WRAPPED, SEALED, CAULKED, GASKETED, OR TAPED: JOINTS AROUND FENESTRATION AND DOOR FRAMES (BOTH MANUFACTURED AND SITE-BUILT), JUNCTIONS BETWEEN WALLS AND FOUNDATIONS, AT BUILDING CORNERS, AND ROOFS OR CEILINGS, PENETRATIONS FOR ROOFS, WALLS, AND FLOORS, BUILDING ASSEMBLIES USED AS DUCTS OR PLENUMS, JOINTS, SEAMS, CONNECTIONS BETWEEN PLANES, AND OTHER CHANGES IN AIR BARRIER MATERIALS.

STRUCTURAL STEEL COMPONENTS - DOMESTICALLY MANUFACTURED

PREMIUM EFFICIENCY ELECTRICAL COMPONENTS - ELECTRICAL MOTORS, TRANSFORMERS AND SIMILAR EQUIPMENT WILL BE CHOSEN TO OPTIMIZE EFFICIENCY

WINDOWS - OVERALL UNIT U-0.25 OR LOWER. SOLAR HEAT GAIN COEFFICIENT OF 0.40 OR LESS WHERE PRACTICAL. BIRD SAFE GLASS AND STRIKE REDUCTION TECHNOLOGIES SHOULD BE EMPLOYED IN MAJOR BIRD MIGRATION ROUTES, SUCH AS ELIMINATING FLY-THROUGH CONDITIONS, DESIGNING BUILDINGS WITH A TOTAL WINDOW SURFACE AREA OF 25-40 PERCENT RELATIVE TO THE ENTIRE FACADE (LOW WINDOW TO WALL RATIO), AND CREATING VISUAL MARKERS. SEE THE CITY OF TORONTO'S GUIDE TO "BIRD FRIENDLY BEST PRACTICES GLASS" FOR GUIDANCE ON BIRD SAFE DESIGN.

LIGHTING FIXTURES - MUST BE LED OR MOST EFFICIENT ALTERNATIVE IF LED IS UNAVAILABLE. LIGHTING MUST BE AUTOMATICALLY CONTROLLED WHENEVER POSSIBLE. TIME OF DAY, OCCUPANCY, AND DAYLIGHTING SENSORS MUST ALSO BE INSTALLED WHENEVER POSSIBLE.

STAIRWELLS – MAXIMUM SIZE LIGHTS (WINDOWS) IN THE STAIRWAY DOORS TO ENCOURAGE STAIR USE AND IMPROVE SECURITY. ADDITIONALLY, VACNACY SENSORS OR OCCUPANCY-BASED DIMMERS SHOULD BE INSTALLED IN ALL STAIRWELLS.

LOW FLOW FIXTURES – SHOWERHEADS SHOULD USE 2.0 GALLONS PER MINUTE (GPM) OF WATER OR LESS. A FAUCET USES 1.5 GPM OF WATER OR LESS. WHERE POSSIBLE DUAL TOILETS SHOULD BE UTILIZED, AND ALL TOILETS SHOULD BE "LOW FLUSH" TOILETS, USING 1.28 GALLONS/FLUSH OR LESS WATER.

HIGH EFFICIENCY HAND DRYERS – RESTROOMS WITH HAND DRIERS SHOULD USE HIGH EFFICIENCY PRODUCTS

RAINWATER/GREYWATER RECLAMATION – MUST BE CONSIDERED WHERE PERMITTED, APPLICABLE, AND RATIONAL

GENDER NEUTRAL RESTROOMS – MUST PROVIDE CONVIENENTLY-LOCATED GENDER NEUTRAL RESTROOMS AND LACTATION ROOMS IN NEW PROJECTS AND MAJOR RENOVATIONS

WATER HEATING – POINT OF USE OR ON DEMAND WATER HEATING WHEREVER POSSIBLE – 6 GAL FOR JANITOR CLOSETS. ELECTRIFICATION OF WATER HEATING WILL BE PRIORITIZED. WHERE POINT OF USE OR ON DEMAND WATER HEATING IS NOT POSSIBLE HEAT PUMPS SHOULD BE INSTALLED WHERE APPROPRIATE.

JANITOR CLOSETS – AMPLE NUMBER, SIZE, AND LOCATIONS INCLUDED IN NEW PROJECTS AND MAJOR RENOVATIONS

ALL APPLIANCES - ENERGY STAR OR BETTER, WHEN RATED

VENDING – IF VENDING MACHINES ARE REQUIRED THEY MUST BE ENERGY STAR RATED

CARPET TILES – NO ROLLED GOODS

LONG LIFE CYCLE/REDUCED MAINTENANCE – DURABLE MATERIALS INTERIOR & EXTERIOR, WILL BE USED TO ENHANCE LONGEVITY AND REDUCE MAINTENANCE

LOW MAINTENANCE – ROBUST EQUIPMENT, MATERIALS & SYSTEMS – EASY ACCESS – AMPLE SIZED EQUIPMENT ROOMS – MORE ZONE VALVES, ISOLATION CAPABILITIES, ETC. – LOW MAINTENANCE LANDSCAPE

HIGH EFFICIENCY DATA CENTER – RUN DARK DESIGN, NO STAFF PERMANENTLY HOUSED IN DATA EQUIPMENT ROOM, HEAT RECLAMATION, RACK/EQUIPMENT LAYOUT CONSIDERATION (HOT AISLE/COOL AISLE & EQUIPMENT STACKING CONSIDERATIONS)

ELECTRIC VEHICLE CHARGING - WHERE APPROPRIATE, IN PARKING LOT, RAMP, OR CITY FLEET PARKING MAJOR RENOVATIONS OR NEW CONSTRUCTION, EV CHARGERS OR CHARGING INFRASTRUCTURE SHOULD BE IMPLEMENTED.

PERSONAL APPLIANCE POLICY - PLEASE CONTINUE TO FOLLOW THE PERSONAL AND CITY OWNED APPLIANCE POLICY INCLUDED IN THE ADDENDUM

VEHICLE IDLING POLICY - PLEASE CONTINUE TO FOLLOW THE VEHICLE IDLING POLICY INCLUDED IN THE ADDENDUM

ENERGY STAR COMPUTERS – ENERGY STAR CERTFIED COMPUTERS SHOULD BE PRIORITIZED IN PURCHASING